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TPC Benchmark™ H
Full Disclosure Report

Sun Microsystems Sun Fire™ X4140 Server
Using Sybase IQ 12.6 Single Application Server

Submitted for Review
Report Date: Apr 15, 2008

TPC Benchmark H Full Disclosure Report

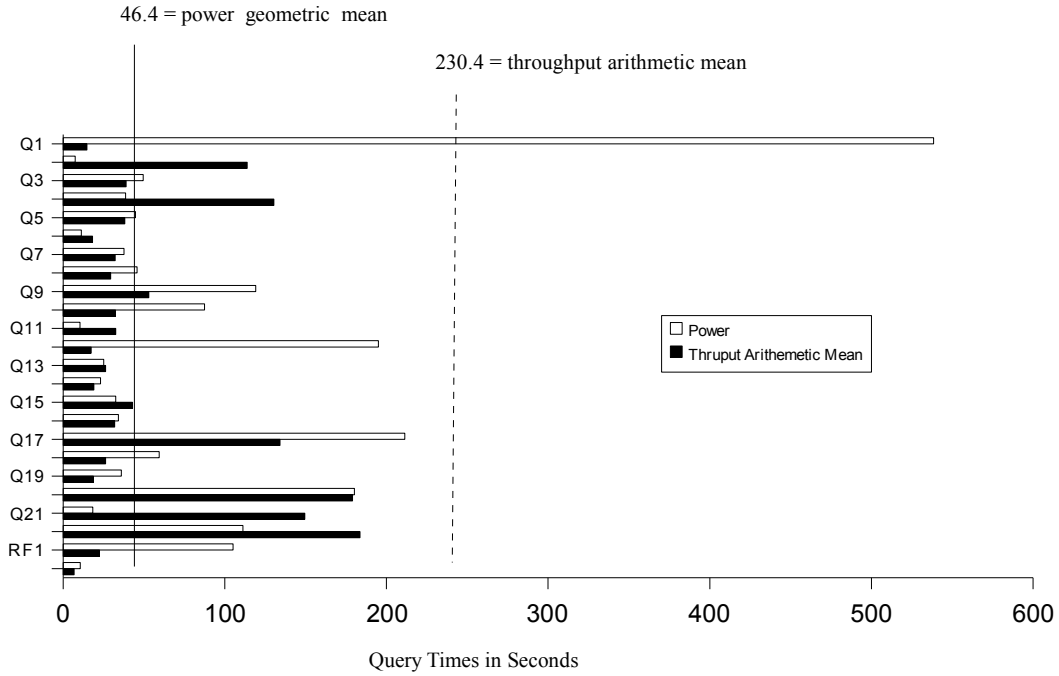
First Printing

901 San Antonio Road, Palo Alto, California 94303 U.S.A.

Sun microsystems / SYBASE	**Sun Fire™ X4140 Server with Sybase IQ 12.6 Single Application Server**	**TPC-H Rev. 2.6.2** **Report Date: Apr 15, 2008**

Total System Cost	Composite Query per Hour Metric	Price/Performance
$ 27,503.90	**8,337.7** QphH@100GB	**$ 3.30** per QphH@100GB

Database Size	Database Manager	Operating System	Other Software	Availability Date
100GB	**Sybase IQ 12.6 Single Application Server**	**Solaris 10**	**Solaris Volume Manager**	**Apr 15, 2005**



Database Load Time = 60 min	Load Includes Backup: N	Total Storage/Database Size= 5.4

RAID (Base tables): RAID 1	RAID (Base tables and auxiliary data structures): RAID 1	RAID (All): N

System Configuration:

SunFire X4140 Server each with
- 2 Opteron 3.0 GHz Dual Core processors
- 16 GB memory
- 8 X 73GB internal disks (10K RPM)

Total Storage: 544 GB

(in this calculation 1 GB is defined as 1024 * 1024 * 1024)

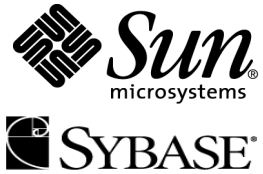
Sun Fire™ X4140 Server with Sybase IQ 12.6 Single Application Server

TPC-H Rev. 2.6.2

Report Date: Apr 15, 2008

Description	Part Number	Source	Unit Price	Qty	Ext. Price	3 Yr. maint.
Server Hardware						
SunFire X4140, 2x3.0 GHz CPUs, 16GB memory, 8 x 73GB (15K) disks		1	9,851.00	1	9,851.00	
3 Year Gold Warranty Upgrade – X4140 Server		1		1		2,030.00
Sun Server Discount					985.10	
Server Hardware Subtotal					8,865.90	2,030.00
External Storage						
None						
Server Software						
Sybase IQ Single App Svr – per cpu core	11467	4	2,595.00	4	10,380.00	
Sybase IQ 3 Years Extended Support 24 x 7	98477	4	1,557	4		6,228.00
Sybase discount					0.00	
Server Software Subtotal					10,380.00	6,228.00
			Total		19,245.90	8,258.00
			3 Yr. Cost		27,503.90	
			QphH@ 100GB		8,337.7	
			$/QphH@ 100GB		3.30	
Service for Sun products is from Sun Microsystems, Inc.						
Service for Sybase products is from Sybase Inc.						
Notes (Source):					11881	9851
1. Sun Microsystems Inc.						
2. Sybase Inc.						
PriceQuotes provided in Appendix G						

Audited by: Brad Askins, InfoSizing, Inc. (www.sizing.com)



Sun Fire™ X4140 Server with Sybase IQ 12.6 Single Application Server

TPC-H Rev. 2.6.2

Report Date: Apr 15, 2008

Numerical Quantities

Measurement Results:

Database Scale Factor	= 100GB
Total Data Storage / Database Size	= 5.4
Start of database load time	= 02-07-2008 14:39:16
End of database load time	= 02-07-2008 15:38:54
Database Load Time	= 60 min
Query Streams for Throughput Test	= 6
TPC-H Power	= 7,756.2
TPC-H Throughput	= 8,962.7
TPC-H Composite Query-per-Hour Rating (QphH@100GB)	= 8,337.7
Total System Price Over 3 Years ($US)	= 27,503.90
TPC-H Price/Performance Metric ($/QphH@100GB)	= 3.30

Measurement Intervals:

Measurement Interval in Throughput Test (Ts)	= 5,302 seconds

Duration of Stream Execution:

Stream ID	Seed	Start Date	Start Time	End Date	End Time	Duration
Stream 00	207153854	7-Feb-08	17:33:55	7-Feb-08	18:01:10	0:27:15
Stream 01	207153855	7-Feb-08	18:01:11	7-Feb-08	19:10:19	1:09:08
Stream 02	207153856	7-Feb-08	18:01:11	7-Feb-08	19:28:40	1:27:30
Stream 03	207153857	7-Feb-08	18:01:11	7-Feb-08	19:28:08	1:26:57
Stream 04	207153858	7-Feb-08	18:01:11	7-Feb-08	19:28:58	1:27:47
Stream 05	207153859	7-Feb-08	18:01:11	7-Feb-08	19:29:32	1:28:21
Stream 06	207153860	7-Feb-08	18:01:11	7-Feb-08	19:28:29	1:27:18
Refresh			18:01:11	7-Feb-08	18:37:54	0:21:58

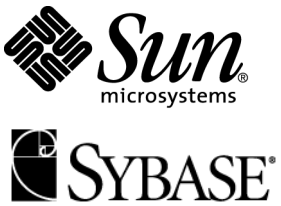
Sun Fire™ X4140 Server with Sybase IQ 12.6 Single Application Server

TPC-H Rev. 2.6.2

Report Date: Apr 15, 2008

TPC-H Timing Intervals (in seconds)

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12
Stream 00	538.50	7.40	49.50	38.70	44.70	11.30	37.70	45.80	119.20	87.50	10.50	27.40
Stream 01	969.08	8.70	195.20	55.90	95.90	18.80	71.90	50.50	225.40	161.50	24.50	46.30
Stream 02	1684.67	30.40	111.60	166.40	153.60	58.30	183.00	140.10	409.70	407.10	23.80	113.30
Stream 03	1013.14	8.10	94.00	168.30	288.60	47.20	131.00	195.90	256.30	177.00	20.40	68.90
Stream 04	961.83	9.40	93.30	180.70	290.80	44.40	56.70	99.50	483.50	329.50	16.40	117.90
Stream 05	967.62	12.30	80.60	206.50	93.30	30.40	76.20	91.70	253.10	230.30	37.20	65.00
Stream 06	675.76	12.90	154.70	125.70	121.50	29.20	228.90	98.50	532.40	595.10	21.10	59.40
Minimum	675.76	8.10	80.60	55.90	93.30	18.80	56.70	50.50	225.40	161.50	16.40	46.30
Average	1045.35	13.63	121.57	150.58	173.95	38.05	124.62	112.70	360.07	316.75	23.90	78.47
Maximum	1684.67	30.40	195.20	206.50	290.80	58.30	228.90	195.90	532.40	595.10	37.20	117.90



Sun Fire™ X4140 Server with Sybase IQ 12.6 Single Application Server

TPC-H Rev. 2.6.2

Report Date: Apr 15, 2008

	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20	Q21	Q22	RF1	RF2
Stream 00	195.00	25.10	23.10	32.50	34.10	211.30	59.50	36.10	180.20	18.40	111.30	105.10
Stream 01	295.40	31.00	37.10	50.80	42.80	1032.30	82.10	63.60	992.90	26.80	230.20	178.50
Stream 02	611.40	85.10	64.10	177.20	121.70	692.90	236.90	91.60	327.40	69.20	157.20	223.10
Stream 03	539.40	31.50	52.50	122.00	105.20	808.60	86.20	50.10	231.20	49.60	191.20	140.00
Stream 04	482.30	69.40	173.00	136.00	127.20	628.10	243.70	50.10	564.00	55.50	189.30	191.40
Stream 05	534.00	72.20	141.10	83.80	43.80	752.00	250.60	90.50	1090.40	103.20	236.80	164.50
Stream 06	690.40	44.90	54.30	149.60	53.00	760.80	85.00	85.70	303.10	62.40	154.00	145.40
Minimum	295.40	31.00	37.10	50.80	42.80	628.10	82.10	50.10	231.20	26.80	154.00	140.00
Average	525.48	55.68	87.02	119.90	82.28	779.12	164.08	71.93	584.83	61.12	193.12	173.82
Maximum	690.40	85.10	173.00	177.20	127.20	1032.30	250.60	91.60	1090.40	103.20	236.80	223.10

Table of Contents

INFO SIZING

TPC TRANSACTION PROCESSING PERFORMANCE COUNCIL CERTIFIED AUDITOR

Benchmark Sponsors:

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April 1, 2008

I verified the TPC Benchmark™ H performance of the following configuration:

Platform: **Sun Fire X4140 Server**

Database Manager: **Sybase IQ 12.6 Single Application Server**

Operating System: **Solaris 10**

The results were:

CPU (Speed)	Memory	Disks	QphH@100GB
Sun Fire V490 with:			
2 x Opteron Dual Core (3.0 GHz)	16 GB Main	18 x 73 GB (internal)	**8337.7**

In my opinion, this performance result was produced in compliance with the TPC's requirements for the benchmark. The following verification items were given special attention:

" The database records were defined with the proper layout and size

" The database population was generated using DBGEN

" The database was properly scaled to 100GB and populated accordingly

• The compliance of the database auxiliary data structures was verified

• The database load time was correctly measured and reported

" The required ACID properties were verified and met

" The query input variables were generated by QGEN

" The query text was produced using minor modifications

" The execution of the queries against the SF1 database produced compliant answers

" A compliant implementation specific layer was used to drive the tests

" The throughput tests involved 6 query streams

" The ratio between the longest and the shortest query was such that no query timing was adjusted

" The execution times for queries and refresh functions were correctly measured and reported

" The repeatability of the measured results was verified

" The required amount of database log was configured

" The system pricing was verified for major components and maintenance

" The major pages from the FDR were verified for accuracy

Additional Audit Notes:

None.

Respectfully Yours,

Francois Rabb, President

Bradley J. Askins, Auditor

TPC Benchmark H Overview

The TPC BenchmarkTM H (TPC-H) is a Decision Support benchmark. It is a suite of business-oriented ad-hoc queries and concurrent modifications. The queries and the data populating the database have been chosen to have broad industry-wide relevance while maintaining a sufficient degree of ease of implementation. This benchmark illustrates Decision Support systems that:

- Examine large volumes of data
- Execute queries with a high degree of complexity
- Give answers to critical business questions

TPC-H evaluates the performance of various Decision Support systems by the execution of sets of queries against a standard database under controlled conditions. The TPC-H queries:

- Give answers to real-world business questions
- Simulate generated ad-hoc queries
- Are far more complex than most OLTP transactions
- Include a rich breadth of operators and selectivity constraints
- Generate intensive activity on the part of the database server component of the system under test
- Are executed against a database complying to specific population and scaling requirements
- Are implemented with constraints derived from staying closely synchronized with an on-line production database

1. General Items

1.1 Benchmark Sponsor

A statement identifying the benchmark sponsor(s) and other participating companies must be provided.

Sun Microsystems, Inc. and Sybase Inc. are the sponsors of this TPC-H benchmark.

1.2 Parameter Settings

Settings must be provided for all customer-tunable parameters and options that have been changed from the defaults found in actual products, including but not limited to:

- *Database Tuning Options*
- *Optimizer/Query execution options*
- *Query processing tool/language configuration parameters*
- *Recovery/commit options*
- *Consistency/locking options*
- *Operating system and configuration parameters*
- *Configuration parameters and options for any other software component incorporated into the pricing structure*
- *Compiler optimization options*

Appendix A contains the Solaris and Sybase IQ parameters used in this benchmark.

1.3 Configuration Diagram

Provide diagrams of both the measured and priced configurations, accompanied by a description of the differences.

Configuration (Priced and Measured are identical):

SUN Fire X4150 Server

2 X 3.0 GHz Opteron Dual Core processors

32 GB Memory

8 X 73 GB 15K RPM internal disks

No External Storage

2. Clause 1 Logical Database Design

2.1 Database Definition Statements

Listings must be provided for all table definition statements and all other statements used to set up the test and qualification databases.

Appendix B contains the programs and scripts that create and analyze the tables and indexes for the TPC-H database.

2.2 Physical Organization

The physical organization of tables and indices within the test and qualification databases must be disclosed. If the column ordering of any table is different from that specified in Clause 1.4, it must be noted.

No record clustering or index clustering was used. Column ordering was changed for some tables. Refer to the table create statements in Appendix B for further details.

2.3 Horizontal Partitioning

Horizontal partitioning of tables and rows in the test and qualification databases (see Clause 1.5.4) must be disclosed.

Horizontal partitioning was not used for any of the tables.

2.4 Replication

Any replication of physical objects must be disclosed and must conform to the requirements of Clause 1.5.6.

No replication was used.

3. Clause 2 Queries and Refresh Functions

3.1 Query Language

The query language used to implement the queries must be identified.

SQL was the query language used to implement all queries.

3.2 Verifying Method for Random Number Generation

The method of verification for the random number generation must be described unless the supplied DBGEN and QGEN were used.

TPC supplied versions 2.6.2 of DBGEN and QGEN were used for this TPC-H benchmark.

3.3 Generating Values for Substitution Parameters

The method used to generate values for substitution parameters must be disclosed. If QGEN is not used for this purpose, then the source code of any non-commercial tool used must be disclosed. If QGEN is used, the version number, release number, modification number, and patch level of QGEN must be disclosed.

The supplied QGEN version 2.6.2 was used to generate the substitution parameters.

3.4 Query Text and Output Data from Qualification Database

The executable query text used for query validation must be disclosed along with the corresponding output data generated during the execution of the query text against the qualification database. If minor modifications (see Clause 2.2.3) have been applied to any functional query definitions or approved variants in order to obtain executable query text, these modifications must be disclosed and justified. The justification for a particular minor query modification can apply collectively to all queries for which it has been used. The output data for the power and throughput tests must be made available electronically upon request.

Appendix C contains the query text and query output. The standard queries were used throughout with the following modifications:

- In Q1, Q4, Q5, Q6, Q10, Q12, Q14, Q15 and Q20, the "dateadd" function is used to perform date arithmetic.
- In Q7, Q8 and Q9, the "datepart" function is used to extract part of a date (e.g., "year").
- In Q2, Q3, Q10, Q18 and Q21, the "top" function is used to restrict the number of output rows.
- The semicolon (;) is used as a command delimiter.

3.5 Query Substitution Parameters and Seeds Used

The query substitution parameters used for all performance tests must be disclosed in tabular format, along with the seeds used to generate these parameters.

Appendix D contains the seed and query substitution parameters.

3.6 Query Isolation Level

The isolation level used to run the queries must be disclosed. If the isolation level does not map closely to the levels defined in Clause 3.4, additional descriptive detail must be provided.

The queries and transactions were run with isolation level 3 (repeatable read).

3.7 Source Code of Refresh Functions

The details of how the refresh functions were implemented must be disclosed (including source code of any non-commercial program used).

Appendix B contains the source code for the refresh functions.

4. Clause 3 Database System Properties

4.1 ACID Properties

The ACID (Atomicity, Consistency, Isolation and Durability) properties of transaction processing systems must be supported by the system under test during the timed portion of this benchmark. Since TPC-H is not a transaction processing benchmark, the ACID properties must be evaluated outside the timed portion of the test.

Source code for the ACID test is included in Appendix B.

4.2 Atomicity

The system under test must guarantee that transactions are atomic; the system will either perform all individual operations on the data, or will assure that no partially-completed operations leave any effects on the data.

4.2.1 Completed Transaction

Perform the ACID Transaction for a randomly selected set of input data and verify that the appropriate rows have been changed in the ORDERS, LINEITEM, and HISTORY tables

1. The total price from the ORDERS table and the extended price from the LINEITEM table were retrieved for a randomly selected order key.
2. The ACID Transaction was performed using the order key from step 1.
3. The ACID Transaction committed.
4. The total price from the ORDERS table and the extended price from the LINEITEM table were retrieved for the same order key. It was verified that the appropriate rows had been changed.

4.2.2 Aborted Transaction

Perform the ACID Transaction for a randomly selected set of input data, substituting a ROLLBACK of the transaction for the COMMIT of the transaction. Verify that the appropriate rows have not been changed in the ORDERS, LINEITEM, and HISTORY tables.

1. The total price from the ORDERS table and the extended price from the LINEITEM table were retrieved for a randomly selected order key.
2. The ACID Transaction was performed using the order key from step 1. The transaction was stopped prior to the commit.
3. The ACID Transaction was ROLLED BACK.
4. The total price from the ORDERS table and the extended price from the LINEITEM table were retrieved for the same order key. It was verified that the appropriate rows had not been changed.

4.3 Consistency

Consistency is the property of the application that requires any execution of transactions to take the database from one consistent state to another.

4.3.1 Consistency Test

Verify that ORDERS and LINEITEM tables are initially consistent, submit the prescribed number of ACID Transactions with randomly selected input parameters, and re-verify the consistency of the ORDERS and LINEITEM.

1. The consistency of the ORDERS and LINEITEM tables was verified based on a sample of order keys.
2. 100 ACID Transactions were submitted by each of twenty one execution streams.
3. The consistency of the ORDERS and LINEITEM tables was re-verified.

4.4 Isolation

Operations of concurrent transactions must yield results which are indistinguishable from the results which would be obtained by forcing each transaction to be serially executed to completion in the proper order.

4.4.1 Read-Write Conflict with Commit

Demonstrate isolation for the read-write conflict of a read-write transaction and a read-only transaction when the read-write transaction is committed.

1. An ACID Transaction was started for a randomly selected O_KEY, L_KEY, and DELTA. The ACID Transaction was suspended prior to COMMIT.
2. An ACID Query was started for the same O_KEY used in step 1.
3. The ACID Transaction was resumed and COMMITTED.
4. The ACID Query completed. It returned the data as committed by the ACID Transaction.

4.4.2 Read-Write Conflict with Rollback

Demonstrate isolation for the read-write conflict of a read-write transaction and a read-only transaction when the read-write transaction is rolled back.

1. An ACID Transaction was started for a randomly selected O_KEY, L_KEY, and DELTA. The ACID Transaction was suspended prior to ROLLBACK.
2. An ACID Query was started for the same O_KEY used in step 1. The ACID Query did not see the uncommitted changes made by the ACID Transaction.
3. The ACID Transaction was ROLLED BACK.
4. The ACID Query completed.

4.4.3 Write-Write Conflict with Commit

Demonstrate isolation for the write-write conflict of two update transactions when the first transaction is committed.

1. An ACID Transaction, T1, was started for a randomly selected O_KEY, L_KEY, and DELTA. T1 was suspended prior to COMMIT.
2. Another ACID Transaction, T2, was started using the same O_KEY and L_KEY and a randomly selected DELTA.
3. T2 waited.
4. T1 was allowed to COMMIT and T2 completed.

5. It was verified that T2.L_EXTENDEDPRICE = T1.L_EXTENDEDPRICE + (DELTA1*(T1.L_EXTENDEDPRICE/T1.L_QUANTITY))

4.4.4 Write-Write Conflict with Rollback

Demonstrate isolation for the write-write conflict of two update transactions when the first transaction is rolled back.

1. An ACID Transaction, T1, was started for a randomly selected O_KEY, L_KEY, and DELTA. T1 was suspended prior to ROLLBACK.
2. Another ACID Transaction, T2, was started using the same O_KEY and L_KEY and a randomly selected DELTA.
3. T2 waited.
4. T1 was allowed to ROLLBACK and T2 completed.
5. It was verified that T2.L_EXTENDEDPRICE = T1.L_EXTENDEDPRICE.

4.4.5 Concurrent Progress of Read and Write Transactions

Demonstrate the ability of read and write transactions affecting different database tables to make progress concurrently.

1. An ACID Transaction, T1, was started for a randomly selected O_KEY, L_KEY, and DELTA. T1 was suspended prior to ROLLBACK.
2. Another Transaction, T2, was started which did the following:

   For random values of PS_PARTKEY and PS_SUPPKEY, all columns of the PARTSUPP table for which PS_PARTKEY and PS_SUPPKEY are equal, are returned.
3. T2 completed.
4. T1 was allowed to COMMIT.
5. It was verified that appropriate rows in ORDERS, LINEITEM and HISTORY tables were changed.

4.4.6 Read-Only Query Conflict with Update Transaction

Demonstrate that the continuous submission of arbitrary (read-only) queries against one or more tables of the database does not indefinitely delay update transactions affecting those tables from making progress.

1. A Transaction, T1, executing Q1 against the qualification database, was started using a randomly selected DELTA.
2. An ACID Transaction T2, was started for a randomly selected O_KEY, L_KEY and DELTA.
3. T2 completed and appropriate rows in the ORDERS, LINEITEM and HISTORY tables had been changed.
4. Transaction T1 completed executing Q1.

4.5 Durability

The SUT must guarantee durability: the ability to preserve the effects of committed transactions and insure database consistency after recovery from any one of the failures listed in Clause 3.5.3.

4.5.1 Failure of a Durable Medium

Guarantee the database and committed updates are preserved across a permanent irrecoverable failure of any single durable medium containing TPC-H database tables or recovery log tables.

All disks containing TPC-H tables, indexes and the catalog file are on RAID1 volumes. When one of these disks was removed from from the server during the durability test, Sybase IQ continued to run as if nothing happened until the (non-mirrored) IQ temp segment on that disk was referenced. At that time IQ crashed, a expected. Power to the X4150 server server was then cut off. The outcome is described in section 4.5.2.

4.5.2 System Crash

Guarantee the database and committed updates are preserved across an instantaneous interruption (system crash/system hang) in processing which requires the system to reboot to recover.

The system crash and memory failure tests were combined by cutting off power to the X4150 server during the durability test. When power was restored, the system rebooted and the database was restarted. The durability success file and the HISTORY table were compared successfully.

4.5.3 Memory Failure

Guarantee the database and committed updates are preserved across failure of all or part of memory (loss of contents).

See section 4.5.2.

5. Clause 4 Scaling and Database Population

5.1 Ending Cardinality of Tables

The cardinality (i.e., the number of rows) of each table of the test database, as it existed at the completion of the database load (see clause 4.2.5) must be disclosed.

Table	***Rows***
Lineitem	*600,037,902*
orders	*150,000,000*
Partsupp	*80,000,000*
Part	*20,000,000*
Customer	*15,000,000*
Supplier	*1,000,000*
Nation	*25*
Region	*5*

5.2 Distribution of Tables and Logs Across Media

The distribution of tables and logs across all media must be explicitly described.

- All tables and indexes were stored on 4 RAID 1 volumes. Each volume was constructed from two raw partitions using the Solaris Volume Manager.
- The Temp database for Sybase IQ was configured using eight raw partitions, one on each of the internal disks. The Temp database was not mirrored.

All the details for configuring the storage used for the tables, logs, temp database, swap space, etc. are provided in appendix B.

5.3 Database partition/replication mapping

The mapping of database partitions/replications must be explicitly described.

Database partitioning/replication was not used.

5.4 RAID Feature

Implementations may use some form of RAID to ensure high availability. If used for data, auxiliary storage (e.g. indexes) or temporary space, the level of RAID must be disclosed for each device.

RAID 1 was used for all base tables and auxiliary data structures. In addition, the Sybase IQ utility db file and tpch log file also resided on a RAID 1 device on each node.

5.5 Modifications to the DBGEN

Any modifications to the DBGEN (see Clause 4.2.1) source code must be disclosed. In the event that a program other than DBGEN was used to populate the database, it must be disclosed in its entirety.

The supplied DBGEN version 2.6.2 was used to generate the database population for this benchmark.

5.6 Database Load Time

The database load time for the test database (see clause 4.3) must be disclosed.

The database load time was =60 min

5.7 Data Storage Ratio

The data storage ratio must be disclosed. It is computed as the ratio between the total amount of priced disk space, and the chosen test database size as defined in Clause 4.1.3.

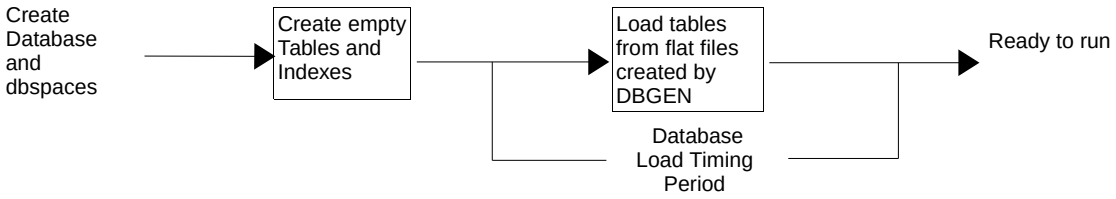
The data storage ratio is computed from the following information:

Disk Type	# Of Disks	Space Per Disk*	Sub-Total Disk Space**
internal	8	73 GB	271.9 GB
external	0	0 GB	0 GB
		Total Space	**544 GB**
		Data Storage Ratio	**5.4**

** Disk manufacturer definition of one GB is 10^9 bytes*
***In this calculation one GB is defined as 2^30 bytes*

5.8 Database Load Mechanism Details and Illustration

The details of the database load must be described, including a block diagram illustrating the overall process.



The test database was loaded using flat files. All load scripts are included in Appendix B.

5.9 Qualification Database Configuration

Any differences between the configuration of the qualification database and the test database must be disclosed.

The qualification database used identical scripts to create and load the data with adjustments for size differences.

6. Clause 5 Performance Metrics and Execution Rules

6.1 System Activity Between Load and Performance Tests

Any system activity on the SUT that takes place between the conclusion of the load test and the beginning of the performance test must be fully disclosed.

1. Auditor requested queries were run against the database to verify the correctness of the load

All scripts and queries used are included in Appendix F

6.2 Steps in the Power Test

The details of the steps followed to implement the power test (.e.g., system boot, database restart, etc.) must be disclosed.

The following steps were used to implement the power test:

1. RF1 Refresh Transaction
2. Stream 00 Execution
3. RF2 Refresh Transaction

6.3 Timing Intervals for Each Query and Refresh Functions

The timing intervals for each query and for both refresh functions must be reported for the power test.

The timing intervals for each query and both update functions are reported on the page titled "Numerical Quantities", contained in the beginning of this document and replicated in the Executive Summary document.

6.4 Number of Streams for the Throughput Test

The number of execution streams used for the throughput test must be disclosed.

6 streams were used for the throughput test.

6.5 Start and End Date/Times for Each Query Stream

The start time and finish time for each query stream must be reported for the throughput test.

The start times and finish times for each query stream in the throughput test are reported on the page titled "Numerical Quantities", contained in the beginning of this document and replicated in the Executive Summary document.

6.6 Total Elapsed Time of the Measurement Interval

The total elapsed time of the measurement interval must be reported for the throughput test.

The total elapsed time of the throughput test is reported on the page titled "Numerical Quantities", contained in the beginning of this document and replicated in the Executive Summary document.

6.7 Refresh Function Start Date/Time and Finish Date/Time

Start and finish time for each refresh function in the refresh stream must be reported for the throughput test.

The start and finish times for each refresh function:

Refresh Function	Start Date	Start Time	End Date	End Time
RF1	7-Feb-08	18:01:11	7-Feb-08	18:05:01
RF2	7-Feb-08	18:05:01	7-Feb-08	18:07:59
RF1	7-Feb-08	18:08:00	7-Feb-08	18:10:37
RF2	7-Feb-08	18:10:37	7-Feb-08	18:14:20
RF1	7-Feb-08	18:14:21	7-Feb-08	18:17:32
RF2	7-Feb-08	18:17:32	7-Feb-08	18:19:52
RF1	7-Feb-08	18:19:52	7-Feb-08	18:23:01
RF2	7-Feb-08	18:23:01	7-Feb-08	18:26:13
RF1	7-Feb-08	18:26:13	7-Feb-08	18:30:10
RF2	7-Feb-08	18:30:10	7-Feb-08	18:32:54
RF1	7-Feb-08	18:32:55	7-Feb-08	18:35:29
RF2	7-Feb-08	18:35:29	7-Feb-08	18:37:54

6.8 Timing Intervals for Each Query and Each Refresh Function for Each Stream

The timing intervals for each query of each stream and each refresh function must be reported for the throughput test.

The timing intervals for each query and each refresh function for the throughput test are reported on the page titled "Numerical Quantities", contained in the beginning of this document and replicated in the Executive Summary document.

6.9 Performance Metrics

The computed performance metric, related numerical quantities and price performance metric must be reported.

The performance metrics, and the numbers on which they are based, are reported on the page titled "Numerical Quantities", contained in the beginning of this document and replicated in the Executive Summary document.

6.10 The Performance Metric and Numerical Quantities from Both Runs

The performance metric and numerical quantities from both runs must be disclosed.

Performance results from the first two executions of the TPC-H benchmark indicated the following percent difference for the three metrics:

Run ID	QppH@1000GB	8962.7	QphH@1000GB
Run 1	7,725.3	9,098.2	8,383.7
Run 2	7,756.2	8,962.7	8,337.7
% Difference	0.40%	-1.51%	-0.55%

6.11 System Activity Between Performance Tests

Any activity on the SUT that takes place between the conclusion of Run1 and the beginning of Run2 must be disclosed.

The database was not restarted after it was loaded or between the two runs.

7. Clause 6 SUT and Driver Implementation

7.1 Driver

A detailed description of how the driver performs its functions must be supplied, including any related source code or scripts. This description should allow an independent reconstruction of the driver.

The entire test is run by executing the do_test shellscript.

The text of do_test is provided in Appendix E and the texts of all the scripts invoked by do_test are provided in Appendix B.

The query streams within the power and throughput tests are generated by a script called gen_streams_new.ksh which uses QGEN to generate the query stream files.

The Power Test portion of do_test is performed by executing the update_power.sql script which runs the refresh functions and the power stream queries.

The Throughput Test portion of ntest is performed by executing the 6 query stream scripts, stream1.sql – stream6.sql, along with simultaneously executing the update_throughput6.sql script.

7.2 Implementation-Specific Layer

If an implementation-specific layer is used, then a detailed description of how it performs its functions must be supplied, including any related source code or scripts. This description should allow an independent reconstruction of the implementation-specific layer.

All database configuration was done through scripts disclosed in Appendix B.

The performance tests are performed using dbisqlc. dbisqlc is a Sybase-provided utility that allows SQL statements to be executed against a Sybase IQ database. The dbisqlc utility is invoked from the command-line on the SUT. It reads input from files containing SQL statements and sends results to stdout. dbisqlc uses information in the .odbc.ini file to connect to the database. The performance test scripts utilizing dbisqlc can be found in Appendix E.

The ACID tests are performed using dbtest. dbtest is a Sybase-provided utility, similar to dbisqlc, but providing additional scripting capabilities. It is invoked from the command-line on the SUT and uses information in the .odbc.ini file to connect to the database. ACID test scripts utilizing dbtest can be found in Appendix B.

7.3 Profile-Directed Optimization

If profile-directed optimization as described in Clause 5.2.9 is used, such use must be disclosed.

Profile-directed optimization was not used.

8. Clause 7 Pricing

8.1 Hardware and Software Used

A detailed list of hardware and software used in the priced system must be reported. Each item must have vendor part number, description, and release/revision level, and either general availability status or committed delivery date. If package-pricing is used, contents of the package must be disclosed. Pricing source(s) and effective date(s) of price(s) must also be reported.

Refer to the Executive Summary.

8.2 Total Three Year Price

The total 3-year price of the entire configuration must be reported, including hardware, software, and maintenance charges. Separate component pricing is recommended. The basis of all discounts used must be disclosed.

The total 3-year price of the configuration is $27,503.90. For details of pricing, see the second page of the Executive Summary.

Discounts were taken from actual price quotes,available to any buyer with like conditions, provided by Sun Microsystems Inc. and Sybase Inc. The respective price quotes are included in Appendix G of this document.

8.3 Availability Date

The committed delivery date for general availability of products used in the price calculations must be reported. When the priced system includes products with different availability dates, the reported availability date for the priced system must be the date at which all components are committed to be available.

All hardware and software components have been generally available for at least several months before the release of this report. Hence all hardware and software components used in the measured configuration are *a fortori* available as of Apr 15, 2005.

9. Auditor's Information and Attestation Letter

The auditor's agency name, address, phone number, and Attestation letter with a brief audit summary report indicating compliance must be included in the full disclosure report. A statement should be included specifying who to contact in order to obtain further information regarding the audit process.

The auditor's attestation letter follows the table of contents.

Appendix A. Solaris 10 and Sybase IQ 12.6 Parameters

This Appendix contains Solaris kernel parameters and environment variables and Sybase IQ system parameters.

