



**TPC Benchmark™ D  
Full Disclosure Report**

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Dell PowerEdge 6100  
Using  
Informix-OnLine XPS 8.20TC1  
and  
Microsoft Windows NT 4.0

First Edition  
Submitted for review  
18 August 1997

First Edition -- 26 August 1997

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Benchmark results are highly dependent on workload, specific application requirements, and system design and implementation. Relative system performance will vary as a result of these and other factors. Therefore, TPC Benchmark™ D should not be used as a substitute for a specific customer application benchmark when critical capacity planning and/or product evaluation decisions are contemplated.

All performance data contained in this report was obtained in a rigorously controlled environment. Results obtained in other operating environments may vary significantly. No warranty of system performance or price/performance is expressed or implied in this report.

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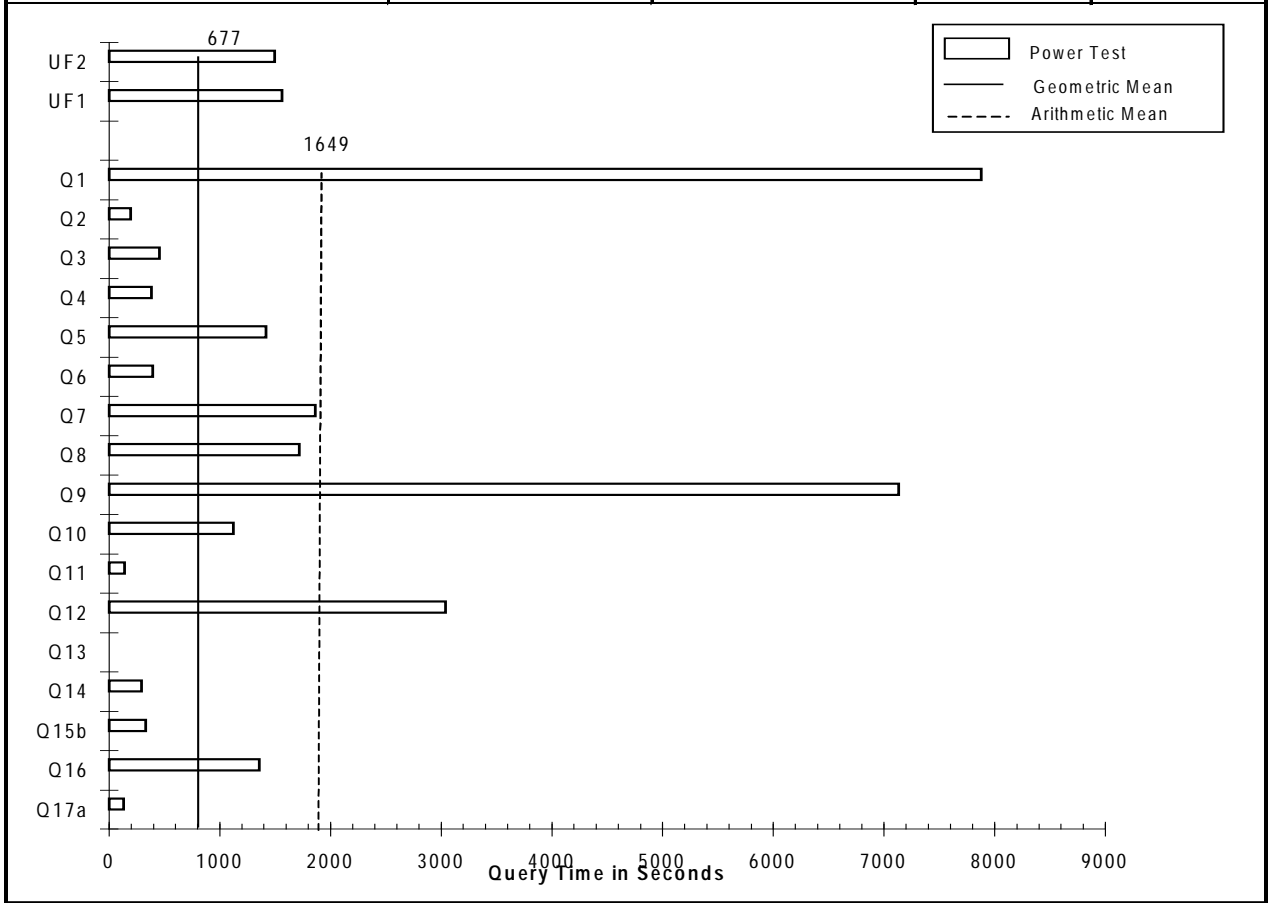
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	<b>Dell PowerEdge 6100</b> Using <b>Informix Online XPS v. 8.20TC1</b>		TPC-D Rev: 1.2.3 Report Date: 18-Aug-97	
	Total System Cost <b>\$362,096</b>	TPC-D Power <b>531.5</b> QppD@100GB	TPC-D Throughput <b>195.3</b> QthD@100GB	Price/Performance <b>\$1,124</b> QphD@100GB
Database Size <b>100GB</b>	Database Manager <b>Informix Online XPS v. 8.20TC1</b>	Operating System <b>Microsoft Windows NT 4.0</b>	Other Software <b>None</b>	Availability Date <b>22-Jan-98</b>



Database Load Time = 18:52:46 | Total Data Storage / Database Size 5.20 | RAID: Y

**System Configuration**  
 4 200MHz Pentium Pro Processors w/ 1 MB cache  
 2GB Main Memory  
 60 9GB Disk Drives  
 1 4GB Disk Drive

INFORMIX <sup>®</sup>		<b>Dell PowerEdge 6100</b>				TPC-D Rev: 1.2.3	
DELL <sup>®</sup>		<b>Using</b>				Report Date:	
		<b>Informix Online XPS v. 8.20TC1</b>				18-Aug-97	
Description	Part Number	Source	Unit Price	Qty	Extended Price	5 Yr. Maint. Cost	
<b>Server Hardware</b>							
Dell PowerEdge 6100	220-0376	Dell	9,096	1	9,096	3,083	
Card	311-0346	Dell	859	1	859	-	
Pentium Pro/200 w/ 1M L2	311-0345	Dell	3,269	3	9,807	-	
4 GB DIMM Board w/ 2GB	311-0257	Dell	25,499	1	25,499	-	
PERC Raid Controllers	340-6104	Dell	1,299	4	5,196	-	
32MB Parity Cache for PERC	311-1409	Dell	199	4	796	-	
IntelPro 100 Network Interface Card	430-0008	Dell	99	1	99	-	
Readyware fee for NIC	365-1234	Dell	15	1	15	-	
4/8 GB DAT Drive	340-1300	Dell	749	1	749	-	
Ultrascan 800 HS Monitor	320-5401	Dell	374	1	374	-	
APC 2200 VA	23389-45	(1) Dell	1,019	3	3,057	-	
<b>Subtotal</b>					<b>55,547</b>	<b>3,083</b>	
<b>Server Software</b>							
NT 4.0 Serverw/10 CAL		Microsoft	799	1	799	4,045	
INFORMIX XPS 8.20TC1(40 users)		Informix	3,000	40	120,000	133,600	
		Informix Discount	29%		(34,800)	(38,744)	
<b>Subtotal</b>					<b>85,999</b>	<b>98,901</b>	
<b>Storage</b>							
PowerEdge Scalable Disk System	220-9031	Dell	1,449	7	10,143	16,681	
9GB Pluggable UW SCSI-3 Disk Drive	340-5889 (2)	Dell	1,499	60	89,940	-	
4GB Pluggable UW SCSI-3 Disk Drive	340-7676 (2)	Dell	899	1	899	-	
SCSI Cable	310-0052	Dell	129	7	903	-	
<b>Subtotal</b>					<b>101,885</b>	<b>16,681</b>	
<b>Total</b>					<b>243,431</b>	<b>118,665</b>	
(1) 10% or minimum 2 spares are added in place of onsite service. (products have 5 year return-to-vendor warantee)		5 Year Cost of Ownership			\$ 362,096		
		QphD@100GB			322		
(2) Maintenance included in PowerEdge Scalable Disk System maintenance price		\$/QphD@100GB			\$ 1,124		
<b>Audited By: Francois Raab, Information Paradigm</b>							
Prices used in TPC benchmarks reflect the actual prices a customer would pay for a one-time purchase of the stated components. Individually negotiated discounts are not permitted. Special prices based on assumptions about past or future purchases are not permitted. All discounts reflect standard pricing policies for the listed components. For complete details, see the pricing sections of the TPC benchmark specifications. If you find that the stated prices are not available according to these terms, please inform the TPC at <a href="mailto:pricing@tpc.org">pricing@tpc.org</a> .							



**Dell PowerEdge 6100**  
**Using**  
**Informix Online XPS v. 8.20TC1**

TPC-D Rev: 1.2.3

Report Date:  
 18-Aug-97

Measurement Results

Scale Factor	=	100
Total Data Storage / Database Size	=	5.20
Database Load Time	=	18:52:46
Query Streams for Throughput Test	=	0
TPC-D Power Metric(QppD@100GB)	=	531.5
TPC-D Throughput Metric(QthD@100GB)	=	195.3
Composite QphD@100GB	=	322.2
Total System Price Over 5 Years	=	362,096
TPC-D Price/Performance Metric	=	\$ 1,124

Measurement Intervals

Measurement Interval in Throughput Test (Ts)	=	31334
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Duration of stream execution

Stream ID	Seed	Start-Date	Start-Time	End-Date	End-Time	Total Time
Stream00	69599	08/11/97	21:32:59	08/12/97	6:15:13	8:42:14
Updates	UF1	08/11/97	21:32:59	08/11/97	21:58:10	0:25:11
	UF2	08/12/97	5:45:20	08/12/97	6:15:13	0:29:53

TPC-D Timing Intervals (in seconds):

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
7953.7	193.6	452.5	388.3	1399.6	391.0	1863.1	1713.4	7260.8	1125.7
Q11	Q12	Q13	Q14	Q15b	Q16	Q17a	UF1	UF2	
144.1	3028.0	4.2	291.5	316.8	1372.0	131.5	1511.5	1793.4	



Information Paradigm

TPC TRANSACTION PROCESSING PERFORMANCE COUNCIL

Certified Auditor

Test Sponsors: John M. Stephens, Jr. Manager, Performance Engineering Informix Software, Inc. 4100 Bohannon Drive Menlo Park, CA 94025 Jack Steeg Director, Alliance Marketing Dell Computer Corporation 2214 West Braker Lane Austin, TX 78758

August 18, 1997

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

Platform: Dell PowerEdge 6100
DataBase Manager: INFORMIX-OnLine XPS Version 8.20TCI
Operating System: Microsoft Windows NT 4.0

The results were:

Table with 5 columns: CPU's Speed, Memory, Disks, QppD@100, QthD@100. Row 1: Dell PowerEdge 6100. Row 2: 4 Pentium Pro (200 MHz), 2 GB, 58 x 9 GB / 2 x 4 GB, 531.5, 195.3

In my opinion, these performance results were produced in compliance with the TPC requirements for the benchmark. The following verification items were given special attention:

- The TIME table was not used
The input variables were generated by QGEN
The database was populated using DBGEN
The database was maintained by the "Reset" method
The throughput metric was computed using the results from the power test
The ratio between the longest and the shortest query was such that one query timing was adjusted
A compliant implementation specific layer was used
The query text was produced using compliant variants and minor modifications

- The database records were defined with the proper layout and size
- The database was properly scaled to 100GB and populated accordingly
- The database load time was correctly measured and reported
- The ACID Properties were verified and met
- The reported execution times were correctly measured and reported
- Measurement repeatability was verified
- At least 8 hours 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,

A handwritten signature in black ink, appearing to read "François Raab", with a long horizontal flourish extending to the right.

François Raab  
President

Dell PowerEdge 6100 (4-CPU)

### Document Structure

The TPC Benchmark™ D Standard Specification requires test sponsors to publish, submit to the TPC, and make available to the public, a full disclosure report for any result considered to be compliant with the specification. The required contents for the full disclosure report are specified in Clause 8.

This report is submitted to satisfy the specification's requirement for full disclosure. It documents the compliance of the benchmark implementation and execution reported for the Dell PowerEdge 6100 using INFORMIX-OnLine XPS version 8.20TC1.

In the specification, the main headings in Clause 8 are keyed to the other clauses. The headings in this report use the same sequence, so that they correspond to the titles or subjects referred to in Clause 8.

Each section in this report begins with the text of the corresponding item from Clause 8 of the specification, printed using italic type. The following plain text explains how this benchmark complies with that specific portion of the specification. In sections where Clause 8 requires extensive listings the appropriate appendix in this report is referenced.

### TPC Benchmark™ D Overview

The TPC Benchmark™ D (TPC-D) is a decision support benchmark. It is a suite of business oriented queries and concurrent updates. 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. The 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-D evaluates the performance of various decision support systems by the execution of sets of queries against a standard database under controlled conditions. The TPC-D queries:

- Give answers to real-world business questions;
- 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 components 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.

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## 1.1 Benchmark Sponsor

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

Informix Software, Inc. and Dell Computer Corporation are the sponsors of this TPC-D benchmark.

## 1.2 Parameter Settings

*Settings must be provided for all customer-tunable parameters and options which 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*

*This requirement can be satisfied by providing a full list of all parameters and options.*

Appendix Appendix : , “

DBMS and System Parameters”, contains the XPS and Microsoft Windows NT 4.0 parameters used in this benchmark.

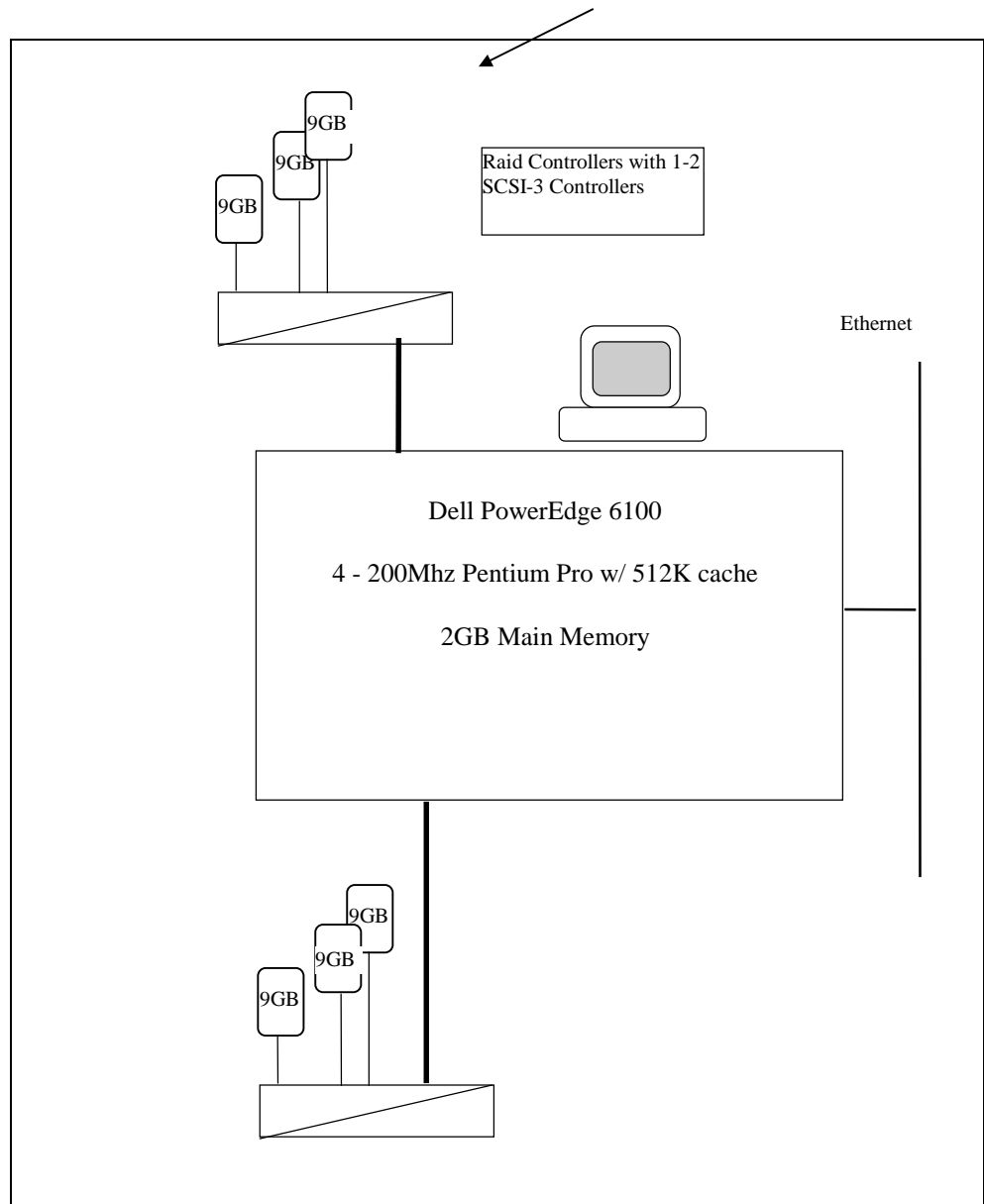
## 1.3 Configuration Diagrams

*Provide diagrams of both the measured and priced configurations, accompanied by a description of the differences. This includes, but is not limited to:*

- *Number and type of processors;*
- *Size of allocated memory, and any specific mapping/partitioning of memory unique to the test;*
- *Number of type of disk unites (and controllers, if applicable);*
- *Number of channels or bus connections to disk units, including their protocol type;*

- *Number of LAN (e.g., Ethernet) connections, including routers, workstations, terminals, etc., that were physically used in the test or are incorporated into the pricing structure;*
- *Type and run-time execution location of software components (e.g., DBMS, query processing tools/languages, middle-ware components, software drivers, etc.)*

The priced and tested configurations were identical, consisting of a single Dell Computer Corporation Dell PowerEdge 6100, configured with 4 Pentium-Pro processors running at 200Mhz and including 512KB cache. The system contained 2GB of main memory, 4 RAID modules, managing 7 SCSI controllers, 60 9GB disk drives and a single 4GB disk drive. All 60 9GB disks were mirrored at the OS level to assure data integrity.



## 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 Appendix B: , “Database Creation Statements”, contains the programs and scripts that create and analyze the tables and indexes for the qualification and test databases used in this benchmark.

### 2.2 Physical Organization

*The physical organization of tables and indexes, 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 in this benchmark. No changes were made to the column ordering presented in Clause 1.4 of the specification. Further details can be found in Appendix Appendix B: , “Database Creation Statements”.

### 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 used for all tables and indexes except nation and region. Further details can be found in Appendix Appendix B: , “Database Creation Statements”.

### 2.4 Replication

*While there are some restrictions placed upon the physical replication of objects in the test and qualification database (see Clause 1.5.6), any such replication must be disclosed.*

No replication was used in this benchmark.

## 3 Clause 2 Queries and Update Functions

---

### 3.1 Query Language

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

INFORMIX-SQL was used to implement the queries and update functions used in this benchmark.

### 3.2 Random Number Generation

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

This benchmark used version 1.2.0 of DBGEN and QGEN without modification for random number generation.