==========

Sybase IQ Server Configuration Parameters

==========

utility.cfg

```
-n util_x4140
-c  32m
-gd all
-gl all
-gm 15
-gp 4096
-ti 4400
-tl 300
-iqtc 128
-iqmc 128
```

tpch.cfg

```
# note the port number here must matche the one in
# .odbc.ini

-n tpch_x4140
-x tcpip{port=3002}
-c  12m
-gd all
-gl all
-gm 30
-gp 4096
-ti 4400
-tl 300
-iqmc 9000
-iqtc 5000
-iqmt 1600
-iqgovern 12
-iqpartition 2
```

==========

Sybase IQ Database Options

(altered from default)

==========

options.sql

==========

```
SET OPTION PUBLIC.Allow_Nulls_By_Default='Off';
SET OPTION PUBLIC.Append_Load='On';
SET OPTION PUBLIC.Flatten_Subqueries = 'On';
SET OPTION PUBLIC.Force_No_Scroll_Cursors='On';
SET OPTION PUBLIC.Load_Memory_Mb=0;
SET OPTION PUBLIC.Max_IQ_Threads_Per_Connection=100;
SET OPTION PUBLIC.Minimize_Storage='On';
SET OPTION PUBLIC.Notify_Modulus=10000000;
SET OPTION PUBLIC.Query_Temp_Space_Limit=0;
SET OPTION PUBLIC.Row_Counts='On';
SET OPTION PUBLIC.Default_Like_Range_Selectivity = 1;
SET OPTION PUBLIC.Query_Plan='off';
SET OPTION PUBLIC.Hash_Thrashing_Percent=100;

SET OPTION
PUBLIC.SignificantDigitsForDoubleEquality=15;

SET OPTION PUBLIC.Default_Having_Selectivity = 1;

SET OPTION PUBLIC.Garray_Fill_Factor_Percent=2;
SET OPTION PUBLIC.Main_Reserved_DBSpace_MB=100;
SET OPTION PUBLIC.Max_Hash_Rows = 10000000;
SET OPTION PUBLIC.Prefetch_Threads_Percent=15;

SET OPTION PUBLIC.Sweeper_Threads_Percent=10 ;

SET OPTION PUBLIC.Sort_Phase1_Helpers=2;
SET OPTION PUBLIC.Wash_Area_Buffers_Percent = '18';
```

==========

==========

Sybase IQ Environment Variables

==========

```
SYBASE="/export/home/sybase"
export SYBASE
SYBASE_OCS="OCS-12_5"
export SYBASE_OCS
ASDIR="${SYBASE}/ASIQ-12_6"
export ASDIR
PATH="${ASDIR}/bin:${SYBASE}/${SYBASE_OCS}/bin:$
{PATH}:/etc:."
export PATH
LD_LIBRARY_PATH_64="${ASDIR}/lib:$LD_LIBRARY_PATH_64"
export LD_LIBRARY_PATH_64
LD_LIBRARY_PATH="${ASDIR}/lib:$LD_LIBRARY_PATH"
export LD_LIBRARY_PATH
```

==========

.odbc.ini

==========

```
[ODBC Data Sources]
tpch=ASIQ Driver
utility_db=ASIQ Driver

[tpch]
Driver=/export/home/sybase/asiq12/lib/dbodbc7_r.so.1
EngineName=tpch_x4140
CommLinks=tcpip{host=10.8.33.153;Port=3002}
DatabaseName=tpch
UserID=DBA
Password=SQL
DBG=yes
LOG=/tmp/tpch_odbc.log

[utility_db]
Driver=/export/home/sybase/asiq12/lib/dbodbc7_r.so.1
EngineName=util_x4140
CommLinks=tcpip{host=10.8.33.153;Port=2638}
DatabaseName=utility_db
UserID=DBA
Password=SQL
DBG=yes
LOG=/tmp/utility_db_odbc.log
```

==========

Solaris Parameters

(altered from default)

==========

/etc/system

==========

```
set tune_t_fsflushr=600
set autoup=36000000
set lotsfree = 4096
set bufhwm = 10000
```

Appendix B. Programs and Scripts

```
================================================
```

check_query1.bash

```
================================================

#!/bin/bash
#
# First remove the rf1.lock so that the Query Stream
will start
#
rm -f /export/home/sybase/run/scripts/rf1.lock
#
# Sleep while the rf2.lock file exists
# when the query stream completes it will remove the
rf2.lock
#
while [ -f /export/home/sybase/run/scripts/rf2.lock ]
do
 # Wait for the Query Steam to complete
 # check every 10 seconds
 # echo "Lock File Exists"
 sleep 10
done
# Return Control to the RF stream

================================================
```

create_database.sql

```
CREATE DATABASE '/sybase2/tpch.db'
TRANSACTION LOG ON
COLLATION 'ISO_BINENG'
CASE RESPECT
PAGE SIZE 4096
BLANK PADDING ON
JAVA ON
JCONNECT ON
IQ PATH '/sybase2/M01'
IQ PAGE SIZE 524288
TEMPORARY PATH '/sybase2/T01'
================================================
```

create_dbspaces.sql

```
================================================
set temporary option on_error='continue';
create dbspace main2     as '/sybase2/M02' iq store;
create dbspace main3     as '/sybase2/M03' iq store;
create dbspace main4     as '/sybase2/M04' iq store;

create dbspace iqtemp2   as '/sybase2/T02' iq
temporary store;
create dbspace iqtemp3   as '/sybase2/T03' iq
temporary store;
create dbspace iqtemp4   as '/sybase2/T04' iq
temporary store;
create dbspace iqtemp5   as '/sybase2/T05' iq
temporary store;
create dbspace iqtemp6   as '/sybase2/T06' iq
temporary store;
create dbspace iqtemp7   as '/sybase2/T07' iq
temporary store;
create dbspace iqtemp8   as '/sybase2/T08' iq
temporary store;
================================================
```

```
================================================
```

create_tables_int.sql

```
================================================

CREATE TABLE region
  (
    r_regionkey            unsigned int,
    r_name                 char(25),
    r_comment              varchar(152),
    PRIMARY KEY (r_regionkey)
  );

CREATE TABLE nation
  (
    n_nationkey            unsigned int,
    n_name                 char(25),
    n_regionkey            unsigned int,
    n_comment              varchar(152),
    PRIMARY KEY (n_nationkey)
  );
CREATE HG INDEX n_regionkey_hg ON
nation(n_regionkey) ;


CREATE TABLE supplier
  (
    s_suppkey              unsigned int,
    s_name                 char(25),
    s_address              varchar(40),
    s_nationkey            unsigned int,
    s_phone                char(15),
    s_acctbal              double precision,
    s_comment              varchar(101),
    PRIMARY KEY (s_suppkey)
  );
CREATE HG INDEX s_nationkey_hg ON
supplier(s_nationkey) ;


CREATE TABLE part
  (
    p_partkey              unsigned int,
    p_name                 varchar(55),
    p_mfgr                 char(25),
    p_brand                char(10),
    p_type                 varchar(25),
    p_size                 int,
    p_container            char(10),
    p_retailprice          double precision,
    p_comment              varchar(23),
    PRIMARY KEY(p_partkey)
  );

CREATE TABLE partsupp
  (
    ps_partkey             unsigned int,
    ps_suppkey             unsigned int,
    ps_availqty            integer,
    ps_supplycost          double precision,
    ps_comment             varchar(199),
    PRIMARY KEY (ps_partkey, ps_suppkey)
  );
CREATE HG INDEX ps_partkey_hg ON
partsupp(ps_partkey) ;
CREATE HG INDEX ps_suppkey_hg ON
partsupp(ps_suppkey) ;

CREATE TABLE customer
  (
    c_custkey              unsigned int,
    c_name                 varchar(25),
    c_address              varchar(40),
    c_nationkey            unsigned int,
    c_phone                char(15),
    c_acctbal              double precision,
    c_mktsegment           char(10),
    c_comment              varchar(117),
    PRIMARY KEY(c_custkey)
  );
CREATE HG INDEX c_nationkey_hg ON
customer(c_nationkey) ;


CREATE TABLE orders
  (
    o_orderkey             unsigned int,
    o_custkey              unsigned int,
    o_orderstatus          char(1),
```

```
    o_totalprice           double precision,
    o_orderdate            date,
    o_orderpriority        char(15),
    o_clerk                char(15),
    o_shippriority         int,
    o_comment              varchar(79),
    PRIMARY KEY (o_orderkey)
  );
CREATE HG INDEX o_custkey_hg ON orders(o_custkey) ;
CREATE DATE INDEX o_orderdate_date ON
orders(o_orderdate) ;


CREATE TABLE lineitem
  (
    l_orderkey             unsigned int,
    l_partkey              unsigned int,
    l_suppkey              unsigned int,
    l_linenumber           int,
    l_quantity             double precision,
    l_extendedprice        double precision,
    l_discount             double precision,
    l_tax                  double precision,
    l_returnflag           char(1),
    l_linestatus           char(1),
    l_shipdate             date,
    l_commitdate           date,
    l_receiptdate          date,
    l_shipinstruct         char(25),
    l_shipmode             char(10),
    l_comment              varchar(44)
  );

CREATE HG INDEX l_orderkey_hg ON
lineitem(l_orderkey) ;
CREATE HG INDEX l_partkey_hg ON lineitem(l_partkey) ;
CREATE HG INDEX l_suppkey_hg ON lineitem(l_suppkey) ;
CREATE DATE INDEX l_shipdate_date ON
lineitem(l_shipdate) ;
CREATE DATE INDEX l_receiptdate_date ON
lineitem(l_receiptdate);
```

==========

tpch_rf_int.sql

==========

```
create table refresh_control ( rf1_data_set int not
null, rf2_data_set int not null);
insert into refresh_control values (0,0);
commit;
CREATE PROCEDURE DBA.tpch_rf1 (IN c_directory
varchar(128),
                               IN c_stream varchar(3))
ON EXCEPTION RESUME
BEGIN
  DECLARE delim_asci integer;
  DECLARE c_data_set varchar(3);
  DECLARE i_data_set integer;
  DECLARE c_cmd long varchar;
  DECLARE outfilename varchar(128); -- Debug
  DECLARE outfilename2 varchar(128); -- Debug
  DECLARE c_lf varchar(2);
  DECLARE t_qstart timestamp;
  DECLARE t_qstop timestamp;
  DECLARE n_seconds numeric(16,5);
  DECLARE c_sqlstate CHAR(5);
  SET t_qstart = now(*);
  SET c_lf=char(10);
  SELECT rf1_data_set INTO i_data_set FROM
refresh_control;
  SET c_data_set=CAST(i_data_set+1 AS varchar(3));
  SET c_cmd='load table orders ( '+c_lf;
  SET c_cmd=c_cmd+' o_orderkey
'+char(39)+'|'+char(39)+', '+c_lf;
  SET c_cmd=c_cmd+' o_custkey
'+char(39)+'|'+char(39)+', '+c_lf;
  SET c_cmd=c_cmd+' o_orderstatus
'+char(39)+'|'+char(39)+', '+c_lf;
  SET c_cmd=c_cmd+' o_totalprice
'+char(39)+'|'+char(39)+', '+c_lf;
  SET c_cmd=c_cmd+' o_orderdate date('+char(39)+'YYYY-
MM-DD'+char(39)+'), filler(1), '+c_lf;
  SET c_cmd=c_cmd+' o_orderpriority
'+char(39)+'|'+char(39)+', '+c_lf;
  SET c_cmd=c_cmd+' o_clerk '+char(39)+'|'+char(39)+',
'+c_lf;
  SET c_cmd=c_cmd+' o_shippriority
'+char(39)+'|'+char(39)+','+c_lf;
  SET c_cmd=c_cmd+' o_comment
'+char(39)+'|'+char(39)+' ) '+c_lf;
  SET c_cmd=c_cmd+'from '+char(39)+c_directory
+'orders.tbl.u'+c_data_set+char(39)+c_lf;
  SET c_cmd=c_cmd+'row delimited by
'+char(39)+'\\x0a'+char(39)+' quotes off escapes off
preview on;';
  EXECUTE IMMEDIATE c_cmd;
  SELECT SQLSTATE INTO c_sqlstate;
  IF c_sqlstate != '00000' THEN
    ROLLBACK;
    RAISERROR 23002 'RF1 failed at Step 1 with
SQLSTATE: ', c_sqlstate;
    RETURN(1);
  END IF;
  SET c_cmd='load table lineitem ( '+c_lf;
  SET c_cmd=c_cmd+' l_orderkey
'+char(39)+'|'+char(39)+', '+c_lf;
  SET c_cmd=c_cmd+' l_partkey
'+char(39)+'|'+char(39)+', '+c_lf;
  SET c_cmd=c_cmd+' l_suppkey
'+char(39)+'|'+char(39)+', '+c_lf;
  SET c_cmd=c_cmd+' l_linenumber
'+char(39)+'|'+char(39)+', '+c_lf;
  SET c_cmd=c_cmd+' l_quantity
'+char(39)+'|'+char(39)+', '+c_lf;
  SET c_cmd=c_cmd+' l_extendedprice
'+char(39)+'|'+char(39)+', '+c_lf;
  SET c_cmd=c_cmd+' l_discount
'+char(39)+'|'+char(39)+', '+c_lf;
  SET c_cmd=c_cmd+' l_tax '+char(39)+'|'+char(39)+',
'+c_lf;
  SET c_cmd=c_cmd+' l_returnflag
'+char(39)+'|'+char(39)+', '+c_lf;
  SET c_cmd=c_cmd+' l_linestatus
'+char(39)+'|'+char(39)+', '+c_lf;
  SET c_cmd=c_cmd+' l_shipdate date('+char(39)+'YYYY-
MM-DD'+char(39)+'), filler(1), '+c_lf;
  SET c_cmd=c_cmd+' l_commitdate
date('+char(39)+'YYYY-MM-DD'+char(39)+'), filler(1),
'+c_lf;
  SET c_cmd=c_cmd+' l_receiptdate
date('+char(39)+'YYYY-MM-DD'+char(39)+'), filler(1),
'+c_lf;
  SET c_cmd=c_cmd+' l_shipinstruct
'+char(39)+'|'+char(39)+', '+c_lf;
  SET c_cmd=c_cmd+' l_shipmode
'+char(39)+'|'+char(39)+', '+c_lf;
  SET c_cmd=c_cmd+' l_comment
'+char(39)+'|'+char(39)+' )'+c_lf;
  SET c_cmd=c_cmd+'from '+char(39)+c_directory
+'lineitem.tbl.u'+c_data_set+char(39)+c_lf;
  SET c_cmd=c_cmd+'row delimited by
'+char(39)+'\\x0a'+char(39)+c_lf+'quotes off escapes
off preview on;';
  EXECUTE IMMEDIATE c_cmd;
  SELECT SQLSTATE INTO c_sqlstate;
  IF c_sqlstate != '00000' THEN
    rollback;
    RAISERROR 23002 'RF1 failed at Step 2 with
SQLSTATE: ', c_sqlstate;
    RETURN(1);
  END IF;
  UPDATE refresh_control SET
rf1_data_set=cast(c_data_set AS integer);
```

```
  COMMIT;
  SET t_qstop = now(*);
  SET
n_seconds=cast(datediff(millisecond,t_qstart,t_qstop)
AS numeric(16,5))/1000;
  SET c_cmd='Stream updates Update update_'+c_stream
+'_RF1 LENGTH -- '+cast(n_seconds AS varchar(20))+ '
seconds' ;
  SELECT c_cmd;
  RETURN(0);
END;
CREATE PROCEDURE DBA.tpch_rf2 (in c_directory
varchar(128),
                               in c_stream varchar(3))
ON exception resume
BEGIN
  DECLARE delim_asci integer;
  DECLARE c_data_set varchar(3);
  DECLARE i_data_set integer;
  DECLARE c_cmd long varchar;
  DECLARE outfilename varchar(128); -- Debug
  DECLARE c_lf varchar(2);
  DECLARE t_qstart timestamp;
  DECLARE t_qstop timestamp;
  DECLARE n_seconds numeric(16,5);
  DECLARE c_sqlstate CHAR(5);
  SET t_qstart = now(*);
  SET c_lf=char(10);
  SELECT rf2_data_set INTO i_data_set FROM
refresh_control;
  SET c_data_set=CAST(i_data_set+1 AS varchar(3));
  CREATE TABLE #delete_table ( d_orderkey UNSIGNED
INT, PRIMARY KEY (d_orderkey) );
  SET c_cmd='load table #delete_table  (d_orderkey
'+char(39)+'\\x0a'+char(39)+') '+c_lf;
  SET c_cmd=c_cmd+'from '+char(39)+c_directory
+'delete.'+c_data_set+char(39)+c_lf;
  SET c_cmd=c_cmd+'quotes off '+c_lf;
  SET c_cmd=c_cmd+'escapes off; '+c_lf;
  EXECUTE IMMEDIATE c_cmd;
  SELECT SQLSTATE INTO c_sqlstate;
  IF c_sqlstate != '00000' THEN
    ROLLBACK;
    SET c_cmd='RF2 failed at Step 1 with SQLSTATE:
'+c_sqlstate;
    RAISERROR 23002 c_cmd;
    RETURN(1);
  END IF;
  DELETE lineitem FROM lineitem
     WHERE l_orderkey in (select d_orderkey from
#delete_table);
  SELECT SQLSTATE INTO c_sqlstate;
  IF c_sqlstate != '00000' THEN
    ROLLBACK;
    SET c_cmd='RF2 failed at Step 2 with SQLSTATE:
'+c_sqlstate;
    RAISERROR 23002 c_cmd;
    RETURN(1);
  END IF;
  DELETE orders FROM orders
      WHERE o_orderkey in (select d_orderkey from
#delete_table);
  SELECT SQLSTATE INTO c_sqlstate;
  IF c_sqlstate != '00000' THEN
    ROLLBACK;
    SET c_cmd='RF2 failed at Step 3 with SQLSTATE:
'+c_sqlstate;
    RAISERROR 23002 c_cmd;
    RETURN(1);
  END IF;
  UPDATE refresh_control SET
rf2_data_set=CAST(c_data_set AS integer);
  COMMIT;
  DROP TABLE #delete_table;
  SET t_qstop = now(*);
  SET
n_seconds=cast(datediff(millisecond,t_qstart,t_qstop)
as numeric(16,5))/1000;
  SET c_cmd='Stream updates Update update_'+c_stream
+'_RF2 LENGTH -- '+cast(n_seconds as varchar(20))+ '
seconds' ;
  SELECT c_cmd;
  RETURN(0);
END;
```

==========

load_region.sql

==========

```
LOAD TABLE REGION (
R_REGIONKEY                                '|',
R_NAME                                     '|',
R_COMMENT                                  '|'
)
FROM '/sybase_stage/region.tbl'
escapes off
quotes off
row delimited by '\x0a'
WITH CHECKPOINT ON;
commit;
```

==========

load_nation.sql

==========

```
LOAD TABLE NATION (
N_NATIONKEY                                '|',
N_NAME                                     '|',
N_REGIONKEY                                '|',
N_COMMENT                                  '|'
)
FROM '/sybase_stage/nation.tbl'
escapes off
quotes off
row delimited by '\x0a'
WITH CHECKPOINT ON;
commit;
```

==========

load_customer.sql

==========

```
LOAD TABLE CUSTOMER (
C_CUSTKEY                                  '|',
C_NAME                                     '|',
C_ADDRESS                                  '|',
C_NATIONKEY                                '|',
C_PHONE                                    '|',
C_ACCTBAL                                  '|',
C_MKTSEGMENT                               '|',
C_COMMENT                                  '|'
)
FROM '/sybase_stage/customer.tbl'
escapes off
quotes off
row delimited by '\x0a'
WITH CHECKPOINT ON;
commit;
```

==========

load_part.sql

==========

```
LOAD TABLE PART (
P_PARTKEY                                  '|',
P_NAME                                     '|',
P_MFGR                                     '|',
P_BRAND                                    '|',
P_TYPE                                     '|',
P_SIZE                                     '|',
P_CONTAINER                                '|',
P_RETAILPRICE                              '|',
P_COMMENT                                  '|'
)
```

```
FROM '/sybase_stage/part.tbl'
escapes off
quotes off
row delimited by '\x0a'
WITH CHECKPOINT ON;
commit;
```

```
================================================
```

load_supplier.sql

```
================================================

LOAD TABLE SUPPLIER (
S_SUPPKEY                                '|',
S_NAME                                   '|',
S_ADDRESS                                '|',
S_NATIONKEY                              '|',
S_PHONE                                  '|',
S_ACCTBAL                                '|',
S_COMMENT                                '|'
)
FROM '/sybase_stage/supplier.tbl'
escapes off
quotes off
row delimited by '\x0a'
WITH CHECKPOINT ON;
commit;
```

```
================================================
```

load_partsupp.sql

```
================================================

LOAD TABLE PARTSUPP (
PS_PARTKEY                               '|',
PS_SUPPKEY                               '|',
PS_AVAILQTY                              '|',
PS_SUPPLYCOST                            '|',
PS_COMMENT                               '|'
)
FROM '/sybase_stage/partsupp.tbl'
escapes off
quotes off
row delimited by '\x0a'
WITH CHECKPOINT ON;
commit;
```

```
================================================
```

load_orders.sql

```
================================================

LOAD TABLE ORDERS (
O_ORDERKEY                                 '|',
O_CUSTKEY                                  '|',
O_ORDERSTATUS                              '|',
O_TOTALPRICE                               '|',
O_ORDERDATE                                '|',
O_ORDERPRIORITY                            '|',
O_CLERK                                    '|',
O_SHIPPRIORITY                             '|',
O_COMMENT                                  '|'
)
FROM
'/sybase_stage/orders.tbl'
escapes off
quotes off
row delimited by '\x0a'
WITH CHECKPOINT ON;
commit;
```

```
================================================
```

load_lineitem.sql

```
================================================

LOAD TABLE LINEITEM (
L_ORDERKEY                               '|',
L_PARTKEY                                '|',
L_SUPPKEY                                '|',
L_LINENUMBER                             '|',
L_QUANTITY                               '|',
L_EXTENDEDPRICE                          '|',
L_DISCOUNT                               '|',
L_TAX                                    '|',
L_RETURNFLAG                             '|',
L_LINESTATUS                             '|',
L_SHIPDATE                               '|',
L_COMMITDATE                             '|',
L_RECEIPTDATE                            '|',
L_SHIPINSTRUCT                           '|',
L_SHIPMODE                               '|',
L_COMMENT                                '|'
)
FROM
     '/sybase_stage/lineitem.tbl'
escapes off
quotes off
row delimited by '\x0a'
WITH CHECKPOINT ON;
commit;
checkpoint;
commit;
```

```
================================================
```

update_power.sql

```
================================================

create variable qstart timestamp;
create variable qstop timestamp;
create variable c_sqlstate CHAR(5);
create variable c_path varchar(128);
set c_path='/sybase_stage/';
set qstart=now(*);
select 'Stream 0 RF1 START -- ', qstart ;
call tpch_rf1 (c_path,'0');
set qstop=now(*);
select 'Stream 0 Update RF1 LENGTH --
',cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds';
select 'Stream 0 RF1 FINISH -- ', qstop ;
-- Sleep Until the query stream completes
set qstart = now(*);
select 'Stream 0 RF WAITING -- ', qstart;
xp_cmdshell('/export/home/sybase/run/scripts/check_que
ry1.bash');
set qstart = now(*);
select 'Stream 0 RF CONTINUING -- ', qstart;
set qstart = now(*);
select 'Stream 0 RF2 START -- ', qstart ;
call tpch_rf2 (c_path,'0');
set qstop=now(*);
select 'Stream 0 Update RF2 LENGTH --
',cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds';
select 'Stream 0 RF2 FINISH -- ', qstop ;
```

```
================================================
```

update_throughput6.sql

```
create variable qstart timestamp;
create variable qstop timestamp;
create variable c_sqlstate CHAR(5);
create variable c_path varchar(128);
set qstart = now(*);
set c_path='/sybase_stage/';
select 'Stream updates START -- ', qstart ;
select @@servername, db_name();
call tpch_rf1 (c_path,'1');
commit;
tpch_wait;
call tpch_rf2 (c_path,'1');
commit;
tpch_wait;
```

```
call tpch_rf1 (c_path,'2');
commit;
tpch_wait;
call tpch_rf2 (c_path,'2');
commit;
tpch_wait;
call tpch_rf1 (c_path,'3');
commit;
tpch_wait;
call tpch_rf2 (c_path,'3');
commit;
tpch_wait;
call tpch_rf1 (c_path,'4');
commit;
tpch_wait;
call tpch_rf2 (c_path,'4');
commit;
tpch_wait;
call tpch_rf1 (c_path,'5');
commit;
tpch_wait;
call tpch_rf2 (c_path,'5');
commit;
-- to have fixed wait time, comment next line and uncomment the line after
tpch_wait;
--xp_cmdshell('sleep 4740'); -- sleep 4680 seconds 78 minutes to better prepare
refresh1 stream1 run2
call tpch_rf1 (c_path,'6');
commit;
tpch_wait;
call tpch_rf2 (c_path,'6');
commit;
set qstop = now(*);
select 'Stream updates STOP -- ', qstop ;
```

==========

gen_streams_new.ksh

==========

```
#!/bin/ksh

if (( $# < 2 ))
then
   echo "usage:  $0    seed  scale_factor  num_streams"
   exit
fi


PATH=/export/home/sybase/ASIQ-12_5/bin:/export/home/sybase/OCS-12_5/bi
n:/usr/openwin/bin:/bin:.:/usr/dist/pkgs/forte_dev/SUNWspro/bin:/usr/ccs/bin:/u
sr/dt/bin:/usr/dist/pkgs/devpro,v4.0/5.x-
sparc/bin:/usr/dist/local/exe:/usr/dist/exe:/usr/ucb:/usr/sbin:/net/josie/export/hom
e18/rgostan/bin:/export/home/sybase/run/scripts:/etc:.:/export/home/sybase/run/t
pch/appendix/dbgen
export PATH
export DSS_PATH=/export/home/sybase/run/scripts;
export DSS_CONFIG=/export/home/sybase/run/tpch/appendix/dbgen;
export DSS_DIST=dists.dss;
export
DSS_QUERY=/export/home/sybase/run/tpch/appendix/templates/queries;
#export
DSS_QUERY=/export/home/sybase/run/tpch/appendix/templates/queries.debug;

seed=$1;
sf=$2;
ns=$3

i=0

while ((i<=ns))
do
  qgen -c -p $i -l qparm${i}.txt -i $DSS_QUERY/init.sql -t
$DSS_QUERY/complete.sql -r $seed -s $sf  \
    1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 > stream${i}.sql
  ((seed=seed+1))
  ((i=i+1))
done

((last_seed=seed-1))
echo $last_seed
```

==========

tpch_wait.sql

```
if exists (select 1
          from SYS.SYSPROCEDURE
          where proc_name = 'tpch_wait') then
    DROP procedure tpch_wait;
end if
;

-- Script to put a delay between TPCH updates.
-- Normally we just want to sleep a bit to spread
updates out
-- through the entire throughput test. Sometimes we
run out of
-- space; if so, just wait some more...
create procedure tpch_wait()
begin

  declare local temporary table t_iq_spaceused(
    mainKB     unsigned bigint,
    mainKBUsed unsigned bigInt,
    tempKB     unsigned bigInt,
    tempKBUsed unsigned bigInt,
    )
    in SYSTEM on commit preserve rows;

  declare maintotal unsigned bigint;
  declare mainused unsigned bigint;
  declare temptotal unsigned bigint;
  declare tempused unsigned bigint;
  declare mainfree unsigned bigint;
  declare command varchar(255);

  waitloop:
  LOOP
       truncate table t_iq_spaceused;
       execute immediate
            'iq utilities main into t_iq_spaceused
command statistics 30000' ;

       select         mainKB,
                      mainKBUsed,
                      tempKB,
                      tempKBUsed
         into maintotal, mainused, temptotal,
tempused
         from t_iq_spaceused;

        message 'TPCH main total: ',maintotal,'  main
used : ',mainused;
        message 'TPCH temp total: ',temptotal,'  temp
used : ',tempused;
       set mainfree = maintotal-mainused;
        message 'TPCH main free : ',mainfree;

       if ( mainfree > 124000 )   -- this is for 1GB;
1000 times larger for 1TB
             then leave waitloop;
             end if;

        waitfor delay '00:05:00';

  END LOOP waitloop;

  drop table t_iq_spaceused;
  commit;
```

```
end
;
```

```
================================================
```

stream0.sql

```
================================================

-- using 207153854 as a seed to the RNG
create variable qstart timestamp;
create variable qstop timestamp;
select 'Stream begin time -- ',now(*) as "time";
-- @(#)14.sql  2.1.8.1
-- TPC-H/TPC-R Promotion Effect Query (Q14)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 0 Query 14 START -- ', qstart ;
select
        100.00 * sum(case
                when p_type like 'PROMO%'
                        then l_extendedprice * (1 -
l_discount)
                else 0
        end) / sum(l_extendedprice * (1 - l_discount))
as promo_revenue
from
        lineitem,
        part
where
        l_partkey = p_partkey
        and l_shipdate >= '1996-01-01'
         and l_shipdate < dateadd(month,
1,'1996-01-01');
commit ;
set qstop = now(*);
select 'Stream 0 Query 14 STOP -- ', qstop ;
select 'Stream 0 Query 14 LENGTH -- ',
cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)2.sql   2.1.8.2
-- TPC-H/TPC-R Minimum Cost Supplier Query (Q2)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 0 Query 2 START -- ', qstart ;
select top 100
        s_acctbal,
        s_name,
        n_name,
        p_partkey,
        p_mfgr,
        s_address,
        s_phone,
        s_comment
from
        part,
        supplier,
        partsupp,
        nation,
        region
where
        p_partkey = ps_partkey
        and s_suppkey = ps_suppkey
        and p_size = 30
        and p_type like '%COPPER'
        and s_nationkey = n_nationkey
        and n_regionkey = r_regionkey
        and r_name = 'ASIA'
        and ps_supplycost = (
                select
                        min(ps_supplycost)
                from
                        partsupp,
                        supplier,
                        nation,
                        region
                where
                        p_partkey = ps_partkey
                        and s_suppkey = ps_suppkey
                        and s_nationkey = n_nationkey
                        and n_regionkey = r_regionkey
                        and r_name = 'ASIA'
        )
order by
        s_acctbal desc,
        n_name,
        s_name,
        p_partkey;
commit ;
set qstop = now(*);
select 'Stream 0 Query 2 STOP -- ', qstop ;
select 'Stream 0 Query 2 LENGTH -- ',
cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)9.sql   2.1.8.1
-- TPC-H/TPC-R Product Type Profit Measure Query (Q9)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 0 Query 9 START -- ', qstart ;
select
        nation,
        o_year,
        sum(amount) as sum_profit
from
        (
                select
                        n_name as nation,
                          datepart(year, o_orderdate) as
o_year,
                        l_extendedprice * (1 -
l_discount) - ps_supplycost * l_quantity as amount
                from
                        part,
                        supplier,
                        lineitem,
                        partsupp,
                        orders,
                        nation
                where
                        s_suppkey = l_suppkey
                        and ps_suppkey = l_suppkey
                        and ps_partkey = l_partkey
                        and p_partkey = l_partkey
                        and o_orderkey = l_orderkey
                        and s_nationkey = n_nationkey
                        and p_name like '%pink%'
        ) as profit
group by
        nation,
        o_year
order by
        nation,
        o_year desc;
commit ;
set qstop = now(*);
select 'Stream 0 Query 9 STOP -- ', qstop ;
select 'Stream 0 Query 9 LENGTH -- ',
cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)20.sql  2.1.8.1
-- TPC-H/TPC-R Potential Part Promotion Query (Q20)
-- Function Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 0 Query 20 START -- ', qstart ;
```

```
select
	s_name,
	s_address
from
	supplier,
	nation
where
	s_suppkey in (
		select
			ps_suppkey
		from
			partsupp
		where
			ps_partkey in (
				select
					p_partkey
				from
					part
				where
					p_name like
'navajo%'
			)
			and ps_availqty > (
				select
					0.5 *
sum(l_quantity)
				from
					lineitem
				where
					l_partkey =
ps_partkey
					and l_suppkey =
ps_suppkey
					and l_shipdate
>= '1993-01-01'
                                        and l_shipdate
< dateadd(year,1,'1993-01-01')
			)
	)
	and s_nationkey = n_nationkey
	and n_name = 'JAPAN'
order by
	s_name;
commit ;
set qstop = now(*);
select 'Stream 0 Query 20 STOP -- ', qstop ;
select 'Stream 0 Query 20 LENGTH -- ',
cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)6.sql   2.1.8.1
-- TPC-H/TPC-R Forecasting Revenue Change Query (Q6)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 0 Query 6 START -- ', qstart ;
select
	sum(l_extendedprice * l_discount) as revenue
from
	lineitem
where
	l_shipdate >= '1995-01-01'
	 and l_shipdate < dateadd(year,1,'1995-01-01')
	and l_discount between 0.05 - 0.01 and 0.05 +
0.01
	and l_quantity < 24;
commit ;
set qstop = now(*);
select 'Stream 0 Query 6 STOP -- ', qstop ;
select 'Stream 0 Query 6 LENGTH -- ',
cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)17.sql  2.1.8.1
-- TPC-H/TPC-R Small-Quantity-Order Revenue Query
(Q17)
-- Functional Query Definition
-- Approved February 1998
```

```
set qstart = now(*);
select 'Stream 0 Query 17 START -- ', qstart ;
select
	sum(l_extendedprice) / 7.0 as avg_yearly
from
	lineitem,
	part
where
	p_partkey = l_partkey
	and p_brand = 'Brand#54'
	and p_container = 'SM PACK'
	and l_quantity < (
		select
			0.2 * avg(l_quantity)
		from
			lineitem
		where
			l_partkey = p_partkey
	);
commit ;
set qstop = now(*);
select 'Stream 0 Query 17 STOP -- ', qstop ;
select 'Stream 0 Query 17 LENGTH -- ',
cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)18.sql  2.1.8.1
-- TPC-H/TPC-R Large Volume Customer Query (Q18)
-- Function Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 0 Query 18 START -- ', qstart ;
select top 100
	c_name,
	c_custkey,
	o_orderkey,
	o_orderdate,
	o_totalprice,
	sum(l_quantity)
from
	customer,
	orders,
	lineitem
where
	o_orderkey in (
		select
			l_orderkey
		from
			lineitem
		group by
			l_orderkey having
				sum(l_quantity) > 314
	)
	and c_custkey = o_custkey
	and o_orderkey = l_orderkey
group by
	c_name,
	c_custkey,
	o_orderkey,
	o_orderdate,
	o_totalprice
order by
	o_totalprice desc,
	o_orderdate;
commit ;
set qstop = now(*);
select 'Stream 0 Query 18 STOP -- ', qstop ;
select 'Stream 0 Query 18 LENGTH -- ',
cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)8.sql   2.1.8.1
-- TPC-H/TPC-R National Market Share Query (Q8)
-- Functional Query Definition
-- Approved February 1998
```

```
set qstart = now(*);
select 'Stream 0 Query 8 START -- ', qstart ;
select
	o_year,
	sum(case
		when nation = 'IRAQ' then volume
		else 0
	end) / sum(volume) as mkt_share
from
	(
		select
			 datepart(year, o_orderdate) as
o_year,
			l_extendedprice * (1 -
l_discount) as volume,
			n2.n_name as nation
		from
			part,
			supplier,
			lineitem,
			orders,
			customer,
			nation n1,
			nation n2,
			region
		where
			p_partkey = l_partkey
			and s_suppkey = l_suppkey
			and l_orderkey = o_orderkey
			and o_custkey = c_custkey
			and c_nationkey =
n1.n_nationkey
			and n1.n_regionkey =
r_regionkey
			and r_name = 'MIDDLE EAST'
			and s_nationkey =
n2.n_nationkey
			and o_orderdate between
'1995-01-01' and '1996-12-31'
			and p_type = 'ECONOMY BURNISHED
TIN'
	) as all_nations
group by
	o_year
order by
	o_year;
commit ;
set qstop = now(*);
select 'Stream 0 Query 8 STOP -- ', qstop ;
select 'Stream 0 Query 8 LENGTH -- ',
cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)21.sql  2.1.8.1
-- TPC-H/TPC-R Suppliers Who Kept Orders Waiting Query
(Q21)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 0 Query 21 START -- ', qstart ;
select top 100
	s_name,
	count(*) as numwait
from
	supplier,
	lineitem l1,
	orders,
	nation
where
	s_suppkey = l1.l_suppkey
	and o_orderkey = l1.l_orderkey
	and o_orderstatus = 'F'
	and l1.l_receiptdate > l1.l_commitdate
	and exists (
		select
			*
		from
			lineitem l2
		where
			l2.l_orderkey = l1.l_orderkey
			and l2.l_suppkey <>
l1.l_suppkey
	)
	and not exists (
		select
			*
		from
			lineitem l3
		where
			l3.l_orderkey = l1.l_orderkey
			and l3.l_suppkey <>
l1.l_suppkey
			and l3.l_receiptdate >
l3.l_commitdate
	)
	and s_nationkey = n_nationkey
	and n_name = 'EGYPT'
group by
	s_name
order by
	numwait desc,
	s_name;
commit ;
set qstop = now(*);
select 'Stream 0 Query 21 STOP -- ', qstop ;
select 'Stream 0 Query 21 LENGTH -- ',
cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)13.sql  2.1.8.1
-- TPC-H/TPC-R Customer Distribution Query (Q13)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 0 Query 13 START -- ', qstart ;
select
	c_count,
	count(*) as custdist
from
	(
		select
			c_custkey,
			count(o_orderkey)
		from
			customer left outer join orders
on
				c_custkey = o_custkey
				and o_comment not like
'%express%accounts%'
		group by
			c_custkey
	) as c_orders (c_custkey, c_count)
group by
	c_count
order by
	custdist desc,
	c_count desc;
commit ;
set qstop = now(*);
select 'Stream 0 Query 13 STOP -- ', qstop ;
select 'Stream 0 Query 13 LENGTH -- ',
cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)3.sql   2.1.8.1
-- TPC-H/TPC-R Shipping Priority Query (Q3)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 0 Query 3 START -- ', qstart ;
select top 10
	l_orderkey,
```

```
       sum(l_extendedprice * (1 - l_discount)) as
revenue,
       o_orderdate,
       o_shippriority
from
       customer,
       orders,
       lineitem
where
       c_mktsegment = 'FURNITURE'
       and c_custkey = o_custkey
       and l_orderkey = o_orderkey
       and o_orderdate < '1995-03-16'
       and l_shipdate >  '1995-03-16'
group by
       l_orderkey,
       o_orderdate,
       o_shippriority
order by
       revenue desc,
       o_orderdate;
commit ;
set qstop = now(*);
select 'Stream 0 Query 3 STOP -- ', qstop ;
select 'Stream 0 Query 3 LENGTH -- ',
cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)22.sql  2.1.8.1
-- TPC-H/TPC-R Global Sales Opportunity Query (Q22)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 0 Query 22 START -- ', qstart ;
select
       cntrycode,
       count(*) as numcust,
       sum(c_acctbal) as totacctbal
from
       (
              select
                       substring(c_phone,1,2) as
cntrycode,
                     c_acctbal
              from
                     customer
              where
                       substring(c_phone,1,2) in
                            ('17', '13', '10', '30',
'34', '28', '12')
                     and c_acctbal > (
                            select
                                   avg(c_acctbal)
                            from
                                   customer
                            where
                                   c_acctbal > 0.00
                                     and
substring(c_phone,1,2) in
                                          ('17',
'13', '10', '30', '34', '28', '12')
                     )
                     and not exists (
                            select
                                   *
                            from
                                   orders
                            where
                                   o_custkey =
c_custkey
                     )
       ) as custsale
group by
       cntrycode
order by
       cntrycode;
commit ;
set qstop = now(*);
select 'Stream 0 Query 22 STOP -- ', qstop ;
select 'Stream 0 Query 22 LENGTH -- ',
cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)16.sql  2.1.8.1
-- TPC-H/TPC-R Parts/Supplier Relationship Query (Q16)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 0 Query 16 START -- ', qstart ;
select
       p_brand,
       p_type,
       p_size,
       count(distinct ps_suppkey) as supplier_cnt
from
       partsupp,
       part
where
       p_partkey = ps_partkey
       and p_brand <> 'Brand#35'
       and p_type not like 'ECONOMY PLATED%'
       and p_size in (6, 46, 41, 50, 38, 4, 14, 24)
       and ps_suppkey not in (
              select
                     s_suppkey
              from
                     supplier
              where
                     s_comment like '%Customer
%Complaints%'
       )
group by
       p_brand,
       p_type,
       p_size
order by
       supplier_cnt desc,
       p_brand,
       p_type,
       p_size;
commit ;
set qstop = now(*);
select 'Stream 0 Query 16 STOP -- ', qstop ;
select 'Stream 0 Query 16 LENGTH -- ',
cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)4.sql   2.1.8.1
-- TPC-H/TPC-R Order Priority Checking Query (Q4)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 0 Query 4 START -- ', qstart ;
select
       o_orderpriority,
       count(*) as order_count
from
       orders
where
       o_orderdate >= '1995-07-01'
        and o_orderdate < dateadd(month,
3,'1995-07-01')
       and exists (
              select
                     *
              from
                     lineitem
              where
                     l_orderkey = o_orderkey
                     and l_commitdate <
l_receiptdate
       )
group by
```

```
	o_orderpriority
order by
	o_orderpriority;
commit ;
set qstop = now(*);
select 'Stream 0 Query 4 STOP -- ', qstop ;
select 'Stream 0 Query 4 LENGTH -- ',
cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)11.sql  2.1.8.1
-- TPC-H/TPC-R Important Stock Identification Query
(Q11)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 0 Query 11 START -- ', qstart ;
select
	ps_partkey,
	sum(ps_supplycost * ps_availqty) as value
from
	partsupp,
	supplier,
	nation
where
	ps_suppkey = s_suppkey
	and s_nationkey = n_nationkey
	and n_name = 'GERMANY'
group by
	ps_partkey having
		sum(ps_supplycost * ps_availqty) > (
			select
				sum(ps_supplycost *
ps_availqty) * 0.0000010000
			from
				partsupp,
				supplier,
				nation
			where
				ps_suppkey = s_suppkey
				and s_nationkey =
n_nationkey
				and n_name = 'GERMANY'
		)
order by
	value desc;
commit ;
set qstop = now(*);
select 'Stream 0 Query 11 STOP -- ', qstop ;
select 'Stream 0 Query 11 LENGTH -- ',
cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)15.sql  2.1.8.1
-- TPC-H/TPC-R Top Supplier Query (Q15)
-- Functional Query Definition
-- Approved February 1998

set qstart = now(*);
select 'Stream 0 Query 15 START -- ', qstart ;
create view revenue0 (supplier_no, total_revenue) as
	select
		l_suppkey,
		sum(l_extendedprice * (1 - l_discount))
	from
		lineitem
	where
		l_shipdate >= '1995-01-01'
		 and l_shipdate < dateadd(month,
3,'1995-01-01')
	group by
		l_suppkey;


select
	s_suppkey,
	s_name,
	s_address,
	s_phone,
	total_revenue
from
	supplier,
	revenue0
where
	s_suppkey = supplier_no
	and total_revenue = (
		select
			max(total_revenue)
		from
			revenue0
	)
order by
	s_suppkey;

drop view revenue0;
commit ;
set qstop = now(*);
select 'Stream 0 Query 15 STOP -- ', qstop ;
select 'Stream 0 Query 15 LENGTH -- ',
cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)1.sql   2.1.8.1
-- TPC-H/TPC-R Pricing Summary Report Query (Q1)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 0 Query 1 START -- ', qstart ;
select
	l_returnflag,
	l_linestatus,
	sum(l_quantity) as sum_qty,
	sum(l_extendedprice) as sum_base_price,
	sum(l_extendedprice * (1 - l_discount)) as
sum_disc_price,
	sum(l_extendedprice * (1 - l_discount) * (1 +
l_tax)) as sum_charge,
	avg(l_quantity) as avg_qty,
	avg(l_extendedprice) as avg_price,
	avg(l_discount) as avg_disc,
	count(*) as count_order
from
	lineitem
where
	l_shipdate <= dateadd(day,-106,'1998-12-01')
group by
	l_returnflag,
	l_linestatus
order by
	l_returnflag,
	l_linestatus;
commit ;
set qstop = now(*);
select 'Stream 0 Query 1 STOP -- ', qstop ;
select 'Stream 0 Query 1 LENGTH -- ',
cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)10.sql  2.1.8.1
-- TPC-H/TPC-R Returned Item Reporting Query (Q10)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 0 Query 10 START -- ', qstart ;
select top 20
	c_custkey,
	c_name,
	sum(l_extendedprice * (1 - l_discount)) as
revenue,
	c_acctbal,
	n_name,
	c_address,
	c_phone,
	c_comment
```

```
from
	customer,
	orders,
	lineitem,
	nation
where
	c_custkey = o_custkey
	and l_orderkey = o_orderkey
	and o_orderdate >= '1993-10-01'
	 and o_orderdate < dateadd(month,
3,'1993-10-01')
	and l_returnflag = 'R'
	and c_nationkey = n_nationkey
group by
	c_custkey,
	c_name,
	c_acctbal,
	c_phone,
	n_name,
	c_address,
	c_comment
order by
	revenue desc;
commit ;
set qstop = now(*);
select 'Stream 0 Query 10 STOP -- ', qstop ;
select 'Stream 0 Query 10 LENGTH -- ',
cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)19.sql  2.1.8.1
-- TPC-H/TPC-R Discounted Revenue Query (Q19)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 0 Query 19 START -- ', qstart ;
select
	sum(l_extendedprice* (1 - l_discount)) as
revenue
from
	lineitem,
	part
where
	(
		p_partkey = l_partkey
		and p_brand = 'Brand#13'
		and p_container in ('SM CASE', 'SM
BOX', 'SM PACK', 'SM PKG')
		and l_quantity >= 1 and l_quantity <= 1
+ 10
		and p_size between 1 and 5
		and l_shipmode in ('AIR', 'AIR REG')
		and l_shipinstruct = 'DELIVER IN
PERSON'
	)
	or
	(
		p_partkey = l_partkey
		and p_brand = 'Brand#13'
		and p_container in ('MED BAG', 'MED
BOX', 'MED PKG', 'MED PACK')
		and l_quantity >= 16 and l_quantity <=
16 + 10
		and p_size between 1 and 10
		and l_shipmode in ('AIR', 'AIR REG')
		and l_shipinstruct = 'DELIVER IN
PERSON'
	)
	or
	(
		p_partkey = l_partkey
		and p_brand = 'Brand#43'
		and p_container in ('LG CASE', 'LG
BOX', 'LG PACK', 'LG PKG')
		and l_quantity >= 22 and l_quantity <=
22 + 10
		and p_size between 1 and 15
		and l_shipmode in ('AIR', 'AIR REG')
		and l_shipinstruct = 'DELIVER IN
PERSON'
	);
commit ;
set qstop = now(*);
select 'Stream 0 Query 19 STOP -- ', qstop ;
select 'Stream 0 Query 19 LENGTH -- ',
cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)5.sql   2.1.8.1
-- TPC-H/TPC-R Local Supplier Volume Query (Q5)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 0 Query 5 START -- ', qstart ;
select
	n_name,
	sum(l_extendedprice * (1 - l_discount)) as
revenue
from
	customer,
	orders,
	lineitem,
	supplier,
	nation,
	region
where
	c_custkey = o_custkey
	and l_orderkey = o_orderkey
	and l_suppkey = s_suppkey
	and c_nationkey = s_nationkey
	and s_nationkey = n_nationkey
	and n_regionkey = r_regionkey
	and r_name = 'AMERICA'
	and o_orderdate >= '1995-01-01'
	 and o_orderdate < dateadd(year,1,'1995-01-01')
group by
	n_name
order by
	revenue desc;
commit ;
set qstop = now(*);
select 'Stream 0 Query 5 STOP -- ', qstop ;
select 'Stream 0 Query 5 LENGTH -- ',
cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)7.sql   2.1.8.1
-- TPC-H/TPC-R Volume Shipping Query (Q7)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 0 Query 7 START -- ', qstart ;
select
	supp_nation,
	cust_nation,
	l_year,
	sum(volume) as revenue
from
	(
		select
			n1.n_name as supp_nation,
			n2.n_name as cust_nation,
			  datepart(year, l_shipdate) as
l_year,
			l_extendedprice * (1 -
l_discount) as volume
		from
			supplier,
			lineitem,
			orders,
			customer,
			nation n1,
			nation n2
```

```
		where
			s_suppkey = l_suppkey
			and o_orderkey = l_orderkey
			and c_custkey = o_custkey
			and s_nationkey =
n1.n_nationkey
			and c_nationkey =
n2.n_nationkey
			and (
				(n1.n_name = 'IRAQ' and
n2.n_name = 'PERU')
				or (n1.n_name = 'PERU'
and n2.n_name = 'IRAQ')
			)
			and l_shipdate between
'1995-01-01' and '1996-12-31'
	) as shipping
group by
	supp_nation,
	cust_nation,
	l_year
order by
	supp_nation,
	cust_nation,
	l_year;
commit ;
set qstop = now(*);
select 'Stream 0 Query 7 STOP -- ', qstop ;
select 'Stream 0 Query 7 LENGTH -- ',
cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)12.sql  2.1.8.1
-- TPC-H/TPC-R Shipping Modes and Order Priority Query
(Q12)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 0 Query 12 START -- ', qstart ;
select
	l_shipmode,
	sum(case
		when o_orderpriority = '1-URGENT'
			or o_orderpriority = '2-HIGH'
			then 1
		else 0
	end) as high_line_count,
	sum(case
		when o_orderpriority <> '1-URGENT'
			and o_orderpriority <> '2-HIGH'
			then 1
		else 0
	end) as low_line_count
from
	orders,
	lineitem
where
	o_orderkey = l_orderkey
	and l_shipmode in ('SHIP', 'FOB')
	and l_commitdate < l_receiptdate
	and l_shipdate < l_commitdate
	and l_receiptdate >= '1995-01-01'
	 and l_receiptdate < dateadd(year,
1,'1995-01-01')
group by
	l_shipmode
order by
	l_shipmode;
commit ;
set qstop = now(*);
select 'Stream 0 Query 12 STOP -- ', qstop ;
select 'Stream 0 Query 12 LENGTH -- ',
cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;

select 'Stream completion time -- ',now(*) as "time";

disconnect;

exit;
```