### 3.3 Substitution Parameter Generation

*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.*

This benchmark used version 1.2.0 of QGEN. The only modification was to modify the text used to control the number of rows returned to conform to Informix's 'SELECT FIRST <n>' syntax. The change required in tpcd.h is summarized below.

```
OLD: #define SET_ROWCOUNT "{return %d rows}\n"
```

```
NEW: #define SET_ROWCOUNT "FIRST %d"
```

### 3.4 Query Text and Output Data used for Query Validation

*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 query modifications have been applied to any functional query definition or approved variant in order to obtain executable query text, these modifications must be disclosed and justified. The justification for a particular minor query modification can be applied collectively to all queries for which it has been used.)*

Appendix Appendix C: , "Query Validation EQT and Output", contains the executable query text used during query validation and the resulting output. The following minor query modifications were used to obtain the executable query text that was used for query validation and the performance runs:

- In Q2, Q3 and Q10 the Informix "SELECT FIRST <N>" was used to limit the size of the answer set as allowed by Clause 2.1.2.7.

- All date expressions were rewritten using equivalent INFORMIX syntax as allowed by Clause 2.2.3.3c.
- In Q7, Q8, Q9 and Q13, the nested table expression included in the functional query definition solely for the purpose of grouping on an expression have been removed, table names promoted from the nested table expression to the from clause, and the GROUP BY and ORDER BY clauses modified to use an ordinal in place of the nested table expression referenced in the functional query definitions. This is allowed by Clause 2.2.3.3d.
- In Q8, ROUND(..., 2) has been added to the outermost select to control intermediate arithmetic precision as allowed by 2.2.3.3f.
- In Q15b and Q17a, the space allocation directive “in <dbslice>” has been added to the table creation syntax provided in the approved query variant as allowed by 2.2.3.3j.

### 3.5 Substitution Parameters and QGEN Seeds

*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 Appendix D: , “Substitution Parameters and Seeds”, includes the QGEN seed value and resulting substitution parameters used in the performance tests.

### 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 update functions were run at isolation level 2 (as defined in Clause 3.4), what Informix refers to as Repeatable Read.

### 3.7 Source Code of Update Functions

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

Appendix Appendix E: , “Implementation Specific Layer and Drivers”, contains the full source code for the update functions and their associated reset routines.

### 3.8 Database Maintenance Option

*The details of the database maintenance option selected (i.e., reset or evolve) must be disclosed (including the source code of any non-commercial program used).*

This benchmark used the reset option. Source code for the associated scripts can be found in Appendix Appendix E: , “Implementation Specific Layer and Drivers”.

## 4 Clause 3 Database System Properties

---

### 4.1 ACID Properties

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

Complete source code for the ACID test is included in Appendix Appendix F: , “ACID Test Source Code”.

### 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 ORDER, LINEITEM, and HISTORY tables.*

1. The total price from the ORDER 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 ORDER 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 ORDER, LINEITEM and HISTORY tables.*

1. The total price from the ORDER 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 COMMIT was replaced with a ROLLBACK.
4. The total price from the ORDER 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 the ORDER 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 ORDER and LINEITEM tables.*

1. The consistency of the ORDER and LINEITEM tables was verified based on a sample of O\_ORDERKEY's.
2. 100 ACID Transactions were submitted from each of 2 execution streams.
3. The consistency of the ORDER and LINEITEM tables was re-verified.

## 4.4 Isolation

*Operation of concurrent transactions must yield results which are indistinguishable from the result which would have been 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 with 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. The ACID Query did not see the uncommitted changes made by the ACID Transaction.
3. The ACID Transaction resumed executed a COMMIT.
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 resumed executed a ROLLBACK WORK.
4. The ACID Query completed. It returned the data as seen prior to the start of the ACID Transaction.

#### 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, DELTA1. 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, DELTA2.
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, DELTA1. 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, DELTA2.
3. T2 waited.
4. T1 was allowed to COMMIT 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 ACID Transaction, T2, was started and, using randomly selected values of PS\_PARTKEY and PS\_SUPPKEY, selected all rows in the PARTSUPP table for which match the selected values of PS\_PARTKEY and PS\_SUPPKEY.
3. T2 completed.
4. T1 was allowed to COMMIT.
5. It was verified that appropriate rows in the ORDER, 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 of the tables of the database does not indefinitely delay update transactions affecting those tables from making progress.*

1. A database session, S1, began an execution of Q1 against the qualification database using a randomly selected DELTA.
2. While S1 was executing, a second database session, S2, began an ACID Transaction, T1, using randomly selected values for O\_KEY, L\_KEY and DELTA.
3. Immediately following its first execution for Q1, S1 began another execution of Q1 using a different, randomly selected DELTA.
4. T1 waited for the first execution of Q1 by S1 to complete, and then completed its ACID Transaction. It was verified that the appropriate rows in the ORDER, LINEITEM and HISTORY tables had been changed.
5. The second execution of Q1 by S1 waited for T1 to complete and then it proceeded to completion.

### 4.5 Durability

*The tested system must guarantee durability: the ability to preserve the effects of committed transactions and ensure database consistency after recovery from any one of the failures listed in Clause 3.5.2.*

#### 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-D database tables or recovery log files.*

The disks containing the TPC-D tables and log files were mirrored. During the durability test the disk containing one side of a data file mirror was removed from its cabinet. The test continued uninterrupted, using the remaining half of the mirror.

#### 4.5.2 System Crash and Memory Failure

*Guarantee the database and committed updates are preserved across an instantaneous interruption (system crash/system hang) in process which requires the system to reboot to recover... Guarantee the database and committed updates are preserved across failure of all or part of memory (loss of contents).*

The system crash and memory failure test were combined. Power to the server was turned off 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 and the update counts matched.

## 5 Clause 4 Scaling and Database Population

### 5.1 Table Cardinalities

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

Table	Rows
Order	#####
Lineitem	#####
Customer	15,000,000
Part	20,000,000
Supplier	1,000,000
Partsupp	80,000,000
Nation	25
Region	5

Figure 1: Table Cardinalities

### 5.2 Distribution of Tables and Logs Across Media

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

This benchmark used NT filesystems to hold all database files and logs, as well as all DBMS and OS executables. The allocation of disk to the various tasks is detailed in the table below.

Drive	DISK		Use
	Count	Size	
C	0.5	4GB	NT System
E	0.5	4GB	Informix Tools
F	2	9GB	1/14th of
G -T	4	9GB	Data/Index/Temp
W	2	9GB	Log, Logical Log

Figure 2: Disk Usage Summary

### 5.3 Database Partition/Replication Mapping

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

The database used in this benchmark employed no replication. For a detailed disclosure of the creation and use of database partitions, refer to Appendix Appendix B: , “Database Creation Statements”.

#### **5.4 RAID Usage**

*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 (i.e., mirroring) was used for all database tables, logs and indexes, including the root dbspace.

#### **5.5 Modifications to DBGEN**

*Any modification 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 1.2.0) was used without modification.

#### **5.6 Database Contents Validation**

*The contents of the first ten rows of each table in the test database must be disclosed.*

Appendix Appendix G: , “Database Contents” contains the first 10 rows of each table in the test database.

#### **5.7 Database Load Time**

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

The database load time was 18:52:46.

#### **5.8 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 database size as defined in Clause 4.1.3.*

The data storage ratio reported in the Executive Summary in the Preface to this report was based on the following information:

Disk Type	# of Disks	Disk Capacity	Disk Space
9 GB	60	8.6 GB	516 GB
4 GB	1	3.8 GB	3.8 GB
Total:			519.8 GB
SF:			100 GB
<b>Data Storage Ratio</b>			<b>5.20</b>

**Figure 3: Data Storage Ratio Details**

## 5.9 Database Load Description

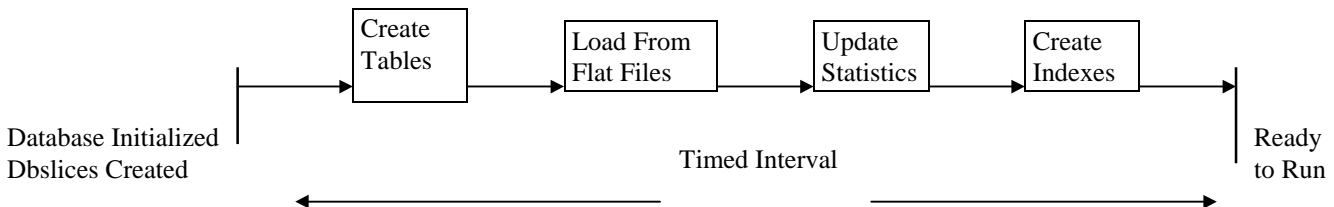
*The details of the database load mechanism must be described and illustrated with a block diagram.*

The database was loaded using XPS/Pload, which used flat files generated by DBGEN as input. The same mechanism was used to load both the qualification database and the test database. The number of flat files used to load each table within each data set is detailed below, along with a depiction of the complete load process. All scripts and command files used during the load are contained in Appendix Appendix B: , “Database Creation Statements”.

Table	Database	
	Qualification	Test
Order	1	80
Lineitem	1	80
Customer	1	80
Part	1	80
Supplier	1	80
Partsupp	1	80
Nation	1	1
Region	1	1

**Figure 4: Flat File Usage Summary**

**Figure 5: Load Test Process Summary**



## 6 Clause 5 Performance Metrics and Execution Rules

### 6.1 Power Test Overview

*The details of the steps followed in the power test (i.e., system boot, database restart, etc.) must be disclosed.*

The following procedure was used to implement the power test:

1. Database Restart
2. UF1 Update Function Executed
3. Query Stream 00 Executed
4. UF2 Update Function Executed

### 6.2 Power Test Timing Intervals

*The timing intervals for each query of the measured set and for both update functions must be reported for the power test.*

The timing intervals for the reported power test were:

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
7953.7	193.6	452.5	388.3	1399.6	391.0	1863.1	1713.4	7260.8	1125.7

Q11	Q12	Q13	Q14	Q15b	Q16	Q17a	UF1	UF2
144.1	3028.0	4.2	291.5	316.8	1372.0	131.5	1511.5	1793.4

**Figure 6: Power Test Timing Intervals**

### 6.3 Throughput Test Configuration

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

The throughput test was not executed during this benchmark. The timing intervals from the power test were used to calculate the throughput metric as allowed by Clause 5.3.1.4.

### 6.4 Query Stream Timings

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

The start and end time for each query stream are contained in the Numerical Quantities Summary of the Executive Summary in the preface of this report.

## 6.5 Elapsed Time of the Measurement Interval

*The total elapsed time of the measurement interval must be disclosed.*

The total elapsed time of the measurement interval is contained in the Numerical Quantities Summary of the Executive Summary in the preface of this report.

## 6.6 Timing Intervals for the Throughput Test

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

Since this benchmark did not execute the throughput test, the timing intervals for the power test were used to calculate the throughput metric. The timing intervals for each query and update function in the power test are contained in the Numerical Quantities Summary of the Executive Summary in the preface of this report.

## 6.7 Performance Metrics

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

The performance metrics, the price performance metric and all the underlying data on which they are based are contained in the Numerical Quantities Summary of the Executive Summary in the preface of this report.

## 6.8 Metric Reproducibility

*A description of the method used to determine the reproducibility of the measurements must be reported. This must include the performance metrics (QppD, QthD and QphD) from the reproducibility runs.*

Performance results from consecutive runs of the performance test revealed the following variability in the performance metrics:

	Run1	Run2	Run3	Reported
QppD @ 100 GB	535.8	531.5	0.0	531.5
QthD @ 100 GB	198.0	195.3	0.0	195.3
QphD @ 100 GB	325.7	322.2	0.0	322.2
\$/QphD @ 100 GB				\$1,124
Variation	1.09%			

**Figure 7: Metric Variability**

## 7 Clause 6: SUT and Driver Implementation

---

### 7.1 Driver Overview

*A detailed textual description of how the driver performs its functions, how its various components interact and any product functionality or environmental setting on which it relies must be disclosed.*

The driver configuration used for this implementation of TPC-D™ is quite simple. A central script (“driver”) relies on QGEN to translate query templates into Executable Query Text(EQT). These are submitted to the DBMS through Informix’s standard interactive query tool, DBACCESS. The update functions (and their associated reset scripts) use standard Informix SQL to load from the flat files generated by DBGEN. The rows are either loaded directly into the base tables(for UF1 and uf2\_reset) or are loaded into a temporary table which is then used to direct the deletion of rows from the base tables (for UF2 and uf1\_reset).

The complete source code for the driver script and all related non-commercial tools is provided in Appendix Appendix E: , “Implementation Specific Layer and Drivers”.

### 7.2 Implementation Specific Layer Overview

*If an implementation specific layer is used, then a detailed textual description of how the driver performs its functions, how its various components interact and any product functionality or environmental setting on which it relies must be disclosed.*

Since standard Informix tools provide all the functionality needed to execute the benchmark, no implementation specific layer was required.

### 7.3 Profile-directed Optimization

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

No profile-directed optimization was used in this benchmark.

### 8.1 Pricing Summary

*A detail list of hardware and software used in the priced system must be reported.*

Please refer to the Pricing Spreadsheet found in the executive summary at the beginning of this report.

### 8.2 Total System Cost

*The total 5-year price of the entire configuration must be reported, including hardware, software and maintenance charges.*

Please refer to the Pricing Spreadsheet found in the executive summary at the beginning of this report.

### 8.3 System Availability

*The committed delivery date for general availability (availability date) of products used in the priced calculations must be reported.*

Please refer to the executive summary at the beginning of this report.

**9.1 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.*

The attestation letter for this benchmark is included at the beginning of this report.

## Appendix A: DBMS and System Parameters

### A-1: DBMS Parameters

Note: The following is a complete listing of the ONCONFIG used on the SUT. Since all but a few settings are system dependent, and therefore differ from the defaults, highlighting of changes has been omitted for easier reading.

```

*****
*****
#
#           INFORMIX SOFTWARE, INC.
#
# Title:   onconfig.std-> xps (04.01.96, gws).
# Description: INFORMIX-OnLine Configuration
Parameters
#
*****
*****

# Root Dbspace Configuration

ROOTOFFSET  0          # Offset of root dbspace into
device (Kbytes)
ROOTSIZE    2048000    # Size of root
dbspace (Kbytes)

# Disk Mirroring Configuration Parameters

MIRROR      0          # Mirroring flag (Yes = 1, No = 0)
MIRRORPATH  # Path for device containing
mirrored root
MIRROROFFSET 0          # Offset into mirrored device
(Kbytes)

# Physical Log Configuration

PHYSFILE    1600000    # Physical log file size
(Kbytes)
PHYSYSLICE  rootdbs

# Logical Log Configuration

LOGFILES    5          # Number of logical log files
LOGSIZE     20000     # Logical log size (Kbytes)

# Diagnostics

MSGPATH    \\INFORM4\e$\informix\online.log
CONSOLE    \\INFORM4\e$\informix\console.log
ALARMPROGRAM # Alarm
program path

# System Archive Tape Device

TAPEDEV     nul        # Tape device path
TAPEBLK     16         # Tape block size (Kbytes)
TAPESIZE    10240      # Maximum amount of data to
put on tape (Kbytes)

```

```

# Log Archive Tape Device

LTAPEDEV     nul        # Log tape device path
LTAPEBLK     16         # Log tape block size (Kbytes)
LTAPESIZE    10240      # Max amount of data to put
on log tape (Kbytes)

# Optical

STAGEBLOB           # INFORMIX-
OnLine/Optical staging area

# System Configuration

SERVERNUM      10        # Unique id corresponding to
a OnLine instance
DBSERVERNAME   ol_inform4 # Name of default
database server
DBSERVERALIASES # List of alternate
dbservernames
NETTYPE        onsoctcp,1,,NET # Override sqlhosts
nettype parameters
DEADLOCK_TIMEOUT 60      # Max time to wait of
lock in distributed env.
RESIDENT       1         # Forced residency flag (Yes = 1,
No = 0)

MULTIPROCESSOR 1         # 0 for single-processor, 1
for multi-processor
NUMCPUVPS      4         # Number of user
(cpu) vps
SINGLE_CPU_VP   0         # If non-zero, limit number
of cpu vps to one

NOAGE          0         # Process aging
AFF_SPROC     0         # Affinity start processor
AFF_NPROCS    0         # Affinity number of
processors

# Shared Memory Parameters

USERTHREADS   100
TRANSACTIONS  100
LOCKS         900000    # Maximum number of locks
BUFFERS       40000     # Maximum number of shared
buffers
TBLSPACES     1600      # Maximum number of open
tblspaces
CHUNKS        1600      # Maximum number of chunks
NUMAIOVPS     1         # Number of IO vps
DBSPACES      3200      # Maximum number of
dbspaces
PHYSBUFF      64        # Physical log buffer size
(Kbytes)
LOGBUFF       64        # Logical log buffer size
(Kbytes)
LOGSMAX       40        # Maximum number of logical
log files
CLEANERS      8         # Number of buffer cleaner
processes
#SHMBASE      0x2000000L # Shared memory base
address
SHMBASE       0xC00000L # Shared memory base
address
SHMVIRTSIZE   40960     # initial virtual shared
memory segment size
#SHMVIRTSIZE  8192     # initial virtual shared
memory segment size

```

```

SHMADD      81920      # Size of new shared memory
segments (Kbytes)
SHMTOTAL   1700000    # Total shared memory
(Kbytes). 0=>unlimited
CKPTINTVL   1800      # Check point interval (in
sec)
LRUS        16        # Number of LRU queues
LRU_MAX_DIRTY 75      # LRU percent dirty begin
cleaning limit
LRU_MIN_DIRTY 70      # LRU percent dirty end
cleaning limit
LTXHWM      60        # Long transaction high water
mark percentage
LTXEHW      70        # Long transaction high water
mark (exclusive)
TXTIMEOUT   300      # Transaction timeout (in sec)
STACKSIZE   32        # Stack size (Kbytes)

# System Page Size
# BUFFSIZE - OnLine no longer supports this configuration
parameter.
# To determine the page size used by OnLine on your
platform
# see the last line of output from the command, 'onstat
-b'.

# Recovery Variables
# OFF_RECVRY_THREADS:
# Number of parallel worker threads during fast recovery or
an offline restore.
# ON_RECVRY_THREADS:
# Number of parallel worker threads during an online restore.

OFF_RECVRY_THREADS 10 # Default number of
offline worker threads
ON_RECVRY_THREADS  1  # Default number of
online worker threads

# Data Replication Variables
# DRAUTO: 0 manual, 1 retain type, 2 reverse type
DRAUTO 0 # DR automatic switchover
DRINTERVAL 30 # DR max time between DR
buffer flushes (in sec)
DRTIMEOUT 30 # DR network timeout (in sec)
DRLOSTFOUND e:\tmp # DR lost+found file path

# Read Ahead Variables
RA_PAGES 128 # Number of pages to attempt
to read ahead
RA_THRESHOLD 64 # Number of pages left
before next group

# DBSPACETEMP:
# OnLine equivalent of DBTEMP for SE. This is the list of
dbspaces
# that the OnLine SQL Engine will use to create temp tables
etc.
# If specified it must be a colon separated list of dbspaces
that exist
# when the OnLine system is brought online. If not
specified, or if
# all dbspaces specified are invalid, various ad hoc queries
will create
# temporary files in /tmp instead.

#DBSPACETEMP ALL # Default temp dbspaces

```

```

DBSPACETEMP
temp_slice1,temp_slice2,temp_slice3,temp_slice4,temp_slic
e5,temp_slice6,temp_slice7,temp_slice11,temp_slice12,temp
_slice13,temp_slice14,temp_slice15,temp_slice16,temp_slic
e17 # Default temp dbspaces

# DUMP*:
# The following parameters control the type of diagnostics
information which
# is preserved when an unanticipated error condition
(assertion failure) occurs
# during OnLine operations.
# For DUMPSHMEM, DUMPGCORE and DUMPCORE 1
means Yes, 0 means No.

DUMPPDIR \tmp # Preserve diagnostics in this
directory
DUMPSHMEM 1 # Dump a copy of shared
memory
DUMPGCORE 0 # Dump a core image using
'gcore'
DUMPCORE 0 # Dump a core image
(Warning:this aborts OnLine)
DUMPCNT 1 # Number of shared memory or
gcore dumps for
# a single user's
session

# ADT*
# ADT* parameters moved to adtcfg file

FILLFACTOR 95 # Fill factor for building indexes

# method for OnLine to use when determining current time
USEOSTIME 0 # 0: use internal time(fast), 1: get
time from OS(slow)

# Parallel Database Queries (pdq)
PDQPRIORITY 100 # Degree of parallelism: 0 ... 100,
# OFF => 0, LOW => 1,
HIGH => 100
MAX_PDQPRIORITY 100 # Maximum allowed
pdqpriority
DS_MAX_QUERIES 1 # Maximum number of decision
support queries
DS_TOTAL_MEMORY 1300000 # Decision support
memory (Kbytes)
DS_MAX_SCANS 32 # Maximum number of decision
support scans
DS_POOLSIZE 500
DS_HASHSIZE 251
DATASKIP # List of dbspaces to skip

# OPTCOMPIND
# 0 => Nested loop joins will be preferred (where
# possible) over sortmerge joins and hash joins.
# 1 => If the transaction isolation mode is not
# "repeatable read", optimizer behaves as in (2)
# below. Otherwise it behaves as in (0) above.
# 2 => Use costs regardless of the transaction isolation
# mode. Nested loop joins are not necessarily
# preferred. Optimizer bases its decision purely
# on costs.
# XSOPTCOMPIND 2 # To hint the optimizer

LOG_BACKUP_MODE NONE
CONFIGSIZE LARGE
#CONFIGSIZE HUGE

```

```
# XPS_GLOBAL_CONFIGURATION_ENDS
#XPS ADDITIONS
# ROOTPATH      E:\IFMXDATA\ol_inform4\rootdbs%c
ROOTPATH       W:\ol_inform4\rootdbs%c
ROOTSLICE      rootdbs
PHYSSLICE      rootdbs

SBUFFER 880
LBUFFER 8032
HBUFFER 48992
```

```
COSERVER      1
NODE          INFORM4 #
SADDR        inform4:26800,5,0
LADDR        inform4:26805,20,3
HADDR        inform4:26925,10,3
```

```
SADDR        inform4:27800,5,1
LADDR        inform4:27805,20,1
HADDR        inform4:27925,10,1
```

```
SADDR        inform4:28800,5,2
LADDR        inform4:28805,20,2
HADDR        inform4:28925,10,2
```

```
SADDR        inform4:29800,5,3
LADDR        inform4:29805,20,3
HADDR        inform4:29925,10,3
END
```

```
# COSERVER      2
# NODE          INFORM2 #
# SADDR        inform2:26800,5,0
# LADDR        inform2:26805,20,0
# HADDR        inform2:26925,10,0
```

```
# SADDR        inform2:27800,5,1
# LADDR        inform2:27805,20,1
# HADDR        inform2:27925,10,1
#
```

```
# SADDR        inform2:28800,5,2
# LADDR        inform2:28805,20,2
# HADDR        inform2:28925,10,2
#
```

```
# SADDR        inform2:29800,5,3
# LADDR        inform2:29805,20,3
# HADDR        inform2:29925,10,3
# END
```

### A-2: Environment Variable Settings

```
set INFORMIXDIR=\\INFORM4\E$\Informix
set INFORMIXSERVER=ol_inform4.1
set ONCONFIG=ONCONFIG
set
PATH=\\INFORM4\E$\Informix\bin;%PATH%;c:\mks\mks
nt
set INFORMIXSQLHOSTS=\\INFORM4
set DBNLS=0
set LANG=English
set COLLCHAR=1
```

```
set DSS_CONFIG=W:\tpcd\dbgen
set DSS_QUERY=W:\tpcd\queries2
set DSS_SEED=W:\tpcd\seeds
set DSS_LOG=W:\tpcd\log
set DSS_BAT=W:\tpcd\bat
```

```
set DSS_RES=W:\tpcd\results
set DSS_BIN=W:\tpcd\bin
set DSS_UPDATE=W:\update
set
PATH=%PATH%;%DSS_CONFIG%;%DSS_BAT%;%DSS
_BIN%;C:\msdev\bin;w:\tpcd\;
set SQXPLN=E:\informix\sqexpln\informix.out
set ABCDWXYZ=1
set DBDATE=Y4MD-
set PDQPRIORITY=100
set DEBUG=MAXSCAN:4,HFEVAL
```

### A-3: System Parameters

```
Key Name:      SOFTWARE\Informix
Class Name:    <NO CLASS>
Last Write Time: 8/7/97 - 6:48 PM
```

```
Key Name:      SOFTWARE\Informix\RCE
Class Name:    <NO CLASS>
Last Write Time: 8/7/97 - 6:51 PM
```

```
Value 0
Name:          group
Type:          REG_SZ
Data:          TPCDNT\Informix-Admin
```

```
Key Name:      SOFTWARE\Informix\Setup Framework
Class Name:    <NO CLASS>
Last Write Time: 8/7/97 - 6:48 PM
```

```
Key Name:      SOFTWARE\Informix\Setup
Framework\CurrentVersion
Class Name:    <NO CLASS>
Last Write Time: 8/7/97 - 6:48 PM
```

```
Key Name:      SOFTWARE\Informix\Setup
Framework\CurrentVersion\Setups
Class Name:    <NO CLASS>
Last Write Time: 8/7/97 - 6:48 PM
```

```
Key Name:      SOFTWARE\Informix\Setup
Framework\CurrentVersion\Setups\Directories
Class Name:    <NO CLASS>
Last Write Time: 8/7/97 - 6:51 PM
```

```
Value 0
Name:          \\INFORM4\E$\IFMXDATA
Type:          REG_DWORD
Data:          0x1
```

```
Value 1
Name:          \\INFORM4\E$\IFMXDATA\ol_inform4
Type:          REG_DWORD
Data:          0x1
```

```
Value 2
Name:          \\INFORM4\E$\Informix
Type:          REG_DWORD
Data:          0x1
```

```
Value 3
Name:          \\INFORM4\E$\Informix\aaodir
Type:          REG_DWORD
Data:          0x1
```

```
Value 4
Name:          \\INFORM4\E$\Informix\bin
```

Type: REG\_DWORD  
Data: 0x1

Value 5  
Name: \\INFORM4\E\$\Informix\dbssodir  
Type: REG\_DWORD  
Data: 0x1

Value 6  
Name: \\INFORM4\E\$\Informix\demo  
Type: REG\_DWORD  
Data: 0x1

Value 7  
Name: \\INFORM4\E\$\Informix\demo\dbaccess  
Type: REG\_DWORD  
Data: 0x1

Value 8  
Name: \\INFORM4\E\$\Informix\etc  
Type: REG\_DWORD  
Data: 0x1

Value 9  
Name: \\INFORM4\E\$\Informix\forms  
Type: REG\_DWORD  
Data: 0x1

Value 10  
Name: \\INFORM4\E\$\Informix\help  
Type: REG\_DWORD  
Data: 0x1

Value 11  
Name: \\INFORM4\E\$\Informix\infxtmp  
Type: REG\_DWORD  
Data: 0x1

Value 12  
Name: \\INFORM4\E\$\Informix\msg  
Type: REG\_DWORD  
Data: 0x1

Value 13  
Name: \\INFORM4\E\$\Informix\release  
Type: REG\_DWORD  
Data: 0x1

Value 14  
Name: \\INFORM4\E\$\Informix\sqexpln  
Type: REG\_DWORD  
Data: 0x1

Value 15  
Name: \\INFORM4\E\$\tmp  
Type: REG\_DWORD  
Data: 0x1

Key Name: SOFTWARE\Informix\Setup  
Framework\CurrentVersion\Setups\Files  
Class Name: <NO CLASS>  
Last Write Time: 8/7/97 - 6:51 PM  
Value 0  
Name: \\INFORM4\\INFORM4\admin\$\system32\drivers\etc\hosts.  
equiv  
Type: REG\_DWORD

Data: 0x1

Value 1  
Name: \\INFORM4\E\$\IFMXDATA\ol\_inform4\rootdbs1  
Type: REG\_DWORD  
Data: 0x1

Value 2  
Name: \\INFORM4\E\$\Informix\aaodir\adctfg.0  
Type: REG\_DWORD  
Data: 0x1

Value 3  
Name: \\INFORM4\E\$\Informix\console.log  
Type: REG\_DWORD  
Data: 0x1

Value 4  
Name: \\INFORM4\E\$\Informix\etc\infos.ol\_inform4  
Type: REG\_DWORD  
Data: 0x1

Value 5  
Name: \\INFORM4\E\$\Informix\etc\bldutil.out  
Type: REG\_DWORD  
Data: 0x1

Value 6  
Name: \\INFORM4\E\$\Informix\etc\buildsmi.out  
Type: REG\_DWORD  
Data: 0x1

Value 7  
Name: \\INFORM4\E\$\Informix\etc\oncfg\_ol\_inform4.0  
Type: REG\_DWORD  
Data: 0x1

Value 8  
Name: \\INFORM4\E\$\Informix\ETC\ONCONFIG  
Type: REG\_DWORD  
Data: 0x1

Value 9  
Name: \\INFORM4\E\$\Informix\help\errmsg.ann  
Type: REG\_DWORD  
Data: 0x1

Value 10  
Name: \\INFORM4\E\$\Informix\help\errmsg.ftg  
Type: REG\_DWORD  
Data: 0x1

Value 11  
Name: \\INFORM4\E\$\Informix\help\errmsg.fts  
Type: REG\_DWORD  
Data: 0x1

Value 12  
Name: \\INFORM4\E\$\Informix\help\errmsg.gid  
Type: REG\_DWORD  
Data: 0x1

Value 13  
Name: \\INFORM4\E\$\Informix\help\errmsg.ph  
Type: REG\_DWORD

Data: 0x1

Value 14  
Name: \\INFORM4\E\$\Informix\online.log  
Type: REG\_DWORD  
Data: 0x1

Value 15  
Name: \\INFORM4\E\$\Informix\SETENV.CMD  
Type: REG\_DWORD  
Data: 0x1

Value 16  
Name: C:\TEMP\setup.log  
Type: REG\_DWORD  
Data: 0x1

Value 17  
Name: C:\WINNT\System32\online\_service.log  
Type: REG\_DWORD  
Data: 0x1

Value 18  
Name: E:\Informix\bin\DBACCESS.EXE  
Type: REG\_DWORD  
Data: 0x1

Value 19  
Name: E:\Informix\bin\dbschema.exe  
Type: REG\_DWORD  
Data: 0x1

Value 20  
Name: E:\Informix\bin\dgtrans.ini  
Type: REG\_DWORD  
Data: 0x1

Value 21  
Name: E:\Informix\bin\dgtrans.sys  
Type: REG\_DWORD  
Data: 0x1

Value 22  
Name: E:\Informix\bin\ifmxdg.dll  
Type: REG\_DWORD  
Data: 0x1

Value 23  
Name: E:\Informix\bin\imacrouter.exe  
Type: REG\_DWORD  
Data: 0x1

Value 24  
Name: E:\Informix\bin\makedate.exe  
Type: REG\_DWORD  
Data: 0x1

Value 25  
Name: E:\Informix\bin\onevd.exe  
Type: REG\_DWORD  
Data: 0x1

Value 26  
Name: E:\Informix\bin\oninit.exe  
Type: REG\_DWORD  
Data: 0x1

Value 27

Name: E:\Informix\bin\ONMODE.EXE  
Type: REG\_DWORD  
Data: 0x1

Value 28  
Name: E:\Informix\bin\ONPARAMS.EXE  
Type: REG\_DWORD  
Data: 0x1

Value 29  
Name: E:\Informix\bin\ONSPACES.EXE  
Type: REG\_DWORD  
Data: 0x1

Value 30  
Name: E:\Informix\bin\ONSTAT.EXE  
Type: REG\_DWORD  
Data: 0x1

Value 31  
Name: E:\Informix\bin\onutil.exe  
Type: REG\_DWORD  
Data: 0x1

Value 32  
Name: E:\Informix\bin\rce.exe  
Type: REG\_DWORD  
Data: 0x1

Value 33  
Name: E:\Informix\bin\rcmdsvc.exe  
Type: REG\_DWORD  
Data: 0x1

Value 34  
Name: E:\Informix\bin\readme.txt  
Type: REG\_DWORD  
Data: 0x1

Value 35  
Name: E:\Informix\bin\xboot.exe  
Type: REG\_DWORD  
Data: 0x1

Value 36  
Name: E:\Informix\bin\xctl.exe  
Type: REG\_DWORD  
Data: 0x1

Value 37  
Name: E:\Informix\bin\xmppatch.exe  
Type: REG\_DWORD  
Data: 0x1

Value 38  
Name: E:\Informix\bin\xmpprof.exe  
Type: REG\_DWORD  
Data: 0x1

Value 39  
Name: E:\Informix\etc\arc\_purge.sql  
Type: REG\_DWORD  
Data: 0x1

Value 40  
Name: E:\Informix\etc\BLDUTIL.BAT  
Type: REG\_DWORD  
Data: 0x1

Value 41	Name: E:\Informix\etc\bldutil.in1 Type: REG_DWORD Data: 0x1	Type: REG_DWORD Data: 0x1
Value 42	Name: E:\Informix\etc\bldutil.in2 Type: REG_DWORD Data: 0x1	Value 55 Name: E:\Informix\etc\sym.out Type: REG_DWORD Data: 0x1
Value 43	Name: E:\Informix\etc\bldutil.in3 Type: REG_DWORD Data: 0x1	Value 56 Name: E:\Informix\etc\sysmaster.sql Type: REG_DWORD Data: 0x1
Value 44	Name: E:\Informix\etc\bldutil.sh Type: REG_DWORD Data: 0x1	Value 57 Name: E:\Informix\etc\SYSUTILS.SQL Type: REG_DWORD Data: 0x1
Value 45	Name: E:\Informix\etc\BUILDSMI.BAT Type: REG_DWORD Data: 0x1	Value 58 Name: E:\Informix\etc\XPG4_IS.SQL Type: REG_DWORD Data: 0x1
Value 46	Name: E:\Informix\etc\buildsmi.in1 Type: REG_DWORD Data: 0x1	Value 59 Name: E:\Informix\help\ERRMESS.HLP Type: REG_DWORD Data: 0x1
Value 47	Name: E:\Informix\etc\buildsmi.in2 Type: REG_DWORD Data: 0x1	Value 60 Name: E:\Informix\msg\4gl.iem Type: REG_DWORD Data: 0x1
Value 48	Name: E:\Informix\etc\buildsmi.in3 Type: REG_DWORD Data: 0x1	Value 61 Name: E:\Informix\msg\4glusr.iem Type: REG_DWORD Data: 0x1
Value 49	Name: E:\Informix\etc\buildsmi.in4 Type: REG_DWORD Data: 0x1	Value 62 Name: E:\Informix\msg\4glusr.msg Type: REG_DWORD Data: 0x1
Value 50	Name: E:\Informix\etc\CMDSHELL.ICO Type: REG_DWORD Data: 0x1	Value 63 Name: E:\Informix\msg\all.iem Type: REG_DWORD Data: 0x1
Value 51	Name: E:\Informix\etc\CNV50T60.SQL Type: REG_DWORD Data: 0x1	Value 64 Name: E:\Informix\msg\archive.iem Type: REG_DWORD Data: 0x1
Value 52	Name: E:\Informix\etc\DBACCESS.ICO Type: REG_DWORD Data: 0x1	Value 65 Name: E:\Informix\msg\audit.iem Type: REG_DWORD Data: 0x1
Value 53	Name: E:\Informix\etc\onconfig.std Type: REG_DWORD Data: 0x1	Value 66 Name: E:\Informix\msg\be.iem Type: REG_DWORD Data: 0x1
Value 54	Name: E:\Informix\etc\oninit.sym	Value 67 Name: E:\Informix\msg\c_err_e.dat Type: REG_DWORD Data: 0x1

Value 68  
 Name: E:\Informix\msg\c\_err\_f.dat  
 Type: REG\_DWORD  
 Data: 0x1

Value 69  
 Name: E:\Informix\msg\dbacc.iem  
 Type: REG\_DWORD  
 Data: 0x1

Value 70  
 Name: E:\Informix\msg\dbacc.lmk  
 Type: REG\_DWORD  
 Data: 0x1

Value 71  
 Name: E:\Informix\msg\dbatool.iem  
 Type: REG\_DWORD  
 Data: 0x1

Value 72  
 Name: E:\Informix\msg\dbised.iem  
 Type: REG\_DWORD  
 Data: 0x1

Value 73  
 Name: E:\Informix\msg\dbised.lmk  
 Type: REG\_DWORD  
 Data: 0x1

Value 74  
 Name: E:\Informix\msg\dbisedh.iem  
 Type: REG\_DWORD  
 Data: 0x1

Value 75  
 Name: E:\Informix\msg\dbload.iem  
 Type: REG\_DWORD  
 Data: 0x1

Value 76  
 Name: E:\Informix\msg\dbupd.iem  
 Type: REG\_DWORD  
 Data: 0x1

Value 77  
 Name: E:\Informix\msg\ef77.iem  
 Type: REG\_DWORD  
 Data: 0x1

Value 78  
 Name: E:\Informix\msg\english\itoxmsg.pam  
 Type: REG\_DWORD  
 Data: 0x1

Value 79  
 Name: E:\Informix\msg\errmsg.txt  
 Type: REG\_DWORD  
 Data: 0x1

Value 80  
 Name: E:\Informix\msg\errmsg\_e.dat  
 Type: REG\_DWORD  
 Data: 0x1

Value 81  
 Name: E:\Informix\msg\errmsg\_f.dat  
 Type: REG\_DWORD

Data: 0x1

Value 82  
 Name: E:\Informix\msg\esql.iem  
 Type: REG\_DWORD  
 Data: 0x1

Value 83  
 Name: E:\Informix\msg\esqlc.iem  
 Type: REG\_DWORD  
 Data: 0x1

Value 84  
 Name: E:\Informix\msg\esqlcob.iem  
 Type: REG\_DWORD  
 Data: 0x1

Value 85  
 Name: E:\Informix\msg\fmt\_e.dat  
 Type: REG\_DWORD  
 Data: 0x1

Value 86  
 Name: E:\Informix\msg\fmt\_f.dat  
 Type: REG\_DWORD  
 Data: 0x1

Value 87  
 Name: E:\Informix\msg\formbld.iem  
 Type: REG\_DWORD  
 Data: 0x1

Value 88  
 Name: E:\Informix\msg\forms.iem  
 Type: REG\_DWORD  
 Data: 0x1

Value 89  
 Name: E:\Informix\msg\hlp\_e.hpf  
 Type: REG\_DWORD  
 Data: 0x1

Value 90  
 Name: E:\Informix\msg\hlp\_f.hpf  
 Type: REG\_DWORD  
 Data: 0x1

Value 91  
 Name: E:\Informix\msg\hlp\_km\_e.hpf  
 Type: REG\_DWORD  
 Data: 0x1

Value 92  
 Name: E:\Informix\msg\hlp\_km\_f.hpf  
 Type: REG\_DWORD  
 Data: 0x1