==========

stream1.sql

```
-- using 207153855 as a seed to the RNG
create variable qstart timestamp;
create variable qstop timestamp;
select 'Stream begin time -- ',now(*) as "time";
-- @(#)21.sql		2.1.8.1
-- TPC-H/TPC-R Suppliers Who Kept Orders Waiting Query (Q21)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 1 Query 21 START -- ', qstart ;
select top 100
		s_name,
		count(*) as numwait
from
		supplier,
		lineitem l1,
		orders,
		nation
where
		s_suppkey = l1.l_suppkey
		and o_orderkey = l1.l_orderkey
		and o_orderstatus = 'F'
		and l1.l_receiptdate > l1.l_commitdate
		and exists (
			select
				*
			from
				lineitem l2
			where
				l2.l_orderkey = l1.l_orderkey
				and l2.l_suppkey <> l1.l_suppkey
		)
		and not exists (
			select
				*
			from
				lineitem l3
			where
				l3.l_orderkey = l1.l_orderkey
				and l3.l_suppkey <> l1.l_suppkey
				and l3.l_receiptdate > l3.l_commitdate
		)
		and s_nationkey = n_nationkey
		and n_name = 'VIETNAM'
group by
		s_name
order by
		numwait desc,
		s_name;
commit ;
set qstop = now(*);
select 'Stream 1 Query 21 STOP -- ', qstop ;
select 'Stream 1 Query 21 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)3.sql		2.1.8.1
-- TPC-H/TPC-R Shipping Priority Query (Q3)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 1 Query 3 START -- ', qstart ;
```

```
select top 10
        l_orderkey,
        sum(l_extendedprice * (1 - l_discount)) as revenue,
        o_orderdate,
        o_shippriority
from
        customer,
        orders,
        lineitem
where
        c_mktsegment = 'MACHINERY'
        and c_custkey = o_custkey
        and l_orderkey = o_orderkey
        and o_orderdate < '1995-03-02'
        and l_shipdate >  '1995-03-02'
group by
        l_orderkey,
        o_orderdate,
        o_shippriority
order by
        revenue desc,
        o_orderdate;
commit ;
set qstop = now(*);
select 'Stream 1 Query 3 STOP -- ', qstop ;
select 'Stream 1 Query 3 LENGTH -- ', cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)18.sql           2.1.8.1
-- TPC-H/TPC-R Large Volume Customer Query (Q18)
-- Function Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 1 Query 18 START -- ', qstart ;
select top 100
        c_name,
        c_custkey,
        o_orderkey,
        o_orderdate,
        o_totalprice,
        sum(l_quantity)
from
        customer,
        orders,
        lineitem
where
        o_orderkey in (
                select
                        l_orderkey
                from
                        lineitem
                group by
                        l_orderkey having
                                sum(l_quantity) > 312
        )
        and c_custkey = o_custkey
        and o_orderkey = l_orderkey
group by
        c_name,
        c_custkey,
        o_orderkey,
        o_orderdate,
        o_totalprice
order by
        o_totalprice desc,
        o_orderdate;
commit ;
set qstop = now(*);
select 'Stream 1 Query 18 STOP -- ', qstop ;
select 'Stream 1 Query 18 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)5.sql            2.1.8.1
-- TPC-H/TPC-R Local Supplier Volume Query (Q5)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 1 Query 5 START -- ', qstart ;
select
        n_name,
        sum(l_extendedprice * (1 - l_discount)) as revenue
from
        customer,
        orders,
        lineitem,
        supplier,
        nation,
        region
where
        c_custkey = o_custkey
        and l_orderkey = o_orderkey
        and l_suppkey = s_suppkey
        and c_nationkey = s_nationkey
        and s_nationkey = n_nationkey
        and n_regionkey = r_regionkey
        and r_name = 'ASIA'
        and o_orderdate >= '1996-01-01'
    and o_orderdate < dateadd(year,1,'1996-01-01')
group by
        n_name
order by
        revenue desc;
commit ;
set qstop = now(*);
select 'Stream 1 Query 5 STOP -- ', qstop ;
select 'Stream 1 Query 5 LENGTH -- ', cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)11.sql           2.1.8.1
-- TPC-H/TPC-R Important Stock Identification Query (Q11)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 1 Query 11 START -- ', qstart ;
select
        ps_partkey,
        sum(ps_supplycost * ps_availqty) as value
from
        partsupp,
        supplier,
        nation
where
        ps_suppkey = s_suppkey
        and s_nationkey = n_nationkey
        and n_name = 'SAUDI ARABIA'
group by
        ps_partkey having
                sum(ps_supplycost * ps_availqty) > (
                        select
                                sum(ps_supplycost * ps_availqty) *
0.0000010000
                        from
                                partsupp,
                                supplier,
                                nation
                        where
                                ps_suppkey = s_suppkey
                                and s_nationkey = n_nationkey
                                and n_name = 'SAUDI ARABIA'
                )
order by
        value desc;
commit ;
```

```
set qstop = now(*);
select 'Stream 1 Query 11 STOP -- ', qstop ;
select 'Stream 1 Query 11 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)7.sql            2.1.8.1
-- TPC-H/TPC-R Volume Shipping Query (Q7)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 1 Query 7 START -- ', qstart ;
select
        supp_nation,
        cust_nation,
        l_year,
        sum(volume) as revenue
from
        (
                select
                        n1.n_name as supp_nation,
                        n2.n_name as cust_nation,
            datepart(year, l_shipdate) as l_year,
                        l_extendedprice * (1 - l_discount) as volume
                from
                        supplier,
                        lineitem,
                        orders,
                        customer,
                        nation n1,
                        nation n2
                where
                        s_suppkey = l_suppkey
                        and o_orderkey = l_orderkey
                        and c_custkey = o_custkey
                        and s_nationkey = n1.n_nationkey
                        and c_nationkey = n2.n_nationkey
                        and (
                                (n1.n_name = 'CANADA' and
n2.n_name = 'MOROCCO')
                                or (n1.n_name = 'MOROCCO' and
n2.n_name = 'CANADA')
                        )
                        and l_shipdate between '1995-01-01' and
'1996-12-31'
        ) as shipping
group by
        supp_nation,
        cust_nation,
        l_year
order by
        supp_nation,
        cust_nation,
        l_year;
commit ;
set qstop = now(*);
select 'Stream 1 Query 7 STOP -- ', qstop ;
select 'Stream 1 Query 7 LENGTH -- ', cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)6.sql            2.1.8.1
-- TPC-H/TPC-R Forecasting Revenue Change Query (Q6)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 1 Query 6 START -- ', qstart ;
select
        sum(l_extendedprice * l_discount) as revenue
from
        lineitem
where
        l_shipdate >= '1996-01-01'
        and l_shipdate < dateadd(year,1,'1996-01-01')
        and l_discount between 0.02 - 0.01 and 0.02 + 0.01
        and l_quantity < 24;
commit ;
set qstop = now(*);
select 'Stream 1 Query 6 STOP -- ', qstop ;
select 'Stream 1 Query 6 LENGTH -- ', cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)20.sql           2.1.8.1
-- TPC-H/TPC-R Potential Part Promotion Query (Q20)
-- Function Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 1 Query 20 START -- ', qstart ;
select
        s_name,
        s_address
from
        supplier,
        nation
where
        s_suppkey in (
                select
                        ps_suppkey
                from
                        partsupp
                where
                        ps_partkey in (
                                select
                                        p_partkey
                                from
                                        part
                                where
                                        p_name like 'antique%'
                        )
                        and ps_availqty > (
                                select
                                        0.5 * sum(l_quantity)
                                from
                                        lineitem
                                where
                                        l_partkey = ps_partkey
                                        and l_suppkey =
ps_suppkey
                                        and l_shipdate >=
'1997-01-01'
                                        and l_shipdate < dateadd(year,1,'1997-01-01')
                                )
        )
        and s_nationkey = n_nationkey
        and n_name = 'ARGENTINA'
order by
        s_name;
commit ;
set qstop = now(*);
select 'Stream 1 Query 20 STOP -- ', qstop ;
select 'Stream 1 Query 20 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)17.sql           2.1.8.1
-- TPC-H/TPC-R Small-Quantity-Order Revenue Query (Q17)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 1 Query 17 START -- ', qstart ;
select
        sum(l_extendedprice) / 7.0 as avg_yearly
from
        lineitem,
        part
```

```
where
	p_partkey = l_partkey
	and p_brand = 'Brand#51'
	and p_container = 'SM DRUM'
	and l_quantity < (
		select
			0.2 * avg(l_quantity)
		from
			lineitem
		where
			l_partkey = p_partkey
	);
commit ;
set qstop = now(*);
select 'Stream 1 Query 17 STOP -- ', qstop ;
select 'Stream 1 Query 17 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)12.sql	2.1.8.1
-- TPC-H/TPC-R Shipping Modes and Order Priority Query (Q12)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 1 Query 12 START -- ', qstart ;
select
	l_shipmode,
	sum(case
		when o_orderpriority = '1-URGENT'
			or o_orderpriority = '2-HIGH'
			then 1
		else 0
	end) as high_line_count,
	sum(case
		when o_orderpriority <> '1-URGENT'
			and o_orderpriority <> '2-HIGH'
			then 1
		else 0
	end) as low_line_count
from
	orders,
	lineitem
where
	o_orderkey = l_orderkey
	and l_shipmode in ('FOB', 'SHIP')
	and l_commitdate < l_receiptdate
	and l_shipdate < l_commitdate
	and l_receiptdate >= '1996-01-01'
    and l_receiptdate < dateadd(year,1,'1996-01-01')
group by
	l_shipmode
order by
	l_shipmode;
commit ;
set qstop = now(*);
select 'Stream 1 Query 12 STOP -- ', qstop ;
select 'Stream 1 Query 12 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)16.sql	2.1.8.1
-- TPC-H/TPC-R Parts/Supplier Relationship Query (Q16)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 1 Query 16 START -- ', qstart ;
select
	p_brand,
	p_type,
	p_size,
	count(distinct ps_suppkey) as supplier_cnt
from
	partsupp,
	part
where
	p_partkey = ps_partkey
	and p_brand <> 'Brand#15'
	and p_type not like 'STANDARD POLISHED%'
	and p_size in (16, 21, 31, 32, 36, 18, 19, 6)
	and ps_suppkey not in (
		select
			s_suppkey
		from
			supplier
		where
			s_comment like '%Customer%Complaints%'
	)
group by
	p_brand,
	p_type,
	p_size
order by
	supplier_cnt desc,
	p_brand,
	p_type,
	p_size;
commit ;
set qstop = now(*);
select 'Stream 1 Query 16 STOP -- ', qstop ;
select 'Stream 1 Query 16 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)15.sql	2.1.8.1
-- TPC-H/TPC-R Top Supplier Query (Q15)
-- Functional Query Definition
-- Approved February 1998

set qstart = now(*);
select 'Stream 1 Query 15 START -- ', qstart ;
create view revenue1 (supplier_no, total_revenue) as
	select
		l_suppkey,
		sum(l_extendedprice * (1 - l_discount))
	from
		lineitem
	where
		l_shipdate >= '1993-01-01'
	   and l_shipdate < dateadd(month,3,'1993-01-01')
	group by
		l_suppkey;



select
	s_suppkey,
	s_name,
	s_address,
	s_phone,
	total_revenue
from
	supplier,
	revenue1
where
	s_suppkey = supplier_no
	and total_revenue = (
		select
			max(total_revenue)
		from
			revenue1
	)
order by
	s_suppkey;

drop view revenue1;
commit ;
set qstop = now(*);
select 'Stream 1 Query 15 STOP -- ', qstop ;
select 'Stream 1 Query 15 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
```

```
as numeric)/1000, ' seconds' ;
-- @(#)13.sql            2.1.8.1
-- TPC-H/TPC-R Customer Distribution Query (Q13)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 1 Query 13 START -- ', qstart ;
select
        c_count,
        count(*) as custdist
from
        (
                select
                        c_custkey,
                        count(o_orderkey)
                from
                        customer left outer join orders on
                                c_custkey = o_custkey
                                and o_comment not like '%express
%deposits%'
                group by
                        c_custkey
        ) as c_orders (c_custkey, c_count)
group by
        c_count
order by
        custdist desc,
        c_count desc;
commit ;
set qstop = now(*);
select 'Stream 1 Query 13 STOP -- ', qstop ;
select 'Stream 1 Query 13 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)10.sql            2.1.8.1
-- TPC-H/TPC-R Returned Item Reporting Query (Q10)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 1 Query 10 START -- ', qstart ;
select top 20
        c_custkey,
        c_name,
        sum(l_extendedprice * (1 - l_discount)) as revenue,
        c_acctbal,
        n_name,
        c_address,
        c_phone,
        c_comment
from
        customer,
        orders,
        lineitem,
        nation
where
        c_custkey = o_custkey
        and l_orderkey = o_orderkey
        and o_orderdate >= '1994-08-01'
    and o_orderdate < dateadd(month,3,'1994-08-01')
        and l_returnflag = 'R'
        and c_nationkey = n_nationkey
group by
        c_custkey,
        c_name,
        c_acctbal,
        c_phone,
        n_name,
        c_address,
        c_comment
order by
        revenue desc;
commit ;
set qstop = now(*);
select 'Stream 1 Query 10 STOP -- ', qstop ;
select 'Stream 1 Query 10 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)2.sql             2.1.8.2
-- TPC-H/TPC-R Minimum Cost Supplier Query (Q2)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 1 Query 2 START -- ', qstart ;
select top 100
        s_acctbal,
        s_name,
        n_name,
        p_partkey,
        p_mfgr,
        s_address,
        s_phone,
        s_comment
from
        part,
        supplier,
        partsupp,
        nation,
        region
where
        p_partkey = ps_partkey
        and s_suppkey = ps_suppkey
        and p_size = 18
        and p_type like '%STEEL'
        and s_nationkey = n_nationkey
        and n_regionkey = r_regionkey
        and r_name = 'AFRICA'
        and ps_supplycost = (
                select
                        min(ps_supplycost)
                from
                        partsupp,
                        supplier,
                        nation,
                        region
                where
                        p_partkey = ps_partkey
                        and s_suppkey = ps_suppkey
                        and s_nationkey = n_nationkey
                        and n_regionkey = r_regionkey
                        and r_name = 'AFRICA'
        )
order by
        s_acctbal desc,
        n_name,
        s_name,
        p_partkey;
commit ;
set qstop = now(*);
select 'Stream 1 Query 2 STOP -- ', qstop ;
select 'Stream 1 Query 2 LENGTH -- ', cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)8.sql             2.1.8.1
-- TPC-H/TPC-R National Market Share Query (Q8)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 1 Query 8 START -- ', qstart ;
select
        o_year,
        sum(case
```

```
                        when nation = 'CANADA' then volume
                        else 0
                end) / sum(volume) as mkt_share
from
                (
                        select
                    datepart(year, o_orderdate) as o_year,
                                l_extendedprice * (1 - l_discount) as volume,
                                n2.n_name as nation
                        from
                                part,
                                supplier,
                                lineitem,
                                orders,
                                customer,
                                nation n1,
                                nation n2,
                                region
                        where
                                p_partkey = l_partkey
                                and s_suppkey = l_suppkey
                                and l_orderkey = o_orderkey
                                and o_custkey = c_custkey
                                and c_nationkey = n1.n_nationkey
                                and n1.n_regionkey = r_regionkey
                                and r_name = 'AMERICA'
                                and s_nationkey = n2.n_nationkey
                                and o_orderdate between '1995-01-01' and
'1996-12-31'
                                and p_type = 'LARGE BRUSHED TIN'
                ) as all_nations
group by
                o_year
order by
                o_year;
commit ;
set qstop = now(*);
select 'Stream 1 Query 8 STOP -- ', qstop ;
select 'Stream 1 Query 8 LENGTH -- ', cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)14.sql           2.1.8.1
-- TPC-H/TPC-R Promotion Effect Query (Q14)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 1 Query 14 START -- ', qstart ;
select
                100.00 * sum(case
                        when p_type like 'PROMO%'
                                then l_extendedprice * (1 - l_discount)
                        else 0
                end) / sum(l_extendedprice * (1 - l_discount)) as promo_revenue
from
                lineitem,
                part
where
                l_partkey = p_partkey
                and l_shipdate >= '1997-01-01'
        and l_shipdate < dateadd(month,1,'1997-01-01');
commit ;
set qstop = now(*);
select 'Stream 1 Query 14 STOP -- ', qstop ;
select 'Stream 1 Query 14 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)19.sql           2.1.8.1
-- TPC-H/TPC-R Discounted Revenue Query (Q19)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 1 Query 19 START -- ', qstart ;
select
                sum(l_extendedprice* (1 - l_discount)) as revenue
from
                lineitem,
                part
where
                (
                        p_partkey = l_partkey
                        and p_brand = 'Brand#11'
                        and p_container in ('SM CASE', 'SM BOX', 'SM PACK',
'SM PKG')
                        and l_quantity >= 6 and l_quantity <= 6 + 10
                        and p_size between 1 and 5
                        and l_shipmode in ('AIR', 'AIR REG')
                        and l_shipinstruct = 'DELIVER IN PERSON'
                )
                or
                (
                        p_partkey = l_partkey
                        and p_brand = 'Brand#51'
                        and p_container in ('MED BAG', 'MED BOX', 'MED
PKG', 'MED PACK')
                        and l_quantity >= 17 and l_quantity <= 17 + 10
                        and p_size between 1 and 10
                        and l_shipmode in ('AIR', 'AIR REG')
                        and l_shipinstruct = 'DELIVER IN PERSON'
                )
                or
                (
                        p_partkey = l_partkey
                        and p_brand = 'Brand#42'
                        and p_container in ('LG CASE', 'LG BOX', 'LG PACK',
'LG PKG')
                        and l_quantity >= 29 and l_quantity <= 29 + 10
                        and p_size between 1 and 15
                        and l_shipmode in ('AIR', 'AIR REG')
                        and l_shipinstruct = 'DELIVER IN PERSON'
                );
commit ;
set qstop = now(*);
select 'Stream 1 Query 19 STOP -- ', qstop ;
select 'Stream 1 Query 19 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)9.sql            2.1.8.1
-- TPC-H/TPC-R Product Type Profit Measure Query (Q9)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 1 Query 9 START -- ', qstart ;
select
                nation,
                o_year,
                sum(amount) as sum_profit
from
                (
                        select
                                n_name as nation,
                    datepart(year, o_orderdate) as o_year,
                                l_extendedprice * (1 - l_discount) -
ps_supplycost * l_quantity as amount
                        from
                                part,
                                supplier,
                                lineitem,
                                partsupp,
                                orders,
                                nation
                        where
                                s_suppkey = l_suppkey
                                and ps_suppkey = l_suppkey
```

```
                                and ps_partkey = l_partkey
                                and p_partkey = l_partkey
                                and o_orderkey = l_orderkey
                                and s_nationkey = n_nationkey
                                and p_name like '%orange%'
        ) as profit
group by
        nation,
        o_year
order by
        nation,
        o_year desc;
commit ;
set qstop = now(*);
select 'Stream 1 Query 9 STOP -- ', qstop ;
select 'Stream 1 Query 9 LENGTH -- ', cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)22.sql           2.1.8.1
-- TPC-H/TPC-R Global Sales Opportunity Query (Q22)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 1 Query 22 START -- ', qstart ;
select
        cntrycode,
        count(*) as numcust,
        sum(c_acctbal) as totacctbal
from
        (
                select
            substring(c_phone,1,2) as cntrycode,
                                c_acctbal
                from
                                customer
                where
            substring(c_phone,1,2) in
                                        ('10', '27', '18', '25', '19', '32', '21')
                                and c_acctbal > (
                                        select
                                                avg(c_acctbal)
                                        from
                                                customer
                                        where
                                                c_acctbal > 0.00
                        and substring(c_phone,1,2) in
                                                                ('10', '27',
'18', '25', '19', '32', '21')
                                )
                                and not exists (
                                        select
                                                *
                                        from
                                                orders
                                        where
                                                o_custkey = c_custkey
                                )
        ) as custsale
group by
        cntrycode
order by
        cntrycode;
commit ;
set qstop = now(*);
select 'Stream 1 Query 22 STOP -- ', qstop ;
select 'Stream 1 Query 22 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)1.sql            2.1.8.1
-- TPC-H/TPC-R Pricing Summary Report Query (Q1)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 1 Query 1 START -- ', qstart ;
select
        l_returnflag,
        l_linestatus,
        sum(l_quantity) as sum_qty,
        sum(l_extendedprice) as sum_base_price,
        sum(l_extendedprice * (1 - l_discount)) as sum_disc_price,
        sum(l_extendedprice * (1 - l_discount) * (1 + l_tax)) as sum_charge,
        avg(l_quantity) as avg_qty,
        avg(l_extendedprice) as avg_price,
        avg(l_discount) as avg_disc,
        count(*) as count_order
from
        lineitem
where
        l_shipdate <= dateadd(day,-114,'1998-12-01')
group by
        l_returnflag,
        l_linestatus
order by
        l_returnflag,
        l_linestatus;
commit ;
set qstop = now(*);
select 'Stream 1 Query 1 STOP -- ', qstop ;
select 'Stream 1 Query 1 LENGTH -- ', cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)4.sql            2.1.8.1
-- TPC-H/TPC-R Order Priority Checking Query (Q4)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 1 Query 4 START -- ', qstart ;
select
        o_orderpriority,
        count(*) as order_count
from
        orders
where
        o_orderdate >= '1993-04-01'
    and o_orderdate < dateadd(month,3,'1993-04-01')
        and exists (
                select
                        *
                from
                        lineitem
                where
                        l_orderkey = o_orderkey
                        and l_commitdate < l_receiptdate
        )
group by
        o_orderpriority
order by
        o_orderpriority;
commit ;
set qstop = now(*);
select 'Stream 1 Query 4 STOP -- ', qstop ;
select 'Stream 1 Query 4 LENGTH -- ', cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;

select 'Stream completion time -- ',now(*) as "time";

disconnect;

exit;
```

==========

stream2.sql

```
-- using 207153856 as a seed to the RNG
create variable qstart timestamp;
create variable qstop timestamp;
select 'Stream begin time -- ',now(*) as "time";
-- @(#)6.sql            2.1.8.1
-- TPC-H/TPC-R Forecasting Revenue Change Query (Q6)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 2 Query 6 START -- ', qstart ;
select
        sum(l_extendedprice * l_discount) as revenue
from
        lineitem
where
        l_shipdate >= '1996-01-01'
    and l_shipdate < dateadd(year,1,'1996-01-01')
        and l_discount between 0.08 - 0.01 and 0.08 + 0.01
        and l_quantity < 25;
commit ;
set qstop = now(*);
select 'Stream 2 Query 6 STOP -- ', qstop ;
select 'Stream 2 Query 6 LENGTH -- ', cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)17.sql           2.1.8.1
-- TPC-H/TPC-R Small-Quantity-Order Revenue Query (Q17)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 2 Query 17 START -- ', qstart ;
select
        sum(l_extendedprice) / 7.0 as avg_yearly
from
        lineitem,
        part
where
        p_partkey = l_partkey
        and p_brand = 'Brand#53'
        and p_container = 'LG BOX'
        and l_quantity < (
                select
                        0.2 * avg(l_quantity)
                from
                        lineitem
                where
                        l_partkey = p_partkey
        );
commit ;
set qstop = now(*);
select 'Stream 2 Query 17 STOP -- ', qstop ;
select 'Stream 2 Query 17 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)14.sql           2.1.8.1
-- TPC-H/TPC-R Promotion Effect Query (Q14)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 2 Query 14 START -- ', qstart ;
select
        100.00 * sum(case
                when p_type like 'PROMO%'
                        then l_extendedprice * (1 - l_discount)
                else 0
        end) / sum(l_extendedprice * (1 - l_discount)) as promo_revenue
from
        lineitem,
        part
where
        l_partkey = p_partkey
        and l_shipdate >= '1997-01-01'
    and l_shipdate < dateadd(month,1,'1997-01-01');
commit ;
set qstop = now(*);
select 'Stream 2 Query 14 STOP -- ', qstop ;
select 'Stream 2 Query 14 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)16.sql           2.1.8.1
-- TPC-H/TPC-R Parts/Supplier Relationship Query (Q16)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 2 Query 16 START -- ', qstart ;
select
        p_brand,
        p_type,
        p_size,
        count(distinct ps_suppkey) as supplier_cnt
from
        partsupp,
        part
where
        p_partkey = ps_partkey
        and p_brand <> 'Brand#55'
        and p_type not like 'LARGE ANODIZED%'
        and p_size in (35, 15, 49, 27, 6, 3, 39, 25)
        and ps_suppkey not in (
                select
                        s_suppkey
                from
                        supplier
                where
                        s_comment like '%Customer%Complaints%'
        )
group by
        p_brand,
        p_type,
        p_size
order by
        supplier_cnt desc,
        p_brand,
        p_type,
        p_size;
commit ;
set qstop = now(*);
select 'Stream 2 Query 16 STOP -- ', qstop ;
select 'Stream 2 Query 16 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)19.sql           2.1.8.1
-- TPC-H/TPC-R Discounted Revenue Query (Q19)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 2 Query 19 START -- ', qstart ;
select
        sum(l_extendedprice* (1 - l_discount)) as revenue
from
        lineitem,
        part
where
        (
                p_partkey = l_partkey
                and p_brand = 'Brand#23'
                and p_container in ('SM CASE', 'SM BOX', 'SM PACK',
```

```
'SM PKG')
                        and l_quantity >= 2 and l_quantity <= 2 + 10
                        and p_size between 1 and 5
                        and l_shipmode in ('AIR', 'AIR REG')
                        and l_shipinstruct = 'DELIVER IN PERSON'
                )
                or
                (
                        p_partkey = l_partkey
                        and p_brand = 'Brand#34'
                        and p_container in ('MED BAG', 'MED BOX', 'MED
PKG', 'MED PACK')
                        and l_quantity >= 18 and l_quantity <= 18 + 10
                        and p_size between 1 and 10
                        and l_shipmode in ('AIR', 'AIR REG')
                        and l_shipinstruct = 'DELIVER IN PERSON'
                )
                or
                (
                        p_partkey = l_partkey
                        and p_brand = 'Brand#41'
                        and p_container in ('LG CASE', 'LG BOX', 'LG PACK',
'LG PKG')
                        and l_quantity >= 26 and l_quantity <= 26 + 10
                        and p_size between 1 and 15
                        and l_shipmode in ('AIR', 'AIR REG')
                        and l_shipinstruct = 'DELIVER IN PERSON'
                );
commit ;
set qstop = now(*);
select 'Stream 2 Query 19 STOP -- ', qstop ;
select 'Stream 2 Query 19 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)10.sql           2.1.8.1
-- TPC-H/TPC-R Returned Item Reporting Query (Q10)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 2 Query 10 START -- ', qstart ;
select top 20
                c_custkey,
                c_name,
                sum(l_extendedprice * (1 - l_discount)) as revenue,
                c_acctbal,
                n_name,
                c_address,
                c_phone,
                c_comment
from
                customer,
                orders,
                lineitem,
                nation
where
                c_custkey = o_custkey
                and l_orderkey = o_orderkey
                and o_orderdate >= '1993-05-01'
        and o_orderdate < dateadd(month,3,'1993-05-01')
                and l_returnflag = 'R'
                and c_nationkey = n_nationkey
group by
                c_custkey,
                c_name,
                c_acctbal,
                c_phone,
                n_name,
                c_address,
                c_comment
order by
                revenue desc;
commit ;
set qstop = now(*);
select 'Stream 2 Query 10 STOP -- ', qstop ;
select 'Stream 2 Query 10 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)9.sql            2.1.8.1
-- TPC-H/TPC-R Product Type Profit Measure Query (Q9)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 2 Query 9 START -- ', qstart ;
select
                nation,
                o_year,
                sum(amount) as sum_profit
from
                (
                        select
                                n_name as nation,
                        datepart(year, o_orderdate) as o_year,
                                l_extendedprice * (1 - l_discount) -
ps_supplycost * l_quantity as amount
                        from
                                part,
                                supplier,
                                lineitem,
                                partsupp,
                                orders,
                                nation
                        where
                                s_suppkey = l_suppkey
                                and ps_suppkey = l_suppkey
                                and ps_partkey = l_partkey
                                and p_partkey = l_partkey
                                and o_orderkey = l_orderkey
                                and s_nationkey = n_nationkey
                                and p_name like '%mint%'
                ) as profit
group by
                nation,
                o_year
order by
                nation,
                o_year desc;
commit ;
set qstop = now(*);
select 'Stream 2 Query 9 STOP -- ', qstop ;
select 'Stream 2 Query 9 LENGTH -- ', cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)2.sql            2.1.8.2
-- TPC-H/TPC-R Minimum Cost Supplier Query (Q2)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 2 Query 2 START -- ', qstart ;
select top 100
                s_acctbal,
                s_name,
                n_name,
                p_partkey,
                p_mfgr,
                s_address,
                s_phone,
                s_comment
from
                part,
                supplier,
                partsupp,
                nation,
                region
```

```
where
	p_partkey = ps_partkey
	and s_suppkey = ps_suppkey
	and p_size = 6
	and p_type like '%BRASS'
	and s_nationkey = n_nationkey
	and n_regionkey = r_regionkey
	and r_name = 'ASIA'
	and ps_supplycost = (
		select
			min(ps_supplycost)
		from
			partsupp,
			supplier,
			nation,
			region
		where
			p_partkey = ps_partkey
			and s_suppkey = ps_suppkey
			and s_nationkey = n_nationkey
			and n_regionkey = r_regionkey
			and r_name = 'ASIA'
	)
order by
	s_acctbal desc,
	n_name,
	s_name,
	p_partkey;
commit ;
set qstop = now(*);
select 'Stream 2 Query 2 STOP -- ', qstop ;
select 'Stream 2 Query 2 LENGTH -- ', cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)15.sql	2.1.8.1
-- TPC-H/TPC-R Top Supplier Query (Q15)
-- Functional Query Definition
-- Approved February 1998

set qstart = now(*);
select 'Stream 2 Query 15 START -- ', qstart ;
create view revenue2 (supplier_no, total_revenue) as
	select
		l_suppkey,
		sum(l_extendedprice * (1 - l_discount))
	from
		lineitem
	where
		l_shipdate >= '1995-01-01'
	and l_shipdate < dateadd(month,3,'1995-01-01')
	group by
		l_suppkey;


select
	s_suppkey,
	s_name,
	s_address,
	s_phone,
	total_revenue
from
	supplier,
	revenue2
where
	s_suppkey = supplier_no
	and total_revenue = (
		select
			max(total_revenue)
		from
			revenue2
	)
order by
	s_suppkey;

drop view revenue2;
commit ;
set qstop = now(*);
select 'Stream 2 Query 15 STOP -- ', qstop ;
select 'Stream 2 Query 15 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)8.sql	2.1.8.1
-- TPC-H/TPC-R National Market Share Query (Q8)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 2 Query 8 START -- ', qstart ;
select
	o_year,
	sum(case
		when nation = 'SAUDI ARABIA' then volume
		else 0
	end) / sum(volume) as mkt_share
from
	(
		select
	    datepart(year, o_orderdate) as o_year,
			l_extendedprice * (1 - l_discount) as volume,
			n2.n_name as nation
		from
			part,
			supplier,
			lineitem,
			orders,
			customer,
			nation n1,
			nation n2,
			region
		where
			p_partkey = l_partkey
			and s_suppkey = l_suppkey
			and l_orderkey = o_orderkey
			and o_custkey = c_custkey
			and c_nationkey = n1.n_nationkey
			and n1.n_regionkey = r_regionkey
			and r_name = 'MIDDLE EAST'
			and s_nationkey = n2.n_nationkey
			and o_orderdate between '1995-01-01' and
'1996-12-31'
			and p_type = 'LARGE PLATED TIN'
	) as all_nations
group by
	o_year
order by
	o_year;
commit ;
set qstop = now(*);
select 'Stream 2 Query 8 STOP -- ', qstop ;
select 'Stream 2 Query 8 LENGTH -- ', cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)5.sql	2.1.8.1
-- TPC-H/TPC-R Local Supplier Volume Query (Q5)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 2 Query 5 START -- ', qstart ;
select
	n_name,
	sum(l_extendedprice * (1 - l_discount)) as revenue
from
	customer,
	orders,
	lineitem,
	supplier,
```

```
        nation,
        region
where
        c_custkey = o_custkey
        and l_orderkey = o_orderkey
        and l_suppkey = s_suppkey
        and c_nationkey = s_nationkey
        and s_nationkey = n_nationkey
        and n_regionkey = r_regionkey
        and r_name = 'EUROPE'
        and o_orderdate >= '1996-01-01'
    and o_orderdate < dateadd(year,1,'1996-01-01')
group by
        n_name
order by
        revenue desc;
commit ;
set qstop = now(*);
select 'Stream 2 Query 5 STOP -- ', qstop ;
select 'Stream 2 Query 5 LENGTH -- ', cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)22.sql          2.1.8.1
-- TPC-H/TPC-R Global Sales Opportunity Query (Q22)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 2 Query 22 START -- ', qstart ;
select
        cntrycode,
        count(*) as numcust,
        sum(c_acctbal) as totacctbal
from
        (
                select
            substring(c_phone,1,2) as cntrycode,
                        c_acctbal
                from
                        customer
                where
            substring(c_phone,1,2) in
                                ('15', '10', '13', '17', '28', '18', '31')
                        and c_acctbal > (
                                select
                                        avg(c_acctbal)
                                from
                                        customer
                                where
                                        c_acctbal > 0.00
                    and substring(c_phone,1,2) in
                                                        ('15', '10',
'13', '17', '28', '18', '31')
                        )
                        and not exists (
                                select
                                        *
                                from
                                        orders
                                where
                                        o_custkey = c_custkey
                        )
        ) as custsale
group by
        cntrycode
order by
        cntrycode;
commit ;
set qstop = now(*);
select 'Stream 2 Query 22 STOP -- ', qstop ;
select 'Stream 2 Query 22 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)12.sql          2.1.8.1
-- TPC-H/TPC-R Shipping Modes and Order Priority Query (Q12)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 2 Query 12 START -- ', qstart ;
select
        l_shipmode,
        sum(case
                when o_orderpriority = '1-URGENT'
                        or o_orderpriority = '2-HIGH'
                        then 1
                else 0
        end) as high_line_count,
        sum(case
                when o_orderpriority <> '1-URGENT'
                        and o_orderpriority <> '2-HIGH'
                        then 1
                else 0
        end) as low_line_count
from
        orders,
        lineitem
where
        o_orderkey = l_orderkey
        and l_shipmode in ('MAIL', 'REG AIR')
        and l_commitdate < l_receiptdate
        and l_shipdate < l_commitdate
        and l_receiptdate >= '1997-01-01'
    and l_receiptdate < dateadd(year,1,'1997-01-01')
group by
        l_shipmode
order by
        l_shipmode;
commit ;
set qstop = now(*);
select 'Stream 2 Query 12 STOP -- ', qstop ;
select 'Stream 2 Query 12 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)7.sql           2.1.8.1
-- TPC-H/TPC-R Volume Shipping Query (Q7)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 2 Query 7 START -- ', qstart ;
select
        supp_nation,
        cust_nation,
        l_year,
        sum(volume) as revenue
from
        (
                select
                        n1.n_name as supp_nation,
                        n2.n_name as cust_nation,
                    datepart(year, l_shipdate) as l_year,
                        l_extendedprice * (1 - l_discount) as volume
                from
                        supplier,
                        lineitem,
                        orders,
                        customer,
                        nation n1,
                        nation n2
                where
                        s_suppkey = l_suppkey
                        and o_orderkey = l_orderkey
                        and c_custkey = o_custkey
                        and s_nationkey = n1.n_nationkey
                        and c_nationkey = n2.n_nationkey
```

```
                                and (
                                        (n1.n_name = 'SAUDI ARABIA'
and n2.n_name = 'KENYA')
                                        or (n1.n_name = 'KENYA' and
n2.n_name = 'SAUDI ARABIA')
                                )
                                and l_shipdate between '1995-01-01' and
'1996-12-31'
        ) as shipping
group by
        supp_nation,
        cust_nation,
        l_year
order by
        supp_nation,
        cust_nation,
        l_year;
commit ;
set qstop = now(*);
select 'Stream 2 Query 7 STOP -- ', qstop ;
select 'Stream 2 Query 7 LENGTH -- ', cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)13.sql           2.1.8.1
-- TPC-H/TPC-R Customer Distribution Query (Q13)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 2 Query 13 START -- ', qstart ;
select
        c_count,
        count(*) as custdist
from
        (
                select
                        c_custkey,
                        count(o_orderkey)
                from
                        customer left outer join orders on
                                c_custkey = o_custkey
                                and o_comment not like '%special
%deposits%'
                group by
                        c_custkey
        ) as c_orders (c_custkey, c_count)
group by
        c_count
order by
        custdist desc,
        c_count desc;
commit ;
set qstop = now(*);
select 'Stream 2 Query 13 STOP -- ', qstop ;
select 'Stream 2 Query 13 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)18.sql           2.1.8.1
-- TPC-H/TPC-R Large Volume Customer Query (Q18)
-- Function Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 2 Query 18 START -- ', qstart ;
select top 100
        c_name,
        c_custkey,
        o_orderkey,
        o_orderdate,
        o_totalprice,
        sum(l_quantity)
from
        customer,
        orders,
        lineitem
where
        o_orderkey in (
                select
                        l_orderkey
                from
                        lineitem
                group by
                        l_orderkey having
                                sum(l_quantity) > 314
        )
        and c_custkey = o_custkey
        and o_orderkey = l_orderkey
group by
        c_name,
        c_custkey,
        o_orderkey,
        o_orderdate,
        o_totalprice
order by
        o_totalprice desc,
        o_orderdate;
commit ;
set qstop = now(*);
select 'Stream 2 Query 18 STOP -- ', qstop ;
select 'Stream 2 Query 18 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)1.sql            2.1.8.1
-- TPC-H/TPC-R Pricing Summary Report Query (Q1)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 2 Query 1 START -- ', qstart ;
select
        l_returnflag,
        l_linestatus,
        sum(l_quantity) as sum_qty,
        sum(l_extendedprice) as sum_base_price,
        sum(l_extendedprice * (1 - l_discount)) as sum_disc_price,
        sum(l_extendedprice * (1 - l_discount) * (1 + l_tax)) as sum_charge,
        avg(l_quantity) as avg_qty,
        avg(l_extendedprice) as avg_price,
        avg(l_discount) as avg_disc,
        count(*) as count_order
from
        lineitem
where
        l_shipdate <= dateadd(day,-61,'1998-12-01')
group by
        l_returnflag,
        l_linestatus
order by
        l_returnflag,
        l_linestatus;
commit ;
set qstop = now(*);
select 'Stream 2 Query 1 STOP -- ', qstop ;
select 'Stream 2 Query 1 LENGTH -- ', cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)4.sql            2.1.8.1
-- TPC-H/TPC-R Order Priority Checking Query (Q4)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 2 Query 4 START -- ', qstart ;
select
        o_orderpriority,
        count(*) as order_count
```

```
from
	orders
where
	o_orderdate >= '1995-11-01'
	and o_orderdate < dateadd(month,3,'1995-11-01')
	and exists (
		select
			*
		from
			lineitem
		where
			l_orderkey = o_orderkey
			and l_commitdate < l_receiptdate
	)
group by
	o_orderpriority
order by
	o_orderpriority;
commit ;
set qstop = now(*);
select 'Stream 2 Query 4 STOP -- ', qstop ;
select 'Stream 2 Query 4 LENGTH -- ', cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)20.sql	2.1.8.1
-- TPC-H/TPC-R Potential Part Promotion Query (Q20)
-- Function Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 2 Query 20 START -- ', qstart ;
select
	s_name,
	s_address
from
	supplier,
	nation
where
	s_suppkey in (
		select
			ps_suppkey
		from
			partsupp
		where
			ps_partkey in (
				select
					p_partkey
				from
					part
				where
					p_name like 'lace%'
			)
			and ps_availqty > (
				select
					0.5 * sum(l_quantity)
				from
					lineitem
				where
					l_partkey = ps_partkey
					and l_suppkey =
ps_suppkey
					and l_shipdate >=
'1995-01-01'
					and l_shipdate < dateadd(year,1,'1995-01-01')
				)
	)
	and s_nationkey = n_nationkey
	and n_name = 'MOZAMBIQUE'
order by
	s_name;
commit ;
set qstop = now(*);
select 'Stream 2 Query 20 STOP -- ', qstop ;
select 'Stream 2 Query 20 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)3.sql	2.1.8.1
-- TPC-H/TPC-R Shipping Priority Query (Q3)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 2 Query 3 START -- ', qstart ;
select top 10
	l_orderkey,
	sum(l_extendedprice * (1 - l_discount)) as revenue,
	o_orderdate,
	o_shippriority
from
	customer,
	orders,
	lineitem
where
	c_mktsegment = 'BUILDING'
	and c_custkey = o_custkey
	and l_orderkey = o_orderkey
	and o_orderdate < '1995-03-18'
	and l_shipdate >  '1995-03-18'
group by
	l_orderkey,
	o_orderdate,
	o_shippriority
order by
	revenue desc,
	o_orderdate;
commit ;
set qstop = now(*);
select 'Stream 2 Query 3 STOP -- ', qstop ;
select 'Stream 2 Query 3 LENGTH -- ', cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)11.sql	2.1.8.1
-- TPC-H/TPC-R Important Stock Identification Query (Q11)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 2 Query 11 START -- ', qstart ;
select
	ps_partkey,
	sum(ps_supplycost * ps_availqty) as value
from
	partsupp,
	supplier,
	nation
where
	ps_suppkey = s_suppkey
	and s_nationkey = n_nationkey
	and n_name = 'INDIA'
group by
	ps_partkey having
		sum(ps_supplycost * ps_availqty) > (
			select
				sum(ps_supplycost * ps_availqty) *
0.0000010000
			from
				partsupp,
				supplier,
				nation
			where
				ps_suppkey = s_suppkey
				and s_nationkey = n_nationkey
				and n_name = 'INDIA'
		)
order by
	value desc;
```

```
commit ;
set qstop = now(*);
select 'Stream 2 Query 11 STOP -- ', qstop ;
select 'Stream 2 Query 11 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)21.sql           2.1.8.1
-- TPC-H/TPC-R Suppliers Who Kept Orders Waiting Query (Q21)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 2 Query 21 START -- ', qstart ;
select top 100
        s_name,
        count(*) as numwait
from
        supplier,
        lineitem l1,
        orders,
        nation
where
        s_suppkey = l1.l_suppkey
        and o_orderkey = l1.l_orderkey
        and o_orderstatus = 'F'
        and l1.l_receiptdate > l1.l_commitdate
        and exists (
                select
                        *
                from
                        lineitem l2
                where
                        l2.l_orderkey = l1.l_orderkey
                        and l2.l_suppkey <> l1.l_suppkey
        )
        and not exists (
                select
                        *
                from
                        lineitem l3
                where
                        l3.l_orderkey = l1.l_orderkey
                        and l3.l_suppkey <> l1.l_suppkey
                        and l3.l_receiptdate > l3.l_commitdate
        )
        and s_nationkey = n_nationkey
        and n_name = 'KENYA'
group by
        s_name
order by
        numwait desc,
        s_name;
commit ;
set qstop = now(*);
select 'Stream 2 Query 21 STOP -- ', qstop ;
select 'Stream 2 Query 21 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;

select 'Stream completion time -- ',now(*) as "time";

disconnect;

exit;
```