Value 93  
 Name: E:\Informix\msg\hlp\_r\_e.hpf  
 Type: REG\_DWORD  
 Data: 0x1

Value 94  
 Name: E:\Informix\msg\hlp\_r\_f.hpf  
 Type: REG\_DWORD  
 Data: 0x1

Value 95

Name: E:\Informix\msg\isam.iem  
 Type: REG\_DWORD  
 Data: 0x1

Value 96  
 Name: E:\Informix\msg\itoxmsg.pam  
 Type: REG\_DWORD  
 Data: 0x1

Value 97  
 Name: E:\Informix\msg\license.iem  
 Type: REG\_DWORD  
 Data: 0x1

Value 98  
 Name: E:\Informix\msg\makefile  
 Type: REG\_DWORD  
 Data: 0x1

Value 99  
 Name: E:\Informix\msg\menukey.iem  
 Type: REG\_DWORD  
 Data: 0x1

Value 100  
 Name: E:\Informix\msg\mkem.iem  
 Type: REG\_DWORD  
 Data: 0x1

Value 101  
 Name: E:\Informix\msg\mls.iem  
 Type: REG\_DWORD  
 Data: 0x1

Value 102  
 Name: E:\Informix\msg\mls2.iem  
 Type: REG\_DWORD  
 Data: 0x1

Value 103  
 Name: E:\Informix\msg\n4gl.iem  
 Type: REG\_DWORD  
 Data: 0x1

Value 104  
 Name: E:\Informix\msg\n4glusr.iem  
 Type: REG\_DWORD  
 Data: 0x1

Value 105  
 Name: E:\Informix\msg\necc.iem  
 Type: REG\_DWORD  
 Data: 0x1

Value 106  
 Name: E:\Informix\msg\nerm.iem  
 Type: REG\_DWORD  
 Data: 0x1

Value 107  
 Name: E:\Informix\msg\nesql.iem  
 Type: REG\_DWORD  
 Data: 0x1

Value 108  
 Name: E:\Informix\msg\net.iem  
 Type: REG\_DWORD  
 Data: 0x1

Value 109  
 Name: E:\Informix\msg\netsrv.iem  
 Type: REG\_DWORD  
 Data: 0x1

Value 110  
 Name: E:\Informix\msg\nformbld.iem  
 Type: REG\_DWORD  
 Data: 0x1

Value 111  
 Name: E:\Informix\msg\nforms.iem  
 Type: REG\_DWORD  
 Data: 0x1

Value 112  
 Name: E:\Informix\msg\nls.iem  
 Type: REG\_DWORD  
 Data: 0x1

Value 113  
 Name: E:\Informix\msg\ntol.iem  
 Type: REG\_DWORD  
 Data: 0x1

Value 114  
 Name: E:\Informix\msg\nonbar.iem  
 Type: REG\_DWORD  
 Data: 0x1

Value 115  
 Name: E:\Informix\msg\noncheck.iem  
 Type: REG\_DWORD  
 Data: 0x1

Value 116  
 Name: E:\Informix\msg\nonline.iem  
 Type: REG\_DWORD  
 Data: 0x1

Value 117  
 Name: E:\Informix\msg\noptical.iem  
 Type: REG\_DWORD  
 Data: 0x1

Value 118  
 Name: E:\Informix\msg\nos.iem  
 Type: REG\_DWORD  
 Data: 0x1

Value 119  
 Name: E:\Informix\msg\npload.iem  
 Type: REG\_DWORD  
 Data: 0x1

Value 120  
 Name: E:\Informix\msg\nrds.iem  
 Type: REG\_DWORD  
 Data: 0x1

Value 121  
 Name: E:\Informix\msg\nrdsterm.iem  
 Type: REG\_DWORD  
 Data: 0x1

Value 122  
 Name: E:\Informix\msg\nrsam.iem

Type: REG\_DWORD  
Data: 0x1

Value 123  
Name: E:\Informix\msg\secheck.iem  
Type: REG\_DWORD  
Data: 0x1

Value 124  
Name: E:\Informix\msg\security.iem  
Type: REG\_DWORD  
Data: 0x1

Value 125  
Name: E:\Informix\msg\shell.iem  
Type: REG\_DWORD  
Data: 0x1

Value 126  
Name: E:\Informix\msg\sql.iem  
Type: REG\_DWORD  
Data: 0x1

Value 127  
Name: E:\Informix\msg\sqli.iem  
Type: REG\_DWORD  
Data: 0x1

Value 128  
Name: E:\Informix\msg\util.iem  
Type: REG\_DWORD  
Data: 0x1

Value 129  
Name: E:\Informix\msg\xopen.iem  
Type: REG\_DWORD  
Data: 0x1

Value 130  
Name: E:\Informix\msg\xps.iem  
Type: REG\_DWORD  
Data: 0x1

Value 131  
Name: E:\Informix\release\README.WRI  
Type: REG\_DWORD  
Data: 0x1

Key Name: SOFTWARE\Informix\Setup  
Framework\CurrentVersion\Setups\Groups  
Class Name: <NO CLASS>  
Last Write Time: 8/7/97 - 6:48 PM  
Value 0  
Name: \\INFORM4\Informix-Admin(Global)  
Type: REG\_DWORD  
Data: 0x1

Key Name: SOFTWARE\Informix\Setup  
Framework\CurrentVersion\Setups\Program Manager  
Groups  
Class Name: <NO CLASS>  
Last Write Time: 8/7/97 - 6:50 PM  
Value 0  
Name: INFORMIX-XPS Server(Common)  
Type: REG\_DWORD  
Data: 0x1

Key Name: SOFTWARE\Informix\Setup  
Framework\CurrentVersion\Setups\Registry Keys  
Class Name: <NO CLASS>  
Last Write Time: 8/7/97 - 6:51 PM  
Value 0  
Name: \\INFORM4\HKEY\_LOCAL\_MACHINE\SOFTWARE\Informix\RCE  
Type: REG\_DWORD  
Data: 0x1

Value 1  
Name: \\INFORM4\HKEY\_LOCAL\_MACHINE\SOFTWARE\Informix\XPS8.0PG1\CurrentVersion\Environment  
Type: REG\_DWORD  
Data: 0x1

Value 2  
Name: HKEY\_LOCAL\_MACHINE\SOFTWARE\Informix\SQLHSTS  
Type: REG\_DWORD  
Data: 0x1

Value 3  
Name: HKEY\_LOCAL\_MACHINE\SOFTWARE\Informix\SQLHSTS\ol\_inform4  
Type: REG\_DWORD  
Data: 0x1

Value 4  
Name: HKEY\_LOCAL\_MACHINE\SOFTWARE\Informix\SQLHSTS\ol\_inform4\ol\_inform4.1  
Type: REG\_DWORD  
Data: 0x1

Value 5  
Name: HKEY\_LOCAL\_MACHINE\SOFTWARE\Informix\XPS8.0PG1\CurrentVersion\Security  
Type: REG\_DWORD  
Data: 0x1

Value 6  
Name: HKEY\_LOCAL\_MACHINE\SOFTWARE\Informix\XPS8.0PG1\CurrentVersion\Security\IXAAO Group  
Type: REG\_DWORD  
Data: 0x1

Value 7  
Name: HKEY\_LOCAL\_MACHINE\SOFTWARE\Informix\XPS8.0PG1\CurrentVersion\Security\IXDBSA Group  
Type: REG\_DWORD  
Data: 0x1

Value 8  
Name: HKEY\_LOCAL\_MACHINE\SOFTWARE\Informix\XPS8.0PG1\CurrentVersion\Security\IXDBSSO Group  
Type: REG\_DWORD  
Data: 0x1

Value 9  
Name:  
HKEY\_LOCAL\_MACHINE\SOFTWARE\Informix\XPS8.0  
0PG1\CurrentVersion\Security\IXUSERS Group  
Type: REG\_DWORD  
Data: 0x1

Value 10  
Name:  
HKEY\_LOCAL\_MACHINE\SOFTWARE\Informix\XPS8.0  
0PG1\CurrentVersion\Security\Users  
Type: REG\_DWORD  
Data: 0x1

Value 11  
Name:  
HKEY\_LOCAL\_MACHINE\SOFTWARE\Informix\XPS8.0  
0PG1\CurrentVersion\Security\Users\Usernames  
Type: REG\_DWORD  
Data: 0x1

Value 12  
Name:  
HKEY\_LOCAL\_MACHINE\SYSTEM\CurrentControlSet\Se  
rvices\EventLog\Security\XPS8.00PG1  
Type: REG\_DWORD  
Data: 0x1

Key Name: SOFTWARE\Informix\Setup  
Framework\CurrentVersion\Setups\Services  
Class Name: <NO CLASS>  
Last Write Time: 8/7/97 - 6:51 PM

Value 0  
Name: \\INFORM4\XPSRCE  
Type: REG\_DWORD  
Data: 0x1

Value 1  
Name: MsgServ  
Type: REG\_DWORD  
Data: 0x1

Key Name: SOFTWARE\Informix\Setup  
Framework\CurrentVersion\Setups\Shares  
Class Name: <NO CLASS>  
Last Write Time: 8/7/97 - 6:51 PM

Value 0  
Name: \\INFORM4\SQEXPLN  
Type: REG\_DWORD  
Data: 0x1

Key Name: SOFTWARE\Informix\Setup  
Framework\CurrentVersion\Setups\Users  
Class Name: <NO CLASS>  
Last Write Time: 8/7/97 - 6:51 PM

Value 0  
Name: \\INFORM4\informix  
Type: REG\_DWORD  
Data: 0x2

Key Name: SOFTWARE\Informix\SQLHOSTS  
Class Name: <NO CLASS>  
Last Write Time: 8/7/97 - 6:51 PM

Key Name:  
SOFTWARE\Informix\SQLHOSTS\ol\_inform4  
Class Name: <NO CLASS>  
Last Write Time: 8/7/97 - 6:51 PM

Value 0  
Name: HOST  
Type: REG\_SZ  
Data: -

Value 1  
Name: OPTIONS  
Type: REG\_SZ  
Data:

Value 2  
Name: PROTOCOL  
Type: REG\_SZ  
Data: group

Value 3  
Name: SERVICE  
Type: REG\_SZ  
Data: -

Key Name:  
SOFTWARE\Informix\SQLHOSTS\ol\_inform4\ol\_inform4.1  
Class Name: <NO CLASS>  
Last Write Time: 8/7/97 - 6:51 PM

Value 0  
Name: HOST  
Type: REG\_SZ  
Data: inform4

Value 1  
Name: OPTIONS  
Type: REG\_SZ  
Data:

Value 2  
Name: PROTOCOL  
Type: REG\_SZ  
Data: olsoc tcp

Value 3  
Name: SERVICE  
Type: REG\_SZ  
Data: turbo

Key Name: SOFTWARE\Informix\XPS8.00PG1  
Class Name: <NO CLASS>  
Last Write Time: 8/7/97 - 6:48 PM

Key Name:  
SOFTWARE\Informix\XPS8.00PG1\CurrentVersion  
Class Name: <NO CLASS>  
Last Write Time: 8/7/97 - 6:48 PM

Key Name:  
SOFTWARE\Informix\XPS8.00PG1\CurrentVersion\Enviro  
nment  
Class Name: <NO CLASS>  
Last Write Time: 8/7/97 - 6:51 PM

Value 0  
Name: COLLCHAR  
Type: REG\_SZ

Data: 1

Value 1  
 Name: DBNLS  
 Type: REG\_SZ  
 Data: 0

Value 2  
 Name: INFORMIXDIR  
 Type: REG\_SZ  
 Data: \\INFORM4\ES\Informix

Value 3  
 Name: INFORMIXSERVER  
 Type: REG\_SZ  
 Data: ol\_inform4.1

Value 4  
 Name: INFORMIXSQLHOSTS  
 Type: REG\_SZ  
 Data: \\INFORM4

Value 5  
 Name: LANG  
 Type: REG\_SZ  
 Data: English

Value 6  
 Name: ONCONFIG  
 Type: REG\_SZ  
 Data: ONCONFIG

Value 7  
 Name: REGMACHINE  
 Type: REG\_SZ  
 Data: \\INFORM4

Key Name:  
 SOFTWARE\Informix\XPS8.00PG1\CurrentVersion\Security  
 Class Name: <NO CLASS>  
 Last Write Time: 8/7/97 - 6:51 PM

Key Name:  
 SOFTWARE\Informix\XPS8.00PG1\CurrentVersion\Security\IXAAO Group  
 Class Name: <NO CLASS>  
 Last Write Time: 8/7/97 - 6:51 PM

Value 0  
 Name: Name  
 Type: REG\_SZ  
 Data: Informix-Admin

Key Name:  
 SOFTWARE\Informix\XPS8.00PG1\CurrentVersion\Security\IXDBSA Group  
 Class Name: <NO CLASS>  
 Last Write Time: 8/7/97 - 6:51 PM

Value 0  
 Name: Domain  
 Type: REG\_SZ  
 Data: TPCDNT

Value 1  
 Name: Name  
 Type: REG\_SZ

Data: Informix-Admin

Key Name:  
 SOFTWARE\Informix\XPS8.00PG1\CurrentVersion\Security\IXDBSSO Group  
 Class Name: <NO CLASS>  
 Last Write Time: 8/7/97 - 6:51 PM

Value 0  
 Name: Name  
 Type: REG\_SZ  
 Data: Informix-Admin

Key Name:  
 SOFTWARE\Informix\XPS8.00PG1\CurrentVersion\Security\IXUSERS Group  
 Class Name: <NO CLASS>  
 Last Write Time: 8/7/97 - 6:51 PM

Value 0  
 Name: Name  
 Type: REG\_SZ  
 Data: \*

Key Name:  
 SOFTWARE\Informix\XPS8.00PG1\CurrentVersion\Security\Users  
 Class Name: <NO CLASS>  
 Last Write Time: 8/7/97 - 7:29 PM

Value 0  
 Name: UIDSeed  
 Type: REG\_DWORD  
 Data: 0x6

Key Name:  
 SOFTWARE\Informix\XPS8.00PG1\CurrentVersion\Security\Users\Usernames  
 Class Name: <NO CLASS>  
 Last Write Time: 8/7/97 - 7:29 PM

Value 0  
 Name: TPCDNT\informix  
 Type: REG\_DWORD  
 Data: 0x6

Value 1  
 Name: UID6  
 Type: REG\_SZ  
 Data: TPCDNT\informix

Key Name:  
 SOFTWARE\Informix\XPS8.00PG1\CurrentVersion\Setup  
 Class Name: <NO CLASS>  
 Last Write Time: 8/7/97 - 6:51 PM

Value 0  
 Name: InstallDate  
 Type: REG\_SZ  
 Data: 08/07/1997, 18:49

Value 1  
 Name: Installed by  
 Type: REG\_SZ  
 Data: TPCDNT\informix

Value 2  
 Name: PathName

Type: REG\_SZ  
Data: \\INFORM4\E\$\Informix

Value 3  
Name: Role Separation  
Type: REG\_DWORD  
Data: 0

Value 4  
Name: Server installed  
Type: REG\_DWORD  
Data: 0x1

Value 5  
Name: SoftwareType  
Type: REG\_SZ  
Data: server

Value 6  
Name: Version  
Type: REG\_SZ  
Data: 8.00 PG1

Key Name:  
SOFTWARE\Informix\XPS8.00PG1\CurrentVersion\Setup\Directories  
Class Name: <NO CLASS>  
Last Write Time: 8/7/97 - 6:51 PM

Value 0  
Name: \\INFORM4\E\$\IFMXDATA  
Type: REG\_SZ  
Data: New

Value 1  
Name: \\INFORM4\E\$\IFMXDATA\ol\_inform4  
Type: REG\_SZ  
Data: New

Value 2  
Name: \\INFORM4\E\$\Informix  
Type: REG\_SZ  
Data: New

Value 3  
Name: \\INFORM4\E\$\Informix\aaodir  
Type: REG\_SZ  
Data: New

Value 4  
Name: \\INFORM4\E\$\Informix\bin  
Type: REG\_SZ  
Data: New

Value 5  
Name: \\INFORM4\E\$\Informix\dbssodir  
Type: REG\_SZ  
Data: New

Value 6  
Name: \\INFORM4\E\$\Informix\demo  
Type: REG\_SZ  
Data: New

Value 7  
Name: \\INFORM4\E\$\Informix\demo\dbaccess  
Type: REG\_SZ  
Data: New

Value 8  
Name: \\INFORM4\E\$\Informix\etc  
Type: REG\_SZ  
Data: New

Value 9  
Name: \\INFORM4\E\$\Informix\forms  
Type: REG\_SZ  
Data: New

Value 10  
Name: \\INFORM4\E\$\Informix\help  
Type: REG\_SZ  
Data: New

Value 11  
Name: \\INFORM4\E\$\Informix\infxtmp  
Type: REG\_SZ  
Data: New

Value 12  
Name: \\INFORM4\E\$\Informix\msg  
Type: REG\_SZ  
Data: New

Value 13  
Name: \\INFORM4\E\$\Informix\release  
Type: REG\_SZ  
Data: New

Value 14  
Name: \\INFORM4\E\$\Informix\sqexpln  
Type: REG\_SZ  
Data: New

Value 15  
Name: \\INFORM4\E\$\tmp  
Type: REG\_SZ  
Data: New

Key Name:  
SOFTWARE\Informix\XPS8.00PG1\CurrentVersion\Setup\Files  
Class Name: <NO CLASS>  
Last Write Time: 8/7/97 - 6:51 PM

Value 0  
Name: \\INFORM4\\INFORM4\admin\$\system32\drivers\etc\hosts.equiv  
Type: REG\_SZ  
Data: New

Value 1  
Name: \\INFORM4\E\$\IFMXDATA\ol\_inform4\rootdbs1  
Type: REG\_SZ  
Data: New

Value 2  
Name: \\INFORM4\E\$\Informix\aaodir\adctfg.0  
Type: REG\_SZ  
Data: New

Value 3  
Name: \\INFORM4\E\$\Informix\console.log  
Type: REG\_SZ

Data:	New		
Value 4		Value 17	
Name:		Name:	C:\WINNT\System32\online_service.log
\\INFORM4\E\$\Informix\etc\infos.ol_inform4		Type:	REG_SZ
Type:	REG_SZ	Data:	New
Data:	New	Value 18	
Value 5		Name:	E:\Informix\bin\DBACCESS.EXE
Name:	\\INFORM4\E\$\Informix\etc\bldutil.out	Type:	REG_SZ
Type:	REG_SZ	Data:	1997-05-13
Data:	New	Value 19	
Value 6		Name:	E:\Informix\bin\dbschema.exe
Name:	\\INFORM4\E\$\Informix\etc\buildsmi.out	Type:	REG_SZ
Type:	REG_SZ	Data:	1997-04-04
Data:	New	Value 20	
Value 7		Name:	E:\Informix\bin\dgtrans.ini
Name:		Type:	REG_SZ
\\INFORM4\E\$\Informix\etc\oncfg_ol_inform4.0		Data:	1996-05-14
Type:	REG_SZ	Value 21	
Data:	New	Name:	E:\Informix\bin\dgtrans.sys
Value 8		Type:	REG_SZ
Name:	\\INFORM4\E\$\Informix\ETC\ONCONFIG	Data:	1996-05-28
Type:	REG_SZ	Value 22	
Data:	New	Name:	E:\Informix\bin\ifmxdg.dll
Value 9		Type:	REG_SZ
Name:	\\INFORM4\E\$\Informix\help\errmsg.ann	Data:	1996-11-11
Type:	REG_SZ	Value 23	
Data:	New	Name:	E:\Informix\bin\jmacrouter.exe
Value 10		Type:	REG_SZ
Name:	\\INFORM4\E\$\Informix\help\errmsg.ftg	Data:	1996-06-21
Type:	REG_SZ	Value 24	
Data:	New	Name:	E:\Informix\bin\makedate.exe
Value 11		Type:	REG_SZ
Name:	\\INFORM4\E\$\Informix\help\errmsg.fts	Data:	1997-05-13
Type:	REG_SZ	Value 25	
Data:	New	Name:	E:\Informix\bin\onevd.exe
Value 12		Type:	REG_SZ
Name:	\\INFORM4\E\$\Informix\help\errmsg.gid	Data:	1997-05-13
Type:	REG_SZ	Value 26	
Data:	New	Name:	E:\Informix\bin\oninit.exe
Value 13		Type:	REG_SZ
Name:	\\INFORM4\E\$\Informix\help\errmsg.ph	Data:	1997-05-13
Type:	REG_SZ	Value 27	
Data:	New	Name:	E:\Informix\bin\ONMODE.EXE
Value 14		Type:	REG_SZ
Name:	\\INFORM4\E\$\Informix\online.log	Data:	1997-05-13
Type:	REG_SZ	Value 28	
Data:	New	Name:	E:\Informix\bin\ONPARAMS.EXE
Value 15		Type:	REG_SZ
Name:	\\INFORM4\E\$\Informix\SETENV.CMD	Data:	1997-05-13
Type:	REG_SZ	Value 29	
Data:	New	Name:	E:\Informix\bin\ONSPACES.EXE
Value 16		Type:	REG_SZ
Name:	C:\TEMP\setup.log	Data:	1997-05-13
Type:	REG_SZ	Value 30	
Data:	New	Name:	E:\Informix\bin\ONSTAT.EXE

Type: REG\_SZ  
Data: 1997-05-13

Value 31  
Name: E:\Informix\bin\onutil.exe  
Type: REG\_SZ  
Data: 1997-05-13

Value 32  
Name: E:\Informix\bin\rce.exe  
Type: REG\_SZ  
Data: 1996-11-11

Value 33  
Name: E:\Informix\bin\rcmdsvc.exe  
Type: REG\_SZ  
Data: 1996-12-02

Value 34  
Name: E:\Informix\bin\readme.txt  
Type: REG\_SZ  
Data: 1996-05-14

Value 35  
Name: E:\Informix\bin\xboot.exe  
Type: REG\_SZ  
Data: 1996-11-11

Value 36  
Name: E:\Informix\bin\xctl.exe  
Type: REG\_SZ  
Data: 1996-11-11

Value 37  
Name: E:\Informix\bin\xmppatch.exe  
Type: REG\_SZ  
Data: 1996-08-06

Value 38  
Name: E:\Informix\bin\xmpprof.exe  
Type: REG\_SZ  
Data: 1996-08-06

Value 39  
Name: E:\Informix\etc\arc\_purge.sql  
Type: REG\_SZ  
Data: 1996-01-29

Value 40  
Name: E:\Informix\etc\BLDUTIL.BAT  
Type: REG\_SZ  
Data: 1996-05-02

Value 41  
Name: E:\Informix\etc\bldutil.in1  
Type: REG\_SZ  
Data: 1996-03-01

Value 42  
Name: E:\Informix\etc\bldutil.in2  
Type: REG\_SZ  
Data: 1996-03-01

Value 43  
Name: E:\Informix\etc\bldutil.in3  
Type: REG\_SZ  
Data: 1996-03-01

Value 44  
Name: E:\Informix\etc\bldutil.sh  
Type: REG\_SZ  
Data: 1996-03-01

Value 45  
Name: E:\Informix\etc\BUILDSMI.BAT  
Type: REG\_SZ  
Data: 1996-05-02

Value 46  
Name: E:\Informix\etc\buildsmi.in1  
Type: REG\_SZ  
Data: 1996-03-01

Value 47  
Name: E:\Informix\etc\buildsmi.in2  
Type: REG\_SZ  
Data: 1996-03-01

Value 48  
Name: E:\Informix\etc\buildsmi.in3  
Type: REG\_SZ  
Data: 1996-03-12

Value 49  
Name: E:\Informix\etc\buildsmi.in4  
Type: REG\_SZ  
Data: 1996-03-01

Value 50  
Name: E:\Informix\etc\CMDSHELL.ICO  
Type: REG\_SZ  
Data: 1996-05-09

Value 51  
Name: E:\Informix\etc\CNV50T60.SQL  
Type: REG\_SZ  
Data: 1994-05-20

Value 52  
Name: E:\Informix\etc\DBACCESS.ICO  
Type: REG\_SZ  
Data: 1996-05-09

Value 53  
Name: E:\Informix\etc\onconfig.tsd  
Type: REG\_SZ  
Data: 1997-05-14

Value 54  
Name: E:\Informix\etc\oninit.sym  
Type: REG\_SZ  
Data: 1997-04-22

Value 55  
Name: E:\Informix\etc\sym.out  
Type: REG\_SZ  
Data: 1996-11-11

Value 56  
Name: E:\Informix\etc\sysmaster.sql  
Type: REG\_SZ  
Data: 1996-06-07

Value 57  
Name: E:\Informix\etc\SYSUTILS.SQL  
Type: REG\_SZ

Data:	1996-01-29	Name:	E:\Informix\msg\dbatool.iem
Value 58		Type:	REG_SZ
Name:	E:\Informix\etc\XPG4_IS.SQL	Data:	1997-03-14
Type:	REG_SZ	Value 72	
Data:	1994-09-06	Name:	E:\Informix\msg\dbised.iem
Value 59		Type:	REG_SZ
Name:	E:\Informix\help\ERRMESS.HLP	Data:	1997-03-14
Type:	REG_SZ	Value 73	
Data:	1995-12-22	Name:	E:\Informix\msg\dbised.lmk
Value 60		Type:	REG_SZ
Name:	E:\Informix\msg\4gl.iem	Data:	1996-08-19
Type:	REG_SZ	Value 74	
Data:	1996-03-06	Name:	E:\Informix\msg\dbisedh.iem
Value 61		Type:	REG_SZ
Name:	E:\Informix\msg\4glusr.iem	Data:	1997-03-14
Type:	REG_SZ	Value 75	
Data:	1996-03-06	Name:	E:\Informix\msg\dbload.iem
Value 62		Type:	REG_SZ
Name:	E:\Informix\msg\4glusr.msg	Data:	1997-03-14
Type:	REG_SZ	Value 76	
Data:	1996-03-06	Name:	E:\Informix\msg\dbupd.iem
Value 63		Type:	REG_SZ
Name:	E:\Informix\msg\all.iem	Data:	1997-03-14
Type:	REG_SZ	Value 77	
Data:	1997-03-14	Name:	E:\Informix\msg\ef77.iem
Value 64		Type:	REG_SZ
Name:	E:\Informix\msg\archive.iem	Data:	1997-03-14
Type:	REG_SZ	Value 78	
Data:	1997-03-14	Name:	E:\Informix\msg\english\itoxmsg.pam
Value 65		Type:	REG_SZ
Name:	E:\Informix\msg\audit.iem	Data:	1996-08-19
Type:	REG_SZ	Value 79	
Data:	1997-03-14	Name:	E:\Informix\msg\errmsg.txt
Value 66		Type:	REG_SZ
Name:	E:\Informix\msg\be.iem	Data:	1996-03-06
Type:	REG_SZ	Value 80	
Data:	1997-03-14	Name:	E:\Informix\msg\errmsg_e.dat
Value 67		Type:	REG_SZ
Name:	E:\Informix\msg\c_err_e.dat	Data:	1996-03-06
Type:	REG_SZ	Value 81	
Data:	1996-03-06	Name:	E:\Informix\msg\errmsg_f.dat
Value 68		Type:	REG_SZ
Name:	E:\Informix\msg\c_err_f.dat	Data:	1996-03-06
Type:	REG_SZ	Value 82	
Data:	1996-03-06	Name:	E:\Informix\msg\esql.iem
Value 69		Type:	REG_SZ
Name:	E:\Informix\msg\dbacc.iem	Data:	1996-01-22
Type:	REG_SZ	Value 83	
Data:	1997-03-14	Name:	E:\Informix\msg\esqlc.iem
Value 70		Type:	REG_SZ
Name:	E:\Informix\msg\dbacc.lmk	Data:	1996-01-22
Type:	REG_SZ	Value 84	
Data:	1996-08-19	Name:	E:\Informix\msg\esqlcob.iem
Value 71		Type:	REG_SZ
		Data:	1996-03-06

Value 85  
 Name: E:\Informix\msg\fmt\_e.dat  
 Type: REG\_SZ  
 Data: 1996-03-06

Value 86  
 Name: E:\Informix\msg\fmt\_f.dat  
 Type: REG\_SZ  
 Data: 1996-03-06

Value 87  
 Name: E:\Informix\msg\formbld.iem  
 Type: REG\_SZ  
 Data: 1996-01-22

Value 88  
 Name: E:\Informix\msg\forms.iem  
 Type: REG\_SZ  
 Data: 1996-01-22

Value 89  
 Name: E:\Informix\msg\hlp\_e.hpf  
 Type: REG\_SZ  
 Data: 1996-03-06

Value 90  
 Name: E:\Informix\msg\hlp\_f.hpf  
 Type: REG\_SZ  
 Data: 1996-03-06

Value 91  
 Name: E:\Informix\msg\hlp\_km\_e.hpf  
 Type: REG\_SZ  
 Data: 1996-03-06

Value 92  
 Name: E:\Informix\msg\hlp\_km\_f.hpf  
 Type: REG\_SZ  
 Data: 1996-03-06

Value 93  
 Name: E:\Informix\msg\hlp\_r\_e.hpf  
 Type: REG\_SZ  
 Data: 1996-03-06

Value 94  
 Name: E:\Informix\msg\hlp\_r\_f.hpf  
 Type: REG\_SZ  
 Data: 1996-03-06

Value 95  
 Name: E:\Informix\msg\isam.iem  
 Type: REG\_SZ  
 Data: 1997-03-14

Value 96  
 Name: E:\Informix\msg\itoxmsg.pam  
 Type: REG\_SZ  
 Data: 1996-08-19

Value 97  
 Name: E:\Informix\msg\license.iem  
 Type: REG\_SZ  
 Data: 1997-03-14

Value 98  
 Name: E:\Informix\msg\makefile

Type: REG\_SZ  
 Data: 1996-08-20

Value 99  
 Name: E:\Informix\msg\menukey.iem  
 Type: REG\_SZ  
 Data: 1997-03-14

Value 100  
 Name: E:\Informix\msg\mkem.iem  
 Type: REG\_SZ  
 Data: 1997-03-14

Value 101  
 Name: E:\Informix\msg\mls.iem  
 Type: REG\_SZ  
 Data: 1996-01-04

Value 102  
 Name: E:\Informix\msg\mls2.iem  
 Type: REG\_SZ  
 Data: 1996-01-04

Value 103  
 Name: E:\Informix\msg\n4gl.iem  
 Type: REG\_SZ  
 Data: 1996-03-06

Value 104  
 Name: E:\Informix\msg\n4glusr.iem  
 Type: REG\_SZ  
 Data: 1996-03-06

Value 105  
 Name: E:\Informix\msg\necc.iem  
 Type: REG\_SZ  
 Data: 1996-01-22

Value 106  
 Name: E:\Informix\msg\nerm.iem  
 Type: REG\_SZ  
 Data: 1997-03-14

Value 107  
 Name: E:\Informix\msg\nesql.iem  
 Type: REG\_SZ  
 Data: 1996-01-22

Value 108  
 Name: E:\Informix\msg\net.iem  
 Type: REG\_SZ  
 Data: 1997-03-14

Value 109  
 Name: E:\Informix\msg\netsrv.iem  
 Type: REG\_SZ  
 Data: 1997-03-14

Value 110  
 Name: E:\Informix\msg\nformbld.iem  
 Type: REG\_SZ  
 Data: 1996-01-22

Value 111  
 Name: E:\Informix\msg\nforms.iem  
 Type: REG\_SZ  
 Data: 1996-01-22

Value 112	Name: E:\Informix\msg\nls.iem	Data: 1997-03-14	Value 126	Name: E:\Informix\msg\sql.iem	Data: 1997-03-14
	Type: REG_SZ			Type: REG_SZ	
	Data: 1997-03-14			Data: 1997-03-14	
Value 113	Name: E:\Informix\msg\ntol.iem		Value 127	Name: E:\Informix\msg\sql.iem	
	Type: REG_SZ			Type: REG_SZ	
	Data: 1996-01-04			Data: 1997-03-14	
Value 114	Name: E:\Informix\msg\onbar.iem		Value 128	Name: E:\Informix\msg\util.iem	
	Type: REG_SZ			Type: REG_SZ	
	Data: 1996-08-19			Data: 1997-03-14	
Value 115	Name: E:\Informix\msg\oncheck.iem		Value 129	Name: E:\Informix\msg\xopen.iem	
	Type: REG_SZ			Type: REG_SZ	
	Data: 1997-03-14			Data: 1997-03-14	
Value 116	Name: E:\Informix\msg\online.iem		Value 130	Name: E:\Informix\msg\xps.iem	
	Type: REG_SZ			Type: REG_SZ	
	Data: 1997-03-14			Data: 1997-03-14	
Value 117	Name: E:\Informix\msg\optical.iem		Value 131	Name: E:\Informix\release\README.WRI	
	Type: REG_SZ			Type: REG_SZ	
	Data: 1996-01-22			Data: 1996-01-30	
Value 118	Name: E:\Informix\msg\os.iem		Key Name:	SOFTWARE\Informix\XPS8.00PG1\CurrentVersion\Setup\	
	Type: REG_SZ			Groups	
	Data: 1997-03-14			Class Name: <NO CLASS>	
Value 119	Name: E:\Informix\msg\pload.iem			Last Write Time: 8/7/97 - 6:51 PM	
	Type: REG_SZ		Key Name:	SOFTWARE\Informix\XPS8.00PG1\CurrentVersion\Setup\	
	Data: 1997-03-14			Groups\  INFORM4\Informix-Admin(Global)	
Value 120	Name: E:\Informix\msg\rds.iem			Class Name: <NO CLASS>	
	Type: REG_SZ			Last Write Time: 8/7/97 - 6:51 PM	
	Data: 1997-03-14		Value 0	Name: Object	
Value 121	Name: E:\Informix\msg\rdstern.iem			Type: REG_SZ	
	Type: REG_SZ			Data: New	
	Data: 1997-03-14		Key Name:	SOFTWARE\Informix\XPS8.00PG1\CurrentVersion\Setup\P	
Value 122	Name: E:\Informix\msg\rsam.iem			rogram Manager Groups	
	Type: REG_SZ			Class Name: <NO CLASS>	
	Data: 1997-03-14			Last Write Time: 8/7/97 - 6:51 PM	
Value 123	Name: E:\Informix\msg\secheck.iem		Key Name:	SOFTWARE\Informix\XPS8.00PG1\CurrentVersion\Setup\P	
	Type: REG_SZ			rogram Manager Groups\INFORMIX-XPS Server(Common)	
	Data: 1997-03-14			Class Name: <NO CLASS>	
Value 124	Name: E:\Informix\msg\security.iem			Last Write Time: 8/7/97 - 6:51 PM	
	Type: REG_SZ		Value 0	Name: Object	
	Data: 1997-03-14			Type: REG_SZ	
Value 125	Name: E:\Informix\msg\shell.iem			Data: New	
	Type: REG_SZ		Key Name:		

SOFTWARE\Informix\XPS8.00PG1\CurrentVersion\Setup\Program Manager Groups\INFORMIX-XPS  
Server(Common)\Icons  
Class Name: <NO CLASS>  
Last Write Time: 8/7/97 - 6:51 PM

Value 0  
Name: Command Line Utilities  
Type: REG\_SZ  
Data:

Value 1  
Name: DBAccess  
Type: REG\_SZ  
Data:

Value 2  
Name: Find Error  
Type: REG\_SZ  
Data:

Value 3  
Name: OnMonitor  
Type: REG\_SZ  
Data:

Value 4  
Name: Release Notes  
Type: REG\_SZ  
Data:

Value 5  
Name: Uninstall  
Type: REG\_SZ  
Data:

Key Name:  
SOFTWARE\Informix\XPS8.00PG1\CurrentVersion\Setup\Registry Keys  
Class Name: <NO CLASS>  
Last Write Time: 8/7/97 - 6:51 PM

Value 0  
Name:  
\\INFORM4\HKEY\_LOCAL\_MACHINE\SOFTWARE\Informix\RCE  
Type: REG\_SZ  
Data: New

Value 1  
Name:  
\\INFORM4\HKEY\_LOCAL\_MACHINE\SOFTWARE\Informix\XPS8.00PG1\CurrentVersion\Environment  
Type: REG\_SZ  
Data: New

Value 2  
Name:  
HKEY\_LOCAL\_MACHINE\SOFTWARE\Informix\SQLHOSTS  
Type: REG\_SZ  
Data: New

Value 3  
Name:  
HKEY\_LOCAL\_MACHINE\SOFTWARE\Informix\SQLHOSTS\ol\_inform4  
Type: REG\_SZ  
Data: New

Value 4  
Name:  
HKEY\_LOCAL\_MACHINE\SOFTWARE\Informix\SQLHOSTS\ol\_inform4\ol\_inform4.1  
Type: REG\_SZ  
Data: New

Value 5  
Name:  
HKEY\_LOCAL\_MACHINE\SOFTWARE\Informix\XPS8.00PG1\CurrentVersion\Security  
Type: REG\_SZ  
Data: New

Value 6  
Name:  
HKEY\_LOCAL\_MACHINE\SOFTWARE\Informix\XPS8.00PG1\CurrentVersion\Security\IXAAO Group  
Type: REG\_SZ  
Data: New

Value 7  
Name:  
HKEY\_LOCAL\_MACHINE\SOFTWARE\Informix\XPS8.00PG1\CurrentVersion\Security\IXDBSA Group  
Type: REG\_SZ  
Data: New

Value 8  
Name:  
HKEY\_LOCAL\_MACHINE\SOFTWARE\Informix\XPS8.00PG1\CurrentVersion\Security\IXDBSSO Group  
Type: REG\_SZ  
Data: New

Value 9  
Name:  
HKEY\_LOCAL\_MACHINE\SOFTWARE\Informix\XPS8.00PG1\CurrentVersion\Security\IXUSERS Group  
Type: REG\_SZ  
Data: New

Value 10  
Name:  
HKEY\_LOCAL\_MACHINE\SOFTWARE\Informix\XPS8.00PG1\CurrentVersion\Security\Users  
Type: REG\_SZ  
Data: New

Value 11  
Name:  
HKEY\_LOCAL\_MACHINE\SOFTWARE\Informix\XPS8.00PG1\CurrentVersion\Security\Users\Usernames  
Type: REG\_SZ  
Data: New

Value 12  
Name:  
HKEY\_LOCAL\_MACHINE\SYSTEM\CurrentControlSet\Services\EventLog\Security\XPS8.00PG1  
Type: REG\_SZ  
Data: New

Key Name:  
SOFTWARE\Informix\XPS8.00PG1\CurrentVersion\Setup\Services

Class Name: <NO CLASS>  
Last Write Time: 8/7/97 - 6:51 PM  
Value 0  
Name: \\INFORM4\XPSRCE  
Type: REG\_SZ  
Data: New  
  