==========

stream3.sql

```
-- using 207153857 as a seed to the RNG
create variable qstart timestamp;
create variable qstop timestamp;
select 'Stream begin time -- ',now(*) as "time";
-- @(#)8.sql            2.1.8.1
-- TPC-H/TPC-R National Market Share Query (Q8)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 3 Query 8 START -- ', qstart ;
select
        o_year,
        sum(case
                when nation = 'JAPAN' then volume
                else 0
        end) / sum(volume) as mkt_share
from
        (
                select
            datepart(year, o_orderdate) as o_year,
                        l_extendedprice * (1 - l_discount) as volume,
                        n2.n_name as nation
                from
                        part,
                        supplier,
                        lineitem,
                        orders,
                        customer,
                        nation n1,
                        nation n2,
                        region
                where
                        p_partkey = l_partkey
                        and s_suppkey = l_suppkey
                        and l_orderkey = o_orderkey
                        and o_custkey = c_custkey
                        and c_nationkey = n1.n_nationkey
                        and n1.n_regionkey = r_regionkey
                        and r_name = 'ASIA'
                        and s_nationkey = n2.n_nationkey
                        and o_orderdate between '1995-01-01' and
'1996-12-31'
                        and p_type = 'LARGE ANODIZED TIN'
        ) as all_nations
group by
        o_year
order by
        o_year;
commit ;
set qstop = now(*);
select 'Stream 3 Query 8 STOP -- ', qstop ;
select 'Stream 3 Query 8 LENGTH -- ', cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)5.sql            2.1.8.1
-- TPC-H/TPC-R Local Supplier Volume Query (Q5)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 3 Query 5 START -- ', qstart ;
select
        n_name,
        sum(l_extendedprice * (1 - l_discount)) as revenue
from
        customer,
        orders,
        lineitem,
        supplier,
        nation,
        region
where
        c_custkey = o_custkey
        and l_orderkey = o_orderkey
        and l_suppkey = s_suppkey
        and c_nationkey = s_nationkey
```

```
		and s_nationkey = n_nationkey
		and n_regionkey = r_regionkey
		and r_name = 'MIDDLE EAST'
		and o_orderdate >= '1996-01-01'
	and o_orderdate < dateadd(year,1,'1996-01-01')
group by
		n_name
order by
		revenue desc;
commit ;
set qstop = now(*);
select 'Stream 3 Query 5 STOP -- ', qstop ;
select 'Stream 3 Query 5 LENGTH -- ', cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)4.sql		2.1.8.1
-- TPC-H/TPC-R Order Priority Checking Query (Q4)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 3 Query 4 START -- ', qstart ;
select
		o_orderpriority,
		count(*) as order_count
from
		orders
where
		o_orderdate >= '1993-08-01'
	and o_orderdate < dateadd(month,3,'1993-08-01')
		and exists (
			select
				*
			from
				lineitem
			where
				l_orderkey = o_orderkey
				and l_commitdate < l_receiptdate
		)
group by
		o_orderpriority
order by
		o_orderpriority;
commit ;
set qstop = now(*);
select 'Stream 3 Query 4 STOP -- ', qstop ;
select 'Stream 3 Query 4 LENGTH -- ', cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)6.sql		2.1.8.1
-- TPC-H/TPC-R Forecasting Revenue Change Query (Q6)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 3 Query 6 START -- ', qstart ;
select
		sum(l_extendedprice * l_discount) as revenue
from
		lineitem
where
		l_shipdate >= '1996-01-01'
	and l_shipdate < dateadd(year,1,'1996-01-01')
		and l_discount between 0.05 - 0.01 and 0.05 + 0.01
		and l_quantity < 25;
commit ;
set qstop = now(*);
select 'Stream 3 Query 6 STOP -- ', qstop ;
select 'Stream 3 Query 6 LENGTH -- ', cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)17.sql		2.1.8.1
-- TPC-H/TPC-R Small-Quantity-Order Revenue Query (Q17)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 3 Query 17 START -- ', qstart ;
select
		sum(l_extendedprice) / 7.0 as avg_yearly
from
		lineitem,
		part
where
		p_partkey = l_partkey
		and p_brand = 'Brand#55'
		and p_container = 'LG PACK'
		and l_quantity < (
			select
				0.2 * avg(l_quantity)
			from
				lineitem
			where
				l_partkey = p_partkey
		);
commit ;
set qstop = now(*);
select 'Stream 3 Query 17 STOP -- ', qstop ;
select 'Stream 3 Query 17 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)7.sql		2.1.8.1
-- TPC-H/TPC-R Volume Shipping Query (Q7)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 3 Query 7 START -- ', qstart ;
select
		supp_nation,
		cust_nation,
		l_year,
		sum(volume) as revenue
from
		(
			select
				n1.n_name as supp_nation,
				n2.n_name as cust_nation,
			    datepart(year, l_shipdate) as l_year,
				l_extendedprice * (1 - l_discount) as volume
			from
				supplier,
				lineitem,
				orders,
				customer,
				nation n1,
				nation n2
			where
				s_suppkey = l_suppkey
				and o_orderkey = l_orderkey
				and c_custkey = o_custkey
				and s_nationkey = n1.n_nationkey
				and c_nationkey = n2.n_nationkey
				and (
					(n1.n_name = 'JAPAN' and
n2.n_name = 'VIETNAM')
					or (n1.n_name = 'VIETNAM' and
n2.n_name = 'JAPAN')
				)
				and l_shipdate between '1995-01-01' and
'1996-12-31'
		) as shipping
group by
		supp_nation,
		cust_nation,
		l_year
```

```
order by
	supp_nation,
	cust_nation,
	l_year;
commit ;
set qstop = now(*);
select 'Stream 3 Query 7 STOP -- ', qstop ;
select 'Stream 3 Query 7 LENGTH -- ', cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)1.sql		2.1.8.1
-- TPC-H/TPC-R Pricing Summary Report Query (Q1)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 3 Query 1 START -- ', qstart ;
select
	l_returnflag,
	l_linestatus,
	sum(l_quantity) as sum_qty,
	sum(l_extendedprice) as sum_base_price,
	sum(l_extendedprice * (1 - l_discount)) as sum_disc_price,
	sum(l_extendedprice * (1 - l_discount) * (1 + l_tax)) as sum_charge,
	avg(l_quantity) as avg_qty,
	avg(l_extendedprice) as avg_price,
	avg(l_discount) as avg_disc,
	count(*) as count_order
from
	lineitem
where
	l_shipdate <= dateadd(day,-69,'1998-12-01')
group by
	l_returnflag,
	l_linestatus
order by
	l_returnflag,
	l_linestatus;
commit ;
set qstop = now(*);
select 'Stream 3 Query 1 STOP -- ', qstop ;
select 'Stream 3 Query 1 LENGTH -- ', cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)18.sql		2.1.8.1
-- TPC-H/TPC-R Large Volume Customer Query (Q18)
-- Function Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 3 Query 18 START -- ', qstart ;
select top 100
	c_name,
	c_custkey,
	o_orderkey,
	o_orderdate,
	o_totalprice,
	sum(l_quantity)
from
	customer,
	orders,
	lineitem
where
	o_orderkey in (
		select
			l_orderkey
		from
			lineitem
		group by
			l_orderkey having
				sum(l_quantity) > 315
	)
	and c_custkey = o_custkey
	and o_orderkey = l_orderkey
group by
	c_name,
	c_custkey,
	o_orderkey,
	o_orderdate,
	o_totalprice
order by
	o_totalprice desc,
	o_orderdate;
commit ;
set qstop = now(*);
select 'Stream 3 Query 18 STOP -- ', qstop ;
select 'Stream 3 Query 18 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)22.sql		2.1.8.1
-- TPC-H/TPC-R Global Sales Opportunity Query (Q22)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 3 Query 22 START -- ', qstart ;
select
	cntrycode,
	count(*) as numcust,
	sum(c_acctbal) as totacctbal
from
	(
		select
	substring(c_phone,1,2) as cntrycode,
			c_acctbal
		from
			customer
		where
	substring(c_phone,1,2) in
				('23', '19', '21', '18', '30', '15', '17')
			and c_acctbal > (
				select
					avg(c_acctbal)
				from
					customer
				where
					c_acctbal > 0.00
		and substring(c_phone,1,2) in
					('23', '19',
'21', '18', '30', '15', '17')
			)
			and not exists (
				select
					*
				from
					orders
				where
					o_custkey = c_custkey
			)
	) as custsale
group by
	cntrycode
order by
	cntrycode;
commit ;
set qstop = now(*);
select 'Stream 3 Query 22 STOP -- ', qstop ;
select 'Stream 3 Query 22 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)14.sql		2.1.8.1
-- TPC-H/TPC-R Promotion Effect Query (Q14)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
```

```
select 'Stream 3 Query 14 START -- ', qstart ;
select
        100.00 * sum(case
                when p_type like 'PROMO%'
                        then l_extendedprice * (1 - l_discount)
                else 0
        end) / sum(l_extendedprice * (1 - l_discount)) as promo_revenue
from
        lineitem,
        part
where
        l_partkey = p_partkey
        and l_shipdate >= '1997-01-01'
    and l_shipdate < dateadd(month,1,'1997-01-01');
commit ;
set qstop = now(*);
select 'Stream 3 Query 14 STOP -- ', qstop ;
select 'Stream 3 Query 14 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)9.sql            2.1.8.1
-- TPC-H/TPC-R Product Type Profit Measure Query (Q9)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 3 Query 9 START -- ', qstart ;
select
        nation,
        o_year,
        sum(amount) as sum_profit
from
        (
                select
                        n_name as nation,
                    datepart(year, o_orderdate) as o_year,
                        l_extendedprice * (1 - l_discount) -
ps_supplycost * l_quantity as amount
                from
                        part,
                        supplier,
                        lineitem,
                        partsupp,
                        orders,
                        nation
                where
                        s_suppkey = l_suppkey
                        and ps_suppkey = l_suppkey
                        and ps_partkey = l_partkey
                        and p_partkey = l_partkey
                        and o_orderkey = l_orderkey
                        and s_nationkey = n_nationkey
                        and p_name like '%linen%'
        ) as profit
group by
        nation,
        o_year
order by
        nation,
        o_year desc;
commit ;
set qstop = now(*);
select 'Stream 3 Query 9 STOP -- ', qstop ;
select 'Stream 3 Query 9 LENGTH -- ', cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)10.sql           2.1.8.1
-- TPC-H/TPC-R Returned Item Reporting Query (Q10)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 3 Query 10 START -- ', qstart ;
select top 20
        c_custkey,
        c_name,
        sum(l_extendedprice * (1 - l_discount)) as revenue,
        c_acctbal,
        n_name,
        c_address,
        c_phone,
        c_comment
from
        customer,
        orders,
        lineitem,
        nation
where
        c_custkey = o_custkey
        and l_orderkey = o_orderkey
        and o_orderdate >= '1994-02-01'
    and o_orderdate < dateadd(month,3,'1994-02-01')
        and l_returnflag = 'R'
        and c_nationkey = n_nationkey
group by
        c_custkey,
        c_name,
        c_acctbal,
        c_phone,
        n_name,
        c_address,
        c_comment
order by
        revenue desc;
commit ;
set qstop = now(*);
select 'Stream 3 Query 10 STOP -- ', qstop ;
select 'Stream 3 Query 10 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)15.sql           2.1.8.1
-- TPC-H/TPC-R Top Supplier Query (Q15)
-- Functional Query Definition
-- Approved February 1998

set qstart = now(*);
select 'Stream 3 Query 15 START -- ', qstart ;
create view revenue3 (supplier_no, total_revenue) as
        select
                l_suppkey,
                sum(l_extendedprice * (1 - l_discount))
        from
                lineitem
        where
                l_shipdate >= '1993-01-01'
            and l_shipdate < dateadd(month,3,'1993-01-01')
        group by
                l_suppkey;



select
        s_suppkey,
        s_name,
        s_address,
        s_phone,
        total_revenue
from
        supplier,
        revenue3
where
        s_suppkey = supplier_no
        and total_revenue = (
                select
                        max(total_revenue)
                from
                        revenue3
        )
```

```
order by
	s_suppkey;

drop view revenue3;
commit ;
set qstop = now(*);
select 'Stream 3 Query 15 STOP -- ', qstop ;
select 'Stream 3 Query 15 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)11.sql	2.1.8.1
-- TPC-H/TPC-R Important Stock Identification Query (Q11)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 3 Query 11 START -- ', qstart ;
select
	ps_partkey,
	sum(ps_supplycost * ps_availqty) as value
from
	partsupp,
	supplier,
	nation
where
	ps_suppkey = s_suppkey
	and s_nationkey = n_nationkey
	and n_name = 'VIETNAM'
group by
	ps_partkey having
		sum(ps_supplycost * ps_availqty) > (
			select
				sum(ps_supplycost * ps_availqty) *
0.0000010000
			from
				partsupp,
				supplier,
				nation
			where
				ps_suppkey = s_suppkey
				and s_nationkey = n_nationkey
				and n_name = 'VIETNAM'
		)
order by
	value desc;
commit ;
set qstop = now(*);
select 'Stream 3 Query 11 STOP -- ', qstop ;
select 'Stream 3 Query 11 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)20.sql	2.1.8.1
-- TPC-H/TPC-R Potential Part Promotion Query (Q20)
-- Function Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 3 Query 20 START -- ', qstart ;
select
	s_name,
	s_address
from
	supplier,
	nation
where
	s_suppkey in (
		select
			ps_suppkey
		from
			partsupp
		where
			ps_partkey in (
				select
					p_partkey
				from
					part
				where
					p_name like 'sky%'
			)
			and ps_availqty > (
				select
					0.5 * sum(l_quantity)
				from
					lineitem
				where
					l_partkey = ps_partkey
					and l_suppkey =
ps_suppkey
					and l_shipdate >=
'1994-01-01'
					and l_shipdate < dateadd(year,1,'1994-01-01')
				)
		)
		and s_nationkey = n_nationkey
		and n_name = 'FRANCE'
order by
	s_name;
commit ;
set qstop = now(*);
select 'Stream 3 Query 20 STOP -- ', qstop ;
select 'Stream 3 Query 20 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)2.sql	2.1.8.2
-- TPC-H/TPC-R Minimum Cost Supplier Query (Q2)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 3 Query 2 START -- ', qstart ;
select top 100
	s_acctbal,
	s_name,
	n_name,
	p_partkey,
	p_mfgr,
	s_address,
	s_phone,
	s_comment
from
	part,
	supplier,
	partsupp,
	nation,
	region
where
	p_partkey = ps_partkey
	and s_suppkey = ps_suppkey
	and p_size = 44
	and p_type like '%NICKEL'
	and s_nationkey = n_nationkey
	and n_regionkey = r_regionkey
	and r_name = 'AFRICA'
	and ps_supplycost = (
		select
			min(ps_supplycost)
		from
			partsupp,
			supplier,
			nation,
			region
		where
			p_partkey = ps_partkey
			and s_suppkey = ps_suppkey
			and s_nationkey = n_nationkey
			and n_regionkey = r_regionkey
```

```
                        and r_name = 'AFRICA'
        )
order by
        s_acctbal desc,
        n_name,
        s_name,
        p_partkey;
commit ;
set qstop = now(*);
select 'Stream 3 Query 2 STOP -- ', qstop ;
select 'Stream 3 Query 2 LENGTH -- ', cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)21.sql          2.1.8.1
-- TPC-H/TPC-R Suppliers Who Kept Orders Waiting Query (Q21)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 3 Query 21 START -- ', qstart ;
select top 100
        s_name,
        count(*) as numwait
from
        supplier,
        lineitem l1,
        orders,
        nation
where
        s_suppkey = l1.l_suppkey
        and o_orderkey = l1.l_orderkey
        and o_orderstatus = 'F'
        and l1.l_receiptdate > l1.l_commitdate
        and exists (
                select
                        *
                from
                        lineitem l2
                where
                        l2.l_orderkey = l1.l_orderkey
                        and l2.l_suppkey <> l1.l_suppkey
        )
        and not exists (
                select
                        *
                from
                        lineitem l3
                where
                        l3.l_orderkey = l1.l_orderkey
                        and l3.l_suppkey <> l1.l_suppkey
                        and l3.l_receiptdate > l3.l_commitdate
        )
        and s_nationkey = n_nationkey
        and n_name = 'FRANCE'
group by
        s_name
order by
        numwait desc,
        s_name;
commit ;
set qstop = now(*);
select 'Stream 3 Query 21 STOP -- ', qstop ;
select 'Stream 3 Query 21 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)19.sql          2.1.8.1
-- TPC-H/TPC-R Discounted Revenue Query (Q19)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 3 Query 19 START -- ', qstart ;
select
        sum(l_extendedprice* (1 - l_discount)) as revenue
from
        lineitem,
        part
where
        (
                p_partkey = l_partkey
                and p_brand = 'Brand#25'
                and p_container in ('SM CASE', 'SM BOX', 'SM PACK',
'SM PKG')
                and l_quantity >= 7 and l_quantity <= 7 + 10
                and p_size between 1 and 5
                and l_shipmode in ('AIR', 'AIR REG')
                and l_shipinstruct = 'DELIVER IN PERSON'
        )
        or
        (
                p_partkey = l_partkey
                and p_brand = 'Brand#22'
                and p_container in ('MED BAG', 'MED BOX', 'MED
PKG', 'MED PACK')
                and l_quantity >= 19 and l_quantity <= 19 + 10
                and p_size between 1 and 10
                and l_shipmode in ('AIR', 'AIR REG')
                and l_shipinstruct = 'DELIVER IN PERSON'
        )
        or
        (
                p_partkey = l_partkey
                and p_brand = 'Brand#31'
                and p_container in ('LG CASE', 'LG BOX', 'LG PACK',
'LG PKG')
                and l_quantity >= 22 and l_quantity <= 22 + 10
                and p_size between 1 and 15
                and l_shipmode in ('AIR', 'AIR REG')
                and l_shipinstruct = 'DELIVER IN PERSON'
        );
commit ;
set qstop = now(*);
select 'Stream 3 Query 19 STOP -- ', qstop ;
select 'Stream 3 Query 19 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)13.sql          2.1.8.1
-- TPC-H/TPC-R Customer Distribution Query (Q13)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 3 Query 13 START -- ', qstart ;
select
        c_count,
        count(*) as custdist
from
        (
                select
                        c_custkey,
                        count(o_orderkey)
                from
                        customer left outer join orders on
                                c_custkey = o_custkey
                                and o_comment not like '%special
%deposits%'
                group by
                        c_custkey
        ) as c_orders (c_custkey, c_count)
group by
        c_count
order by
        custdist desc,
        c_count desc;
commit ;
set qstop = now(*);
```

```
select 'Stream 3 Query 13 STOP -- ', qstop ;
select 'Stream 3 Query 13 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)16.sql           2.1.8.1
-- TPC-H/TPC-R Parts/Supplier Relationship Query (Q16)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 3 Query 16 START -- ', qstart ;
select
        p_brand,
        p_type,
        p_size,
        count(distinct ps_suppkey) as supplier_cnt
from
        partsupp,
        part
where
        p_partkey = ps_partkey
        and p_brand <> 'Brand#35'
        and p_type not like 'PROMO BURNISHED%'
        and p_size in (39, 26, 41, 19, 10, 43, 49, 4)
        and ps_suppkey not in (
                select
                        s_suppkey
                from
                        supplier
                where
                        s_comment like '%Customer%Complaints%'
        )
group by
        p_brand,
        p_type,
        p_size
order by
        supplier_cnt desc,
        p_brand,
        p_type,
        p_size;
commit ;
set qstop = now(*);
select 'Stream 3 Query 16 STOP -- ', qstop ;
select 'Stream 3 Query 16 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)12.sql           2.1.8.1
-- TPC-H/TPC-R Shipping Modes and Order Priority Query (Q12)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 3 Query 12 START -- ', qstart ;
select
        l_shipmode,
        sum(case
                when o_orderpriority = '1-URGENT'
                        or o_orderpriority = '2-HIGH'
                        then 1
                else 0
        end) as high_line_count,
        sum(case
                when o_orderpriority <> '1-URGENT'
                        and o_orderpriority <> '2-HIGH'
                        then 1
                else 0
        end) as low_line_count
from
        orders,
        lineitem
where
        o_orderkey = l_orderkey
                and l_shipmode in ('TRUCK', 'REG AIR')
                and l_commitdate < l_receiptdate
                and l_shipdate < l_commitdate
                and l_receiptdate >= '1997-01-01'
        and l_receiptdate < dateadd(year,1,'1997-01-01')
group by
        l_shipmode
order by
        l_shipmode;
commit ;
set qstop = now(*);
select 'Stream 3 Query 12 STOP -- ', qstop ;
select 'Stream 3 Query 12 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)3.sql            2.1.8.1
-- TPC-H/TPC-R Shipping Priority Query (Q3)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 3 Query 3 START -- ', qstart ;
select top 10
        l_orderkey,
        sum(l_extendedprice * (1 - l_discount)) as revenue,
        o_orderdate,
        o_shippriority
from
        customer,
        orders,
        lineitem
where
        c_mktsegment = 'MACHINERY'
        and c_custkey = o_custkey
        and l_orderkey = o_orderkey
        and o_orderdate < '1995-03-04'
        and l_shipdate >  '1995-03-04'
group by
        l_orderkey,
        o_orderdate,
        o_shippriority
order by
        revenue desc,
        o_orderdate;
commit ;
set qstop = now(*);
select 'Stream 3 Query 3 STOP -- ', qstop ;
select 'Stream 3 Query 3 LENGTH -- ', cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;

select 'Stream completion time -- ',now(*) as "time";

disconnect;

exit;
```