Value 1  
Name: MsgServ  
Type: REG\_SZ  
Data: New  
  
Key Name:  
SOFTWARE\Informix\XPS8.00PG1\CurrentVersion\Setup\Shares  
Class Name: <NO CLASS>  
Last Write Time: 8/7/97 - 6:51 PM  
Value 0  
Name: \\INFORM4\SQEXPLN  
Type: REG\_SZ  
Data: New  
  
Key Name:  
SOFTWARE\Informix\XPS8.00PG1\CurrentVersion\Setup\Users  
Class Name: <NO CLASS>  
Last Write Time: 8/7/97 - 6:51 PM

Key Name:  
SOFTWARE\Informix\XPS8.00PG1\CurrentVersion\Setup\Users\\INFORM4\informix  
Class Name: <NO CLASS>  
Last Write Time: 8/7/97 - 6:51 PM  
Value 0  
Name: Object  
Type: REG\_SZ  
Data: Old  
  
Key Name:  
SOFTWARE\Informix\XPS8.00PG1\CurrentVersion\Setup\Users\\INFORM4\informix\Container groups  
Class Name: <NO CLASS>  
Last Write Time: 8/7/97 - 6:51 PM  
Value 0  
Name: \\INFORM4\Administrators(Local)  
Type: REG\_SZ  
Data:  
  
Value 1  
Name: \\INFORM4\Informix-Admin(Global)  
Type: REG\_SZ  
Data:

## Appendix B: Database Creation Statements

### **B-1: create\_tpcd\_database.bat**

```
@echo off
if "%1" == "" goto Usage
if "%DBDATE%" == "" goto EnvUsage

timer
echo create database
echo create database dssf%1 with log; | dbaccess
echo create the cogroup
onuntil cr_group.onu

echo moving logs to another disk
call cr_lfiles.bat
call move_logs.bat

echo create lineitem slice for the line item table
onuntil cr_line.onu

echo create order slice for the order tables
onuntil cr_order.onu

echo create the cust slice for customer table
onuntil cr_cust.onu
echo create supp slice for the supplier tables
onuntil cr_supp.onu
echo create partsupp slice for the partsupp tables
onuntil cr_partsupp.onu
echo create part slice for the parts tables
onuntil cr_part.onu
echo create slice for ocod index
onuntil cr_ocod.onu
echo create slice for lored index
onuntil cr_lored.onu
echo create slice for psp index
onuntil cr_psindex1.onu
echo create slice for pss index
onuntil cr_psindex2.onu
echo create slice for orderkey index
onuntil cr_okey.onu
echo create slice for lpqesod index
onuntil cr_lpqesod.onu
echo create the temp slice for temporary table
onuntil cr_temp.onu

echo "[START] creating tables ..."
sleep 5
timer
dbaccess dssf%1 create_tables.sql
sleep 5
timer
dbaccess dssf%1 load_tables.sql
sleep 5
timer
dbaccess dssf%1 create_indexes.sql
sleep 5
timer
dbaccess dssf%1 alter_it.sql
sleep 5
timer
dbaccess dssf%1 update_stats.sql
```

```
timer
xctl onmode -c
xctl onmode -kuy
echo "Database create and load complete !!"
echo "[END] TPC-D database ready ..."
timer
sleep 60

goto end

:Usage
echo Usage: create_tpcd_database dbsize
goto end

:EnvUsage
echo Environment Variable DBDATE is not set
goto end

:end
echo on
```

### **B-2: cr\_group.onu**

```
create cogroup ifmx from
ol_inform4.1;
```

### **B-3: move\_logs.sh**

```
echo moving logs to another disk
onuntil cr_logslice.onu
xctl onmode -sy
sleep 30
echo onuntil add_log.onu
onuntil add_log.onu
```

```
echo alter cogroup ifmx reset backup;
echo alter cogroup ifmx reset backup; | onuntil
```

```
xctl onmode -l
xctl onmode -l
xctl onmode -l
xctl onmode -l
xctl onmode -l
xctl onmode -c
```

```
echo onuntil drop_log.onu
onuntil drop_log.onu
```

```
xctl onmode -m
sleep 60
```

### **B-4: cr\_line.onu**

```
create dbslice l_month1 from cogroup ifmx chunk
"G:\100G\l_month1" size 1120000;
create dbslice l_month2 from cogroup ifmx chunk
"H:\100G\l_month1" size 1120000;
create dbslice l_month3 from cogroup ifmx chunk
"I:\100G\l_month1" size 1120000;
create dbslice l_month4 from cogroup ifmx chunk
"J:\100G\l_month1" size 1120000;
create dbslice l_month5 from cogroup ifmx chunk
"K:\100G\l_month1" size 1120000;
create dbslice l_month6 from cogroup ifmx chunk
"L:\100G\l_month1" size 1120000;
```













**B-17: create\_tables.sql**

```

drop table lineitem;
create operational table lineitem
(
  l_orderkey integer,
  l_partkey integer ,
  l_suppkey integer ,
  l_linenummer integer ,
  l_quantity decimal(12,2) NOT NULL,
  l_extendedprice decimal(12,2) NOT NULL,
  l_discount decimal(12,2) NOT NULL,
  l_tax decimal(12,2) ,
  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)
) fragment by hybrid(l_orderkey) expression
l_shipdate < '1992-02-01' in l_month1,
l_shipdate >= '1992-02-01' and l_shipdate < '1992-03-01' in
l_month2,
l_shipdate >= '1992-03-01' and l_shipdate < '1992-04-01' in
l_month3,
l_shipdate >= '1992-04-01' and l_shipdate < '1992-05-01' in
l_month4,
l_shipdate >= '1992-05-01' and l_shipdate < '1992-06-01' in
l_month5,
l_shipdate >= '1992-06-01' and l_shipdate < '1992-07-01' in
l_month6,
l_shipdate >= '1992-07-01' and l_shipdate < '1992-08-01' in
l_month7,
l_shipdate >= '1992-08-01' and l_shipdate < '1992-09-01' in
l_month8,
l_shipdate >= '1992-09-01' and l_shipdate < '1992-10-01' in
l_month9,
l_shipdate >= '1992-10-01' and l_shipdate < '1992-11-01' in
l_month10,
l_shipdate >= '1992-11-01' and l_shipdate < '1992-12-01' in
l_month11,
l_shipdate >= '1992-12-01' and l_shipdate < '1993-01-01' in
l_month12,
l_shipdate >= '1993-01-01' and l_shipdate < '1993-02-01' in
l_month13,
l_shipdate >= '1993-02-01' and l_shipdate < '1993-03-01' in
l_month14,
l_shipdate >= '1993-03-01' and l_shipdate < '1993-04-01' in
l_month15,
l_shipdate >= '1993-04-01' and l_shipdate < '1993-05-01' in
l_month16,
l_shipdate >= '1993-05-01' and l_shipdate < '1993-06-01' in
l_month17,
l_shipdate >= '1993-06-01' and l_shipdate < '1993-07-01' in
l_month18,
l_shipdate >= '1993-07-01' and l_shipdate < '1993-08-01' in
l_month19,
l_shipdate >= '1993-08-01' and l_shipdate < '1993-09-01' in
l_month20,
l_shipdate >= '1993-09-01' and l_shipdate < '1993-10-01' in
l_month21,
l_shipdate >= '1993-10-01' and l_shipdate < '1993-11-01' in
l_month22,
l_shipdate >= '1993-11-01' and l_shipdate < '1993-12-01' in
l_month23,
l_shipdate >= '1993-12-01' and l_shipdate < '1994-01-01' in

```

```

l_month24,
l_shipdate >= '1994-01-01' and l_shipdate < '1994-02-01' in
l_month25,
l_shipdate >= '1994-02-01' and l_shipdate < '1994-03-01' in
l_month26,
l_shipdate >= '1994-03-01' and l_shipdate < '1994-04-01' in
l_month27,
l_shipdate >= '1994-04-01' and l_shipdate < '1994-05-01' in
l_month28,
l_shipdate >= '1994-05-01' and l_shipdate < '1994-06-01' in
l_month29,
l_shipdate >= '1994-06-01' and l_shipdate < '1994-07-01' in
l_month30,
l_shipdate >= '1994-07-01' and l_shipdate < '1994-08-01' in
l_month31,
l_shipdate >= '1994-08-01' and l_shipdate < '1994-09-01' in
l_month32,
l_shipdate >= '1994-09-01' and l_shipdate < '1994-10-01' in
l_month33,
l_shipdate >= '1994-10-01' and l_shipdate < '1994-11-01' in
l_month34,
l_shipdate >= '1994-11-01' and l_shipdate < '1994-12-01' in
l_month35,
l_shipdate >= '1994-12-01' and l_shipdate < '1995-01-01' in
l_month36,
l_shipdate >= '1995-01-01' and l_shipdate < '1995-02-01' in
l_month37,
l_shipdate >= '1995-02-01' and l_shipdate < '1995-03-01' in
l_month38,
l_shipdate >= '1995-03-01' and l_shipdate < '1995-04-01' in
l_month39,
l_shipdate >= '1995-04-01' and l_shipdate < '1995-05-01' in
l_month40,
l_shipdate >= '1995-05-01' and l_shipdate < '1995-06-01' in
l_month41,
l_shipdate >= '1995-06-01' and l_shipdate < '1995-07-01' in
l_month42,
l_shipdate >= '1995-07-01' and l_shipdate < '1995-08-01' in
l_month43,
l_shipdate >= '1995-08-01' and l_shipdate < '1995-09-01' in
l_month44,
l_shipdate >= '1995-09-01' and l_shipdate < '1995-10-01' in
l_month45,
l_shipdate >= '1995-10-01' and l_shipdate < '1995-11-01' in
l_month46,
l_shipdate >= '1995-11-01' and l_shipdate < '1995-12-01' in
l_month47,
l_shipdate >= '1995-12-01' and l_shipdate < '1996-01-01' in
l_month48,
l_shipdate >= '1996-01-01' and l_shipdate < '1996-02-01' in
l_month49,
l_shipdate >= '1996-02-01' and l_shipdate < '1996-03-01' in
l_month50,
l_shipdate >= '1996-03-01' and l_shipdate < '1996-04-01' in
l_month51,
l_shipdate >= '1996-04-01' and l_shipdate < '1996-05-01' in
l_month52,
l_shipdate >= '1996-05-01' and l_shipdate < '1996-06-01' in
l_month53,
l_shipdate >= '1996-06-01' and l_shipdate < '1996-07-01' in
l_month54,
l_shipdate >= '1996-07-01' and l_shipdate < '1996-08-01' in
l_month55,
l_shipdate >= '1996-08-01' and l_shipdate < '1996-09-01' in
l_month56,
l_shipdate >= '1996-09-01' and l_shipdate < '1996-10-01' in
l_month57,
l_shipdate >= '1996-10-01' and l_shipdate < '1996-11-01' in

```

```

l_month58,
l_shipdate >= '1996-11-01' and l_shipdate < '1996-12-01' in
l_month59,
l_shipdate >= '1996-12-01' and l_shipdate < '1997-01-01' in
l_month60,
l_shipdate >= '1997-01-01' and l_shipdate < '1997-02-01' in
l_month61,
l_shipdate >= '1997-02-01' and l_shipdate < '1997-03-01' in
l_month62,
l_shipdate >= '1997-03-01' and l_shipdate < '1997-04-01' in
l_month63,
l_shipdate >= '1997-04-01' and l_shipdate < '1997-05-01' in
l_month64,
l_shipdate >= '1997-05-01' and l_shipdate < '1997-06-01' in
l_month65,
l_shipdate >= '1997-06-01' and l_shipdate < '1997-07-01' in
l_month66,
l_shipdate >= '1997-07-01' and l_shipdate < '1997-08-01' in
l_month67,
l_shipdate >= '1997-08-01' and l_shipdate < '1997-09-01' in
l_month68,
l_shipdate >= '1997-09-01' and l_shipdate < '1997-10-01' in
l_month69,
l_shipdate >= '1997-10-01' and l_shipdate < '1997-11-01' in
l_month70,
l_shipdate >= '1997-11-01' and l_shipdate < '1997-12-01' in
l_month71,
l_shipdate >= '1997-12-01' and l_shipdate < '1998-01-01' in
l_month72,
l_shipdate >= '1998-01-01' and l_shipdate < '1998-02-01' in
l_month73,
l_shipdate >= '1998-02-01' and l_shipdate < '1998-03-01' in
l_month74,
l_shipdate >= '1998-03-01' and l_shipdate < '1998-04-01' in
l_month75,
l_shipdate >= '1998-04-01' and l_shipdate < '1998-05-01' in
l_month76,
l_shipdate >= '1998-05-01' and l_shipdate < '1998-06-01' in
l_month77,
l_shipdate >= '1998-06-01' and l_shipdate < '1998-07-01' in
l_month78,
l_shipdate >= '1998-07-01' and l_shipdate < '1998-08-01' in
l_month79,
l_shipdate >= '1998-08-01' and l_shipdate < '1998-09-01' in
l_month80,
l_shipdate >= '1998-09-01' and l_shipdate < '1998-10-01' in
l_month81,
l_shipdate >= '1998-10-01' and l_shipdate < '1998-11-01' in
l_month82,
l_shipdate >= '1998-11-01' and l_shipdate < '1998-12-01' in
l_month83,
l_shipdate >= '1998-12-01' in l_month84
extent size 1100000 next size 2000
lock mode table;

drop table order;
create operational table order
(
o_orderkey integer,
o_custkey integer ,
o_orderstatus char(1) ,
o_totalprice decimal(12,2) ,
o_orderdate date,
o_orderpriority char(15) ,
o_clerk char(15),
o_shippriority integer ,
o_comment varchar(79)
) fragment by hybrid(o_orderkey) expression

```

```

o_orderdate < '1992-02-01' in o_month1,
o_orderdate >= '1992-02-01' and o_orderdate < '1992-03-01'
in o_month2,
o_orderdate >= '1992-03-01' and o_orderdate < '1992-04-01'
in o_month3,
o_orderdate >= '1992-04-01' and o_orderdate < '1992-05-01'
in o_month4,
o_orderdate >= '1992-05-01' and o_orderdate < '1992-06-01'
in o_month5,
o_orderdate >= '1992-06-01' and o_orderdate < '1992-07-01'
in o_month6,
o_orderdate >= '1992-07-01' and o_orderdate < '1992-08-01'
in o_month7,
o_orderdate >= '1992-08-01' and o_orderdate < '1992-09-01'
in o_month8,
o_orderdate >= '1992-09-01' and o_orderdate < '1992-10-01'
in o_month9,
o_orderdate >= '1992-10-01' and o_orderdate < '1992-11-01'
in o_month10,
o_orderdate >= '1992-11-01' and o_orderdate < '1992-12-01'
in o_month11,
o_orderdate >= '1992-12-01' and o_orderdate < '1993-01-01'
in o_month12,
o_orderdate >= '1993-01-01' and o_orderdate < '1993-02-01'
in o_month13,
o_orderdate >= '1993-02-01' and o_orderdate < '1993-03-01'
in o_month14,
o_orderdate >= '1993-03-01' and o_orderdate < '1993-04-01'
in o_month15,
o_orderdate >= '1993-04-01' and o_orderdate < '1993-05-01'
in o_month16,
o_orderdate >= '1993-05-01' and o_orderdate < '1993-06-01'
in o_month17,
o_orderdate >= '1993-06-01' and o_orderdate < '1993-07-01'
in o_month18,
o_orderdate >= '1993-07-01' and o_orderdate < '1993-08-01'
in o_month19,
o_orderdate >= '1993-08-01' and o_orderdate < '1993-09-01'
in o_month20,
o_orderdate >= '1993-09-01' and o_orderdate < '1993-10-01'
in o_month21,
o_orderdate >= '1993-10-01' and o_orderdate < '1993-11-01'
in o_month22,
o_orderdate >= '1993-11-01' and o_orderdate < '1993-12-01'
in o_month23,
o_orderdate >= '1993-12-01' and o_orderdate < '1994-01-01'
in o_month24,
o_orderdate >= '1994-01-01' and o_orderdate < '1994-02-01'
in o_month25,
o_orderdate >= '1994-02-01' and o_orderdate < '1994-03-01'
in o_month26,
o_orderdate >= '1994-03-01' and o_orderdate < '1994-04-01'
in o_month27,
o_orderdate >= '1994-04-01' and o_orderdate < '1994-05-01'
in o_month28,
o_orderdate >= '1994-05-01' and o_orderdate < '1994-06-01'
in o_month29,
o_orderdate >= '1994-06-01' and o_orderdate < '1994-07-01'
in o_month30,
o_orderdate >= '1994-07-01' and o_orderdate < '1994-08-01'
in o_month31,
o_orderdate >= '1994-08-01' and o_orderdate < '1994-09-01'
in o_month32,
o_orderdate >= '1994-09-01' and o_orderdate < '1994-10-01'
in o_month33,
o_orderdate >= '1994-10-01' and o_orderdate < '1994-11-01'
in o_month34,
o_orderdate >= '1994-11-01' and o_orderdate < '1994-12-01'

```

```

in o_month35,
o_orderdate >= '1994-12-01' and o_orderdate < '1995-01-01'
in o_month36,
o_orderdate >= '1995-01-01' and o_orderdate < '1995-02-01'
in o_month37,
o_orderdate >= '1995-02-01' and o_orderdate < '1995-03-01'
in o_month38,
o_orderdate >= '1995-03-01' and o_orderdate < '1995-04-01'
in o_month39,
o_orderdate >= '1995-04-01' and o_orderdate < '1995-05-01'
in o_month40,
o_orderdate >= '1995-05-01' and o_orderdate < '1995-06-01'
in o_month41,
o_orderdate >= '1995-06-01' and o_orderdate < '1995-07-01'
in o_month42,
o_orderdate >= '1995-07-01' and o_orderdate < '1995-08-01'
in o_month43,
o_orderdate >= '1995-08-01' and o_orderdate < '1995-09-01'
in o_month44,
o_orderdate >= '1995-09-01' and o_orderdate < '1995-10-01'
in o_month45,
o_orderdate >= '1995-10-01' and o_orderdate < '1995-11-01'
in o_month46,
o_orderdate >= '1995-11-01' and o_orderdate < '1995-12-01'
in o_month47,
o_orderdate >= '1995-12-01' and o_orderdate < '1996-01-01'
in o_month48,
o_orderdate >= '1996-01-01' and o_orderdate < '1996-02-01'
in o_month49,
o_orderdate >= '1996-02-01' and o_orderdate < '1996-03-01'
in o_month50,
o_orderdate >= '1996-03-01' and o_orderdate < '1996-04-01'
in o_month51,
o_orderdate >= '1996-04-01' and o_orderdate < '1996-05-01'
in o_month52,
o_orderdate >= '1996-05-01' and o_orderdate < '1996-06-01'
in o_month53,
o_orderdate >= '1996-06-01' and o_orderdate < '1996-07-01'
in o_month54,
o_orderdate >= '1996-07-01' and o_orderdate < '1996-08-01'
in o_month55,
o_orderdate >= '1996-08-01' and o_orderdate < '1996-09-01'
in o_month56,
o_orderdate >= '1996-09-01' and o_orderdate < '1996-10-01'
in o_month57,
o_orderdate >= '1996-10-01' and o_orderdate < '1996-11-01'
in o_month58,
o_orderdate >= '1996-11-01' and o_orderdate < '1996-12-01'
in o_month59,
o_orderdate >= '1996-12-01' and o_orderdate < '1997-01-01'
in o_month60,
o_orderdate >= '1997-01-01' and o_orderdate < '1997-02-01'
in o_month61,
o_orderdate >= '1997-02-01' and o_orderdate < '1997-03-01'
in o_month62,
o_orderdate >= '1997-03-01' and o_orderdate < '1997-04-01'
in o_month63,
o_orderdate >= '1997-04-01' and o_orderdate < '1997-05-01'
in o_month64,
o_orderdate >= '1997-05-01' and o_orderdate < '1997-06-01'
in o_month65,
o_orderdate >= '1997-06-01' and o_orderdate < '1997-07-01'
in o_month66,
o_orderdate >= '1997-07-01' and o_orderdate < '1997-08-01'
in o_month67,
o_orderdate >= '1997-08-01' and o_orderdate < '1997-09-01'
in o_month68,
o_orderdate >= '1997-09-01' and o_orderdate < '1997-10-01'