==========

stream4.sql

==========

```
-- using 207153858 as a seed to the RNG
create variable qstart timestamp;
create variable qstop timestamp;
select 'Stream begin time -- ',now(*) as "time";
-- @(#)5.sql            2.1.8.1
-- TPC-H/TPC-R Local Supplier Volume Query (Q5)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
```

```
select 'Stream 4 Query 5 START -- ', qstart ;
select
	n_name,
	sum(l_extendedprice * (1 - l_discount)) as revenue
from
	customer,
	orders,
	lineitem,
	supplier,
	nation,
	region
where
	c_custkey = o_custkey
	and l_orderkey = o_orderkey
	and l_suppkey = s_suppkey
	and c_nationkey = s_nationkey
	and s_nationkey = n_nationkey
	and n_regionkey = r_regionkey
	and r_name = 'AFRICA'
	and o_orderdate >= '1996-01-01'
      and o_orderdate < dateadd(year,1,'1996-01-01')
group by
	n_name
order by
	revenue desc;
commit ;
set qstop = now(*);
select 'Stream 4 Query 5 STOP -- ', qstop ;
select 'Stream 4 Query 5 LENGTH -- ', cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)21.sql	2.1.8.1
-- TPC-H/TPC-R Suppliers Who Kept Orders Waiting Query (Q21)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 4 Query 21 START -- ', qstart ;
select top 100
	s_name,
	count(*) as numwait
from
	supplier,
	lineitem l1,
	orders,
	nation
where
	s_suppkey = l1.l_suppkey
	and o_orderkey = l1.l_orderkey
	and o_orderstatus = 'F'
	and l1.l_receiptdate > l1.l_commitdate
	and exists (
		select
			*
		from
			lineitem l2
		where
			l2.l_orderkey = l1.l_orderkey
			and l2.l_suppkey <> l1.l_suppkey
	)
	and not exists (
		select
			*
		from
			lineitem l3
		where
			l3.l_orderkey = l1.l_orderkey
			and l3.l_suppkey <> l1.l_suppkey
			and l3.l_receiptdate > l3.l_commitdate
	)
	and s_nationkey = n_nationkey
	and n_name = 'UNITED KINGDOM'
group by
	s_name
order by
	numwait desc,
	s_name;
commit ;
set qstop = now(*);
select 'Stream 4 Query 21 STOP -- ', qstop ;
select 'Stream 4 Query 21 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)14.sql	2.1.8.1
-- TPC-H/TPC-R Promotion Effect Query (Q14)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 4 Query 14 START -- ', qstart ;
select
	100.00 * sum(case
		when p_type like 'PROMO%'
			then l_extendedprice * (1 - l_discount)
		else 0
	end) / sum(l_extendedprice * (1 - l_discount)) as promo_revenue
from
	lineitem,
	part
where
	l_partkey = p_partkey
	and l_shipdate >= '1997-01-01'
      and l_shipdate < dateadd(month,1,'1997-01-01');
commit ;
set qstop = now(*);
select 'Stream 4 Query 14 STOP -- ', qstop ;
select 'Stream 4 Query 14 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)19.sql	2.1.8.1
-- TPC-H/TPC-R Discounted Revenue Query (Q19)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 4 Query 19 START -- ', qstart ;
select
	sum(l_extendedprice* (1 - l_discount)) as revenue
from
	lineitem,
	part
where
	(
		p_partkey = l_partkey
		and p_brand = 'Brand#22'
		and p_container in ('SM CASE', 'SM BOX', 'SM PACK',
'SM PKG')
		and l_quantity >= 2 and l_quantity <= 2 + 10
		and p_size between 1 and 5
		and l_shipmode in ('AIR', 'AIR REG')
		and l_shipinstruct = 'DELIVER IN PERSON'
	)
	or
	(
		p_partkey = l_partkey
		and p_brand = 'Brand#55'
		and p_container in ('MED BAG', 'MED BOX', 'MED
PKG', 'MED PACK')
		and l_quantity >= 20 and l_quantity <= 20 + 10
		and p_size between 1 and 10
		and l_shipmode in ('AIR', 'AIR REG')
		and l_shipinstruct = 'DELIVER IN PERSON'
	)
	or
	(
		p_partkey = l_partkey
```

```
                        and p_brand = 'Brand#35'
                        and p_container in ('LG CASE', 'LG BOX', 'LG PACK',
'LG PKG')
                        and l_quantity >= 29 and l_quantity <= 29 + 10
                        and p_size between 1 and 15
                        and l_shipmode in ('AIR', 'AIR REG')
                        and l_shipinstruct = 'DELIVER IN PERSON'
                );
commit ;
set qstop = now(*);
select 'Stream 4 Query 19 STOP -- ', qstop ;
select 'Stream 4 Query 19 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)15.sql           2.1.8.1
-- TPC-H/TPC-R Top Supplier Query (Q15)
-- Functional Query Definition
-- Approved February 1998

set qstart = now(*);
select 'Stream 4 Query 15 START -- ', qstart ;
create view revenue4 (supplier_no, total_revenue) as
                select
                        l_suppkey,
                        sum(l_extendedprice * (1 - l_discount))
                from
                        lineitem
                where
                        l_shipdate >= '1996-01-01'
                and l_shipdate < dateadd(month,3,'1996-01-01')
                group by
                        l_suppkey;



select
                s_suppkey,
                s_name,
                s_address,
                s_phone,
                total_revenue
from
                supplier,
                revenue4
where
                s_suppkey = supplier_no
                and total_revenue = (
                        select
                                max(total_revenue)
                        from
                                revenue4
                )
order by
                s_suppkey;

drop view revenue4;
commit ;
set qstop = now(*);
select 'Stream 4 Query 15 STOP -- ', qstop ;
select 'Stream 4 Query 15 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)17.sql           2.1.8.1
-- TPC-H/TPC-R Small-Quantity-Order Revenue Query (Q17)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 4 Query 17 START -- ', qstart ;
select
                sum(l_extendedprice) / 7.0 as avg_yearly
from
                lineitem,
                part
where
                p_partkey = l_partkey
                and p_brand = 'Brand#52'
                and p_container = 'LG DRUM'
                and l_quantity < (
                        select
                                0.2 * avg(l_quantity)
                        from
                                lineitem
                        where
                                l_partkey = p_partkey
                );
commit ;
set qstop = now(*);
select 'Stream 4 Query 17 STOP -- ', qstop ;
select 'Stream 4 Query 17 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)12.sql           2.1.8.1
-- TPC-H/TPC-R Shipping Modes and Order Priority Query (Q12)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 4 Query 12 START -- ', qstart ;
select
                l_shipmode,
                sum(case
                        when o_orderpriority = '1-URGENT'
                                or o_orderpriority = '2-HIGH'
                                then 1
                        else 0
                end) as high_line_count,
                sum(case
                        when o_orderpriority <> '1-URGENT'
                                and o_orderpriority <> '2-HIGH'
                                then 1
                        else 0
                end) as low_line_count
from
                orders,
                lineitem
where
                o_orderkey = l_orderkey
                and l_shipmode in ('RAIL', 'REG AIR')
                and l_commitdate < l_receiptdate
                and l_shipdate < l_commitdate
                and l_receiptdate >= '1997-01-01'
        and l_receiptdate < dateadd(year,1,'1997-01-01')
group by
                l_shipmode
order by
                l_shipmode;
commit ;
set qstop = now(*);
select 'Stream 4 Query 12 STOP -- ', qstop ;
select 'Stream 4 Query 12 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)6.sql            2.1.8.1
-- TPC-H/TPC-R Forecasting Revenue Change Query (Q6)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 4 Query 6 START -- ', qstart ;
select
                sum(l_extendedprice * l_discount) as revenue
from
                lineitem
where
                l_shipdate >= '1996-01-01'
        and l_shipdate < dateadd(year,1,'1996-01-01')
                and l_discount between 0.03 - 0.01 and 0.03 + 0.01
```

```
		and l_quantity < 24;
commit ;
set qstop = now(*);
select 'Stream 4 Query 6 STOP -- ', qstop ;
select 'Stream 4 Query 6 LENGTH -- ', cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)4.sql		2.1.8.1
-- TPC-H/TPC-R Order Priority Checking Query (Q4)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 4 Query 4 START -- ', qstart ;
select
		o_orderpriority,
		count(*) as order_count
from
		orders
where
		o_orderdate >= '1996-03-01'
	and o_orderdate < dateadd(month,3,'1996-03-01')
		and exists (
			select
				*
			from
				lineitem
			where
				l_orderkey = o_orderkey
				and l_commitdate < l_receiptdate
		)
group by
		o_orderpriority
order by
		o_orderpriority;
commit ;
set qstop = now(*);
select 'Stream 4 Query 4 STOP -- ', qstop ;
select 'Stream 4 Query 4 LENGTH -- ', cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)9.sql		2.1.8.1
-- TPC-H/TPC-R Product Type Profit Measure Query (Q9)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 4 Query 9 START -- ', qstart ;
select
		nation,
		o_year,
		sum(amount) as sum_profit
from
		(
			select
				n_name as nation,
			    datepart(year, o_orderdate) as o_year,
				l_extendedprice * (1 - l_discount) -
ps_supplycost * l_quantity as amount
			from
				part,
				supplier,
				lineitem,
				partsupp,
				orders,
				nation
			where
				s_suppkey = l_suppkey
				and ps_suppkey = l_suppkey
				and ps_partkey = l_partkey
				and p_partkey = l_partkey
				and o_orderkey = l_orderkey
				and s_nationkey = n_nationkey
				and p_name like '%lace%'
		) as profit
group by
		nation,
		o_year
order by
		nation,
		o_year desc;
commit ;
set qstop = now(*);
select 'Stream 4 Query 9 STOP -- ', qstop ;
select 'Stream 4 Query 9 LENGTH -- ', cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)8.sql		2.1.8.1
-- TPC-H/TPC-R National Market Share Query (Q8)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 4 Query 8 START -- ', qstart ;
select
		o_year,
		sum(case
			when nation = 'EGYPT' then volume
			else 0
		end) / sum(volume) as mkt_share
from
		(
			select
			    datepart(year, o_orderdate) as o_year,
				l_extendedprice * (1 - l_discount) as volume,
				n2.n_name as nation
			from
				part,
				supplier,
				lineitem,
				orders,
				customer,
				nation n1,
				nation n2,
				region
			where
				p_partkey = l_partkey
				and s_suppkey = l_suppkey
				and l_orderkey = o_orderkey
				and o_custkey = c_custkey
				and c_nationkey = n1.n_nationkey
				and n1.n_regionkey = r_regionkey
				and r_name = 'MIDDLE EAST'
				and s_nationkey = n2.n_nationkey
				and o_orderdate between '1995-01-01' and
'1996-12-31'
				and p_type = 'MEDIUM POLISHED TIN'
		) as all_nations
group by
		o_year
order by
		o_year;
commit ;
set qstop = now(*);
select 'Stream 4 Query 8 STOP -- ', qstop ;
select 'Stream 4 Query 8 LENGTH -- ', cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)16.sql		2.1.8.1
-- TPC-H/TPC-R Parts/Supplier Relationship Query (Q16)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 4 Query 16 START -- ', qstart ;
select
```

```
	p_brand,
	p_type,
	p_size,
	count(distinct ps_suppkey) as supplier_cnt
from
	partsupp,
	part
where
	p_partkey = ps_partkey
	and p_brand <> 'Brand#25'
	and p_type not like 'SMALL POLISHED%'
	and p_size in (19, 14, 8, 27, 7, 41, 38, 3)
	and ps_suppkey not in (
		select
			s_suppkey
		from
			supplier
		where
			s_comment like '%Customer%Complaints%'
	)
group by
	p_brand,
	p_type,
	p_size
order by
	supplier_cnt desc,
	p_brand,
	p_type,
	p_size;
commit ;
set qstop = now(*);
select 'Stream 4 Query 16 STOP -- ', qstop ;
select 'Stream 4 Query 16 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)11.sql	2.1.8.1
-- TPC-H/TPC-R Important Stock Identification Query (Q11)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 4 Query 11 START -- ', qstart ;
select
	ps_partkey,
	sum(ps_supplycost * ps_availqty) as value
from
	partsupp,
	supplier,
	nation
where
	ps_suppkey = s_suppkey
	and s_nationkey = n_nationkey
	and n_name = 'INDONESIA'
group by
	ps_partkey having
		sum(ps_supplycost * ps_availqty) > (
			select
				sum(ps_supplycost * ps_availqty) *
0.0000010000
			from
				partsupp,
				supplier,
				nation
			where
				ps_suppkey = s_suppkey
				and s_nationkey = n_nationkey
				and n_name = 'INDONESIA'
		)
order by
	value desc;
commit ;
set qstop = now(*);
select 'Stream 4 Query 11 STOP -- ', qstop ;
select 'Stream 4 Query 11 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)2.sql	2.1.8.2
-- TPC-H/TPC-R Minimum Cost Supplier Query (Q2)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 4 Query 2 START -- ', qstart ;
select top 100
	s_acctbal,
	s_name,
	n_name,
	p_partkey,
	p_mfgr,
	s_address,
	s_phone,
	s_comment
from
	part,
	supplier,
	partsupp,
	nation,
	region
where
	p_partkey = ps_partkey
	and s_suppkey = ps_suppkey
	and p_size = 31
	and p_type like '%TIN'
	and s_nationkey = n_nationkey
	and n_regionkey = r_regionkey
	and r_name = 'EUROPE'
	and ps_supplycost = (
		select
			min(ps_supplycost)
		from
			partsupp,
			supplier,
			nation,
			region
		where
			p_partkey = ps_partkey
			and s_suppkey = ps_suppkey
			and s_nationkey = n_nationkey
			and n_regionkey = r_regionkey
			and r_name = 'EUROPE'
	)
order by
	s_acctbal desc,
	n_name,
	s_name,
	p_partkey;
commit ;
set qstop = now(*);
select 'Stream 4 Query 2 STOP -- ', qstop ;
select 'Stream 4 Query 2 LENGTH -- ', cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)10.sql	2.1.8.1
-- TPC-H/TPC-R Returned Item Reporting Query (Q10)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 4 Query 10 START -- ', qstart ;
select top 20
	c_custkey,
	c_name,
	sum(l_extendedprice * (1 - l_discount)) as revenue,
	c_acctbal,
	n_name,
	c_address,
```

```
	c_phone,
	c_comment
from
	customer,
	orders,
	lineitem,
	nation
where
	c_custkey = o_custkey
	and l_orderkey = o_orderkey
	and o_orderdate >= '1994-11-01'
    and o_orderdate < dateadd(month,3,'1994-11-01')
	and l_returnflag = 'R'
	and c_nationkey = n_nationkey
group by
	c_custkey,
	c_name,
	c_acctbal,
	c_phone,
	n_name,
	c_address,
	c_comment
order by
	revenue desc;
commit ;
set qstop = now(*);
select 'Stream 4 Query 10 STOP -- ', qstop ;
select 'Stream 4 Query 10 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)18.sql	2.1.8.1
-- TPC-H/TPC-R Large Volume Customer Query (Q18)
-- Function Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 4 Query 18 START -- ', qstart ;
select top 100
	c_name,
	c_custkey,
	o_orderkey,
	o_orderdate,
	o_totalprice,
	sum(l_quantity)
from
	customer,
	orders,
	lineitem
where
	o_orderkey in (
		select
			l_orderkey
		from
			lineitem
		group by
			l_orderkey having
				sum(l_quantity) > 313
	)
	and c_custkey = o_custkey
	and o_orderkey = l_orderkey
group by
	c_name,
	c_custkey,
	o_orderkey,
	o_orderdate,
	o_totalprice
order by
	o_totalprice desc,
	o_orderdate;
commit ;
set qstop = now(*);
select 'Stream 4 Query 18 STOP -- ', qstop ;
select 'Stream 4 Query 18 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)1.sql	2.1.8.1
-- TPC-H/TPC-R Pricing Summary Report Query (Q1)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 4 Query 1 START -- ', qstart ;
select
	l_returnflag,
	l_linestatus,
	sum(l_quantity) as sum_qty,
	sum(l_extendedprice) as sum_base_price,
	sum(l_extendedprice * (1 - l_discount)) as sum_disc_price,
	sum(l_extendedprice * (1 - l_discount) * (1 + l_tax)) as sum_charge,
	avg(l_quantity) as avg_qty,
	avg(l_extendedprice) as avg_price,
	avg(l_discount) as avg_disc,
	count(*) as count_order
from
	lineitem
where
	l_shipdate <= dateadd(day,-77,'1998-12-01')
group by
	l_returnflag,
	l_linestatus
order by
	l_returnflag,
	l_linestatus;
commit ;
set qstop = now(*);
select 'Stream 4 Query 1 STOP -- ', qstop ;
select 'Stream 4 Query 1 LENGTH -- ', cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)13.sql	2.1.8.1
-- TPC-H/TPC-R Customer Distribution Query (Q13)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 4 Query 13 START -- ', qstart ;
select
	c_count,
	count(*) as custdist
from
	(
		select
			c_custkey,
			count(o_orderkey)
		from
			customer left outer join orders on
				c_custkey = o_custkey
				and o_comment not like '%special
%deposits%'
		group by
			c_custkey
	) as c_orders (c_custkey, c_count)
group by
	c_count
order by
	custdist desc,
	c_count desc;
commit ;
set qstop = now(*);
select 'Stream 4 Query 13 STOP -- ', qstop ;
select 'Stream 4 Query 13 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)7.sql	2.1.8.1
-- TPC-H/TPC-R Volume Shipping Query (Q7)
-- Functional Query Definition
-- Approved February 1998
```

```
set qstart = now(*);
select 'Stream 4 Query 7 START -- ', qstart ;
select
	supp_nation,
	cust_nation,
	l_year,
	sum(volume) as revenue
from
	(
		select
			n1.n_name as supp_nation,
			n2.n_name as cust_nation,
		datepart(year, l_shipdate) as l_year,
			l_extendedprice * (1 - l_discount) as volume
		from
			supplier,
			lineitem,
			orders,
			customer,
			nation n1,
			nation n2
		where
			s_suppkey = l_suppkey
			and o_orderkey = l_orderkey
			and c_custkey = o_custkey
			and s_nationkey = n1.n_nationkey
			and c_nationkey = n2.n_nationkey
			and (
				(n1.n_name = 'CANADA' and
n2.n_name = 'EGYPT')
				or (n1.n_name = 'EGYPT' and
n2.n_name = 'CANADA')
			)
			and l_shipdate between '1995-01-01' and
'1996-12-31'
	) as shipping
group by
	supp_nation,
	cust_nation,
	l_year
order by
	supp_nation,
	cust_nation,
	l_year;
commit ;
set qstop = now(*);
select 'Stream 4 Query 7 STOP -- ', qstop ;
select 'Stream 4 Query 7 LENGTH -- ', cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)22.sql	2.1.8.1
-- TPC-H/TPC-R Global Sales Opportunity Query (Q22)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 4 Query 22 START -- ', qstart ;
select
	cntrycode,
	count(*) as numcust,
	sum(c_acctbal) as totacctbal
from
	(
		select
		substring(c_phone,1,2) as cntrycode,
			c_acctbal
		from
			customer
		where
		substring(c_phone,1,2) in
				('30', '13', '16', '21', '19', '28', '23')
			and c_acctbal > (
				select
					avg(c_acctbal)
				from
					customer
				where
					c_acctbal > 0.00
				and substring(c_phone,1,2) in
					('30', '13',
'16', '21', '19', '28', '23')
			)
			and not exists (
				select
					*
				from
					orders
				where
					o_custkey = c_custkey
			)
	) as custsale
group by
	cntrycode
order by
	cntrycode;
commit ;
set qstop = now(*);
select 'Stream 4 Query 22 STOP -- ', qstop ;
select 'Stream 4 Query 22 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)3.sql	2.1.8.1
-- TPC-H/TPC-R Shipping Priority Query (Q3)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 4 Query 3 START -- ', qstart ;
select top 10
	l_orderkey,
	sum(l_extendedprice * (1 - l_discount)) as revenue,
	o_orderdate,
	o_shippriority
from
	customer,
	orders,
	lineitem
where
	c_mktsegment = 'BUILDING'
	and c_custkey = o_custkey
	and l_orderkey = o_orderkey
	and o_orderdate < '1995-03-21'
	and l_shipdate >  '1995-03-21'
group by
	l_orderkey,
	o_orderdate,
	o_shippriority
order by
	revenue desc,
	o_orderdate;
commit ;
set qstop = now(*);
select 'Stream 4 Query 3 STOP -- ', qstop ;
select 'Stream 4 Query 3 LENGTH -- ', cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)20.sql	2.1.8.1
-- TPC-H/TPC-R Potential Part Promotion Query (Q20)
-- Function Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 4 Query 20 START -- ', qstart ;
select
```

```
	s_name,
	s_address
from
	supplier,
	nation
where
	s_suppkey in (
		select
			ps_suppkey
		from
			partsupp
		where
			ps_partkey in (
				select
					p_partkey
				from
					part
				where
					p_name like 'dodger%'
			)
			and ps_availqty > (
				select
					0.5 * sum(l_quantity)
				from
					lineitem
				where
					l_partkey = ps_partkey
					and l_suppkey =
ps_suppkey
					and l_shipdate >=
'1997-01-01'
				and l_shipdate < dateadd(year,1,'1997-01-01')
				)
	)
	and s_nationkey = n_nationkey
	and n_name = 'SAUDI ARABIA'
order by
	s_name;
commit ;
set qstop = now(*);
select 'Stream 4 Query 20 STOP -- ', qstop ;
select 'Stream 4 Query 20 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;

select 'Stream completion time -- ',now(*) as "time";

disconnect;

exit;
```

==========

stream5.sql

==========

```
-- using 207153859 as a seed to the RNG
create variable qstart timestamp;
create variable qstop timestamp;
select 'Stream begin time -- ',now(*) as "time";
-- @(#)21.sql		2.1.8.1
-- TPC-H/TPC-R Suppliers Who Kept Orders Waiting Query (Q21)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 5 Query 21 START -- ', qstart ;
select top 100
	s_name,
	count(*) as numwait
from
	supplier,
	lineitem l1,
	orders,
	nation
where
	s_suppkey = l1.l_suppkey
	and o_orderkey = l1.l_orderkey
	and o_orderstatus = 'F'
	and l1.l_receiptdate > l1.l_commitdate
	and exists (
		select
			*
		from
			lineitem l2
		where
			l2.l_orderkey = l1.l_orderkey
			and l2.l_suppkey <> l1.l_suppkey
	)
	and not exists (
		select
			*
		from
			lineitem l3
		where
			l3.l_orderkey = l1.l_orderkey
			and l3.l_suppkey <> l1.l_suppkey
			and l3.l_receiptdate > l3.l_commitdate
	)
	and s_nationkey = n_nationkey
	and n_name = 'MOROCCO'
group by
	s_name
order by
	numwait desc,
	s_name;
commit ;
set qstop = now(*);
select 'Stream 5 Query 21 STOP -- ', qstop ;
select 'Stream 5 Query 21 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)15.sql		2.1.8.1
-- TPC-H/TPC-R Top Supplier Query (Q15)
-- Functional Query Definition
-- Approved February 1998

set qstart = now(*);
select 'Stream 5 Query 15 START -- ', qstart ;
create view revenue5 (supplier_no, total_revenue) as
	select
		l_suppkey,
		sum(l_extendedprice * (1 - l_discount))
	from
		lineitem
	where
		l_shipdate >= '1993-01-01'
	and l_shipdate < dateadd(month,3,'1993-01-01')
	group by
		l_suppkey;


select
	s_suppkey,
	s_name,
	s_address,
	s_phone,
	total_revenue
from
	supplier,
	revenue5
where
	s_suppkey = supplier_no
	and total_revenue = (
		select
			max(total_revenue)
```

```
                from
                        revenue5
        )
order by
        s_suppkey;

drop view revenue5;
commit ;
set qstop = now(*);
select 'Stream 5 Query 15 STOP -- ', qstop ;
select 'Stream 5 Query 15 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)4.sql            2.1.8.1
-- TPC-H/TPC-R Order Priority Checking Query (Q4)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 5 Query 4 START -- ', qstart ;
select
        o_orderpriority,
        count(*) as order_count
from
        orders
where
        o_orderdate >= '1993-12-01'
    and o_orderdate < dateadd(month,3,'1993-12-01')
        and exists (
                select
                        *
                from
                        lineitem
                where
                        l_orderkey = o_orderkey
                        and l_commitdate < l_receiptdate
        )
group by
        o_orderpriority
order by
        o_orderpriority;
commit ;
set qstop = now(*);
select 'Stream 5 Query 4 STOP -- ', qstop ;
select 'Stream 5 Query 4 LENGTH -- ', cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)6.sql            2.1.8.1
-- TPC-H/TPC-R Forecasting Revenue Change Query (Q6)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 5 Query 6 START -- ', qstart ;
select
        sum(l_extendedprice * l_discount) as revenue
from
        lineitem
where
        l_shipdate >= '1996-01-01'
    and l_shipdate < dateadd(year,1,'1996-01-01')
        and l_discount between 0.08 - 0.01 and 0.08 + 0.01
        and l_quantity < 25;
commit ;
set qstop = now(*);
select 'Stream 5 Query 6 STOP -- ', qstop ;
select 'Stream 5 Query 6 LENGTH -- ', cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)7.sql            2.1.8.1
-- TPC-H/TPC-R Volume Shipping Query (Q7)
-- Functional Query Definition
-- Approved February 1998

set qstart = now(*);
select 'Stream 5 Query 7 START -- ', qstart ;
select
        supp_nation,
        cust_nation,
        l_year,
        sum(volume) as revenue
from
        (
                select
                        n1.n_name as supp_nation,
                        n2.n_name as cust_nation,
                    datepart(year, l_shipdate) as l_year,
                        l_extendedprice * (1 - l_discount) as volume
                from
                        supplier,
                        lineitem,
                        orders,
                        customer,
                        nation n1,
                        nation n2
                where
                        s_suppkey = l_suppkey
                        and o_orderkey = l_orderkey
                        and c_custkey = o_custkey
                        and s_nationkey = n1.n_nationkey
                        and c_nationkey = n2.n_nationkey
                        and (
                                (n1.n_name = 'SAUDI ARABIA'
and n2.n_name = 'VIETNAM')
                                or (n1.n_name = 'VIETNAM' and
n2.n_name = 'SAUDI ARABIA')
                        )
                        and l_shipdate between '1995-01-01' and
'1996-12-31'
        ) as shipping
group by
        supp_nation,
        cust_nation,
        l_year
order by
        supp_nation,
        cust_nation,
        l_year;
commit ;
set qstop = now(*);
select 'Stream 5 Query 7 STOP -- ', qstop ;
select 'Stream 5 Query 7 LENGTH -- ', cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)16.sql           2.1.8.1
-- TPC-H/TPC-R Parts/Supplier Relationship Query (Q16)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 5 Query 16 START -- ', qstart ;
select
        p_brand,
        p_type,
        p_size,
        count(distinct ps_suppkey) as supplier_cnt
from
        partsupp,
        part
where
        p_partkey = ps_partkey
        and p_brand <> 'Brand#55'
        and p_type not like 'LARGE BRUSHED%'
        and p_size in (17, 35, 32, 22, 4, 6, 33, 3)
        and ps_suppkey not in (
                select
```

```
                        s_suppkey
                from
                        supplier
                where
                        s_comment like '%Customer%Complaints%'
        )
group by
        p_brand,
        p_type,
        p_size
order by
        supplier_cnt desc,
        p_brand,
        p_type,
        p_size;
commit ;
set qstop = now(*);
select 'Stream 5 Query 16 STOP -- ', qstop ;
select 'Stream 5 Query 16 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)19.sql           2.1.8.1
-- TPC-H/TPC-R Discounted Revenue Query (Q19)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 5 Query 19 START -- ', qstart ;
select
        sum(l_extendedprice* (1 - l_discount)) as revenue
from
        lineitem,
        part
where
        (
                p_partkey = l_partkey
                and p_brand = 'Brand#34'
                and p_container in ('SM CASE', 'SM BOX', 'SM PACK',
'SM PKG')
                and l_quantity >= 7 and l_quantity <= 7 + 10
                and p_size between 1 and 5
                and l_shipmode in ('AIR', 'AIR REG')
                and l_shipinstruct = 'DELIVER IN PERSON'
        )
        or
        (
                p_partkey = l_partkey
                and p_brand = 'Brand#43'
                and p_container in ('MED BAG', 'MED BOX', 'MED
PKG', 'MED PACK')
                and l_quantity >= 10 and l_quantity <= 10 + 10
                and p_size between 1 and 10
                and l_shipmode in ('AIR', 'AIR REG')
                and l_shipinstruct = 'DELIVER IN PERSON'
        )
        or
        (
                p_partkey = l_partkey
                and p_brand = 'Brand#34'
                and p_container in ('LG CASE', 'LG BOX', 'LG PACK',
'LG PKG')
                and l_quantity >= 25 and l_quantity <= 25 + 10
                and p_size between 1 and 15
                and l_shipmode in ('AIR', 'AIR REG')
                and l_shipinstruct = 'DELIVER IN PERSON'
        );
commit ;
set qstop = now(*);
select 'Stream 5 Query 19 STOP -- ', qstop ;
select 'Stream 5 Query 19 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)18.sql           2.1.8.1
-- TPC-H/TPC-R Large Volume Customer Query (Q18)
-- Function Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 5 Query 18 START -- ', qstart ;
select top 100
        c_name,
        c_custkey,
        o_orderkey,
        o_orderdate,
        o_totalprice,
        sum(l_quantity)
from
        customer,
        orders,
        lineitem
where
        o_orderkey in (
                select
                        l_orderkey
                from
                        lineitem
                group by
                        l_orderkey having
                                sum(l_quantity) > 314
        )
        and c_custkey = o_custkey
        and o_orderkey = l_orderkey
group by
        c_name,
        c_custkey,
        o_orderkey,
        o_orderdate,
        o_totalprice
order by
        o_totalprice desc,
        o_orderdate;
commit ;
set qstop = now(*);
select 'Stream 5 Query 18 STOP -- ', qstop ;
select 'Stream 5 Query 18 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)14.sql           2.1.8.1
-- TPC-H/TPC-R Promotion Effect Query (Q14)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 5 Query 14 START -- ', qstart ;
select
        100.00 * sum(case
                when p_type like 'PROMO%'
                        then l_extendedprice * (1 - l_discount)
                else 0
        end) / sum(l_extendedprice * (1 - l_discount)) as promo_revenue
from
        lineitem,
        part
where
        l_partkey = p_partkey
        and l_shipdate >= '1993-01-01'
    and l_shipdate < dateadd(month,1,'1993-01-01');
commit ;
set qstop = now(*);
select 'Stream 5 Query 14 STOP -- ', qstop ;
select 'Stream 5 Query 14 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)22.sql           2.1.8.1
-- TPC-H/TPC-R Global Sales Opportunity Query (Q22)
-- Functional Query Definition
-- Approved February 1998
```

```
set qstart = now(*);
select 'Stream 5 Query 22 START -- ', qstart ;
select
	cntrycode,
	count(*) as numcust,
	sum(c_acctbal) as totacctbal
from
	(
		select
	substring(c_phone,1,2) as cntrycode,
				c_acctbal
		from
				customer
		where
	substring(c_phone,1,2) in
					('14', '10', '16', '15', '11', '22', '19')
				and c_acctbal > (
					select
						avg(c_acctbal)
					from
						customer
					where
						c_acctbal > 0.00
			and substring(c_phone,1,2) in
								('14', '10',
'16', '15', '11', '22', '19')
				)
				and not exists (
					select
						*
					from
						orders
					where
						o_custkey = c_custkey
				)
	) as custsale
group by
	cntrycode
order by
	cntrycode;
commit ;
set qstop = now(*);
select 'Stream 5 Query 22 STOP -- ', qstop ;
select 'Stream 5 Query 22 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)11.sql	2.1.8.1
-- TPC-H/TPC-R Important Stock Identification Query (Q11)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 5 Query 11 START -- ', qstart ;
select
	ps_partkey,
	sum(ps_supplycost * ps_availqty) as value
from
	partsupp,
	supplier,
	nation
where
	ps_suppkey = s_suppkey
	and s_nationkey = n_nationkey
	and n_name = 'RUSSIA'
group by
	ps_partkey having
		sum(ps_supplycost * ps_availqty) > (
			select
				sum(ps_supplycost * ps_availqty) *
0.0000010000
			from
				partsupp,
				supplier,
				nation
			where
				ps_suppkey = s_suppkey
				and s_nationkey = n_nationkey
				and n_name = 'RUSSIA'
		)
order by
	value desc;
commit ;
set qstop = now(*);
select 'Stream 5 Query 11 STOP -- ', qstop ;
select 'Stream 5 Query 11 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)13.sql	2.1.8.1
-- TPC-H/TPC-R Customer Distribution Query (Q13)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 5 Query 13 START -- ', qstart ;
select
	c_count,
	count(*) as custdist
from
	(
		select
			c_custkey,
			count(o_orderkey)
		from
			customer left outer join orders on
				c_custkey = o_custkey
				and o_comment not like '%special
%packages%'
		group by
			c_custkey
	) as c_orders (c_custkey, c_count)
group by
	c_count
order by
	custdist desc,
	c_count desc;
commit ;
set qstop = now(*);
select 'Stream 5 Query 13 STOP -- ', qstop ;
select 'Stream 5 Query 13 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)3.sql	2.1.8.1
-- TPC-H/TPC-R Shipping Priority Query (Q3)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 5 Query 3 START -- ', qstart ;
select top 10
	l_orderkey,
	sum(l_extendedprice * (1 - l_discount)) as revenue,
	o_orderdate,
	o_shippriority
from
	customer,
	orders,
	lineitem
where
	c_mktsegment = 'HOUSEHOLD'
	and c_custkey = o_custkey
	and l_orderkey = o_orderkey
	and o_orderdate < '1995-03-06'
	and l_shipdate >  '1995-03-06'
group by
```

```
		l_orderkey,
		o_orderdate,
		o_shippriority
order by
		revenue desc,
		o_orderdate;
commit ;
set qstop = now(*);
select 'Stream 5 Query 3 STOP -- ', qstop ;
select 'Stream 5 Query 3 LENGTH -- ', cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)1.sql		2.1.8.1
-- TPC-H/TPC-R Pricing Summary Report Query (Q1)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 5 Query 1 START -- ', qstart ;
select
		l_returnflag,
		l_linestatus,
		sum(l_quantity) as sum_qty,
		sum(l_extendedprice) as sum_base_price,
		sum(l_extendedprice * (1 - l_discount)) as sum_disc_price,
		sum(l_extendedprice * (1 - l_discount) * (1 + l_tax)) as sum_charge,
		avg(l_quantity) as avg_qty,
		avg(l_extendedprice) as avg_price,
		avg(l_discount) as avg_disc,
		count(*) as count_order
from
		lineitem
where
		l_shipdate <= dateadd(day,-85,'1998-12-01')
group by
		l_returnflag,
		l_linestatus
order by
		l_returnflag,
		l_linestatus;
commit ;
set qstop = now(*);
select 'Stream 5 Query 1 STOP -- ', qstop ;
select 'Stream 5 Query 1 LENGTH -- ', cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)2.sql		2.1.8.2
-- TPC-H/TPC-R Minimum Cost Supplier Query (Q2)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 5 Query 2 START -- ', qstart ;
select top 100
		s_acctbal,
		s_name,
		n_name,
		p_partkey,
		p_mfgr,
		s_address,
		s_phone,
		s_comment
from
		part,
		supplier,
		partsupp,
		nation,
		region
where
		p_partkey = ps_partkey
		and s_suppkey = ps_suppkey
		and p_size = 19
		and p_type like '%STEEL'
		and s_nationkey = n_nationkey
		and n_regionkey = r_regionkey
		and r_name = 'AFRICA'
		and ps_supplycost = (
			select
				min(ps_supplycost)
			from
				partsupp,
				supplier,
				nation,
				region
			where
				p_partkey = ps_partkey
				and s_suppkey = ps_suppkey
				and s_nationkey = n_nationkey
				and n_regionkey = r_regionkey
				and r_name = 'AFRICA'
		)
order by
		s_acctbal desc,
		n_name,
		s_name,
		p_partkey;
commit ;
set qstop = now(*);
select 'Stream 5 Query 2 STOP -- ', qstop ;
select 'Stream 5 Query 2 LENGTH -- ', cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)5.sql		2.1.8.1
-- TPC-H/TPC-R Local Supplier Volume Query (Q5)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 5 Query 5 START -- ', qstart ;
select
		n_name,
		sum(l_extendedprice * (1 - l_discount)) as revenue
from
		customer,
		orders,
		lineitem,
		supplier,
		nation,
		region
where
		c_custkey = o_custkey
		and l_orderkey = o_orderkey
		and l_suppkey = s_suppkey
		and c_nationkey = s_nationkey
		and s_nationkey = n_nationkey
		and n_regionkey = r_regionkey
		and r_name = 'ASIA'
		and o_orderdate >= '1996-01-01'
	and o_orderdate < dateadd(year,1,'1996-01-01')
group by
		n_name
order by
		revenue desc;
commit ;
set qstop = now(*);
select 'Stream 5 Query 5 STOP -- ', qstop ;
select 'Stream 5 Query 5 LENGTH -- ', cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)8.sql		2.1.8.1
-- TPC-H/TPC-R National Market Share Query (Q8)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 5 Query 8 START -- ', qstart ;
```

```
select
        o_year,
        sum(case
                when nation = 'VIETNAM' then volume
                else 0
        end) / sum(volume) as mkt_share
from
        (
                select
            datepart(year, o_orderdate) as o_year,
                        l_extendedprice * (1 - l_discount) as volume,
                        n2.n_name as nation
                from
                        part,
                        supplier,
                        lineitem,
                        orders,
                        customer,
                        nation n1,
                        nation n2,
                        region
                where
                        p_partkey = l_partkey
                        and s_suppkey = l_suppkey
                        and l_orderkey = o_orderkey
                        and o_custkey = c_custkey
                        and c_nationkey = n1.n_nationkey
                        and n1.n_regionkey = r_regionkey
                        and r_name = 'ASIA'
                        and s_nationkey = n2.n_nationkey
                        and o_orderdate between '1995-01-01' and
'1996-12-31'
                        and p_type = 'MEDIUM BURNISHED
NICKEL'
        ) as all_nations
group by
        o_year
order by
        o_year;
commit ;
set qstop = now(*);
select 'Stream 5 Query 8 STOP -- ', qstop ;
select 'Stream 5 Query 8 LENGTH -- ', cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)20.sql           2.1.8.1
-- TPC-H/TPC-R Potential Part Promotion Query (Q20)
-- Function Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 5 Query 20 START -- ', qstart ;
select
        s_name,
        s_address
from
        supplier,
        nation
where
        s_suppkey in (
                select
                        ps_suppkey
                from
                        partsupp
                where
                        ps_partkey in (
                                select
                                        p_partkey
                                from
                                        part
                                where
                                        p_name like 'peru%'
                        )
                        and ps_availqty > (
                                select
                                        0.5 * sum(l_quantity)
                                from
                                        lineitem
                                where
                                        l_partkey = ps_partkey
                                        and l_suppkey =
ps_suppkey
                                        and l_shipdate >=
'1996-01-01'
                                        and l_shipdate < dateadd(year,1,'1996-01-01')
                                )
                )
                and s_nationkey = n_nationkey
                and n_name = 'IRAN'
order by
        s_name;
commit ;
set qstop = now(*);
select 'Stream 5 Query 20 STOP -- ', qstop ;
select 'Stream 5 Query 20 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)12.sql           2.1.8.1
-- TPC-H/TPC-R Shipping Modes and Order Priority Query (Q12)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 5 Query 12 START -- ', qstart ;
select
        l_shipmode,
        sum(case
                when o_orderpriority = '1-URGENT'
                        or o_orderpriority = '2-HIGH'
                        then 1
                else 0
        end) as high_line_count,
        sum(case
                when o_orderpriority <> '1-URGENT'
                        and o_orderpriority <> '2-HIGH'
                        then 1
                else 0
        end) as low_line_count
from
        orders,
        lineitem
where
        o_orderkey = l_orderkey
        and l_shipmode in ('REG AIR', 'AIR')
        and l_commitdate < l_receiptdate
        and l_shipdate < l_commitdate
        and l_receiptdate >= '1997-01-01'
    and l_receiptdate < dateadd(year,1,'1997-01-01')
group by
        l_shipmode
order by
        l_shipmode;
commit ;
set qstop = now(*);
select 'Stream 5 Query 12 STOP -- ', qstop ;
select 'Stream 5 Query 12 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)17.sql           2.1.8.1
-- TPC-H/TPC-R Small-Quantity-Order Revenue Query (Q17)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 5 Query 17 START -- ', qstart ;
select
```

```
	sum(l_extendedprice) / 7.0 as avg_yearly
from
	lineitem,
	part
where
	p_partkey = l_partkey
	and p_brand = 'Brand#54'
	and p_container = 'MED BOX'
	and l_quantity < (
		select
			0.2 * avg(l_quantity)
		from
			lineitem
		where
			l_partkey = p_partkey
	);
commit ;
set qstop = now(*);
select 'Stream 5 Query 17 STOP -- ', qstop ;
select 'Stream 5 Query 17 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)10.sql	2.1.8.1
-- TPC-H/TPC-R Returned Item Reporting Query (Q10)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 5 Query 10 START -- ', qstart ;
select top 20
	c_custkey,
	c_name,
	sum(l_extendedprice * (1 - l_discount)) as revenue,
	c_acctbal,
	n_name,
	c_address,
	c_phone,
	c_comment
from
	customer,
	orders,
	lineitem,
	nation
where
	c_custkey = o_custkey
	and l_orderkey = o_orderkey
	and o_orderdate >= '1993-08-01'
    and o_orderdate < dateadd(month,3,'1993-08-01')
	and l_returnflag = 'R'
	and c_nationkey = n_nationkey
group by
	c_custkey,
	c_name,
	c_acctbal,
	c_phone,
	n_name,
	c_address,
	c_comment
order by
	revenue desc;
commit ;
set qstop = now(*);
select 'Stream 5 Query 10 STOP -- ', qstop ;
select 'Stream 5 Query 10 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)9.sql	2.1.8.1
-- TPC-H/TPC-R Product Type Profit Measure Query (Q9)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 5 Query 9 START -- ', qstart ;
select
	nation,
	o_year,
	sum(amount) as sum_profit
from
	(
		select
			n_name as nation,
		datepart(year, o_orderdate) as o_year,
			l_extendedprice * (1 - l_discount) -
ps_supplycost * l_quantity as amount
		from
			part,
			supplier,
			lineitem,
			partsupp,
			orders,
			nation
		where
			s_suppkey = l_suppkey
			and ps_suppkey = l_suppkey
			and ps_partkey = l_partkey
			and p_partkey = l_partkey
			and o_orderkey = l_orderkey
			and s_nationkey = n_nationkey
			and p_name like '%grey%'
	) as profit
group by
	nation,
	o_year
order by
	nation,
	o_year desc;
commit ;
set qstop = now(*);
select 'Stream 5 Query 9 STOP -- ', qstop ;
select 'Stream 5 Query 9 LENGTH -- ', cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;

select 'Stream completion time -- ',now(*) as "time";

disconnect;

exit;
```

==========

stream6.sql

==========

```
-- using 207153860 as a seed to the RNG
create variable qstart timestamp;
create variable qstop timestamp;
select 'Stream begin time -- ',now(*) as "time";
-- @(#)10.sql	2.1.8.1
-- TPC-H/TPC-R Returned Item Reporting Query (Q10)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 6 Query 10 START -- ', qstart ;
select top 20
	c_custkey,
	c_name,
	sum(l_extendedprice * (1 - l_discount)) as revenue,
	c_acctbal,
	n_name,
	c_address,
	c_phone,
	c_comment
```

```
from
	customer,
	orders,
	lineitem,
	nation
where
	c_custkey = o_custkey
	and l_orderkey = o_orderkey
	and o_orderdate >= '1994-06-01'
    and o_orderdate < dateadd(month,3,'1994-06-01')
	and l_returnflag = 'R'
	and c_nationkey = n_nationkey
group by
	c_custkey,
	c_name,
	c_acctbal,
	c_phone,
	n_name,
	c_address,
	c_comment
order by
	revenue desc;
commit ;
set qstop = now(*);
select 'Stream 6 Query 10 STOP -- ', qstop ;
select 'Stream 6 Query 10 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)3.sql	2.1.8.1
-- TPC-H/TPC-R Shipping Priority Query (Q3)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 6 Query 3 START -- ', qstart ;
select top 10
	l_orderkey,
	sum(l_extendedprice * (1 - l_discount)) as revenue,
	o_orderdate,
	o_shippriority
from
	customer,
	orders,
	lineitem
where
	c_mktsegment = 'BUILDING'
	and c_custkey = o_custkey
	and l_orderkey = o_orderkey
	and o_orderdate < '1995-03-23'
	and l_shipdate >  '1995-03-23'
group by
	l_orderkey,
	o_orderdate,
	o_shippriority
order by
	revenue desc,
	o_orderdate;
commit ;
set qstop = now(*);
select 'Stream 6 Query 3 STOP -- ', qstop ;
select 'Stream 6 Query 3 LENGTH -- ', cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)15.sql	2.1.8.1
-- TPC-H/TPC-R Top Supplier Query (Q15)
-- Functional Query Definition
-- Approved February 1998

set qstart = now(*);
select 'Stream 6 Query 15 START -- ', qstart ;
create view revenue6 (supplier_no, total_revenue) as
	select
		l_suppkey,
		sum(l_extendedprice * (1 - l_discount))
	from
		lineitem
	where
		l_shipdate >= '1996-01-01'
	and l_shipdate < dateadd(month,3,'1996-01-01')
	group by
		l_suppkey;



select
	s_suppkey,
	s_name,
	s_address,
	s_phone,
	total_revenue
from
	supplier,
	revenue6
where
	s_suppkey = supplier_no
	and total_revenue = (
		select
			max(total_revenue)
		from
			revenue6
	)
order by
	s_suppkey;

drop view revenue6;
commit ;
set qstop = now(*);
select 'Stream 6 Query 15 STOP -- ', qstop ;
select 'Stream 6 Query 15 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)13.sql	2.1.8.1
-- TPC-H/TPC-R Customer Distribution Query (Q13)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 6 Query 13 START -- ', qstart ;
select
	c_count,
	count(*) as custdist
from
	(
		select
			c_custkey,
			count(o_orderkey)
		from
			customer left outer join orders on
				c_custkey = o_custkey
				and o_comment not like '%special
%packages%'
		group by
			c_custkey
	) as c_orders (c_custkey, c_count)
group by
	c_count
order by
	custdist desc,
	c_count desc;
commit ;
set qstop = now(*);
select 'Stream 6 Query 13 STOP -- ', qstop ;
select 'Stream 6 Query 13 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)6.sql	2.1.8.1
-- TPC-H/TPC-R Forecasting Revenue Change Query (Q6)
-- Functional Query Definition
-- Approved February 1998
```

```
set qstart = now(*);
select 'Stream 6 Query 6 START -- ', qstart ;
select
	sum(l_extendedprice * l_discount) as revenue
from
	lineitem
where
	l_shipdate >= '1997-01-01'
      and l_shipdate < dateadd(year,1,'1997-01-01')
	and l_discount between 0.06 - 0.01 and 0.06 + 0.01
	and l_quantity < 25;
commit ;
set qstop = now(*);
select 'Stream 6 Query 6 STOP -- ', qstop ;
select 'Stream 6 Query 6 LENGTH -- ', cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)8.sql		2.1.8.1
-- TPC-H/TPC-R National Market Share Query (Q8)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 6 Query 8 START -- ', qstart ;
select
	o_year,
	sum(case
		when nation = 'JORDAN' then volume
		else 0
	end) / sum(volume) as mkt_share
from
	(
		select
	    datepart(year, o_orderdate) as o_year,
			l_extendedprice * (1 - l_discount) as volume,
			n2.n_name as nation
		from
			part,
			supplier,
			lineitem,
			orders,
			customer,
			nation n1,
			nation n2,
			region
		where
			p_partkey = l_partkey
			and s_suppkey = l_suppkey
			and l_orderkey = o_orderkey
			and o_custkey = c_custkey
			and c_nationkey = n1.n_nationkey
			and n1.n_regionkey = r_regionkey
			and r_name = 'MIDDLE EAST'
			and s_nationkey = n2.n_nationkey
			and o_orderdate between '1995-01-01' and
'1996-12-31'
			and p_type = 'SMALL BRUSHED NICKEL'
	) as all_nations
group by
	o_year
order by
	o_year;
commit ;
set qstop = now(*);
select 'Stream 6 Query 8 STOP -- ', qstop ;
select 'Stream 6 Query 8 LENGTH -- ', cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)9.sql		2.1.8.1
-- TPC-H/TPC-R Product Type Profit Measure Query (Q9)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 6 Query 9 START -- ', qstart ;
select
	nation,
	o_year,
	sum(amount) as sum_profit
from
	(
		select
			n_name as nation,
	    datepart(year, o_orderdate) as o_year,
			l_extendedprice * (1 - l_discount) -
ps_supplycost * l_quantity as amount
		from
			part,
			supplier,
			lineitem,
			partsupp,
			orders,
			nation
		where
			s_suppkey = l_suppkey
			and ps_suppkey = l_suppkey
			and ps_partkey = l_partkey
			and p_partkey = l_partkey
			and o_orderkey = l_orderkey
			and s_nationkey = n_nationkey
			and p_name like '%forest%'
	) as profit
group by
	nation,
	o_year
order by
	nation,
	o_year desc;
commit ;
set qstop = now(*);
select 'Stream 6 Query 9 STOP -- ', qstop ;
select 'Stream 6 Query 9 LENGTH -- ', cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)7.sql		2.1.8.1
-- TPC-H/TPC-R Volume Shipping Query (Q7)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 6 Query 7 START -- ', qstart ;
select
	supp_nation,
	cust_nation,
	l_year,
	sum(volume) as revenue
from
	(
		select
			n1.n_name as supp_nation,
			n2.n_name as cust_nation,
	    datepart(year, l_shipdate) as l_year,
			l_extendedprice * (1 - l_discount) as volume
		from
			supplier,
			lineitem,
			orders,
			customer,
			nation n1,
			nation n2
		where
			s_suppkey = l_suppkey
			and o_orderkey = l_orderkey
			and c_custkey = o_custkey
```

```
                        and s_nationkey = n1.n_nationkey
                        and c_nationkey = n2.n_nationkey
                        and (
                                (n1.n_name = 'JAPAN' and
n2.n_name = 'JORDAN')
                                or (n1.n_name = 'JORDAN' and
n2.n_name = 'JAPAN')
                        )
                        and l_shipdate between '1995-01-01' and
'1996-12-31'
        ) as shipping
group by
        supp_nation,
        cust_nation,
        l_year
order by
        supp_nation,
        cust_nation,
        l_year;
commit ;
set qstop = now(*);
select 'Stream 6 Query 7 STOP -- ', qstop ;
select 'Stream 6 Query 7 LENGTH -- ', cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)4.sql            2.1.8.1
-- TPC-H/TPC-R Order Priority Checking Query (Q4)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 6 Query 4 START -- ', qstart ;
select
        o_orderpriority,
        count(*) as order_count
from
        orders
where
        o_orderdate >= '1996-07-01'
    and o_orderdate < dateadd(month,3,'1996-07-01')
        and exists (
                select
                        *
                from
                        lineitem
                where
                        l_orderkey = o_orderkey
                        and l_commitdate < l_receiptdate
        )
group by
        o_orderpriority
order by
        o_orderpriority;
commit ;
set qstop = now(*);
select 'Stream 6 Query 4 STOP -- ', qstop ;
select 'Stream 6 Query 4 LENGTH -- ', cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)11.sql           2.1.8.1
-- TPC-H/TPC-R Important Stock Identification Query (Q11)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 6 Query 11 START -- ', qstart ;
select
        ps_partkey,
        sum(ps_supplycost * ps_availqty) as value
from
        partsupp,
        supplier,
        nation
where
        ps_suppkey = s_suppkey
        and s_nationkey = n_nationkey
        and n_name = 'IRAN'
group by
        ps_partkey having
                sum(ps_supplycost * ps_availqty) > (
                        select
                                sum(ps_supplycost * ps_availqty) *
0.0000010000
                        from
                                partsupp,
                                supplier,
                                nation
                        where
                                ps_suppkey = s_suppkey
                                and s_nationkey = n_nationkey
                                and n_name = 'IRAN'
                )
order by
        value desc;
commit ;
set qstop = now(*);
select 'Stream 6 Query 11 STOP -- ', qstop ;
select 'Stream 6 Query 11 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)22.sql           2.1.8.1
-- TPC-H/TPC-R Global Sales Opportunity Query (Q22)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 6 Query 22 START -- ', qstart ;
select
        cntrycode,
        count(*) as numcust,
        sum(c_acctbal) as totacctbal
from
        (
                select
            substring(c_phone,1,2) as cntrycode,
                        c_acctbal
                from
                        customer
                where
            substring(c_phone,1,2) in
                                ('11', '19', '14', '15', '20', '16', '23')
                        and c_acctbal > (
                                select
                                        avg(c_acctbal)
                                from
                                        customer
                                where
                                        c_acctbal > 0.00
                    and substring(c_phone,1,2) in
                                                ('11', '19',
'14', '15', '20', '16', '23')
                        )
                        and not exists (
                                select
                                        *
                                from
                                        orders
                                where
                                        o_custkey = c_custkey
                        )
        ) as custsale
group by
        cntrycode
order by
        cntrycode;
commit ;
```

```
set qstop = now(*);
select 'Stream 6 Query 22 STOP -- ', qstop ;
select 'Stream 6 Query 22 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)18.sql           2.1.8.1
-- TPC-H/TPC-R Large Volume Customer Query (Q18)
-- Function Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 6 Query 18 START -- ', qstart ;
select top 100
        c_name,
        c_custkey,
        o_orderkey,
        o_orderdate,
        o_totalprice,
        sum(l_quantity)
from
        customer,
        orders,
        lineitem
where
        o_orderkey in (
                select
                        l_orderkey
                from
                        lineitem
                group by
                        l_orderkey having
                                sum(l_quantity) > 312
        )
        and c_custkey = o_custkey
        and o_orderkey = l_orderkey
group by
        c_name,
        c_custkey,
        o_orderkey,
        o_orderdate,
        o_totalprice
order by
        o_totalprice desc,
        o_orderdate;
commit ;
set qstop = now(*);
select 'Stream 6 Query 18 STOP -- ', qstop ;
select 'Stream 6 Query 18 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)12.sql           2.1.8.1
-- TPC-H/TPC-R Shipping Modes and Order Priority Query (Q12)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 6 Query 12 START -- ', qstart ;
select
        l_shipmode,
        sum(case
                when o_orderpriority = '1-URGENT'
                        or o_orderpriority = '2-HIGH'
                        then 1
                else 0
        end) as high_line_count,
        sum(case
                when o_orderpriority <> '1-URGENT'
                        and o_orderpriority <> '2-HIGH'
                        then 1
                else 0
        end) as low_line_count
from
        orders,
        lineitem
where
        o_orderkey = l_orderkey
        and l_shipmode in ('SHIP', 'AIR')
        and l_commitdate < l_receiptdate
        and l_shipdate < l_commitdate
        and l_receiptdate >= '1993-01-01'
    and l_receiptdate < dateadd(year,1,'1993-01-01')
group by
        l_shipmode
order by
        l_shipmode;
commit ;
set qstop = now(*);
select 'Stream 6 Query 12 STOP -- ', qstop ;
select 'Stream 6 Query 12 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)1.sql            2.1.8.1
-- TPC-H/TPC-R Pricing Summary Report Query (Q1)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 6 Query 1 START -- ', qstart ;
select
        l_returnflag,
        l_linestatus,
        sum(l_quantity) as sum_qty,
        sum(l_extendedprice) as sum_base_price,
        sum(l_extendedprice * (1 - l_discount)) as sum_disc_price,
        sum(l_extendedprice * (1 - l_discount) * (1 + l_tax)) as sum_charge,
        avg(l_quantity) as avg_qty,
        avg(l_extendedprice) as avg_price,
        avg(l_discount) as avg_disc,
        count(*) as count_order
from
        lineitem
where
        l_shipdate <= dateadd(day,-93,'1998-12-01')
group by
        l_returnflag,
        l_linestatus
order by
        l_returnflag,
        l_linestatus;
commit ;
set qstop = now(*);
select 'Stream 6 Query 1 STOP -- ', qstop ;
select 'Stream 6 Query 1 LENGTH -- ', cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)5.sql            2.1.8.1
-- TPC-H/TPC-R Local Supplier Volume Query (Q5)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 6 Query 5 START -- ', qstart ;
select
        n_name,
        sum(l_extendedprice * (1 - l_discount)) as revenue
from
        customer,
        orders,
        lineitem,
        supplier,
        nation,
        region
where
        c_custkey = o_custkey
        and l_orderkey = o_orderkey
        and l_suppkey = s_suppkey
```

```
		and c_nationkey = s_nationkey
		and s_nationkey = n_nationkey
		and n_regionkey = r_regionkey
		and r_name = 'EUROPE'
		and o_orderdate >= '1997-01-01'
	and o_orderdate < dateadd(year,1,'1997-01-01')
group by
		n_name
order by
		revenue desc;
commit ;
set qstop = now(*);
select 'Stream 6 Query 5 STOP -- ', qstop ;
select 'Stream 6 Query 5 LENGTH -- ', cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)16.sql		2.1.8.1
-- TPC-H/TPC-R Parts/Supplier Relationship Query (Q16)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 6 Query 16 START -- ', qstart ;
select
		p_brand,
		p_type,
		p_size,
		count(distinct ps_suppkey) as supplier_cnt
from
		partsupp,
		part
where
		p_partkey = ps_partkey
		and p_brand <> 'Brand#35'
		and p_type not like 'STANDARD BURNISHED%'
		and p_size in (13, 42, 17, 26, 19, 3, 12, 11)
		and ps_suppkey not in (
			select
				s_suppkey
			from
				supplier
			where
				s_comment like '%Customer%Complaints%'
		)
group by
		p_brand,
		p_type,
		p_size
order by
		supplier_cnt desc,
		p_brand,
		p_type,
		p_size;
commit ;
set qstop = now(*);
select 'Stream 6 Query 16 STOP -- ', qstop ;
select 'Stream 6 Query 16 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)2.sql		2.1.8.2
-- TPC-H/TPC-R Minimum Cost Supplier Query (Q2)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 6 Query 2 START -- ', qstart ;
select top 100
		s_acctbal,
		s_name,
		n_name,
		p_partkey,
		p_mfgr,
		s_address,
		s_phone,
		s_comment
from
		part,
		supplier,
		partsupp,
		nation,
		region
where
		p_partkey = ps_partkey
		and s_suppkey = ps_suppkey
		and p_size = 7
		and p_type like '%BRASS'
		and s_nationkey = n_nationkey
		and n_regionkey = r_regionkey
		and r_name = 'EUROPE'
		and ps_supplycost = (
			select
				min(ps_supplycost)
			from
				partsupp,
				supplier,
				nation,
				region
			where
				p_partkey = ps_partkey
				and s_suppkey = ps_suppkey
				and s_nationkey = n_nationkey
				and n_regionkey = r_regionkey
				and r_name = 'EUROPE'
		)
order by
		s_acctbal desc,
		n_name,
		s_name,
		p_partkey;
commit ;
set qstop = now(*);
select 'Stream 6 Query 2 STOP -- ', qstop ;
select 'Stream 6 Query 2 LENGTH -- ', cast(datediff(millisecond,qstart,qstop) as
numeric)/1000, ' seconds' ;
-- @(#)14.sql		2.1.8.1
-- TPC-H/TPC-R Promotion Effect Query (Q14)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 6 Query 14 START -- ', qstart ;
select
	100.00 * sum(case
		when p_type like 'PROMO%'
			then l_extendedprice * (1 - l_discount)
		else 0
	end) / sum(l_extendedprice * (1 - l_discount)) as promo_revenue
from
		lineitem,
		part
where
		l_partkey = p_partkey
		and l_shipdate >= '1993-01-01'
	and l_shipdate < dateadd(month,1,'1993-01-01');
commit ;
set qstop = now(*);
select 'Stream 6 Query 14 STOP -- ', qstop ;
select 'Stream 6 Query 14 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)19.sql		2.1.8.1
-- TPC-H/TPC-R Discounted Revenue Query (Q19)
-- Functional Query Definition
-- Approved February 1998
```

```
set qstart = now(*);
select 'Stream 6 Query 19 START -- ', qstart ;
select
	sum(l_extendedprice* (1 - l_discount)) as revenue
from
	lineitem,
	part
where
	(
		p_partkey = l_partkey
		and p_brand = 'Brand#31'
		and p_container in ('SM CASE', 'SM BOX', 'SM PACK',
'SM PKG')
		and l_quantity >= 3 and l_quantity <= 3 + 10
		and p_size between 1 and 5
		and l_shipmode in ('AIR', 'AIR REG')
		and l_shipinstruct = 'DELIVER IN PERSON'
	)
	or
	(
		p_partkey = l_partkey
		and p_brand = 'Brand#21'
		and p_container in ('MED BAG', 'MED BOX', 'MED
PKG', 'MED PACK')
		and l_quantity >= 11 and l_quantity <= 11 + 10
		and p_size between 1 and 10
		and l_shipmode in ('AIR', 'AIR REG')
		and l_shipinstruct = 'DELIVER IN PERSON'
	)
	or
	(
		p_partkey = l_partkey
		and p_brand = 'Brand#23'
		and p_container in ('LG CASE', 'LG BOX', 'LG PACK',
'LG PKG')
		and l_quantity >= 21 and l_quantity <= 21 + 10
		and p_size between 1 and 15
		and l_shipmode in ('AIR', 'AIR REG')
		and l_shipinstruct = 'DELIVER IN PERSON'
	);
commit ;
set qstop = now(*);
select 'Stream 6 Query 19 STOP -- ', qstop ;
select 'Stream 6 Query 19 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)20.sql		2.1.8.1
-- TPC-H/TPC-R Potential Part Promotion Query (Q20)
-- Function Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 6 Query 20 START -- ', qstart ;
select
	s_name,
	s_address
from
	supplier,
	nation
where
	s_suppkey in (
		select
			ps_suppkey
		from
			partsupp
		where
			ps_partkey in (
				select
					p_partkey
				from
					part
				where
					p_name like 'blush%'
			)
			and ps_availqty > (
				select
					0.5 * sum(l_quantity)
				from
					lineitem
				where
					l_partkey = ps_partkey
					and l_suppkey =
ps_suppkey
					and l_shipdate >=
'1994-01-01'
					and l_shipdate < dateadd(year,1,'1994-01-01')
				)
		)
		and s_nationkey = n_nationkey
		and n_name = 'ALGERIA'
order by
	s_name;
commit ;
set qstop = now(*);
select 'Stream 6 Query 20 STOP -- ', qstop ;
select 'Stream 6 Query 20 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)17.sql		2.1.8.1
-- TPC-H/TPC-R Small-Quantity-Order Revenue Query (Q17)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 6 Query 17 START -- ', qstart ;
select
	sum(l_extendedprice) / 7.0 as avg_yearly
from
	lineitem,
	part
where
	p_partkey = l_partkey
	and p_brand = 'Brand#51'
	and p_container = 'MED PACK'
	and l_quantity < (
		select
			0.2 * avg(l_quantity)
		from
			lineitem
		where
			l_partkey = p_partkey
	);
commit ;
set qstop = now(*);
select 'Stream 6 Query 17 STOP -- ', qstop ;
select 'Stream 6 Query 17 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;
-- @(#)21.sql		2.1.8.1
-- TPC-H/TPC-R Suppliers Who Kept Orders Waiting Query (Q21)
-- Functional Query Definition
-- Approved February 1998


set qstart = now(*);
select 'Stream 6 Query 21 START -- ', qstart ;
select top 100
	s_name,
	count(*) as numwait
from
	supplier,
	lineitem l1,
	orders,
	nation
where
	s_suppkey = l1.l_suppkey
	and o_orderkey = l1.l_orderkey
```

```
        and o_orderstatus = 'F'
        and l1.l_receiptdate > l1.l_commitdate
        and exists (
                select
                        *
                from
                        lineitem l2
                where
                        l2.l_orderkey = l1.l_orderkey
                        and l2.l_suppkey <> l1.l_suppkey
        )
        and not exists (
                select
                        *
                from
                        lineitem l3
                where
                        l3.l_orderkey = l1.l_orderkey
                        and l3.l_suppkey <> l1.l_suppkey
                        and l3.l_receiptdate > l3.l_commitdate
        )
        and s_nationkey = n_nationkey
        and n_name = 'GERMANY'
group by
        s_name
order by
        numwait desc,
        s_name;
commit ;
set qstop = now(*);
select 'Stream 6 Query 21 STOP -- ', qstop ;
select 'Stream 6 Query 21 LENGTH -- ', cast(datediff(millisecond,qstart,qstop)
as numeric)/1000, ' seconds' ;

select 'Stream completion time -- ',now(*) as "time";

disconnect;

exit;
```

==========

ACID Test Execution Code

==========

atomicity test

==========

```
dbtest acid_atomic_main.tst > acid_atomic_main.out
```

==========

consistency test

==========

```
dbtest acid_consistency_main.tst >
acid_consistency_main.out
```

==========

isolation tests

==========

```
dbtest acid_isolation_main1.tst >
acid_isolation_main1.out
dbtest acid_isolation_main2.tst >
acid_isolation_main2.out
dbtest acid_isolation_main3.tst >
acid_isolation_main3.out
dbtest acid_isolation_main4.tst >
acid_isolation_main4.out
dbtest acid_isolation_main5.tst >
acid_isolation_main5.out
dbtest acid_isolation_main6.tst >
acid_isolation_main6.out
```

==========

durability test

==========

```
dbtest acid_durability_main.tst >
acid_durability_main.out
```

==========

ACID Test Source Code

==========

==========

acid_atomic_main.tst

==========

```
stringconnect "dsn=tpch;"

execute {select now(*)} into times
print 'Atomicity test start = ', times
print ' '

include 'acid_functions.tst'
commit

%
% Atomicity test with rollback
%
print ' '
print 'Starting atomicity test with rollback'
print ' '

run test 'acid_atomic_setup.tst'

stringconnect "dsn=tpch;"
let counter=0

LOOP {
open cur2 {select ordr, line, delta from aa_whattodo
where seqnum=^}
        substitute counter
print 'counter = ',counter
fetch cur2 into ordr, line, delta
if ROWSTATUS != FOUND then { BREAK LOOP } endif
print 'Acid transaction for: o_key-',ordr,'  l_key-',
line,'  delta-',delta

execute {select o_totalprice, l_quantity,
l_extendedprice
        from orders, lineitem
        where o_orderkey = l_orderkey and o_orderkey
=^ and l_linenumber = ^}
        substitute ordr, line
        into o_total, l_quan, l_price
print   'o_totalprice = ',o_total,'   l_quantity =
',l_quan,
        '       l_extendedprice = ',l_price

execute {call acid_transaction(^, ^,  ^, rprice,
quantity,
                                tax, disc, extprice,
ototal)
        } substitute ordr, line, delta
close cur2
let counter = counter+1

rollback
execute {select now(*)} into times
print 'rollback : ', times

execute {select o_totalprice, l_quantity,
l_extendedprice
        from orders, lineitem
        where o_orderkey = l_orderkey and o_orderkey
```

```
=^ and l_linenumber = ^}
        substitute ordr, line
        into o_total, l_quan, l_price
print   'o_totalprice = ',o_total,'   l_quantity =
',l_quan,
        '       l_extendedprice = ',l_price
print ' '

} ENDLOOP

commit

%
% Atomicity test with commit
%
stringconnect "dsn=tpch;"
print ' '
print 'Starting atomicity test with commit '
print ' '
run test 'acid_atomic_setup.tst'

stringconnect "dsn=tpch;"

open cur1 {select ordr, line, delta from aa_whattodo}
LOOP {
fetch cur1 into ordr, line, delta
if ROWSTATUS != FOUND then { BREAK LOOP } endif
print 'Acid transaction for: o_key-',ordr,'  l_key-',
line,'  delta-',delta
execute {select o_totalprice, l_quantity,
l_extendedprice
        from orders, lineitem
        where o_orderkey = l_orderkey and o_orderkey
=^ and l_linenumber = ^}
        substitute ordr, line
        into o_total, l_quan, l_price
print   'o_totalprice = ',o_total,'   l_quantity =
',l_quan,
        '       l_extendedprice = ',l_price

execute {call acid_transaction(^, ^,  ^, rprice,
quantity,
                               tax, disc, extprice,
ototal)
        } substitute ordr, line, delta
commit
execute {select now(*)} into times
print 'commit : ', times

execute {select o_totalprice, l_quantity,
l_extendedprice
        from orders, lineitem
        where o_orderkey = l_orderkey and o_orderkey
=^ and l_linenumber = ^}
        substitute ordr, line
        into o_total, l_quan, l_price
print   'o_totalprice = ',o_total,'   l_quantity =
',l_quan,
        '       l_extendedprice = ',l_price
print ' '

} ENDLOOP

close cur1
commit

execute {select now(*)} into times
print 'Atomicity test end = ', times

End Test
```

==========

acid_atomic_setup.tst

==========

```
Description    "Creates aa_whattodo table"

stringconnect "dsn=tpch;"

% Drop Table if found

allow error -141
execute { commit }
execute { drop table aa_whattodo }
allow no error

execute {
create table aa_whattodo (
                seqnum       int      not null,
                ordr         int        not null,
                line         int        null,
                delta        int         null)
}

print 'aa_whattodo CREATED!!'
execute {select now(*)} into times
print 'time = ', times

fetch {select count(*) from aa_whattodo } into ROWS
assert ROWS = 0

print 'Number of rows before load: ',ROWS

LOOP ({let counter = 0}; {counter < 5}; {let counter =
counter + 1})
{
       execute {call generate_acid_values()}
              into orderkey, linenumber,delta
       execute {insert into aa_whattodo values ( ^ ,
^ , ^ , ^ ) }
              substitute counter, orderkey,
linenumber, delta
 print  counter, ' ',orderkey, ' ',linenumber,' ',
delta
}
ENDLOOP

commit

fetch {select count(*) from aa_whattodo } into ROWS
assert ROWS = 5

print 'Number of rows after load: ',ROWS

disconnect

End Test
```

==========

acid_consistency_main.tst

==========

```
stringconnect "dsn=tpch;"

execute {select now(*)} into times
print 'Consistency test start = ', times
print ' '

include 'acid_functions.tst'

run test 'acid_consistency_setup.tst'

execute {select now(*)} into times
print 'Consistency test time = ', times
print ' '

run test '-o' 'acid_consistency_q1.ot'
'acid_consistency_query.tst'
disconnect

start test '-o' 'acid_consist_user1.ot' 'stream=1'
'acid_consistency_txn.tst'
sleep 1000
start test '-o' 'acid_consist_user2.ot' 'stream=2'
```

```
'acid_consistency_txn.tst'
sleep 1000
start test '-o' 'acid_consist_user3.ot' 'stream=3'
'acid_consistency_txn.tst'
sleep 1000
start test '-o' 'acid_consist_user4.ot' 'stream=4'
'acid_consistency_txn.tst'
sleep 1000
start test '-o' 'acid_consist_user5.ot' 'stream=5'
'acid_consistency_txn.tst'
sleep 1000
start test '-o' 'acid_consist_user6.ot' 'stream=6'
'acid_consistency_txn.tst'
sleep 1000
start test '-o' 'acid_consist_user7.ot' 'stream=7'
'acid_consistency_txn.tst'
sleep 1000
start test '-o' 'acid_consist_user8.ot' 'stream=8'
'acid_consistency_txn.tst'
sleep 1000
start test '-o' 'acid_consist_user9.ot' 'stream=9'
'acid_consistency_txn.tst'

synchronize 10
% let the log flush...
sleep 10000

stringconnect "dsn=tpch;"
run test '-o' 'acid_consistency_q2.ot'
'acid_consistency_query.tst'

execute {select now(*)} into times
print 'Consistency test end = ', times
print ' '

End Test
```

==========

acid_consistency_query.tst

==========

```
stringconnect "dsn=tpch;"

open cur1 {select stream, seqnum, ordr, line, delta
from acid_table
              where seqnum > 10 order by seqnum}
print ' '

let n=1
LOOP {
   fetch cur1 into str, seq, ord, lin, delta

   fetch {select round(cast(o_totalprice as
numeric(26,16)),2)
              from orders where o_orderkey=^ }
        substitute ord into o_price

   if ROWSTATUS != FOUND then { BREAK LOOP } endif
   if n > 25 then { BREAK LOOP } endif

   fetch { call acid_single_query (^) } substitute ord
into l_total

   fetch {select cast(^ as numeric(12,2)) } substitute
o_price into o_price
   fetch {select cast(^ as numeric(12,2)) } substitute
l_total into l_total

   print 'orderkey = ', ord, '       o_totalprice =
', o_price,
         '       acid query = ' , l_total

   ASSERT (o_price = l_total)
        then { print 'Did not compare correctly' }
ENDASSERT
   let n=n+1
 } ENDLOOP

disconnect

END Test
```

==========

acid_consistency_setup.tst

==========

```
stringconnect "dsn=tpch;"

% Drop Table if found
allow error -141
execute { drop table acid_table }
allow no error

execute {
create table acid_table (
               stream  int    not null,
                seqnum  int   not null,
                ordr    int   not null,
                line    int   null,
                delta   int   null)
}

execute {checkpoint}

print 'acid_table CREATED!!'

fetch {select count(*) from acid_table } into ROWS
assert ROWS = 0
print 'Number of rows before load: ',ROWS
commit

LOOP ({let i = 1}; {i <= 9}; { let i = i + 1})
{
  LOOP ({let j = 1}; {j <= 100}; {let j = j + 1})
    {
       execute { call generate_acid_values()} into
ordr, line, delta
       execute { insert into acid_table values
(^,^,^,^,^) }
                substitute i,j,ordr,line,delta
    } endloop
  print (j-1)*i
} endloop

commit

fetch {select count(*) from acid_table } into ROWS
assert ROWS = 900
print 'Number of rows after load: ',ROWS

End Test
```

==========

acid_consistency_txn.tst

==========

```
stringconnect "dsn=tpch;"

execute {select now(*)} into times
print 'Consistancy test start = ', times
print ' '

LOOP ({let i = 1}; {i <= 100}; { let i = i + 1})
{
 fetch {select ordr, line, delta from acid_table
              where stream=^ and seqnum=^ }
       substitute stream, i
 if ROWSTATUS != FOUND then { print 'not enough rows'
              BREAK LOOP }
 endif

 print 'Acid Trenasaction ',i,
       ':  o_key-', ordr , '  l_key-', line , '
delta-' ,delta
```

```
 execute {call acid_transaction( ^, ^,  ^, rprice,
quantity,
                                tax, disc, extprice,
ototal)
 } substitute ordr, line, delta
 commit
 print 'committed'
 sleep 1000

}
ENDLOOP

synchronize 10

End Test
```

==========

acid_durability_main.tst

==========

```
stringconnect "dsn=tpch;"

execute {select now(*)} into times
print 'Durability test start = ', times
print ' '

include 'acid_functions.tst'
run test 'acid_durability_setup.tst'

execute {select now(*)} into times
print 'Durability test time = ', times
print ' '

run test  '-o' 'acid_durability_q1.ot'
'acid_durability_query.tst'

start test '-o' 'acid_dura_user1.ot' 'stream=1'
'acid_durability_txn.tst'
sleep 1000
start test '-o' 'acid_dura_user2.ot' 'stream=2'
'acid_durability_txn.tst'
sleep 1000
start test '-o' 'acid_dura_user3.ot' 'stream=3'
'acid_durability_txn.tst'
sleep 1000
start test '-o' 'acid_dura_user4.ot' 'stream=4'
'acid_durability_txn.tst'
sleep 1000
start test '-o' 'acid_dura_user5.ot' 'stream=5'
'acid_durability_txn.tst'
sleep 1000
start test '-o' 'acid_dura_user6.ot' 'stream=6'
'acid_durability_txn.tst'
sleep 1000
start test '-o' 'acid_dura_user7.ot' 'stream=7'
'acid_durability_txn.tst'
sleep 1000
start test '-o' 'acid_dura_user8.ot' 'stream=8'
'acid_durability_txn.tst'
sleep 1000
start test '-o' 'acid_dura_user9.ot' 'stream=9'
'acid_durability_txn.tst'

synchronize 10

execute {select now(*)} into times
print 'Durability test time = ', times
print ' '


run test  '-o' 'acid_durability_q2.ot'
'acid_durability_query.tst'

execute {select now(*)} into times
print 'Durability test end = ', times
print ' '

End Test
```

==========

acid_durability_query.tst

==========

```
stringconnect "dsn=tpch;"

open cur1 {select stream, seqnum, ordr, line, delta
from acid_table
               where seqnum > 5 order by seqnum}
print ' '

let n=1
LOOP {
   fetch cur1 into str, seq, ord, lin, delta

   fetch {select round(cast(o_totalprice as
numeric(26,16)),2)
               from orders where o_orderkey=^ }
        substitute ord into o_price

   if ROWSTATUS != FOUND then { BREAK LOOP } endif
   if n > 50 then { BREAK LOOP } endif

   fetch { call acid_single_query (^) } substitute ord
into l_total

   fetch {select cast(^ as numeric(12,2)) } substitute
o_price into o_price
   fetch {select cast(^ as numeric(12,2)) } substitute
l_total into l_total

   print 'orderkey = ', ord, '       o_totalprice =
', o_price,
         '       acid query = ' , l_total

   ASSERT (o_price = l_total)
        then { print 'Did not compare correctly' }
ENDASSERT
   let n=n+1

 } ENDLOOP

disconnect

END Test
```

==========

acid_durability_setup.tst

==========

```
stringconnect "dsn=tpch;"

% Drop Table if found
allow error -141
execute { drop table acid_table }
allow no error

execute {
create table acid_table (
               stream  int     not null,
                seqnum  int    not null,
                ordr    int    not null,
                line    int    null,
                delta   int    null)
}

execute {checkpoint}

print 'acid_table CREATED!!'

fetch {select count(*) from acid_table } into ROWS
assert ROWS = 0
print 'Number of rows before load: ',ROWS
commit
```

```
LOOP ({let i = 1}; {i <= 9}; { let i = i + 1})
{
  LOOP ({let j = 1}; {j <= 200}; { let j = j + 1})
    {
       execute { call generate_acid_values()} into
ordr, line, delta
       execute { insert into acid_table values
(^,^,^,^,^) }
               substitute i,j,ordr,line,delta
    } endloop
  print (j-1)*i
} endloop

commit
execute {checkpoint}

fetch {select count(*) from acid_table } into ROWS

print 'Number of rows after load: ',ROWS

End Test

=====================================================
```

acid_durability_txn.tst

```
=====================================================

stringconnect "dsn=tpch;"

execute {select now(*)} into times
print 'Durability test start = ', times
print ' '
print 'stream  trans. o_key   l_key   p_key   s_key
delta   date_t '

LOOP ({let i = 1}; {i <= 200}; { let i = i + 1})
{
 fetch {select ordr, line, delta from acid_table
       where stream=^ and seqnum=^ }
       substitute stream, i

 if ROWSTATUS != FOUND then { print 'not enough rows'
BREAK LOOP }
 endif

 execute {select l_partkey, l_suppkey from lineitem
               where l_orderkey=^ and l_linenumber=^}
       substitute ordr, line
       into p_key, s_key

 execute {call acid_transaction( ^, ^,  ^)
        } substitute ordr, line, delta
       into  rprice, quantity, tax, disc, extprice,
ototal

 assert SQLCODE=0 then { DIE } endassert
 commit

 execute {select now(*)} into times
 print  stream,'      ',
       'txn ',i, '    ',
        ordr,  '      ',
        line,  '      ',
        p_key, '      ',
        s_key, '      ',
        delta, '      ',
        times, '      '
 sleep 1000
}
ENDLOOP

synchronize 10

End Test

=====================================================
```

acid_functions.tst

```
=====================================================

print 'creating the sleep procedure'

allow error -265
execute { DROP PROCEDURE dbo.sleep}
allow no error

execute{ create procedure dbo.sleep(in sleep_time
integer default null)
begin
  declare command varchar(255);
  select 'xp_cmdshell ''sleep '+str(sleep_time)+''''
into command;
  execute immediate command
end;
}

print 'creating the Acid Transaction'

allow error -265
execute { DROP PROCEDURE acid_transaction }
allow no error

execute{ CREATE PROCEDURE acid_transaction(
                IN  o_key      INT,
                IN  l_key      INT,
                IN  delta      INT,
                OUT rprice     Numeric(18,8),
                OUT quantity   INT,
                OUT tax        Numeric(18,8),
                OUT disc       Numeric(18,8),
                OUT extprice   Numeric(18,8),
                OUT ototal     Numeric(18,8)
                )
ON EXCEPTION RESUME
BEGIN
 DECLARE pkey           INT ;
 DECLARE skey           INT ;
 DECLARE cost           NUMERIC(18,8) ;
 DECLARE new_extprice   NUMERIC(18,8) ;
 DECLARE new_ototal     NUMERIC(18,8) ;
 DECLARE new_quantity   INT ;
 DECLARE c_sqlstate     char(5);
 LOOP1: LOOP
    COMMIT;
    SELECT o_totalprice
      INTO ototal
      FROM orders
     WHERE o_orderkey = o_key ;
    SELECT l_quantity,
           l_extendedprice,
           l_partkey,
           l_suppkey,
           l_tax,
           l_discount
      INTO quantity,
           extprice,
           pkey,
           skey,
           tax,
           disc
      FROM lineitem
     WHERE l_orderkey   = o_key
       AND l_linenumber = l_key;
    -- CLEAN UP IMPRECICE NUMBERS
    SET ototal = ototal -
"TRUNCATE"("truncate"(extprice*(1-disc),2)*(1+tax),2);
    SET rprice = "TRUNCATE"((extprice  / quantity),2);
    SET cost = "TRUNCATE"((rprice * delta),2);
    SET new_extprice = extprice + cost;
    SET new_ototal = "TRUNCATE"(new_extprice * (1.0 -
disc),2);
    SET new_ototal = "TRUNCATE"(new_ototal * (1.0 +
tax),2);
    SET new_ototal = ototal + new_ototal ;
```

```
    SET new_quantity = quantity + delta ;
    --
    -- Update LineItem
    --
    UPDATE lineitem
       SET l_quantity      = new_quantity,
           l_extendedprice = new_extprice
     WHERE l_orderkey=o_key
       AND l_linenumber=l_key;
    SELECT SQLSTATE INTO c_sqlstate;
    IF c_sqlstate = '00000' THEN
        --
        -- Update Orders
        --
        UPDATE orders
           SET o_totalprice = new_ototal
         WHERE o_orderkey = o_key;
        SELECT SQLSTATE INTO c_sqlstate;
        IF c_sqlstate = '00000'  THEN
            INSERT INTO history VALUES ( pkey, skey,
o_key, l_key, delta, now(*)) ;
            SELECT SQLSTATE INTO c_sqlstate;
            IF c_sqlstate = '00000'  THEN
                LEAVE LOOP1;
            END IF;
        END IF;
    END IF;
 END LOOP LOOP1;
 RETURN(0);
END;
}

print 'Acid transaction created'
print ' '

print 'Creating Acid query'

allow error -265
execute { DROP PROCEDURE acid_single_query }
allow no error

execute{
CREATE PROCEDURE acid_single_query( IN o_key INT, OUT
o_total NUMERIC(26,16) )
BEGIN
    SELECT o_total =
        sum ("truncate" ("truncate"(
                        round(cast(l_extendedprice as
numeric(26,16)),2) *
                        (1 - round(cast(l_discount as
numeric(26,16)),2)),2)
                    * (1 + round(cast(l_tax as
numeric(26,16)),2)) , 2))
    FROM lineitem WHERE l_orderkey = o_key;
 END
}

print 'Acid query created'
print ' '

print 'Creating Generate_acid_values function'

allow error -265
execute { DROP PROCEDURE generate_acid_values }
allow no error

execute{
create procedure generate_acid_values(
out orderkey   int,
out linenumber int,
out delta      int)

BEGIN

 declare seed         bigint;
 declare rand_dbl     double precision;
 declare rand_int     int;
 declare out_key      int;
 declare times cursor for select
datediff(millisecond,convert(char(10),getdate(),
116),now(*));
 declare random1 cursor for select rand(seed);
 declare random cursor for select rand();
 declare get_order cursor for
       select o_orderkey from orders where o_orderkey
= rand_int;
 declare get_linenumber cursor for
       select max(l_linenumber) from lineitem
       where l_orderkey = orderkey;

 open times;
 fetch next times into seed;
 open random1;
 fetch next random1 into rand_dbl;

 set out_key = 0;
 loop1:
 while out_key = 0 LOOP
       open random;
       open get_order;

       fetch next random into rand_dbl;
       set rand_int = rand_dbl * 6001215 +1;
       fetch next get_order into out_key;

       close random;
       close get_order;
 end loop loop1;

 set orderkey = out_key;

 open get_linenumber;
 fetch next get_linenumber into linenumber;
 close get_linenumber;

 open random;
 fetch next random into rand_dbl;
 set delta = rand_dbl * 100 + 1;
 close random;

END
}
commit
execute {checkpoint}
print 'Generate_acid_values function created'
print ' '

print 'Creating Generate_Ps_Values function'

allow error -265
execute { DROP PROCEDURE generate_ps_values }
allow no error

execute{
create procedure generate_ps_values(
out partkey    int,
out suppkey    int)

BEGIN

 declare seed         bigint;
 declare rand_dbl     double precision;
 declare rand_int     int;
 declare out_key      int;
 declare counter      int;

 declare times cursor for select
datediff(millisecond,convert(char(10),getdate(),
116),now(*));
 declare random1 cursor for select rand(seed);
 declare random cursor for select rand();
 declare get_supp cursor for
       select ps_suppkey from partsupp
       where ps_suppkey = rand_int;
 declare get_part cursor for
```

```
       select ps_partkey from partsupp
       where ps_suppkey = suppkey;

 open times;
 fetch next times into seed;
 open random1;
 fetch next random1 into rand_dbl;
 close random1;

 set out_key = 0;
 while out_key = 0 LOOP
       open random;
       open get_supp ;

       fetch next random into rand_dbl;
       set rand_int = rand_dbl * 10000 +1;
       fetch next get_supp into out_key;

       close random;
       close get_supp ;
 end loop;
 set suppkey = out_key;

 set out_key = 0;
 set counter  = 0;
 open random;
 open get_part;
 fetch next random into rand_dbl;
 set rand_int = rand_dbl * 10 +1;

 loop1:
 while counter < rand_int LOOP
       set counter = counter+1;
       fetch next get_part into out_key;
 end loop loop1;

 set partkey = out_key;
 close random;
 close get_part;

END
}
commit
execute {checkpoint}
print 'Generate_Ps_Values function created'
print ' '

print 'Creating history table'

allow error -141
execute { drop table history }
allow no error

execute {
create table history (
   h_p_key    unsigned INT NOT NULL ,
   h_s_key    unsigned INT NOT NULL ,
   h_o_key    unsigned INT NOT NULL ,
   h_l_key    INT NOT NULL,
   h_delta    INT NOT NULL,
   h_date_t   TIMESTAMP NOT NULL)
}

commit
execute {checkpoint}
print 'history table created'
print ' '
```

==========

acid_isolation_main1.tst

==========

```
stringconnect "dsn=tpch;"

execute {select now(*)} into times
print ' '
print ' '
print 'Isolation test 1'
print 'start = ', times
print ' '

include 'acid_functions.tst'
include 'acid_isolation_setup.tst'

start test  'acid_isolation_test1.tst'
start test  'acid_isolation_test1_query.tst'

End Test
```

==========

acid_isolation_main2.tst

==========

```
stringconnect "dsn=tpch;"

execute {select now(*)} into times
print ' '
print ' '
print 'Isolation test 2'
print 'start = ', times
print ' '


include 'acid_functions.tst'
include 'acid_isolation_setup.tst'

start test  'acid_isolation_test2.tst'
start test  'acid_isolation_test2_query.tst'

End Test
```

==========

acid_isolation_main3.tst

==========

```
stringconnect "dsn=tpch;"

execute {select now(*)} into times
print ' '
print ' '
print 'Isolation test 3'
print 'start = ', times
print ' '
print 'Isolation test start = ', times

include "acid_functions.tst"
include 'acid_isolation_setup.tst'

start test  'acid_isolation_test3_transaction1.tst'
start test  'acid_isolation_test3_transaction2.tst'

End Test
```