```

```

in o_month69,
o_orderdate >= '1997-10-01' and o_orderdate < '1997-11-01'
in o_month70,
o_orderdate >= '1997-11-01' and o_orderdate < '1997-12-01'
in o_month71,
o_orderdate >= '1997-12-01' and o_orderdate < '1998-01-01'
in o_month72,
o_orderdate >= '1998-01-01' and o_orderdate < '1998-02-01'
in o_month73,
o_orderdate >= '1998-02-01' and o_orderdate < '1998-03-01'
in o_month74,
o_orderdate >= '1998-03-01' and o_orderdate < '1998-04-01'
in o_month75,
o_orderdate >= '1998-04-01' and o_orderdate < '1998-05-01'
in o_month76,
o_orderdate >= '1998-05-01' and o_orderdate < '1998-06-01'
in o_month77,
o_orderdate >= '1998-06-01' and o_orderdate < '1998-07-01'
in o_month78,
o_orderdate >= '1998-07-01' and o_orderdate < '1998-08-01'
in o_month79,
o_orderdate >= '1998-08-01' and o_orderdate < '1998-09-01'
in o_month80,
o_orderdate >= '1998-09-01' and o_orderdate < '1998-10-01'
in o_month81,
o_orderdate >= '1998-10-01' and o_orderdate < '1998-11-01'
in o_month82,
o_orderdate >= '1998-11-01' and o_orderdate < '1998-12-01'
in o_month83,
o_orderdate >= '1998-12-01' in o_month84
extent size 260000 next size 2000
lock mode table;

```

```

drop table customer;
create operational table customer
(
c_custkey integer,
c_name varchar(25),
c_address varchar(40) ,
c_nationkey integer ,
c_phone char(15) ,
c_acctbal decimal(12,2) ,
c_mktsegment char(10) ,
c_comment varchar(117)
) fragment by hash(c_custkey) in cust
extent size 120000 next size 1000
lock mode table;

```

```

drop table part;
create operational table part
(
p_partkey integer,
p_name varchar(55),
p_mfgr char(25),
p_brand char(10) ,
p_type varchar(25) ,
p_size integer ,
p_container char(10) ,
p_retailprice decimal(12,2) ,
p_comment varchar(23)
) fragment by hash(p_partkey) in part
extent size 120000 next size 1000
lock mode table;

```

```

drop table supplier;
create operational table supplier
(
s_suppkey integer,

```

```

s_name char(25),
s_address varchar(40),
s_nationkey integer,
s_phone char(15),
s_acctbal decimal(12,2),
s_comment varchar(101)
) fragment by hash(s_suppkey) in supp
extent size 26000 next size 200
lock mode table;

drop table partsupp;
create operational table partsupp
(
ps_partkey integer,
ps_suppkey integer ,
ps_availqty integer ,
ps_supplycost decimal(12,2) ,
ps_comment varchar(199)
) fragment by hash(ps_partkey) in ps_supp1
extent size 600000 next size 1000
lock mode table;

drop table nation;
create operational table nation
(
n_nationkey integer,
n_name char(25),
n_regionkey integer,
n_comment varchar(152)
) in supp.1
extent size 16 next size 16
lock mode table;

drop table region;
create operational table region
(
r_regionkey integer,
r_name char(25),
r_comment varchar(152)
) in supp.1
extent size 16 next size 16
lock mode table;
grant select on customer to "public";
grant update on customer to "public";
grant insert on customer to "public";
grant delete on customer to "public";
grant index on customer to "public";
grant select on order to "public";
grant update on order to "public";
grant insert on order to "public";
grant delete on order to "public";
grant index on order to "public";
grant select on lineitem to "public";
grant update on lineitem to "public";
grant insert on lineitem to "public";
grant delete on lineitem to "public";
grant index on lineitem to "public";
grant select on part to "public";
grant update on part to "public";
grant insert on part to "public";
grant delete on part to "public";
grant index on part to "public";
grant select on supplier to "public";
grant update on supplier to "public";
grant insert on supplier to "public";
grant delete on supplier to "public";
grant index on supplier to "public";
grant select on partsupp to "public";

```

```

grant update on partsupp to "public";
grant insert on partsupp to "public";
grant delete on partsupp to "public";
grant index on partsupp to "public";
grant select on nation to "public";
grant update on nation to "public";
grant insert on nation to "public";
grant delete on nation to "public";
grant index on nation to "public";
grant select on region to "public";
grant update on region to "public";
grant insert on region to "public";
grant delete on region to "public";
grant index on region to "public";

```

### **B-18: load\_tables.sql**

```

alter table lineitem type (raw);
create external table lineitem_ext
sameas lineitem
using (
format "delimited",
datafiles (
"disk:1:v:\100G\lineitem.tbl.1",
"disk:1:v:\100G\lineitem.tbl.2",
"disk:1:v:\100G\lineitem.tbl.3",
"disk:1:v:\100G\lineitem.tbl.4",
"disk:1:v:\100G\lineitem.tbl.5",
"disk:1:v:\100G\lineitem.tbl.6",
"disk:1:v:\100G\lineitem.tbl.7",
"disk:1:v:\100G\lineitem.tbl.8",
"disk:1:v:\100G\lineitem.tbl.9",
"disk:1:v:\100G\lineitem.tbl.10",
"disk:1:v:\100G\lineitem.tbl.11",
"disk:1:v:\100G\lineitem.tbl.12",
"disk:1:v:\100G\lineitem.tbl.13",
"disk:1:v:\100G\lineitem.tbl.14",
"disk:1:v:\100G\lineitem.tbl.15",
"disk:1:v:\100G\lineitem.tbl.16",
"disk:1:v:\100G\lineitem.tbl.17",
"disk:1:v:\100G\lineitem.tbl.18",
"disk:1:v:\100G\lineitem.tbl.19",
"disk:1:v:\100G\lineitem.tbl.20",
"disk:1:X:\100G\lineitem.tbl.21",
"disk:1:X:\100G\lineitem.tbl.22",
"disk:1:X:\100G\lineitem.tbl.23",
"disk:1:X:\100G\lineitem.tbl.24",
"disk:1:X:\100G\lineitem.tbl.25",
"disk:1:X:\100G\lineitem.tbl.26",
"disk:1:X:\100G\lineitem.tbl.27",
"disk:1:X:\100G\lineitem.tbl.28",
"disk:1:X:\100G\lineitem.tbl.29",
"disk:1:X:\100G\lineitem.tbl.30",
"disk:1:X:\100G\lineitem.tbl.31",
"disk:1:X:\100G\lineitem.tbl.32",
"disk:1:X:\100G\lineitem.tbl.33",
"disk:1:X:\100G\lineitem.tbl.34",
"disk:1:X:\100G\lineitem.tbl.35",
"disk:1:X:\100G\lineitem.tbl.36",
"disk:1:X:\100G\lineitem.tbl.37",
"disk:1:X:\100G\lineitem.tbl.38",
"disk:1:X:\100G\lineitem.tbl.39",
"disk:1:X:\100G\lineitem.tbl.40",
"disk:1:Y:\100G\lineitem.tbl.41",
"disk:1:Y:\100G\lineitem.tbl.42",
"disk:1:Y:\100G\lineitem.tbl.43",
"disk:1:Y:\100G\lineitem.tbl.44",

```

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"disk:1:Y:\100G\lineitem.tbl.45",
"disk:1:Y:\100G\lineitem.tbl.46",
"disk:1:Y:\100G\lineitem.tbl.47",
"disk:1:Y:\100G\lineitem.tbl.48",
"disk:1:Y:\100G\lineitem.tbl.49",
"disk:1:Y:\100G\lineitem.tbl.50",
"disk:1:Y:\100G\lineitem.tbl.51",
"disk:1:Y:\100G\lineitem.tbl.52",
"disk:1:Y:\100G\lineitem.tbl.53",
"disk:1:Y:\100G\lineitem.tbl.54",
"disk:1:Y:\100G\lineitem.tbl.55",
"disk:1:Y:\100G\lineitem.tbl.56",
"disk:1:Y:\100G\lineitem.tbl.57",
"disk:1:Y:\100G\lineitem.tbl.58",
"disk:1:Y:\100G\lineitem.tbl.59",
"disk:1:Y:\100G\lineitem.tbl.60",
"disk:1:Z:\100G\lineitem.tbl.61",
"disk:1:Z:\100G\lineitem.tbl.62",
"disk:1:Z:\100G\lineitem.tbl.63",
"disk:1:Z:\100G\lineitem.tbl.64",
"disk:1:Z:\100G\lineitem.tbl.65",
"disk:1:Z:\100G\lineitem.tbl.66",
"disk:1:Z:\100G\lineitem.tbl.67",
"disk:1:Z:\100G\lineitem.tbl.68",
"disk:1:Z:\100G\lineitem.tbl.69",
"disk:1:Z:\100G\lineitem.tbl.70",
"disk:1:Z:\100G\lineitem.tbl.71",
"disk:1:Z:\100G\lineitem.tbl.72",
"disk:1:Z:\100G\lineitem.tbl.73",
"disk:1:Z:\100G\lineitem.tbl.74",
"disk:1:Z:\100G\lineitem.tbl.75",
"disk:1:Z:\100G\lineitem.tbl.76",
"disk:1:Z:\100G\lineitem.tbl.77",
"disk:1:Z:\100G\lineitem.tbl.78",
"disk:1:Z:\100G\lineitem.tbl.79",
"disk:1:Z:\100G\lineitem.tbl.80"
),
rejectfile "Z:\100G\lineitem%c.rej",
express
);
insert into lineitem select * from lineitem_ext;
drop table lineitem_ext;

alter table order type (raw);
create external table order_ext
sameas order
using (
format "delimited",
datafiles (
"disk:1:v:\100G\order.tbl.1",
"disk:1:v:\100G\order.tbl.2",
"disk:1:v:\100G\order.tbl.3",
"disk:1:v:\100G\order.tbl.4",
"disk:1:v:\100G\order.tbl.5",
"disk:1:v:\100G\order.tbl.6",
"disk:1:v:\100G\order.tbl.7",
"disk:1:v:\100G\order.tbl.8",
"disk:1:v:\100G\order.tbl.9",
"disk:1:v:\100G\order.tbl.10",
"disk:1:v:\100G\order.tbl.11",
"disk:1:v:\100G\order.tbl.12",
"disk:1:v:\100G\order.tbl.13",
"disk:1:v:\100G\order.tbl.14",
"disk:1:v:\100G\order.tbl.15",
"disk:1:v:\100G\order.tbl.16",
"disk:1:v:\100G\order.tbl.17",
"disk:1:v:\100G\order.tbl.18",
"disk:1:v:\100G\order.tbl.19",

```

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"disk:1:v:\100G\order.tbl.20",
"disk:1:X:\100G\order.tbl.21",
"disk:1:X:\100G\order.tbl.22",
"disk:1:X:\100G\order.tbl.23",
"disk:1:X:\100G\order.tbl.24",
"disk:1:X:\100G\order.tbl.25",
"disk:1:X:\100G\order.tbl.26",
"disk:1:X:\100G\order.tbl.27",
"disk:1:X:\100G\order.tbl.28",
"disk:1:X:\100G\order.tbl.29",
"disk:1:X:\100G\order.tbl.30",
"disk:1:X:\100G\order.tbl.31",
"disk:1:X:\100G\order.tbl.32",
"disk:1:X:\100G\order.tbl.33",
"disk:1:X:\100G\order.tbl.34",
"disk:1:X:\100G\order.tbl.35",
"disk:1:X:\100G\order.tbl.36",
"disk:1:X:\100G\order.tbl.37",
"disk:1:X:\100G\order.tbl.38",
"disk:1:X:\100G\order.tbl.39",
"disk:1:X:\100G\order.tbl.40",
"disk:1:Y:\100G\order.tbl.41",
"disk:1:Y:\100G\order.tbl.42",
"disk:1:Y:\100G\order.tbl.43",
"disk:1:Y:\100G\order.tbl.44",
"disk:1:Y:\100G\order.tbl.45",
"disk:1:Y:\100G\order.tbl.46",
"disk:1:Y:\100G\order.tbl.47",
"disk:1:Y:\100G\order.tbl.48",
"disk:1:Y:\100G\order.tbl.49",
"disk:1:Y:\100G\order.tbl.50",
"disk:1:Y:\100G\order.tbl.51",
"disk:1:Y:\100G\order.tbl.52",
"disk:1:Y:\100G\order.tbl.53",
"disk:1:Y:\100G\order.tbl.54",
"disk:1:Y:\100G\order.tbl.55",
"disk:1:Y:\100G\order.tbl.56",
"disk:1:Y:\100G\order.tbl.57",
"disk:1:Y:\100G\order.tbl.58",
"disk:1:Y:\100G\order.tbl.59",
"disk:1:Y:\100G\order.tbl.60",
"disk:1:Z:\100G\order.tbl.61",
"disk:1:Z:\100G\order.tbl.62",
"disk:1:Z:\100G\order.tbl.63",
"disk:1:Z:\100G\order.tbl.64",
"disk:1:Z:\100G\order.tbl.65",
"disk:1:Z:\100G\order.tbl.66",
"disk:1:Z:\100G\order.tbl.67",
"disk:1:Z:\100G\order.tbl.68",
"disk:1:Z:\100G\order.tbl.69",
"disk:1:Z:\100G\order.tbl.70",
"disk:1:Z:\100G\order.tbl.71",
"disk:1:Z:\100G\order.tbl.72",
"disk:1:Z:\100G\order.tbl.73",
"disk:1:Z:\100G\order.tbl.74",
"disk:1:Z:\100G\order.tbl.75",
"disk:1:Z:\100G\order.tbl.76",
"disk:1:Z:\100G\order.tbl.77",
"disk:1:Z:\100G\order.tbl.78",
"disk:1:Z:\100G\order.tbl.79",
"disk:1:Z:\100G\order.tbl.80"
),
rejectfile "Z:\100G\order%c.rej",
express
);
insert into order select * from order_ext;
drop table order_ext;

```

```

alter table customer type (raw);
create external table customer_ext
sameas customer
using (
format "delimited",
datafiles (
"disk:1:v:\100G\customer.tbl.1",
"disk:1:v:\100G\customer.tbl.2",
"disk:1:v:\100G\customer.tbl.3",
"disk:1:v:\100G\customer.tbl.4",
"disk:1:v:\100G\customer.tbl.5",
"disk:1:v:\100G\customer.tbl.6",
"disk:1:v:\100G\customer.tbl.7",
"disk:1:v:\100G\customer.tbl.8",
"disk:1:v:\100G\customer.tbl.9",
"disk:1:v:\100G\customer.tbl.10",
"disk:1:v:\100G\customer.tbl.11",
"disk:1:v:\100G\customer.tbl.12",
"disk:1:v:\100G\customer.tbl.13",
"disk:1:v:\100G\customer.tbl.14",
"disk:1:v:\100G\customer.tbl.15",
"disk:1:v:\100G\customer.tbl.16",
"disk:1:v:\100G\customer.tbl.17",
"disk:1:v:\100G\customer.tbl.18",
"disk:1:v:\100G\customer.tbl.19",
"disk:1:v:\100G\customer.tbl.20",
"disk:1:X:\100G\customer.tbl.21",
"disk:1:X:\100G\customer.tbl.22",
"disk:1:X:\100G\customer.tbl.23",
"disk:1:X:\100G\customer.tbl.24",
"disk:1:X:\100G\customer.tbl.25",
"disk:1:X:\100G\customer.tbl.26",
"disk:1:X:\100G\customer.tbl.27",
"disk:1:X:\100G\customer.tbl.28",
"disk:1:X:\100G\customer.tbl.29",
"disk:1:X:\100G\customer.tbl.30",
"disk:1:X:\100G\customer.tbl.31",
"disk:1:X:\100G\customer.tbl.32",
"disk:1:X:\100G\customer.tbl.33",
"disk:1:X:\100G\customer.tbl.34",
"disk:1:X:\100G\customer.tbl.35",
"disk:1:X:\100G\customer.tbl.36",
"disk:1:X:\100G\customer.tbl.37",
"disk:1:X:\100G\customer.tbl.38",
"disk:1:X:\100G\customer.tbl.39",
"disk:1:X:\100G\customer.tbl.40",
"disk:1:Y:\100G\customer.tbl.41",
"disk:1:Y:\100G\customer.tbl.42",
"disk:1:Y:\100G\customer.tbl.43",
"disk:1:Y:\100G\customer.tbl.44",
"disk:1:Y:\100G\customer.tbl.45",
"disk:1:Y:\100G\customer.tbl.46",
"disk:1:Y:\100G\customer.tbl.47",
"disk:1:Y:\100G\customer.tbl.48",
"disk:1:Y:\100G\customer.tbl.49",
"disk:1:Y:\100G\customer.tbl.50",
"disk:1:Y:\100G\customer.tbl.51",
"disk:1:Y:\100G\customer.tbl.52",
"disk:1:Y:\100G\customer.tbl.53",
"disk:1:Y:\100G\customer.tbl.54",
"disk:1:Y:\100G\customer.tbl.55",
"disk:1:Y:\100G\customer.tbl.56",
"disk:1:Y:\100G\customer.tbl.57",
"disk:1:Y:\100G\customer.tbl.58",
"disk:1:Y:\100G\customer.tbl.59",
"disk:1:Y:\100G\customer.tbl.60",
"disk:1:Z:\100G\customer.tbl.61",
"disk:1:Z:\100G\customer.tbl.62",

```

```

"disk:1:Z:\100G\customer.tbl.63",
"disk:1:Z:\100G\customer.tbl.64",
"disk:1:Z:\100G\customer.tbl.65",
"disk:1:Z:\100G\customer.tbl.66",
"disk:1:Z:\100G\customer.tbl.67",
"disk:1:Z:\100G\customer.tbl.68",
"disk:1:Z:\100G\customer.tbl.69",
"disk:1:Z:\100G\customer.tbl.70",
"disk:1:Z:\100G\customer.tbl.71",
"disk:1:Z:\100G\customer.tbl.72",
"disk:1:Z:\100G\customer.tbl.73",
"disk:1:Z:\100G\customer.tbl.74",
"disk:1:Z:\100G\customer.tbl.75",
"disk:1:Z:\100G\customer.tbl.76",
"disk:1:Z:\100G\customer.tbl.77",
"disk:1:Z:\100G\customer.tbl.78",
"disk:1:Z:\100G\customer.tbl.79",
"disk:1:Z:\100G\customer.tbl.80"
),
rejectfile "Z:\100G\customer%c.rej",
express
);
insert into customer select * from customer_ext;
drop table customer_ext;

```

```

alter table region type (raw);
create external table region_ext
sameas region
using (
format "delimited",
datafiles ("disk:1:Z:\100G\region.tbl"),
rejectfile "Z:\100G\region%c.rej",
express
);
insert into region select * from region_ext;
drop table region_ext;