==========

acid_isolation_main4.tst

==========

```
stringconnect "dsn=tpch;"

execute {select now(*)} into times
print ' '
print ' '
print 'Isolation test 4'
print 'start = ', times
print ' '
print 'Isolation test start = ', times

include 'acid_functions.tst'
include 'acid_isolation_setup.tst'

start test  'acid_isolation_test4_transaction1.tst'
start test  'acid_isolation_test4_transaction2.tst'
```

```
End Test
```

```
====================================================
```

acid_isolation_main5.tst

```
====================================================

stringconnect "dsn=tpch;"

execute {select now(*)} into times
print ' '
print ' '
print 'Isolation test 5'
print 'start = ', times
print ' '

include 'acid_functions.tst'
include 'acid_isolation_setup.tst'

start test 'acid_isolation_test5_transaction1.tst'
start test 'acid_isolation_test5_query.tst'

End Test
```

```
====================================================
```

acid_isolation_main6.tst

```
====================================================

stringconnect "dsn=tpch;"

execute {select now(*)} into times
print ' '
print ' '
print 'Isolation test 6'
print 'start = ', times
print ' '

include 'acid_functions.tst'
include 'acid_isolation_setup.tst'

start test '-u' 'acid_isolation_test6_query.tst'
start test  'acid_isolation_test6_transaction1.tst'

End Test
```

```
====================================================
```

acid_isolation_setup.tst

```
====================================================

stringconnect "dsn=tpch;"

% Drop Table if found

allow error -141
execute { commit }
execute { drop table acid_isolation_table }
allow no error

execute {
create table acid_isolation_table (
                ordr         int    not null,
                line         int    null,
                delta        int    null)
}

execute {checkpoint}

print 'acid_isolation_table CREATED!!'
execute {select now(*)} into times
print 'time = ', times

fetch {select count(*) from acid_isolation_table }
into ROWS
assert ROWS = 0

print 'Number of rows before load: ',ROWS

execute {call generate_acid_values()} into orderkey,
linenumber,delta
execute {insert into acid_isolation_table values ( ^ ,
^ , ^ ) }
                substitute orderkey, linenumber, delta
print  orderkey, ' ',linenumber,' ', delta

commit

fetch {select count(*) from acid_isolation_table }
into ROWS
assert ROWS = 1

print 'Number of rows after load: ',ROWS

disconnect

End Test
```

```
====================================================
```

acid_isolation_test1.tst

```
====================================================

stringconnect "dsn=tpch;"

execute {select ordr, line, delta from
acid_isolation_table}
        into ordr, line, delta

 print 'The following are the data input values for
the ACID Transaction.'
 print '(user 1) o_key-',ordr, '  l_key-', line, '
delta-',delta

 execute {call acid_transaction( ^, ^,  ^,
        rprice, quantity, tax, disc, extprice, ototal)
        } substitute ordr, line, delta

execute {select now(*)} into times
print 'User 1 waiting to commit = ', times
print ' '
synchronize 2
sleep 10000
execute {select now(*)} into times
print 'User 1 about to commit = ', times
commit

execute { select round(cast(o_totalprice as
numeric(18,2)),2)
        from orders where o_orderkey = ^}
        substitute ordr into o_total
print 'User 1 new values: '
print 'user 1 ordr= ', ordr
print 'user 1 o_total= ', o_total
print ' '

End Test
```

```
====================================================
```

acid_isolation_test1_query.tst

```
====================================================

stringconnect "dsn=tpch;"

 synchronize 2
 print ' '
 execute {select now(*)} into times
 print 'User 2 start query = ', times

 execute {select ordr from acid_isolation_table}
        into ordr

 print 'user 2 ordr = ', ordr
 fetch { call acid_single_query (^) } substitute ordr
into o_total
 print 'user 2 o_total=' , o_total
 print ' '
```

```
execute {select now(*)} into times
print 'User 2 completed query = ', times

disconnect

END Test
```

==========

acid_isolation_test2.tst

==========

```
stringconnect "dsn=tpch;"

execute {select ordr, line, delta from
acid_isolation_table}
        into ordr, line, delta

 print 'The following are the data input values for
the ACID Transaction.'
 print '(user 1) o_key-',ordr, '  l_key-', line, '
delta-',delta

 execute {call acid_transaction( ^, ^,  ^,
       rprice, quantity, tax, disc, extprice, ototal)
       } substitute ordr, line, delta

execute {select now(*)} into times
print 'User 1 waiting to roll back = ', times
print ' '
synchronize 2
sleep 10000
execute {select now(*)} into times
print 'User 1 about to roll back = ', times
rollback

execute { select round(cast(o_totalprice as
numeric(18,2)),2)
       from orders where o_orderkey = ^}
       substitute ordr into o_total
print 'User 1 new values: '
print 'user 1 ordr= ', ordr
print 'user 1 o_total= ', o_total
print ' '

End Test
```

==========

acid_isolation_test2_query.tst

==========

```
stringconnect "dsn=tpch;"

 synchronize 2
 print ' '
 execute {select now(*)} into times
 print 'User 2 start query = ', times

 execute {select ordr from acid_isolation_table}
        into ordr

 print 'user 2 ordr = ', ordr
 fetch { call acid_single_query (^) } substitute ordr
into o_total
 print 'user 2 o_total=' , o_total
 print ' '

execute {select now(*)} into times
print 'User 2 completed query = ', times

disconnect

END Test
```

==========

acid_isolation_test3_transaction1.tst

==========

```
stringconnect "dsn=tpch;"

execute {select now(*)} into times
print 'Isolation test 3 test start = ', times
print ' '

 execute {select ordr, line, delta from
acid_isolation_table}
        into ordr, line, delta

 print 'User 1 --  The input data values for User 1
Acid Transaction.'
 print 'User 1 -- o_key = ',ordr
 print 'User 1 -- l_key = ',line
 print 'User 1 -- delta1 = ',delta

 print ' '
 execute {select now(*)} into times
 print 'User 1 -- Starting the Acid Transaction: ',
times

 execute {call acid_transaction( ^, ^,  ^ )}
       substitute ordr, line, delta
       into rprice, quantity, tax, disc, extprice,
ototal

 print ' '
 execute {select now(*)} into times
 print 'User 1 -- Acid Transaction complete: ', times
 print '30 second timer started'
SYNCHRONIZE 2
 sleep 30000

 print ' '
 execute {select now(*)} into times
 print 'User 1 -- starting commit: ', times

 commit
 print ' '
 execute {select now(*)} into times
 print 'User 1 -- transaction commit complete: ',
times

 print ' '
 print 'USER 1 -- original extendedprice = ', extprice
 print 'USER 1 -- original quantity = ', quantity

 fetch { select cast(^ as numeric(18,6))
             + (cast(^ as numeric(18,6))*(cast (^ as
numeric(18,6))
             /cast (^ as numeric(18,6)))) }
       substitute extprice, delta, extprice, quantity
       into result1
 % make it format nicely...
 execute { select cast(^ as numeric(18,2)) }
substitute result1 into result2

 print ' '
 print 'User 1 -- result1 = '
 print '    txn1_extendedprice + (delta1 *
(txn1_extendedprice/txn1_quantity))'
 print 'User 1 -- result1= ', result2
 print ' '

 disconnect
 End Test
```

==========

acid_isolation_test3_transaction2.tst

==========

```
stringconnect "dsn=tpch;"

execute {select ordr, line, delta from
```

```
acid_isolation_table}
        into ordr, line, delta
% generate a new set of values; we only use delta2
execute { call generate_acid_values()} into ordr2,
line2, delta2

 print ' '
 print 'User 2 - The input data values for the Acid
Transaction.'
 print 'User 2 -- o_key = ',ordr
 print 'User 2 -- l_key= ',line
 print 'User 2 -- delta2 = ',delta2

SYNCHRONIZE 2
sleep 5000

 print ' '
 execute {select now(*)} into times
 print 'User 2 -- Starting the Acid Transaction: ',
times

execute {call acid_transaction( ^, ^,  ^ ) }
       substitute ordr, line, delta2
       into rprice, quantity, tax, disc, extprice,
ototal
execute {select round(cast(^ as numeric(20,6)),2) }
       substitute extprice into extprice2

sleep 5000
print ' '
execute {select now(*)} into times
print 'User 2 -- About to commit: ', times
commit

execute {select now(*)} into times
print 'User 2 -- transaction commit complete: ', times

print ' '

print 'USER 2 -- original extendedprice = ', extprice2
print 'USER 2 -- original quantity = ', quantity
print ' '

End Test
```

==========

acid_isolation_test4_transaction1.tst

==========

```
stringconnect "dsn=tpch;"

execute {select now(*)} into times
print 'Isolation test 3 test start = ', times
print ' '

 execute {select ordr, line, delta from
acid_isolation_table}
        into ordr, line, delta

 print 'User 1 --  The input data values for User 1
Acid Transaction.'
 print 'User 1 -- o_key = ',ordr
 print 'User 1 -- l_key = ',line
 print 'User 1 -- delta1 = ',delta

 print ' '
 execute {select now(*)} into times
 print 'User 1 -- Starting the Acid Transaction: ',
times

 execute {call acid_transaction( ^, ^,  ^ )}
       substitute ordr, line, delta
       into rprice, quantity, tax, disc, extprice,
ototal

 print ' '
 execute {select now(*)} into times
 print 'User 1 -- Acid Transaction complete: ', times
 print '30 second timer started'
SYNCHRONIZE 2
 sleep 30000

 print ' '
 execute {select now(*)} into times
 print 'User 1 -- starting rollback: ', times

 rollback
 print ' '
 execute {select now(*)} into times
 print 'User 1 -- transaction rollback complete: ',
times

 execute {select round(cast(^ as numeric(20,6)),2) }
       substitute extprice into extprice2
 print ' '
 print 'USER 1 -- original extendedprice = ',
extprice2
 print 'USER 1 -- original quantity = ', quantity
 print ' '

 disconnect
 End Test
```

==========

acid_isolation_test4_transaction2.tst

==========

```
stringconnect "dsn=tpch;"

execute {select ordr, line, delta from
acid_isolation_table}
        into ordr, line, delta
% generate a new set of values; we only use delta2
execute { call generate_acid_values()} into ordr2,
line2, delta2

 print ' '
 print 'User 2 - The input data values for the Acid
Transaction.'
 print 'User 2 -- o_key = ',ordr
 print 'User 2 -- l_key= ',line
 print 'User 2 -- delta2 = ',delta2

SYNCHRONIZE 2
sleep 5000

 print ' '
 execute {select now(*)} into times
 print 'User 2 -- Starting the Acid Transaction: ',
times

execute {call acid_transaction( ^, ^,  ^ ) }
       substitute ordr, line, delta2
       into rprice, quantity, tax, disc, extprice,
ototal
execute {select round(cast(^ as numeric(20,6)),2) }
       substitute extprice into extprice2

sleep 5000
print ' '
execute {select now(*)} into times
print 'User 2 -- About to commit: ', times
commit

execute {select now(*)} into times
print 'User 2 -- transaction commit complete: ', times
print ' '
print 'USER 2 -- original extendedprice = ', extprice2
print 'USER 2 -- original quantity = ', quantity
print ' '

End Test
```

==========

acid_isolation_test5_query.tst

```
=====================================================

stringconnect "dsn=tpch;"

synchronize 2

execute { call generate_ps_values() } into ps_ptky,
ps_spky
print ' '
print 'user 2 ps_partkey = ', ps_ptky
print 'user 2 ps_suppkey = ', ps_spky
print ' '

execute {select now(*)} into times
print 'User 2 beginning query = ', times
execute {select * from partsupp where ps_partkey=^ and
ps_suppkey=^}
       substitute ps_ptky, ps_spky
       into ps_ptky, ps_spky, ps_aly, ps_spct, ps_ct

print ' '
print 'User2 gets all columns of the PARTSUPP table '
print ' for selected ps_partkey and ps_suppkey doing a
query.'
print ' '
print 'ps_partkey = ', ps_ptky, '     ps_suppkey = ',
ps_spky
print 'ps_availqty = ', ps_aly, '     ps_supplycost =
',ps_spct
print 'ps_comment = ', ps_ct
execute {select now(*)} into times
print 'User 2 query complete = ', times
print ' '

execute {select now(*)} into times
print 'User 2 about to commit = ', times
commit
execute {select now(*)} into times
print 'User 2 transaction commit complete = ', times

print ' '

End Test

=====================================================
```

acid_isolation_test5_transaction1.tst

```
=====================================================

stringconnect "dsn=tpch;"

execute {select ordr, line, delta from
acid_isolation_table}
       into ordr, line, delta

 print ' '
 print 'The following are the input values for the
users1 ACID Transaction.'
 print 'o_key = ',ordr,'      l_key = ',line,'
delta = ',delta
 print ''
execute {select now(*)} into times
print 'User 1 isolation test time = ', times
print ' '
print ' '
execute {select o_totalprice from orders where
o_orderkey=^ }
       substitute ordr into o_tprice
execute {select l_extendedprice, l_quantity,l_partkey,
l_suppkey
       from lineitem
       where l_orderkey=^ and l_linenumber=^}
       substitute ordr, line
       into l_price, l_quant, l_ptky, l_spky
print 'User 1 o_totalprice = ', o_tprice
print 'User 1 l_extendedprice = ', l_price,'
l_quantity = ', l_quant
print 'User 1 l_partkey       = ', l_ptky,'  l_suppkey
= ', l_spky
print ' '

execute {select now(*)} into times
print 'User 1 starting acid transaction = ', times

execute {call acid_transaction( ^, ^,  ^, rprice,
quantity, tax, disc,
       extprice, ototal) } substitute ordr, line,
delta

execute {select now(*)} into times
print 'User 1 waiting to commit = ', times
print ' '
synchronize 2
sleep 10000
execute {select now(*)} into times
print 'User 1 about to commit = ', times
commit
execute {select now(*)} into times
print 'User 1 transaction commit complete = ', times

execute {select o_totalprice from orders where
o_orderkey=^ }
       substitute ordr into o_tprice
execute {select l_extendedprice, l_quantity
       from lineitem where l_orderkey=^ and
l_linenumber=^}
       substitute ordr, line
       into l_price, l_quant
print 'User 1 o_totalprice = ', o_tprice
print 'User 1 l_extendedprice = ', l_price,'
l_quantity = ', l_quant
print 'User 1 l_partkey       = ', l_ptky,'  l_suppkey
= ', l_spky

print ' '
execute {select * from history where h_o_key=^
       and h_date_t=(select max(h_date_t) from
history where h_o_key=^)}
       substitute ordr, ordr
       into hpk, hsk, hok, hlk, hda, hdt

print 'User 1 history entry:'
print '  h_p_key = ', hpk
print '  h_s_key = ', hsk
print '  h_o_key = ', hok
print '  h_l_key = ', hlk
print '  h_delta = ', hda
print '  h_date_t = ', hdt

execute {select now(*)} into times
print 'User 1 isolation test time = ', times
print ''

End Test

=====================================================
```

acid_isolation_test6_query.tst

```
=====================================================

stringconnect "dsn=tpch;"

print 'User1 Query: '
print ' '
print 'User1 starts its query (Q1) here.'
execute {select now(*)} into qstart
print 'Start time for User1 Q1 =', qstart
print ' '
compare fetchall {select
       l_returnflag,
       l_linestatus,
       sum(l_quantity) as sum_qty,
       sum(l_extendedprice) as sum_base_price,
       sum(l_extendedprice * (1 - l_discount)) as
sum_disc_price,
```

```
        sum(l_extendedprice * (1 - l_discount) * (1 +
l_tax)) as sum_charge,
        avg(l_quantity) as avg_qty,
        avg(l_extendedprice) as avg_price,
        avg(l_discount) as avg_disc,
        count(*) as count_order
from    lineitem
where   l_shipdate <= dateadd(day, -1, '1998-12-01')
group by l_returnflag,l_linestatus
order by l_returnflag,l_linestatus
 } in 'queryresult'

execute {select now(*)} into qstop
print 'Stop time for User1 Q1 =', qstop
print ' '

End Test
```

==========

acid_isolation_test6_transaction1.tst

==========

```
stringconnect "dsn=tpch;"

execute {select ordr, line, delta from
acid_isolation_table}
        into ordr, line, delta

 execute {select now(*)} into qstart2
 print 'User2 acid Transaction = ', qstart2
 print 'o_key = ',ordr, '     l_key = ',line, '
delta = ',delta
 print ' '
execute {select o_totalprice from orders where
o_orderkey=^ }
        substitute ordr into o_tprice
execute {select l_extendedprice, l_quantity,l_partkey,
l_suppkey
        from lineitem where l_orderkey=^ and
l_linenumber=^}
        substitute ordr, line
        into l_price, l_quant, l_ptky, l_spky
print 'User 2 o_totalprice = ', o_tprice
print 'User 2 l_extendedprice = ', l_price,'
l_quantity = ', l_quant
print 'User 2 l_partkey       = ', l_ptky,'
l_suppkey = ', l_spky
print ' '

execute {select now(*)} into qstart2
print 'Start Time for User2 Transaction = ', qstart2
print ' '
execute {call acid_transaction( ^, ^,  ^, rprice,
quantity,
                                tax, disc, extprice,
ototal) }
        substitute ordr, line, delta

execute {select now(*)} into qstop2
print 'User 2 about to commit = ', qstop2
commit
execute {select now(*)} into qstop2
print 'User 2 transaction commit complete = ', qstop2
print ' '

execute {select o_totalprice from orders where
o_orderkey=^ }
        substitute ordr
        into o_tprice
execute {select l_extendedprice, l_quantity
        from lineitem where l_orderkey=^ and
l_linenumber=^}
        substitute ordr, line
        into l_price, l_quant
print 'User 2 o_totalprice = ', o_tprice
print 'User 2 l_extendedprice = ', l_price,'
l_quantity = ', l_quant
print 'User 2 l_partkey       = ', l_ptky,'
l_suppkey = ', l_spky
print ' '

print ' '
execute {select * from history
        where h_o_key=^
        and h_date_t=(select max(h_date_t) from
history where h_o_key=^)}
        substitute ordr, ordr
        into hpk, hsk, hok, hlk, hda, hdt

print 'User 2 history entry:'
print '  h_p_key = ', hpk
print '  h_s_key = ', hsk
print '  h_o_key = ', hok
print '  h_l_key = ', hlk
print '  h_delta = ', hda
print '  h_date_t = ', hdt

print ' '
execute {select now(*)} into times
print 'User 2 completed = ', times

End Test
```

==========

Disk Configuration Details

==========

Solaris Volume Manager Setup

Note: The instructions below pertain to the controller number and targets generated by the configuration used in the benchmark. Solaris chooses the controller numbers and traget numbers at boot time depending upon the cabling configuration and slot location of the HBAs. Thus another equivalently configured system may not have the same the controller numbers and SCSI targets as shown below.

Using the **format** command, partition the disks as follows

```
c1t0d0
---------
  0       root    wm    8001 - 8920        7.05GB
  1 unassigned    wu       1 -   13      101.98MB
  2     backup    wm       0 - 8920       68.34GB
  3 unassigned    wm      14 -  653        4.90GB
  4 unassigned    wm     654 - 5875       40.00GB
  6 unassigned    wm    6501 - 8000       11.49GB
  8       boot    wu       0 -    0        7.84MB


c1t1d0
---------
  1 unassigned    wm       1 -   13      101.98MB
  2     backup    wm       0 - 8920       68.34GB
  3 unassigned    wm      14 -  653        4.90GB
  4 unassigned    wm     654 - 5875       40.00GB
  5 unassigned    wm    6501 - 8920       18.54GB
  8       boot    wu       0 -    0        7.84MB


c1t2d0
---------
  2     backup    wu       0 - 8920       68.34GB
  3 unassigned    wm       1 -  653        5.00GB
  4 unassigned    wm     654 - 5875       40.00GB
  5 unassigned    wm    6501 - 8920       18.54GB
  8       boot    wu       0 -    0        7.84MB


c1t3d0
```

```
---------
  2     backup    wu       0 - 8920       68.34GB
  3 unassigned    wm       1 -  653        5.00GB
  4 unassigned    wm     654 - 5875       40.00GB
  5 unassigned    wm    6501 - 8920       18.54GB
  8       boot    wu       0 -    0        7.84MB


c1t4d0
---------
  2     backup    wu       0 - 8920       68.34GB
  3 unassigned    wm       1 -  653        5.00GB
  4 unassigned    wm     654 - 5875       40.00GB
  5 unassigned    wm    6501 - 8920       18.54GB
  8       boot    wu       0 -    0        7.84MB


c1t5d0
---------
  2     backup    wu       0 - 8920       68.34GB
  3 unassigned    wm       1 -  653        5.00GB
  4 unassigned    wm     654 - 5875       40.00GB
  5 unassigned    wm    6501 - 8920       18.54GB
  8       boot    wu       0 -    0        7.84MB


c1t6d0
---------
  1 unassigned    wm       1 -  131        1.00GB
  2     backup    wu       0 - 8920       68.34GB
  3 unassigned    wm     132 -  653        4.00GB
  4 unassigned    wm     654 - 5875       40.00GB
  5 unassigned    wm    6501 - 8920       18.54GB
  8       boot    wu       0 -    0        7.84MB


c1t7d0
---------
  1 unassigned    wm       1 -  131        1.00GB
  2     backup    wu       0 - 8920       68.34GB
  3 unassigned    wm     132 -  653        4.00GB
  4 unassigned    wm     654 - 5875       40.00GB
  5 unassigned    wm    6501 - 8920       18.54GB
  8       boot    wu       0 -    0        7.84MB

Next define

/dev/dsk/c1t0d0s6

as a swap device.


Then use svm as follows to create the mirrors used
for the IQ log and the database devices

# c1 mirrored with c2

metainit d10 1 1  c1t0d0s4
metainit d11 1 1  c1t1d0s4
metainit d15 -m d10 d11

metainit d20 1 1  c1t2d0s4
metainit d21 1 1  c1t3d0s4
metainit d25 -m d20 d21

metainit d30 1 1  c1t4d0s4
metainit d31 1 1  c1t5d0s4
metainit d35 -m d30 d31

metainit d40 1 1  c1t6d0s4
metainit d41 1 1  c1t7d0s4
metainit d45 -m d40 d41
```

File System Setup

```
run the following:

create a filesystem on /dev/md/rdsk/d1 and mount
/dev/md/dsk/d1 on /sybase2


newfs  /dev/md/rdsk/d1

mount  /dev/md/dsk/d1  /sybase2

echo "/dev/md/dsk/d1  /dev/md/rdsk/d1  /sybase2   ufs
1  yes   -" >>/etc/vfstab
```

Database Device Links

```
Finally create the following links in /sybase2 to be
used as temp devices:

/sybase2/T01 -> /dev/rdsk/c1t0d0s3
/sybase2/T02 -> /dev/rdsk/c1t1d0s3
/sybase2/T03 -> /dev/rdsk/c1t2d0s3
/sybase2/T04 -> /dev/rdsk/c1t3d0s3
/sybase2/T05 -> /dev/rdsk/c1t4d0s3
/sybase2/T06 -> /dev/rdsk/c1t5d0s3
/sybase2/T07 -> /dev/rdsk/c1t6d0s3
/sybase2/T08 -> /dev/rdsk/c1t7d0s3

and create the following links in /sybase2 to be used
as  database devices:

/sybase2/M01 -> /dev/md/rdsk/d15
/sybase2/M02 -> /dev/md/rdsk/d25
/sybase2/M03 -> /dev/md/rdsk/d35
/sybase2/M04 -> /dev/md/rdsk/d45
```

Appendix C. Query Text and Query Output

```
=====================================================
```

qualification query 1

```
=====================================================

% select
% l_returnflag,
% l_linestatus,
% sum(l_quantity) as sum_qty,
% sum(l_extendedprice) as sum_base_price,
% sum(l_extendedprice * (1 - l_discount)) as
sum_disc_price,
% sum(l_extendedprice * (1 - l_discount) * (1 +
l_tax)) as sum_charge,
% avg(l_quantity) as avg_qty,
% avg(l_extendedprice) as avg_price,
% avg(l_discount) as avg_disc,
% count(*) as count_order
% from
% lineitem
% where
% l_shipdate <= dateadd(day,-90,'1998-12-01')
% group by
% l_returnflag,
% l_linestatus
% order by
% l_returnflag,
% l_linestatus;
% Estimated 1 rows in query (I/O estimate 1010)
% PLAN> vt_1 (seq)
%
%
% 1 record(s) selected -- actual I/O 0
% select time including I/O 0.32000 seconds - current
time 16:40:13
'A','F',
37734107,56586554400.7292032,53758257134.8694563,55909
065222.8284717,25.5220058532573342,38273.1297346211374
,.0499852958383577168,1478493
'N','F',
991417,1487504710.38000107,1413082168.05409968,1469649
223.19436967,25.5164719205229819,38284.4677608483374,.
0500934266742134809,38854
'N','O',
74476040,111701729697.737336,106118230307.607383,11036
7043872.495174,25.5022267695849895,38249.117988907361,
.049996586053555131,2920374
'R','F',
37719753,56568041380.8983326,53741292684.6045375,55889
619119.8339581,25.5057936126907617,38250.8546260985255
,.0500094058300870121,1478870
% total of 4 rows written

=====================================================
```

qualification query 2

```
=====================================================

% select top 100
% s_acctbal,
% s_name,
% n_name,
% p_partkey,
% p_mfgr,
% s_address,
% s_phone,
% s_comment
% from
% part,
% supplier,
% partsupp,
% nation,
% region
% where
% p_partkey = ps_partkey
% and s_suppkey = ps_suppkey
% and p_size = 15
% and p_type like 'BRASS'
% and s_nationkey = n_nationkey
% and n_regionkey = r_regionkey
% and r_name = 'EUROPE'
% and ps_supplycost = (
% select
% min(ps_supplycost)
% from
% partsupp,
% supplier,
% nation,
% region
% where
% p_partkey = ps_partkey
% and s_suppkey = ps_suppkey
% and s_nationkey = n_nationkey
% and n_regionkey = r_regionkey
% and r_name = 'EUROPE'
% )
% order by
% s_acctbal desc,
% n_name,
% s_name,
% p_partkey;
% Estimated 1 rows in query (I/O estimate 1010)
% PLAN> vt_1 (seq)
%
%
% 1 record(s) selected -- actual I/O 0
% select time including I/O 0.76000 seconds - current
time 16:40:25
9938.53,'Supplier#000005359       ','UNITED KINGDOM
',185358,'Manufacturer#4
','QKuHYh,vZGiwu2FWEJoLDx04','33-429-790-6131','blithe
ly silent pinto beans are furiously. slyly final
deposits acros'
9937.84,'Supplier#000005969       ','ROMANIA
',108438,'Manufacturer#1
','ANDENSOSmk,miq23Xfb5RWt6dvUcvt6Qa','29-520-692-3537
','carefully slow deposits use furiously. slyly ironic
platelets above the ironic'
9936.22,'Supplier#000005250       ','UNITED KINGDOM
',249,'Manufacturer#4           ','B3rqp0xbSEim4Mpy2RH
J','33-320-228-2957','blithely special packages are.
stealthily express deposits across the closely final
instructi'
9923.77000000000119,'Supplier#000002324
','GERMANY                   ',29821,'Manufacturer#4
','y3OD9UywSTOk','17-779-299-1839','quickly express
packages breach quiet pinto beans. requ'
9871.22,'Supplier#000006373       ','GERMANY
',43868,'Manufacturer#5
','J8fcXWsTqM','17-813-485-8637','never silent
deposits integrate furiously blit'
9870.78,'Supplier#000001286       ','GERMANY
',81285,'Manufacturer#2
','YKA,E2fjiVd7eUrzp2Ef8j1QxGo2DFnosaTEH','17-516-924-
4574','final theodolites cajole slyly special,'
9870.78,'Supplier#000001286       ','GERMANY
',181285,'Manufacturer#4
','YKA,E2fjiVd7eUrzp2Ef8j1QxGo2DFnosaTEH','17-516-924-
4574','final theodolites cajole slyly special,'
9852.52000000000119,'Supplier#000008973
','RUSSIA                    ',18972,'Manufacturer#2
','t5L67YdBYYH6o,Vz24jpDyQ9','32-188-594-7038','quickl
y regular instructions wake-- carefully unusual braids
into the expres'
9847.83,'Supplier#000008097       ','RUSSIA
',130557,'Manufacturer#2
','xMe97bpE69NzdwLoX','32-375-640-3593','slyly regular
dependencies sleep slyly furiously express dep'
9847.57,'Supplier#000006345       ','FRANCE
',86344,'Manufacturer#1
','VSt3rzk3qG698u6ld8HhOByvrTcSTSvQlDQDag','16-886-766
```

```
-7945','silent pinto beans should have to snooze
carefully along the final reques'
% total of 100 rows written

==========================================================
```

qualification query 3

```
==========================================================

% select top 10
% l_orderkey,
% sum(l_extendedprice * (1 - l_discount)) as revenue,
% o_orderdate,
% o_shippriority
% from
% customer,
% orders,
% lineitem
% where
% c_mktsegment = 'BUILDING'
% and c_custkey = o_custkey
% and l_orderkey = o_orderkey
% and o_orderdate < '1995-03-15'
% and l_shipdate > '1995-03-15'
% group by
% l_orderkey,
% o_orderdate,
% o_shippriority
% order by
% revenue desc,
% o_orderdate;
% Estimated 1 rows in query (I/O estimate 1010)
% PLAN> vt_1 (seq)
%
%
% 1 record(s) selected -- actual I/O 0
% select time including I/O 0.36000 seconds - current
time 16:40:27
2456423,406181.011100000024,'1995-03-05',0
3459808,405838.698899999917,'1995-03-04',0
492164,390324.061,'1995-02-19',0
1188320,384537.935899999976,'1995-03-09',0
2435712,378673.055799999952,'1995-02-26',0
4878020,378376.795200000048,'1995-03-12',0
5521732,375153.9215,'1995-03-13',0
2628192,373133.309399999976,'1995-02-22',0
993600,371407.45949999994,'1995-03-05',0
2300070,367371.145200000107,'1995-03-13',0
% total of 10 rows written

==========================================================
```

qualification query 4

```
==========================================================

% select
% o_orderpriority,
% count(*) as order_count
% from
% orders
% where
% o_orderdate >= '1993-07-01'
% and o_orderdate < dateadd(month,3,'1993-07-01')
% and exists (
% select
% *
% from
% lineitem
% where
% l_orderkey = o_orderkey
% and l_commitdate < l_receiptdate
% )
% group by
% o_orderpriority
% order by
% o_orderpriority;
% Estimated 1 rows in query (I/O estimate 1010)
% PLAN> vt_1 (seq)
%
%
% 1 record(s) selected -- actual I/O 0
% select time including I/O 0.25000 seconds - current
time 16:40:31
'1-URGENT       ',10594
'2-HIGH         ',10476
'3-MEDIUM       ',10410
'4-NOT SPECIFIED',10556
'5-LOW          ',10487
% total of 5 rows written

==========================================================
```

qualification query 5

```
==========================================================

% select
% n_name,
% sum(l_extendedprice * (1 - l_discount)) as revenue
% from
% customer,
% orders,
% lineitem,
% supplier,
% nation,
% region
% where
% c_custkey = o_custkey
% and l_orderkey = o_orderkey
% and l_suppkey = s_suppkey
% and c_nationkey = s_nationkey
% and s_nationkey = n_nationkey
% and n_regionkey = r_regionkey
% and r_name = 'ASIA'
% and o_orderdate >= '1994-01-01'
% and o_orderdate < dateadd(year,1,'1994-01-01')
% group by
% n_name
% order by
% revenue desc;
% Estimated 1 rows in query (I/O estimate 1010)
% PLAN> vt_1 (seq)
%
%
% 1 record(s) selected -- actual I/O 0
% select time including I/O 0.65000 seconds - current
time 16:40:36
'INDONESIA                ',55502041.1696999431
'VIETNAM                  ',55295086.9966999531
'CHINA                    ',53724494.2565999746
'INDIA                    ',52035512.000200057
'JAPAN                    ',45410175.6954000235
% total of 5 rows written

==========================================================
```

qualification query 6

```
==========================================================

% select
% sum(l_extendedprice * l_discount) as revenue
% from
% lineitem
% where
% l_shipdate >= '1994-01-01'
% and l_shipdate < dateadd(year,1,'1994-01-01')
% and l_discount between .06 - 0.01 and .06 + 0.01
% and l_quantity < 24;
% Estimated 1 rows in query (I/O estimate 1010)
% PLAN> vt_1 (seq)
%
%
% 1 record(s) selected -- actual I/O 0
% select time including I/O 0.15000 seconds - current
time 16:40:41
123141078.228299007
% total of 1 rows written

==========================================================
```

qualification query 7

```
=====================================================

% select
% supp_nation,
% cust_nation,
% l_year,
% sum(volume) as revenue
% from
% (
% select
% n1.n_name as supp_nation,
% n2.n_name as cust_nation,
% datepart(year, l_shipdate) as l_year,
% l_extendedprice * (1 - l_discount) as volume
% from
% supplier,
% lineitem,
% orders,
% customer,
% nation n1,
% nation n2
% where
% s_suppkey = l_suppkey
% and o_orderkey = l_orderkey
% and c_custkey = o_custkey
% and s_nationkey = n1.n_nationkey
% and c_nationkey = n2.n_nationkey
% and (
% (n1.n_name = 'FRANCE' and n2.n_name = 'GERMANY')
% or (n1.n_name = 'GERMANY' and n2.n_name = 'FRANCE')
% )
% and l_shipdate between '1995-01-01' and '1996-12-31'
% ) as shipping
% group by
% supp_nation,
% cust_nation,
% l_year
% order by
% supp_nation,
% cust_nation,
% l_year;
% Estimated 1 rows in query (I/O estimate 1010)
% PLAN> vt_1 (seq)
%
%
% 1 record(s) selected -- actual I/O 0
% select time including I/O 0.67000 seconds - current
time 16:40:43
'FRANCE                    ','GERMANY
',1995,54639732.7335999489
'FRANCE                    ','GERMANY
',1996,54633083.3075999737
'GERMANY                   ','FRANCE
',1995,52531746.6696999669
'GERMANY                   ','FRANCE
',1996,52520549.0223998487
% total of 4 rows written

=====================================================
```

qualification query 8

```
=====================================================

% select
% o_year,
% sum(case
% when nation = 'BRAZIL' then volume
% else 0
% end) / sum(volume) as mkt_share
% from
% (
% select
% datepart(year, o_orderdate) as o_year,
% l_extendedprice * (1 - l_discount) as volume,
% n2.n_name as nation
% from
% part,
% supplier,
% lineitem,
% orders,
% customer,
% nation n1,
% nation n2,
% region
% where
% p_partkey = l_partkey
% and s_suppkey = l_suppkey
% and l_orderkey = o_orderkey
% and o_custkey = c_custkey
% and c_nationkey = n1.n_nationkey
% and n1.n_regionkey = r_regionkey
% and r_name = 'AMERICA'
% and s_nationkey = n2.n_nationkey
% and o_orderdate between '1995-01-01' and
'1996-12-31'
% and p_type = 'ECONOMY ANODIZED STEEL'
% ) as all_nations
% group by
% o_year
% order by
% o_year;
% Estimated 1 rows in query (I/O estimate 1010)
% PLAN> vt_1 (seq)
%
%
% 1 record(s) selected -- actual I/O 0
% select time including I/O 0.86000 seconds - current
time 16:40:47
1995,.0344358904066548347
1996,.041485521293530345
% total of 2 rows written
=====================================================
```

qualification query 9

```
=====================================================

% select
% nation,
% o_year,
% sum(amount) as sum_profit
% from
% (
% select
% n_name as nation,
% datepart(year, o_orderdate) as o_year,
% l_extendedprice * (1 - l_discount) - ps_supplycost *
l_quantity as
%     amount
% from
% part,
% supplier,
% lineitem,
% partsupp,
% orders,
% nation
% where
% s_suppkey = l_suppkey
% and ps_suppkey = l_suppkey
% and ps_partkey = l_partkey
% and p_partkey = l_partkey
% and o_orderkey = l_orderkey
% and s_nationkey = n_nationkey
% and p_name like 'green'
% ) as profit
% group by
% nation,
% o_year
% order by
% nation,
% o_year desc;
% Estimated 1 rows in query (I/O estimate 1010)
% PLAN> vt_1 (seq)
%
%
% 1 record(s) selected -- actual I/O 0
```

```
% select time including I/O 0.69000 seconds - current
time 16:40:48
'ALGERIA                  ',1998,31342867.2345000029
'ALGERIA                  ',1997,57138193.0233001232
'ALGERIA                  ',1996,56140140.1330001235
'ALGERIA                  ',1995,53051469.6533999741
'ALGERIA                  ',1994,53867582.128600049
'ALGERIA                  ',1993,54942718.132400012
'ALGERIA                  ',1992,54628034.7126999021
'ARGENTINA                ',1998,30211185.708099997
'ARGENTINA                ',1997,50805741.75230003
'ARGENTINA                ',1996,51923746.5754999459
% total of 175 rows written
```

==========

qualification query 10

==========

```
% select top 20
% c_custkey,% c_name,
% sum(l_extendedprice * (1 - l_discount)) as revenue,
% c_acctbal,
% n_name,
% c_address,
% c_phone,
% c_comment
% from
% customer,
% orders,
% lineitem,
% nation
% where
% c_custkey = o_custkey
% and l_orderkey = o_orderkey
% and o_orderdate >= '1993-10-01'
% and o_orderdate < dateadd(month,3,'1993-10-01')
% and l_returnflag = 'R'
% and c_nationkey = n_nationkey
% group by
% c_custkey,
% c_name,
% c_acctbal,
% c_phone,
% n_name,
% c_address,
% c_comment
% order by
% revenue desc;
% Estimated 1 rows in query (I/O estimate 1010)
% PLAN> vt_1 (seq)
%
%
% 1 record(s) selected -- actual I/O 0
% select time including I/O 0.50000 seconds - current
time 16:40:55
57040,'Customer#000057040',734235.2455,632.87,'JAPAN
','Eioyzjf4pp','22-895-641-3466','requests sleep
blithely about the furiously i'
143347,'Customer#000143347',
721002.694799999952,2557.4700000000003,'EGYPT
','1aReFYv,Kw4','14-742-935-3718','fluffily bold
excuses haggle finally after the u'
60838,'Customer#000060838',
679127.307700000048,2454.77,'BRAZIL
','64EaJ5vMAHWJlBOxJklpNc2RJiWE','12-913-494-9813','fu
riously even pinto beans integrate under the ruthless
foxes; ironic, even dolphins across the slyl'
101998,'Customer#000101998',
637029.566699999809,3790.89,'UNITED KINGDOM
','01c9CILnNtfOQYmZj','33-593-865-6378','accounts doze
blithely! enticing, final deposits sleep blithely
special accounts. slyly express accounts pla'
125341,'Customer#000125341',
633508.086,4983.51000000000006,'GERMANY
','S29ODD6bceU8QSuuEJznkNaK','17-582-695-5962','quickl
y express requests wake quickly blithely'
25501,'Customer#000025501',
620269.784899999976,7725.04,'ETHIOPIA
','
W556MXuoiaYCCZamJI,Rn0B4ACUGdkQ8DZ','15-874-808-6793',
'quickly special requests sleep evenly among the
special deposits. special deposi'
115831,'Customer#000115831',
596423.867200000167,5098.1,'FRANCE
','rFeBbEEyk dl
ne7zV5fDrmiq1oK09wV7pxqCgIc','16-715-386-3788','carefu
lly bold excuses sleep alongside of the thinly idle'
84223,'Customer#000084223',
594998.023899999976,528.65,'UNITED KINGDOM
','nAVZCs6BaWap rrM27N
2qBnzc5WBauxbA','33-442-824-8191','pending, final
ideas haggle final requests. unusual, regular
asymptotes affix according to the even foxes.'
54289,'Customer#000054289',
585603.391799999952,5583.02,'IRAN
','vXCxoCsU0Bad5JQI ,oobkZ','20-834-292-4707','express
requests sublate blithely regular requests. regular,
even ideas solve.'
39922,'Customer#000039922',
584878.113399999976,7321.10999999999881,'GERMANY
','Zgy4s50l2GKN4pLDPBU8m342gIw6R','17-147-757-8036','e
ven pinto beans haggle. slyly bold accounts inte'
6226,'Customer#000006226',
576783.760599999905,2230.09,'UNITED KINGDOM
','8gPu8,NPGkfyQQ0hcIYUGPIBWc,ybP5g,','33-657-701-3391
','quickly final requests against the regular
instructions wake blithely final instructions. pa'
922,'Customer#000000922',
576767.533299999833,3869.25,'GERMANY
','Az9RFaut7NkPnc5zSD2PwHgVwr4jRzq','17-945-916-9648',
'boldly final requests cajole blith'
147946,'Customer#000147946',
576455.132,2030.1300000000003,'ALGERIA
','iANyZHjqhyy7Ajah0pTrYyhJ','10-886-956-3143','furiou
sly even accounts are blithely above the furiousl'
115640,'Customer#000115640',
569341.193299999952,6436.1,'ARGENTINA
','Vtgfia9qI 7EpHgecU1X','11-411-543-4901','final
instructions are slyly according to the'
73606,'Customer#000073606',
568656.857799999952,1785.67,'JAPAN
','xuR0Tro5yChDfOCrjkd2ol','22-437-653-6966','furiousl
y bold orbits about the furiously busy requests wake
across the furiously quiet theodolites. d'
110246,'Customer#000110246',
566842.981499999881,7763.35,'VIETNAM
','7KzflgX MDOq7sOkI','31-943-426-9837','dolphins
sleep blithely among the slyly final'
142549,'Customer#000142549',
563537.236799999952,5085.9899999999994,'INDONESIA
','ChqEoK43OysjdHbtKCp6dKqjNyvvi9','19-955-562-2398','
regular, unusual dependencies boost slyly; ironic
attainments nag fluffily into the unusual packages?'
146149,'Customer#000146149',
557254.9865,1791.55,'ROMANIA
','s87fvzFQpU','29-744-164-6487','silent, unusual
requests detect quickly slyly regul'
52528,'Customer#000052528',
556397.350899999976,551.79,'ARGENTINA
','NFztyTOR10UOJ','11-208-192-3205','unusual requests
detect. slyly dogged theodolites use slyly. deposit'
23431,'Customer#000023431',
554269.536000000119,3381.86,'ROMANIA
','HgiV0phqhaIa9aydNoIlb','29-915-458-2654','instructi
ons nag quickly. furiously bold accounts cajol'
% total of 20 rows written
```

==========

qualification query 11

==========

```
% select
% ps_partkey,
% sum(ps_supplycost * ps_availqty) as value
```

```
% from
% partsupp,
% supplier,
% nation
% where
% ps_suppkey = s_suppkey
% and s_nationkey = n_nationkey
% and n_name = 'GERMANY'
% group by
% ps_partkey having
% sum(ps_supplycost * ps_availqty) > (
% select
% sum(ps_supplycost * ps_availqty) * 0.0001000000
% from
% partsupp,
% supplier,
% nation
% where
% ps_suppkey = s_suppkey
% and s_nationkey = n_nationkey
% and n_name = 'GERMANY'
% )
% order by
% value desc;
% Estimated 1 rows in query (I/O estimate 1010)
% PLAN> vt_1 (seq)
%
%
% 1 record(s) selected -- actual I/O 0
% select time including I/O 0.49000 seconds - current
time 16:41:01
129760,17538456.8599999994
166726,16503353.9199999988
191287,16474801.9699999988
161758,16101755.5399999976
34452,15983844.7200000018
139035,15907078.3400000006
9403,15451755.6199999988
154358,15212937.8799999982
38823,15064802.8599999994
85606,15053957.150000003
% total of 1048 rows written
```

==========

qualification query 12

==========

```
% select
% l_shipmode,
% sum(case
% when o_orderpriority = '1-URGENT'
% or o_orderpriority = '2-HIGH'
% then 1
% else 0
% end) as high_line_count,
% sum(case
% when o_orderpriority <> '1-URGENT'
% and o_orderpriority <> '2-HIGH'
% then 1
% else 0
% end) as low_line_count
% from
% orders,
% lineitem
% where
% o_orderkey = l_orderkey
% and l_shipmode in ('MAIL', 'SHIP')
% and l_commitdate < l_receiptdate
% and l_shipdate < l_commitdate
% and l_receiptdate >= '1994-01-01'
% and l_receiptdate < dateadd(year,1,'1994-01-01')
% group by
% l_shipmode
% order by
% l_shipmode;
% Estimated 1 rows in query (I/O estimate 1010)
% PLAN> vt_1 (seq)
%
%
% 1 record(s) selected -- actual I/O 0
% select time including I/O 0.26000 seconds - current
time 16:41:03
'MAIL      ',6202,9324
'SHIP      ',6200,9262
% total of 2 rows written
```

==========

qualification query 13

==========

```
% select
% c_count,
% count(*) as custdist
% from
% (
% select
% c_custkey,
% count(o_orderkey)
% from
% customer left outer join orders on
% c_custkey = o_custkey
% and o_comment not like 'specialrequests'
% group by
% c_custkey
% ) as c_orders (c_custkey, c_count)
% group by
% c_count
% order by
% custdist desc,
% c_count desc;
% Estimated 1 rows in query (I/O estimate 1010)
% PLAN> vt_1 (seq)
%
%
% 1 record(s) selected -- actual I/O 0
% select time including I/O 0.17000 seconds - current
time 16:41:06
0,50004
9,6641
10,6566
11,6058
8,5949
12,5553
13,4989
19,4748
7,4707
18,4625
% total of 42 rows written
```

==========

qualification query 14

==========

```
% select
% 100.00 * sum(case
% when p_type like 'PROMO'
% then l_extendedprice * (1 - l_discount)
% else 0
% end) / sum(l_extendedprice * (1 - l_discount)) as
promo_revenue
% from
% lineitem,
% part
% where
% l_partkey = p_partkey
% and l_shipdate >= '1995-09-01'
% and l_shipdate < dateadd(month,1,'1995-09-01');
% Estimated 1 rows in query (I/O estimate 1010)
% PLAN> vt_1 (seq)
%
%
% 1 record(s) selected -- actual I/O 0
% select time including I/O 0.24000 seconds - current
time 16:41:19
```

```
16.3807786263955563
% total of 1 rows written

==================================================
```

qualification query 15

```
==================================================

 Executing command:
% create view revenue0 (supplier_no, total_revenue) as
% select
% l_suppkey,
% sum(l_extendedprice * (1 - l_discount))
% from
% lineitem
% where
% l_shipdate >= '1996-01-01'
% and l_shipdate < dateadd(month,3,'1996-01-01')
% group by
% l_suppkey;
% execution time 0.81000 seconds - current time
16:41:21

 Executing command:
%
% select
% s_suppkey,
% s_name,
% s_address,
% s_phone,
% total_revenue
% from
% supplier,
% revenue0
% where
% s_suppkey = supplier_no
% and total_revenue = (
% select
% max(total_revenue)
% from
% revenue0
% )
% order by
% s_suppkey;
% Estimated 1 rows in query (I/O estimate 1010)
% PLAN> vt_1 (seq)
%
%
% 1 record(s) selected -- actual I/O 0
% select time including I/O 0.27000 seconds - current
time 16:41:21
8449,'Supplier#000008449
','Wp34zim9qYFbVctdW','20-469-856-8873',
1772627.20870000005
% total of 1 rows written

==================================================
```

qualification query 16

```
==================================================

% select
% p_brand,
% p_type,
% p_size,
% count(distinct ps_suppkey) as supplier_cnt
% from
% partsupp,
% part
% where
% p_partkey = ps_partkey
% and p_brand <> 'Brand#45'
% and p_type not like 'MEDIUM POLISHED'
% and p_size in (49, 14, 23, 45, 19, 3, 36, 9)
% and ps_suppkey not in (
% select
% s_suppkey
% from
% supplier
% where
% s_comment like 'CustomerComplaints'
% )
% group by
% p_brand,
% p_type,
% p_size
% order by
% supplier_cnt desc,
% p_brand,
% p_type,
% p_size;
% Estimated 1 rows in query (I/O estimate 1010)
% PLAN> vt_1 (seq)
%
%
% 1 record(s) selected -- actual I/O 0
% select time including I/O 0.27000 seconds - current
time 16:41:22
'Brand#41  ','MEDIUM BRUSHED TIN',3,28
'Brand#54  ','STANDARD BRUSHED COPPER',14,27
'Brand#11  ','STANDARD BRUSHED TIN',23,24
'Brand#11  ','STANDARD BURNISHED BRASS',36,24
'Brand#15  ','MEDIUM ANODIZED NICKEL',3,24
'Brand#15  ','SMALL ANODIZED BRASS',45,24
'Brand#15  ','SMALL BURNISHED NICKEL',19,24
'Brand#21  ','MEDIUM ANODIZED COPPER',3,24
'Brand#22  ','SMALL BRUSHED NICKEL',3,24
'Brand#22  ','SMALL BURNISHED BRASS',19,24

% total of 18314 rows written

==================================================
```

qualification query 17

```
==================================================

% select
% sum(l_extendedprice) / 7.0 as avg_yearly
% from
% lineitem,
% part
% where
% p_partkey = l_partkey
% and p_brand = 'Brand#23'
% and p_container = 'MED BOX'
% and l_quantity < (
% select
% 0.2 * avg(l_quantity)
% from
% lineitem
% where
% l_partkey = p_partkey
% );
% Estimated 1 rows in query (I/O estimate 1010)
% PLAN> vt_1 (seq)
%
%
% 1 record(s) selected -- actual I/O 0
% select time including I/O 0.22000 seconds - current
time 16:41:28
348406.054285713732
% total of 1 rows written

==================================================
```

qualification query 18

```
==================================================

% select top 100
% c_name,
% c_custkey,
% o_orderkey,
% o_orderdate,
% o_totalprice,
% sum(l_quantity)
% from
% customer,
% orders,
```

```
% lineitem
% where
% o_orderkey in (
% select
% l_orderkey
% from
% lineitem
% group by
% l_orderkey having
% sum(l_quantity) > 300
% )
% and c_custkey = o_custkey
% and o_orderkey = l_orderkey
% group by
% c_name,
% c_custkey,
% o_orderkey,
% o_orderdate,
% o_totalprice
% order by
% o_totalprice desc,
% o_orderdate;
% Estimated 1 rows in query (I/O estimate 1010)
% PLAN> vt_1 (seq)
%
%
% 1 record(s) selected -- actual I/O 0
% select time including I/O 0.34000 seconds - current
time 16:41:29
'Customer#000128120',128120,4722021,'1994-04-07',
544089.089999999881,323
'Customer#000144617',144617,3043270,'1997-02-12',
530604.43999999994,317
'Customer#000013940',13940,2232932,'1997-04-13',
522720.61,304
'Customer#000066790',66790,2199712,'1996-09-30',
515531.82,327
'Customer#000046435',46435,4745607,'1997-07-03',
508047.99,309
'Customer#000015272',15272,3883783,'1993-07-28',
500241.33,302
'Customer#000146608',146608,3342468,'1994-06-12',
499794.58,303
'Customer#000096103',96103,5984582,'1992-03-16',
494398.78999999994,312
'Customer#000024341',24341,1474818,'1992-11-15',
491348.26,302
'Customer#000137446',137446,5489475,'1997-05-23',
487763.25,311
% total of 57 rows written
```

==========

qualification query 19

==========

```
% select
% sum(l_extendedprice* (1 - l_discount)) as revenue
% from
% lineitem,
% part
% where
% (
% p_partkey = l_partkey
% and p_brand = 'Brand#12'
% and p_container in ('SM CASE', 'SM BOX', 'SM PACK',
'SM PKG')
% and l_quantity >= 1 and l_quantity <= 1 + 10
% and p_size between 1 and 5
% and l_shipmode in ('AIR', 'AIR REG')
% and l_shipinstruct = 'DELIVER IN PERSON'
% )
% or
% (
% p_partkey = l_partkey
% and p_brand = 'Brand#23'
% and p_container in ('MED BAG', 'MED BOX', 'MED PKG',
'MED PACK')
% and l_quantity >= 10 and l_quantity <= 10 + 10
% and p_size between 1 and 10
% and l_shipmode in ('AIR', 'AIR REG')
% and l_shipinstruct = 'DELIVER IN PERSON'
% )
% or
% (
% p_partkey = l_partkey
% and p_brand = 'Brand#34'
% and p_container in ('LG CASE', 'LG BOX', 'LG PACK',
'LG PKG')
% and l_quantity >= 20 and l_quantity <= 20 + 10
% and p_size between 1 and 15
% and l_shipmode in ('AIR', 'AIR REG')
% and l_shipinstruct = 'DELIVER IN PERSON'
% );
% Estimated 1 rows in query (I/O estimate 1010)
% PLAN> vt_1 (seq)
%
%
% 1 record(s) selected -- actual I/O 0
% select time including I/O 0.35000 seconds - current
time 16:41:46
3083843.05780000031
% total of 1 rows written
```

==========

qualification query 20

==========

```
% select
% s_name,
% s_address
% from
% supplier,
% nation
% where
% s_suppkey in (
% select
% ps_suppkey
% from
% partsupp
% where
% ps_partkey in (
% select
% p_partkey
% from
% part
% where
% p_name like 'forest'
% )
% and ps_availqty > (
% select
% 0.5 * sum(l_quantity)
% from
% lineitem
% where
% l_partkey = ps_partkey
% and l_suppkey = ps_suppkey
% and l_shipdate >= '1994-01-01'
% and l_shipdate < dateadd(year,1,'1994-01-01')
% )
% )
% and s_nationkey = n_nationkey
% and n_name = 'CANADA'
% order by
% s_name;
% Estimated 1 rows in query (I/O estimate 1010)
% PLAN> vt_1 (seq)
%
%
% 1 record(s) selected -- actual I/O 0
% select time including I/O 0.37000 seconds - current
time 16:41:51
'Supplier#000000020
','iybAE,RmTymrZVYaFZva2SH,j'
'Supplier#000000091
```

```
','YV45D7TkfdQanOOZ7q9QxkyGUapU1oOWU6q3'
'Supplier#000000197
','YC2Acon6kjY3zj3Fbxs2k4Vdf7X0cd2F'
'Supplier#000000226       ','83qOdU2EYRdPQAQhEtn
GRZEd'
'Supplier#000000285
','Br7e1nnt1yxrw6ImgpJ7YdhFDjuBf'
'Supplier#000000378       ','FfbhyCxWvcPrO8ltp9'
'Supplier#000000402
','i9Sw4DoyMhzhKXCH9By,AYSgmD'
'Supplier#000000530       ','0qwCMwobKY
OcmLyfRXlagA8ukENJv,'
'Supplier#000000688       ','D
fw5ocppmZpYBBIPI718hCihLDZ5KhKX'
'Supplier#000000710       ','f19YPvOyb
QoYwjKC,oPycpGfieBAcwKJo'
% total of 204 rows written

====================================================
```

qualification query 21

```
====================================================

% select top 100
% s_name,
% count(*) as numwait
% from
% supplier,
% lineitem l1,
% orders,
% nation
% where
% s_suppkey = l1.l_suppkey
% and o_orderkey = l1.l_orderkey
% and o_orderstatus = 'F'
% and l1.l_receiptdate > l1.l_commitdate
% and exists (
% select
% *
% from
% lineitem l2
% where
% l2.l_orderkey = l1.l_orderkey
% and l2.l_suppkey <> l1.l_suppkey
% )
% and not exists (
% select
% *
% from
% lineitem l3
% where
% l3.l_orderkey = l1.l_orderkey
% and l3.l_suppkey <> l1.l_suppkey
% and l3.l_receiptdate > l3.l_commitdate
% )
% and s_nationkey = n_nationkey
% and n_name = 'SAUDI ARABIA'
% group by
% s_name
% order by
% numwait desc,
% s_name;
% Estimated 1 rows in query (I/O estimate 1010)
% PLAN> vt_1 (seq)
%
%
% 1 record(s) selected -- actual I/O 0
% select time including I/O 0.54000 seconds - current
time 16:41:53
'Supplier#000002829       ',20
'Supplier#000005808       ',18
'Supplier#000000262       ',17
'Supplier#000000496       ',17
'Supplier#000002160       ',17
'Supplier#000002301       ',17
'Supplier#000002540       ',17
'Supplier#000003063       ',17
'Supplier#000005178       ',17
'Supplier#000008331       ',17
% total of 100 rows written

====================================================
```

qualification query 22

```
====================================================

% select
% cntrycode,
% count(*) as numcust,
% sum(c_acctbal) as totacctbal
% from
% (
% select
% substring(c_phone,1,2) as cntrycode,
% c_acctbal
% from
% customer
% where
% substring(c_phone,1,2) in
% ('13', '31', '23', '29', '30', '18', '17')
% and c_acctbal > (
% select
% avg(c_acctbal)
% from
% customer
% where
% c_acctbal > 0.00
% and substring(c_phone,1,2) in
% ('13', '31', '23', '29', '30', '18', '17')
% )
% and not exists (
% select
% *
% from
% orders
% where
% o_custkey = c_custkey
% )
% ) as custsale
% group by
% cntrycode
% order by
% cntrycode;
% Estimated 1 rows in query (I/O estimate 1010)
% PLAN> vt_1 (seq)
%
%
% 1 record(s) selected -- actual I/O 0
% select time including I/O 0.18000 seconds - current
time 16:42:07
'13',888,6737713.98999999881
'17',861,6460573.72
'18',964,7236687.40000001431
'23',892,6701457.95000000954
'29',948,7158866.62999999642
'30',909,6808436.13000000119
'31',922,6806670.17999998569
% total of 7 rows written
Appendix D. Seed and Query Substitution Parameters
```

This Appendix contains Seed values and substitution parameters for each stream

Seed Values

```
stream0 207153854
stream1 207153855
stream2 207153856
stream3 207153857
stream4 207153858
stream5 207153859
stream6 207153860
```

Query Parameters

==========

stream0: 207153854

```
14      1996-01-01
2       30      COPPER  ASIA
9       pink
20      navajo  1993-01-01      JAPAN
6       1995-01-01      0.05    24
17      Brand#54        SM PACK
18      314
8       IRAQ    MIDDLE EAST     ECONOMY BURNISHED TIN
21      EGYPT
13      express accounts
3       FURNITURE       1995-03-16
22      17      13      10      30      34      28      12
16      Brand#35        ECONOMY PLATED  6       46      41
        50      38      4       14      24
4       1995-07-01
11      GERMANY         0.0000010000
15      1995-01-01
1       106
10      1993-10-01
19      Brand#13        Brand#13        Brand#43        1       16      22
5       AMERICA         1995-01-01
7       IRAQ    PERU
12      SHIP    FOB     1995-01-01
```

==========

stream1: 207153855

```
21      VIETNAM
3       MACHINERY       1995-03-02
18      312
5       ASIA    1996-01-01
11      SAUDI ARABIA    0.0000010000
7       CANADA  MOROCCO
6       1996-01-01      0.02    24
20      antique         1997-01-01      ARGENTINA
17      Brand#51        SM DRUM
12      FOB     SHIP    1996-01-01
16      Brand#15        STANDARD POLISHED       16
21      31      32      36      18      19      6
15      1993-01-01
13      express         deposits
10      1994-08-01
2       18      STEEL   AFRICA
8       CANADA  AMERICA         LARGE BRUSHED TIN
14      1997-01-01
19      Brand#11        Brand#51        Brand#42        6
        17      29
9       orange
22      10      27      18      25      19      32
21
1       114
4       1993-04-01
```

==========

stream2: 207153856

```
6       1996-01-01      0.08    25
17      Brand#53        LG BOX
14      1997-01-01
16      Brand#55        LARGE ANODIZED 35       15
49      27      6       3       39      25
19      Brand#23        Brand#34        Brand#41        2
        18      26
10      1993-05-01
9       mint
2       6       BRASS   ASIA
15      1995-01-01
8       SAUDI ARABIA    MIDDLE EAST     LARGE PLATED TIN
5       EUROPE  1996-01-01
22      15      10      13      17      28      18
31
12      MAIL    REG AIR         1997-01-01
7       SAUDI ARABIA    KENYA
13      special         deposits
18      314
1       61
4       1995-11-01
20      lace    1995-01-01      MOZAMBIQUE
3       BUILDING        1995-03-18
11      INDIA   0.0000010000
21      KENYA
```

==========

stream3: 207153857

```
8       JAPAN   ASIA    LARGE ANODIZED TIN
5       MIDDLE EAST     1996-01-01
4       1993-08-01
6       1996-01-01      0.05    25
17      Brand#55        LG PACK
7       JAPAN   VIETNAM
1       69
18      315
22      23      19      21      18      30      15
17
14      1997-01-01
9       linen
10      1994-02-01
15      1993-01-01
11      VIETNAM         0.0000010000
20      sky     1994-01-01      FRANCE
2       44      NICKEL  AFRICA
21      FRANCE
19      Brand#25        Brand#22        Brand#31        7
        19      22
13      special         deposits
16      Brand#35        PROMO BURNISHED         39
26      41      19      10      43      49      4
12      TRUCK   REG AIR         1997-01-01
3       MACHINERY       1995-03-04
```

==========

stream4: 207153858

```
5       AFRICA  1996-01-01
21      UNITED KINGDOM
14      1997-01-01
19      Brand#22        Brand#55        Brand#35        2       20      29
15      1996-01-01
17      Brand#52        LG DRUM
12      RAIL    REG AIR 1997-01-01
6       1996-01-01      0.03    24
4       1996-03-01
9       lace
8       EGYPT   MIDDLE EAST     MEDIUM POLISHED TIN
16      Brand#25        SMALL POLISHED  19      14      8       27
        7       41      38      3
11      INDONESIA       0.0000010000
2       31      TIN     EUROPE
10      1994-11-01
18      313
1       77
13      special deposits
7       CANADA          EGYPT
```

22 30 13 16 21 19 28 23
3 BUILDING 1995-03-21
20 dodger 1997-01-01 SAUDI ARABIA

==========

stream5: 207153859

21 morocco
15 1993-01-01
4 1993-12-01
6 1996-01-01 0.08 25
7 saudi arabia vietnam
16 brand#55 large brushed 17 35
32 22 4 6 33 3
19 brand#34 brand#43 brand#34 7
10 25
18 314
14 1993-01-01
22 14 10 16 15 11 22
19
11 russia 0.0000010000
13 special packages
3 household 1995-03-06
1 85
2 19 steel africa
5 asia 1996-01-01
8 vietnam asia medium burnished
nickel
20 peru 1996-01-01 iran
12 reg air air 1997-01-01
17 brand#54 med box
10 1993-08-01
9 grey

==========

stream6: 207153860

```
10      1994-06-01
3       BUILDING        1995-03-23
15      1996-01-01
13      special packages
6       1997-01-01      0.06    25
8       JORDAN  MIDDLE EAST
SMALL BRUSHED NICKEL
9       forest
7       JAPAN   JORDAN
4       1996-07-01
11      IRAN    0.0000010000
22      11      19      14      15
20      16      23
18      312
12      SHIP    AIR     1993-01-01
1       93
5       EUROPE  1997-01-01
16      Brand#35        STANDARD
BURNISHED       13      42      17
26      19      3       12      1
1
2       7       BRASS   EUROPE
14      1993-01-01
19      Brand#31        Brand#21
Brand#23        3       11      21
20      blush   1994-01-01
ALGERIA
17      Brand#51        MED PACK
21      GERMANY
```

Appendix E. Implementation-Specific Layer/Driver Code

```
================================================
```

```
================================================
```

do_test

```
dbisqlc -c "DSN=tpch" -q load_lineitem.sql >
load_lineitem.out &
loadlpid=$!
dbisqlc -c "DSN=tpch" -q load_region.sql
dbisqlc -c "DSN=tpch" -q load_nation.sql
dbisqlc -c "DSN=tpch" -q load_customer.sql
dbisqlc -c "DSN=tpch" -q load_part.sql
dbisqlc -c "DSN=tpch" -q load_supplier.sql
dbisqlc -c "DSN=tpch" -q load_partsupp.sql
dbisqlc -c "DSN=tpch" -q load_orders.sql
loadopid=$!
wait $loadopid
wait $loadlpid
end_load.out
echo " "
seed=`date '+%m%d%H%M%S'`;
echo $seed;
./gen_streams_new.ksh $seed 300
dbisqlc -c "DSN=tpch" -q dbtables-syb.sql >
rdbtablest.out
dbisqlc -c "DSN=tpch" -q dew_cat1.sql >
dew_cat1_start.out
dbisqlc -c "DSN=tpch" -q dew_cat2.sql >
dew_cat2_start.out
dbisqlc -c "DSN=tpch" -q dew_cat3.sql >
dew_cat3_start.out
dbisqlc -c "DSN=tpch" -q check_options.sql >
check_options_start.out
dbisqlc -c "DSN=tpch" -q rf1.sql > rf1.out
dbisqlc -c "DSN=tpch" -q stream0.sql > stream0.out
dbisqlc -c "DSN=tpch" -q rf2.sql > rf2.out
dbisqlc -c "DSN=tpch" -q stream1.sql > stream1.out &
dbisqlc -c "DSN=tpch" -q stream2.sql > stream2.out &
dbisqlc -c "DSN=tpch" -q stream3.sql > stream3.out &
dbisqlc -c "DSN=tpch" -q stream4.sql > stream4.out &
dbisqlc -c "DSN=tpch" -q stream5.sql > stream5.out &
dbisqlc -c "DSN=tpch" -q stream6.sql > stream6.out &
dbisqlc -c "DSN=tpch" -q update_throughput6.sql >
update_throughput.out &
wait

#move  *.out files to audit naming standard
in /sybase_stage/results"
((i=0))
while ((i<=nqs))  # move the streamX.out files to
audit naming standard
do
   mv stream${i}.out /sybase_stage/results/m1s0$
{i}q.out
   ((i=i+1))
done
mv update_power.out /sybase_stage/results/m1s00rf.out
mv
update_throughput.out /sybase_stage/results/m1s01rf.ou
t

dbisqlc -c "DSN=tpch" -q rf1.sql > rf1.out
dbisqlc -c "DSN=tpch" -q stream0.sql > stream0.out
dbisqlc -c "DSN=tpch" -q rf2.sql > rf2.out
dbisqlc -c "DSN=tpch" -q stream1.sql > stream1.out &
dbisqlc -c "DSN=tpch" -q stream2.sql > stream2.out &
dbisqlc -c "DSN=tpch" -q stream3.sql > stream3.out &
dbisqlc -c "DSN=tpch" -q stream4.sql > stream4.out &
dbisqlc -c "DSN=tpch" -q stream5.sql > stream5.out &
dbisqlc -c "DSN=tpch" -q stream6.sql > stream6.out &
dbisqlc -c "DSN=tpch" -q update_throughput6.sql >
update_throughput.out &
wait
dbisqlc -q -c "DSN=tpch" -q dbtables-syb.sql >
rdbtablest_end.out
dbisqlc -q -c "DSN=tpch" -q dew_cat1.sql >
dew_cat1_end.out
dbisqlc -q -c "DSN=tpch" -q dew_cat2.sql >
dew_cat2_end.out
dbisqlc -q -c "DSN=tpch" -q dew_cat3.sql >
dew_cat3_end.out
dbisqlc -q -c "DSN=tpch" check_options.sql >
check_options_end.out
```

Appendix F. Misc database scripts

The dbtables-syb.sql script was run to validate the correctness of the database after the database load. Three other scripts were used to extract basic information about tables and indexes from the database dew_cat1.sql, dew_cat2.sql, dew_cat3.sql.

Auditor Scripts

```
=====================================================
```

dbtables-syb.sql

```
=====================================================

-- =====================================================
--  FILENAME
--       DBTABLES.SQL
--  DESCRIPTION
--       CHECK ROW COUNT AND ROW STRUCTURE/CONTENT FOR
EACH TABLE
--       IN THE TPC-H DATABASE.
--
-- =====================================================
--
-- GET TIMESTAMP
SELECT 'START TIME', CONVERT(CHAR(30), GETDATE(),
120);
go
-- =====================================================
--           TABLE: LINEITEM
-- =====================================================
SELECT COUNT(*) FROM LINEITEM;
go
SELECT * FROM LINEITEM
WHERE L_ORDERKEY IN
      ( 4, 26598,  148577,  387431, 56704, 517442,
600000)
      AND L_LINENUMBER = 1
ORDER BY L_ORDERKEY;
go
-- =====================================================
--           TABLE: ORDERS
-- =====================================================
-- GET TIMESTAMP
SELECT 'TIME', CONVERT(CHAR(30), GETDATE(), 120);
go
SELECT COUNT(*) FROM ORDERS;
go
SELECT * FROM ORDERS
WHERE O_ORDERKEY IN ( 7, 44065, 287590, 411111,
483876, 599942 )
ORDER BY O_ORDERKEY;
go
-- =====================================================
--           TABLE: PART
-- =====================================================
-- GET TIMESTAMP
SELECT 'TIME', CONVERT(CHAR(30), GETDATE(), 120);
go
SELECT COUNT(*) FROM PART;
go
SELECT * FROM PART
WHERE P_PARTKEY IN (1,984,8743,9028,13876,17899,20000)
ORDER BY P_PARTKEY;
go
-- =====================================================
--           TABLE: PARTSUPP
-- =====================================================
-- GET TIMESTAMP
SELECT 'TIME', CONVERT(CHAR(30), GETDATE(), 120);
go
SELECT COUNT(*) FROM PARTSUPP;
go
SELECT* FROM PARTSUPP
   WHERE PS_PARTKEY = 3398
   AND PS_SUPPKEY = (SELECT MIN(PS_SUPPKEY)
      FROM PARTSUPP WHERE PS_PARTKEY = 3398);
go
SELECT* FROM PARTSUPP
   WHERE PS_PARTKEY =15873
   AND PS_SUPPKEY = (SELECT MIN(PS_SUPPKEY)
      FROM PARTSUPP WHERE PS_PARTKEY = 15873);
go
SELECT* FROM PARTSUPP
   WHERE PS_PARTKEY = 11394
   AND PS_SUPPKEY = (SELECT MIN(PS_SUPPKEY)
      FROM PARTSUPP WHERE PS_PARTKEY = 11394);
go
SELECT* FROM PARTSUPP
   WHERE PS_PARTKEY = 6743
   AND PS_SUPPKEY = (SELECT MIN(PS_SUPPKEY)
      FROM PARTSUPP WHERE PS_PARTKEY = 6743);
go
SELECT* FROM PARTSUPP
   WHERE PS_PARTKEY = 19763
   AND PS_SUPPKEY = (SELECT MIN(PS_SUPPKEY)      FROM
PARTSUPP WHERE PS_PARTKEY =19763);
go
-- =====================================================
--           TABLE: SUPPLIER
-- =====================================================
-- GET TIMESTAMP
SELECT 'TIME', CONVERT(CHAR(30), GETDATE(), 120);
go
SELECT COUNT(*) FROM SUPPLIER;
go
SELECT * FROM SUPPLIER
WHERE  S_SUPPKEY IN (83,265,492,784,901,1000)
ORDER BY S_SUPPKEY;
go
-- =====================================================
--           TABLE: CUSTOMER
-- =====================================================
-- GET TIMESTAMP
SELECT 'TIME', CONVERT(CHAR(30), GETDATE(), 120);
go
SELECT COUNT(*) FROM CUSTOMER;
go
SELECT * FROM CUSTOMER
WHERE  C_CUSTKEY IN (832,2653,4924,7845,92016,108070)
ORDER BY C_CUSTKEY;
go
-- =====================================================
--           TABLE: NATION & REGION
-- =====================================================
-- GET TIMESTAMP
SELECT 'TIME', CONVERT(CHAR(30), GETDATE(), 120);
go
SELECT * FROM REGION;
go
SELECT COUNT(*) FROM NATION;
go
SELECT * FROM NATION
WHERE N_NATIONKEY IN (3,10,14,20)
ORDER BY N_NATIONKEY;
go
-- =====================================================
--           CHECK KEY VALUES
-- =====================================================
-- GET TIMESTAMP
SELECT 'TIME', CONVERT(CHAR(30), GETDATE(), 120);
go
if exists (select name from sysobjects where
name='MINMAX')
  drop table MINMAX
go
CREATE TABLE MINMAX
(TNAME CHAR(15),
KEYMIN INTEGER,
KEYMAX INTEGER);
go
INSERT INTO MINMAX
```

```
SELECT 'LINEITEM_ORD',MIN(L_ORDERKEY),MAX(L_ORDERKEY)
FROM LINEITEM;
go
INSERT INTO MINMAX
SELECT
'LINEITEM_NBR',MIN(L_LINENUMBER),MAX(L_LINENUMBER)
FROM LINEITEM;
go
INSERT INTO MINMAX
SELECT 'ORDERS',MIN(O_ORDERKEY),MAX(O_ORDERKEY)
FROM ORDERS;
go
INSERT INTO MINMAX
SELECT 'CUSTOMER',MIN(C_CUSTKEY),MAX(C_CUSTKEY)
FROM CUSTOMER;
go
INSERT INTO MINMAX
SELECT 'PART',MIN(P_PARTKEY),MAX(P_PARTKEY)
FROM PART;
go
INSERT INTO MINMAX
SELECT 'SUPPLIER',MIN(S_SUPPKEY),MAX(S_SUPPKEY)
FROM SUPPLIER;
go
INSERT INTO MINMAX
SELECT 'PARTSUPP_PART',MIN(PS_PARTKEY),MAX(PS_PARTKEY)
FROM PARTSUPP;
go
INSERT INTO MINMAX
SELECT 'PARTSUPP_SUPP',MIN(PS_SUPPKEY),MAX(PS_SUPPKEY)
FROM PARTSUPP;
go
INSERT INTO MINMAX
SELECT 'NATION',MIN(N_NATIONKEY),MAX(N_NATIONKEY)
FROM NATION;
go
INSERT INTO MINMAX
SELECT 'REGION',MIN(R_REGIONKEY),MAX(R_REGIONKEY)
FROM REGION;
go
SELECT * FROM MINMAX;
go
if exists (select name from sysobjects where
name='MINMAX')
  drop table MINMAX
go
SELECT 'END TIME', CONVERT(CHAR(30), GETDATE(), 120);
go
```

==========

dew_cat1.sql

==========

```
SELECT  st.table_name,
                 st.table_type,
                 su.user_name,
                 st.server_type
          from SYS.SYSTABLE st, SYS.SYSUSERPERMS su
          where creator = user_id
order by 4,1,3;
```

==========

dew_cat2.sql

==========

```
 select T.table_name    ,
       T.table_type    ,
        C.column_name   ,
        C.column_id
 From   SYS.SYSTABLE T,
        SYS.SYSCOLUMN C,
        SYS.SYSDOMAIN D,
        SYS.SYSUSERPERMS SU
 where T.creator = SU.user_id
   and T.table_id = C.table_id
   and C.domain_id = D.domain_id
order by 1,2;
```

==========

dew_cat3.sql

==========

```
SELECT  index_name,T.table_name  ,
        column_name   ,
        index_type
 from   SYS.SYSTABLE T,
        SYS.SYSCOLUMN C,
        SYS.SYSINDEX I,
        SYS.SYSUSERPERMS UP,
        SYS.SYSFILE F,
        SYS.SYSIXCOL IC
 where T.table_id = C.table_id
   and C.table_id = I.table_id
   and T.file_id = F.file_id
   and I.table_id = IC.table_id
   AND I.index_id = IC.index_id
   AND IC.column_id = C.column_id
   and T.creator = UP.user_id;
```

Appendix G. Pricing information

Sybase pricing:

Company Sun Microsystems
Contact Richard Gostanian
Phone 781-442-3063
Fax
Address 1 Network Drive, Burlington MA 01803

Quotation for Software and Support

SYBASE Sales Rep: Hollie Nash
Phone: 972-687-6412
Fax: 972-687-6409

CBSS#

	Catalogue Number	Product Description	License Type	Machine	P/S	List Price Per Unit	Quantity	Discount	Extended Price	Extended Support Fees
										3 YEARS
1	11467	Sybase IQ Single App Svr, per cpu core	CP	Sun	P	2,595	4		10,380.00	
3	98477	3 yr support Single App Svr, per cpu core				1,557	4			6,228.00
4		Discount 5% (if total order > $25,000)						.00		
5										
6										
7										
8										
9										
10										
11										
12										

Quote Date: ***3/30/08***
Valid thru:

Total 16,608.00
Licence + 3 year support

Payment terms : Net 30 Days

5400 LBJ Freeway, Suite 1500, Dallas, TX 75240

Sales Quotation

Quote Number: T-US-1222068-A

Quote Date: 4/8/08

Customer : RICHARD GOSTANIAN
SUN MICROSYSTEMS INC
1 NETWORK DRIVE
BURLINGTON MA 01803
Tel / Fax : 7814423063 /

Sun : Holli Babb
Sun Microsystems, Inc.
1617 Southwood Drive
Nashua NH 03063
Tel / Fax : 603-589-0548/781-394-0478

We are pleased to quote as follows:

Validity Period	Credit Terms	Shipping Terms
60 Days	Net 30 Days	Origin

Item	Product Number	Description	Qty	Unit List Price	Disc	Unit Net Price	Extended Net Price
	Sun Proprietary & Confidential, Internal Use Only						
	SunFire X4140 Server						
1	Config ID 6230787	Configuration: B12-FQ1-DB-2G-JL8	1	$11,881.00	N/A	$10,895.90	$10,895.90
1.1	B12-FQ1-DB-2G-JL8	Sun Fire X4140 x64 Server: 1x AMD Opteron Model 2222 (3.0GHz/1MB) dual core processor, 2x 1GB DDR2-667 memory, No HDD, No DVD-RW, 2x PSU, Service processor, 4x 10/100/1000 Ethernet ports, 5x USB 2.0 ports, 1x 16-lane PCIe slot, 2x 8-lane PCIe slots, no	1	$3,245.00	10.00%	$2,920.50	$2,920.50
1.2	X311L	Localized Power Cord Kit North American/Asian This Product is Hazard Class Y, RoHS compliant.	2	N/C	N/A	N/C	N/C

YOU MUST READ THE FOLLOWING: THIS SUN QUOTATION AND ANY ORDER YOU SUBMIT FOR PRODUCTS OR SERVICES IS SUBJECT TO: (1) THE TERMS OF ANY EXISTING SALES AGREEMENT YOU HAVE WITH SUN GOVERNING THAT PRODUCT OR SERVICE, OR,IF NONE, BY SUN'S SALES TERMS FOUND AT http://www.sun.com/sales/salesterms, THE GENERAL TERMS OF WHICH ARE EITHER ATTACHED OR ON THE REVERSE SIDE HEREOF, AND (2) APPLICABLE SUN SERVICE LISTINGS AND STATEMENTS OF WORK FOUND AT http://www.sun.com/service/servicelist [(1) AND (2) COLLECTIVELY BEING CALLED "SUN SALES TERMS."]

ALL ORDERS MUST REFERENCE EITHER YOUR SALES AGREEMENT NUMBER OR THIS SALES QUOTATION AND BE IN CONFORMANCE WTIH SUN SALES TERMS. ORDERS ARE SUBJECT TO ACCEPTANCE BY SUN EITHER THROUGH ISSUANCE OF AN ORDER ACKNOWLEDGEMENT OR DELIVERY OF THE PRODUCTS OR SERVICES. THIS QUOTATION REMAINS FIRM FOR THE PERIOD LISTED ABOVE, EXCEPT THAT SUN MAY MODIFY THIS SALES QUOTATION IF THERE IS A TYPOGRAPHICAL ERROR OR THE AVAILABILITY OF PRODUCTS, SERVICES, OR CREDIT CHANGE. SUN EQUIPMENT, OR PARTS OR COMPONENTS OF SUN EQUPMENT, MAY BE NEW OR USED, REGARDLESS, SUN WARRANTY TERMS APPLY.

Sales Quotation

Quote Number: T-US-1222068-A

Quote Date: 4/8/08

Item	Product Number	Description	Qty	Unit List Price	Disc	Unit Net Price	Extended Net Price
1.3	IWU-B12-3G	This part number corresponds to the following 11i Service item: GOLD-SYS-SVC Sun Fire X4140. Warranty Upgrade to Gold Support for 3 Year.	1	$2,030.00	N/A	$2,030.00	$2,030.00
1.4	XRA-SS2CF-73G15K	73GB 15K RPM 2.5" SAS disk drive with bracket. RoHS-6. X-Option.	8	$469.00	10.00%	$422.10	$3,376.80
1.5	SG-XPCIE8SAS-I-Z	Sun StorageTek (TM) 8-Port internal SAS PCI-Express LSI 3081E Host Bus Adapter with RAID 0, 1, 1E, 10E support. RoHS-6. X-option.	1	$249.00	10.00%	$224.10	$224.10
1.6	X6320A	2 GB Memory kit DDR2-667 Registered ECC DIMMs (2x 1GB) for Sun Fire X4140/X4240/X4440 x64 servers. RoHS-5. X-Option.	7	$230.00	10.00%	$207.00	$1,449.00
1.7	X6301A	AMD Opteron Model 2222 (3.0GHz/1MB) dual core processor for Sun Fire X4140 and X4240 x64 servers. RoHS-5. X-Option.	1	$995.00	10.00%	$895.50	$895.50

List Price Total:	$11,881.00

Total:	$10,895.90