```

```

alter table nation type (raw);
create external table nation_ext
sameas nation
using (
format "delimited",
datafiles ("disk:1:Z:\100G\nation.tbl"),
rejectfile "Z:\100G\nation%c.rej",
express
);
insert into nation select * from nation_ext;
drop table nation_ext;

```

```

alter table supplier type (raw);
create external table supp_ext
sameas supplier
using (
format "delimited",
datafiles (
"disk:1:v:\100G\supplier.tbl.1",
"disk:1:v:\100G\supplier.tbl.2",
"disk:1:v:\100G\supplier.tbl.3",
"disk:1:v:\100G\supplier.tbl.4",
"disk:1:v:\100G\supplier.tbl.5",
"disk:1:v:\100G\supplier.tbl.6",
"disk:1:v:\100G\supplier.tbl.7",
"disk:1:v:\100G\supplier.tbl.8",
"disk:1:v:\100G\supplier.tbl.9",
"disk:1:v:\100G\supplier.tbl.10",
"disk:1:v:\100G\supplier.tbl.11",
"disk:1:v:\100G\supplier.tbl.12",
"disk:1:v:\100G\supplier.tbl.13",

```

```

"disk:1:v:\100G\supplier.tbl.14",
"disk:1:v:\100G\supplier.tbl.15",
"disk:1:v:\100G\supplier.tbl.16",
"disk:1:v:\100G\supplier.tbl.17",
"disk:1:v:\100G\supplier.tbl.18",
"disk:1:v:\100G\supplier.tbl.19",
"disk:1:v:\100G\supplier.tbl.20",
"disk:1:X:\100G\supplier.tbl.21",
"disk:1:X:\100G\supplier.tbl.22",
"disk:1:X:\100G\supplier.tbl.23",
"disk:1:X:\100G\supplier.tbl.24",
"disk:1:X:\100G\supplier.tbl.25",
"disk:1:X:\100G\supplier.tbl.26",
"disk:1:X:\100G\supplier.tbl.27",
"disk:1:X:\100G\supplier.tbl.28",
"disk:1:X:\100G\supplier.tbl.29",
"disk:1:X:\100G\supplier.tbl.30",
"disk:1:X:\100G\supplier.tbl.31",
"disk:1:X:\100G\supplier.tbl.32",
"disk:1:X:\100G\supplier.tbl.33",
"disk:1:X:\100G\supplier.tbl.34",
"disk:1:X:\100G\supplier.tbl.35",
"disk:1:X:\100G\supplier.tbl.36",
"disk:1:X:\100G\supplier.tbl.37",
"disk:1:X:\100G\supplier.tbl.38",
"disk:1:X:\100G\supplier.tbl.39",
"disk:1:X:\100G\supplier.tbl.40",
"disk:1:Y:\100G\supplier.tbl.41",
"disk:1:Y:\100G\supplier.tbl.42",
"disk:1:Y:\100G\supplier.tbl.43",
"disk:1:Y:\100G\supplier.tbl.44",
"disk:1:Y:\100G\supplier.tbl.45",
"disk:1:Y:\100G\supplier.tbl.46",
"disk:1:Y:\100G\supplier.tbl.47",
"disk:1:Y:\100G\supplier.tbl.48",
"disk:1:Y:\100G\supplier.tbl.49",
"disk:1:Y:\100G\supplier.tbl.50",
"disk:1:Y:\100G\supplier.tbl.51",
"disk:1:Y:\100G\supplier.tbl.52",
"disk:1:Y:\100G\supplier.tbl.53",
"disk:1:Y:\100G\supplier.tbl.54",
"disk:1:Y:\100G\supplier.tbl.55",
"disk:1:Y:\100G\supplier.tbl.56",
"disk:1:Y:\100G\supplier.tbl.57",
"disk:1:Y:\100G\supplier.tbl.58",
"disk:1:Y:\100G\supplier.tbl.59",
"disk:1:Y:\100G\supplier.tbl.60",
"disk:1:Z:\100G\supplier.tbl.61",
"disk:1:Z:\100G\supplier.tbl.62",
"disk:1:Z:\100G\supplier.tbl.63",
"disk:1:Z:\100G\supplier.tbl.64",
"disk:1:Z:\100G\supplier.tbl.65",
"disk:1:Z:\100G\supplier.tbl.66",
"disk:1:Z:\100G\supplier.tbl.67",
"disk:1:Z:\100G\supplier.tbl.68",
"disk:1:Z:\100G\supplier.tbl.69",
"disk:1:Z:\100G\supplier.tbl.70",
"disk:1:Z:\100G\supplier.tbl.71",
"disk:1:Z:\100G\supplier.tbl.72",
"disk:1:Z:\100G\supplier.tbl.73",
"disk:1:Z:\100G\supplier.tbl.74",
"disk:1:Z:\100G\supplier.tbl.75",
"disk:1:Z:\100G\supplier.tbl.76",
"disk:1:Z:\100G\supplier.tbl.77",
"disk:1:Z:\100G\supplier.tbl.78",
"disk:1:Z:\100G\supplier.tbl.79",
"disk:1:Z:\100G\supplier.tbl.80"
),

```

```

rejectfile "Z:\100G\supplier%c.rej",
express
);
insert into supplier select * from supp_ext;
drop table supp_ext;

alter table partsupp type (raw);
create external table partsupp_ext
sameas partsupp
using (
format "delimited",
datafiles (
"disk:1:v:\100G\partsupp.tbl.1",
"disk:1:v:\100G\partsupp.tbl.2",
"disk:1:v:\100G\partsupp.tbl.3",
"disk:1:v:\100G\partsupp.tbl.4",
"disk:1:v:\100G\partsupp.tbl.5",
"disk:1:v:\100G\partsupp.tbl.6",
"disk:1:v:\100G\partsupp.tbl.7",
"disk:1:v:\100G\partsupp.tbl.8",
"disk:1:v:\100G\partsupp.tbl.9",
"disk:1:v:\100G\partsupp.tbl.10",
"disk:1:v:\100G\partsupp.tbl.11",
"disk:1:v:\100G\partsupp.tbl.12",
"disk:1:v:\100G\partsupp.tbl.13",
"disk:1:v:\100G\partsupp.tbl.14",
"disk:1:v:\100G\partsupp.tbl.15",
"disk:1:v:\100G\partsupp.tbl.16",
"disk:1:v:\100G\partsupp.tbl.17",
"disk:1:v:\100G\partsupp.tbl.18",
"disk:1:v:\100G\partsupp.tbl.19",
"disk:1:v:\100G\partsupp.tbl.20",
"disk:1:X:\100G\partsupp.tbl.21",
"disk:1:X:\100G\partsupp.tbl.22",
"disk:1:X:\100G\partsupp.tbl.23",
"disk:1:X:\100G\partsupp.tbl.24",
"disk:1:X:\100G\partsupp.tbl.25",
"disk:1:X:\100G\partsupp.tbl.26",
"disk:1:X:\100G\partsupp.tbl.27",
"disk:1:X:\100G\partsupp.tbl.28",
"disk:1:X:\100G\partsupp.tbl.29",
"disk:1:X:\100G\partsupp.tbl.30",
"disk:1:X:\100G\partsupp.tbl.31",
"disk:1:X:\100G\partsupp.tbl.32",
"disk:1:X:\100G\partsupp.tbl.33",
"disk:1:X:\100G\partsupp.tbl.34",
"disk:1:X:\100G\partsupp.tbl.35",
"disk:1:X:\100G\partsupp.tbl.36",
"disk:1:X:\100G\partsupp.tbl.37",
"disk:1:X:\100G\partsupp.tbl.38",
"disk:1:X:\100G\partsupp.tbl.39",
"disk:1:X:\100G\partsupp.tbl.40",
"disk:1:Y:\100G\partsupp.tbl.41",
"disk:1:Y:\100G\partsupp.tbl.42",
"disk:1:Y:\100G\partsupp.tbl.43",
"disk:1:Y:\100G\partsupp.tbl.44",
"disk:1:Y:\100G\partsupp.tbl.45",
"disk:1:Y:\100G\partsupp.tbl.46",
"disk:1:Y:\100G\partsupp.tbl.47",
"disk:1:Y:\100G\partsupp.tbl.48",
"disk:1:Y:\100G\partsupp.tbl.49",
"disk:1:Y:\100G\partsupp.tbl.50",
"disk:1:Y:\100G\partsupp.tbl.51",
"disk:1:Y:\100G\partsupp.tbl.52",
"disk:1:Y:\100G\partsupp.tbl.53",
"disk:1:Y:\100G\partsupp.tbl.54",
"disk:1:Y:\100G\partsupp.tbl.55",
"disk:1:Y:\100G\partsupp.tbl.56",

```

```

"disk:1:Y:\100G\partsupp.tbl.57",
"disk:1:Y:\100G\partsupp.tbl.58",
"disk:1:Y:\100G\partsupp.tbl.59",
"disk:1:Y:\100G\partsupp.tbl.60",
"disk:1:Z:\100G\partsupp.tbl.61",
"disk:1:Z:\100G\partsupp.tbl.62",
"disk:1:Z:\100G\partsupp.tbl.63",
"disk:1:Z:\100G\partsupp.tbl.64",
"disk:1:Z:\100G\partsupp.tbl.65",
"disk:1:Z:\100G\partsupp.tbl.66",
"disk:1:Z:\100G\partsupp.tbl.67",
"disk:1:Z:\100G\partsupp.tbl.68",
"disk:1:Z:\100G\partsupp.tbl.69",
"disk:1:Z:\100G\partsupp.tbl.70",
"disk:1:Z:\100G\partsupp.tbl.71",
"disk:1:Z:\100G\partsupp.tbl.72",
"disk:1:Z:\100G\partsupp.tbl.73",
"disk:1:Z:\100G\partsupp.tbl.74",
"disk:1:Z:\100G\partsupp.tbl.75",
"disk:1:Z:\100G\partsupp.tbl.76",
"disk:1:Z:\100G\partsupp.tbl.77",
"disk:1:Z:\100G\partsupp.tbl.78",
"disk:1:Z:\100G\partsupp.tbl.79",
"disk:1:Z:\100G\partsupp.tbl.80"
),
rejectfile "Z:\100G\partsupp%c.rej",
express
);
insert into partsupp select * from partsupp_ext;
drop table partsupp_ext;

alter table part type (raw);
create external table part_ext
sameas part
using (
format "delimited",
datafiles (
"disk:1:v:\100G\part.tbl.1",
"disk:1:v:\100G\part.tbl.2",
"disk:1:v:\100G\part.tbl.3",
"disk:1:v:\100G\part.tbl.4",
"disk:1:v:\100G\part.tbl.5",
"disk:1:v:\100G\part.tbl.6",
"disk:1:v:\100G\part.tbl.7",
"disk:1:v:\100G\part.tbl.8",
"disk:1:v:\100G\part.tbl.9",
"disk:1:v:\100G\part.tbl.10",
"disk:1:v:\100G\part.tbl.11",
"disk:1:v:\100G\part.tbl.12",
"disk:1:v:\100G\part.tbl.13",
"disk:1:v:\100G\part.tbl.14",
"disk:1:v:\100G\part.tbl.15",
"disk:1:v:\100G\part.tbl.16",
"disk:1:v:\100G\part.tbl.17",
"disk:1:v:\100G\part.tbl.18",
"disk:1:v:\100G\part.tbl.19",
"disk:1:v:\100G\part.tbl.20",
"disk:1:X:\100G\part.tbl.21",
"disk:1:X:\100G\part.tbl.22",
"disk:1:X:\100G\part.tbl.23",
"disk:1:X:\100G\part.tbl.24",
"disk:1:X:\100G\part.tbl.25",
"disk:1:X:\100G\part.tbl.26",
"disk:1:X:\100G\part.tbl.27",
"disk:1:X:\100G\part.tbl.28",
"disk:1:X:\100G\part.tbl.29",
"disk:1:X:\100G\part.tbl.30",
"disk:1:X:\100G\part.tbl.31",

```

```

"disk:1:X:\100G\part.tbl.32",
"disk:1:X:\100G\part.tbl.33",
"disk:1:X:\100G\part.tbl.34",
"disk:1:X:\100G\part.tbl.35",
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"disk:1:X:\100G\part.tbl.37",
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"disk:1:X:\100G\part.tbl.39",
"disk:1:X:\100G\part.tbl.40",
"disk:1:Y:\100G\part.tbl.41",
"disk:1:Y:\100G\part.tbl.42",
"disk:1:Y:\100G\part.tbl.43",
"disk:1:Y:\100G\part.tbl.44",
"disk:1:Y:\100G\part.tbl.45",
"disk:1:Y:\100G\part.tbl.46",
"disk:1:Y:\100G\part.tbl.47",
"disk:1:Y:\100G\part.tbl.48",
"disk:1:Y:\100G\part.tbl.49",
"disk:1:Y:\100G\part.tbl.50",
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"disk:1:Y:\100G\part.tbl.54",
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"disk:1:Y:\100G\part.tbl.56",
"disk:1:Y:\100G\part.tbl.57",
"disk:1:Y:\100G\part.tbl.58",
"disk:1:Y:\100G\part.tbl.59",
"disk:1:Y:\100G\part.tbl.60",
"disk:1:Z:\100G\part.tbl.61",
"disk:1:Z:\100G\part.tbl.62",
"disk:1:Z:\100G\part.tbl.63",
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"disk:1:Z:\100G\part.tbl.67",
"disk:1:Z:\100G\part.tbl.68",
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"disk:1:Z:\100G\part.tbl.70",
"disk:1:Z:\100G\part.tbl.71",
"disk:1:Z:\100G\part.tbl.72",
"disk:1:Z:\100G\part.tbl.73",
"disk:1:Z:\100G\part.tbl.74",
"disk:1:Z:\100G\part.tbl.75",
"disk:1:Z:\100G\part.tbl.76",
"disk:1:Z:\100G\part.tbl.77",
"disk:1:Z:\100G\part.tbl.78",
"disk:1:Z:\100G\part.tbl.79",
"disk:1:Z:\100G\part.tbl.80"
),
rejectfile "Z:\100G\part%c.rej",
express
);
insert into part select * from part_ext;
drop table part_ext;

alter table region type (operational);
alter table nation type (operational);
alter table part type (operational);
alter table partsupp type (operational);
alter table supplier type (operational);
alter table order type (operational);
alter table customer type (operational);
alter table lineitem type (operational);

```

**B-19: *update\_stats.sql***

```
set pdqpriority high;  
begin work;  
update statistics medium resolution 0.1 0.95;  
commit work;
```

**B-20: *alter\_it.sql***

```
alter table nation lock mode (page);
```

```
alter table region lock mode (page);  
alter table supplier lock mode (page);  
alter table part lock mode (page);  
alter table partsupp lock mode (page);  
alter table customer lock mode (page);  
alter table order lock mode (page);  
alter table lineitem lock mode (page);
```

## Appendix C: Query Validation EQT and Output

### C-1: Query 1

-- QUERY 1 PRICING SUMMARY REPORT QUERY

```
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 <= date('1998-12-01') - interval (90)
day (3) to day
group by l_returnflag,l_linestatus
order by l_returnflag,l_linestatus;
```

```
l_returnflag  A
l_linestatus  F
sum_qty       3773034.00
sum_base_price 5319329289.68
sum_disc_price 5053976845.7839
sum_charge    5256336547.68
avg_qty       25.51
avg_price     35964.01
avg_disc      0.05
count_order   147907
```

```
l_returnflag  N
l_linestatus  F
sum_qty       100245.00
sum_base_price 141459686.10
sum_disc_price 134380852.7691
sum_charge    139710306.87
avg_qty       25.63
avg_price     36160.45
avg_disc      0.05
count_order   3912
```

```
l_returnflag  N
l_linestatus  O
sum_qty       7464940.00
sum_base_price 10518546073.98
sum_disc_price 9992072944.4612
sum_charge    10392414192.06
avg_qty       25.54
avg_price     35990.13
avg_disc      0.05
count_order   292262
```

```
l_returnflag  R
l_linestatus  F
sum_qty       3779140.00
sum_base_price 5328886172.99
sum_disc_price 5062370635.9343
```

```
sum_charge    5265431221.82
avg_qty       25.55
avg_price     36025.46
avg_disc      0.05
count_order   147920
```

4 row(s) retrieved.

commit work;  
Data committed.

Query: 1 Date: 1997-08-13 Time: 16:28:05.796 16922.796

begin work;  
Started transaction.

-- using default substitutions

### C-2: Query 2

-- QUERY 2 MINIMUM COST SUPPLIER QUERY

```
select
FIRST 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;

s_acctbal 9828.21
s_name Supplier#000000647
n_name UNITED KINGDOM
p_partkey 13120
p_mfgr Manufacturer#5
s_address jB16PyPyB7B152jMjSPw3mS
s_phone 33-258-202-4782
s_comment z1QhSiMj11Bm7COILwh6QI0B1R2Mg4CLN
```

LhiP0wiMzy72hlkP715in2y6RS6N130lz  
51nSRL5gOg5S26hPCCQN2L

s\_acctbal 9508.37  
s\_name Supplier#000000070  
n\_name FRANCE  
p\_partkey 3563  
p\_mfgr Manufacturer#1  
s\_address M5C616R5h5SIMR3zzmLkSw24j2  
s\_phone 16-821-608-1166  
s\_comment m7z0CPSmBkhlChBAi3LkQ2CLw  
mhl6QP362RPS3044CB2y41yhOhjIBin0CL7yhxmhS  
4hBM07kQ1yyjOjz3C

s\_acctbal 9508.37  
s\_name Supplier#000000070  
n\_name FRANCE  
p\_partkey 17268  
p\_mfgr Manufacturer#4  
s\_address M5C616R5h5SIMR3zzmLkSw24j2  
s\_phone 16-821-608-1166  
s\_comment m7z0CPSmBkhlChBAi3LkQ2CLw  
mhl6QP362RPS3044CB2y41yhOhjIBin0CL7yhxmhS  
4hBM07kQ1yyjOjz3C

s\_acctbal 9453.01  
s\_name Supplier#000000802  
n\_name ROMANIA  
p\_partkey 10021  
p\_mfgr Manufacturer#5  
s\_address 5yARQNSLNRAlOIBnkNQCik3SOlyClk7nmRhA2h0  
s\_phone 29-342-882-6463  
s\_comment 65y3RQ2i0OP6Nz7mS hC  
PwxLy7LjQy6OI63xO3iBCz52Rm1zm0MziCMLij2n6wky  
51  
mBOWx Qh52iz QB1545Amxyj

s\_acctbal 9453.01  
s\_name Supplier#000000802  
n\_name ROMANIA  
p\_partkey 13275  
p\_mfgr Manufacturer#4  
s\_address 5yARQNSLNRAlOIBnkNQCik3SOlyClk7nmRhA2h0  
s\_phone 29-342-882-6463  
s\_comment 65y3RQ2i0OP6Nz7mS hC  
PwxLy7LjQy6OI63xO3iBCz52Rm1zm0MziCMLij2n6wky  
51  
mBOWx Qh52iz QB1545Amxyj

s\_acctbal 9192.10  
s\_name Supplier#000000115  
n\_name UNITED KINGDOM  
p\_partkey 13325  
p\_mfgr Manufacturer#1  
s\_address h0m3lzlSPMw2B0ny7LNyNckjRRn7iyMILBLA  
s\_phone 33-597-248-1220  
s\_comment 1QzQjhSyx  
ixm2lgz2Ry7075RL3MS5z36x56hxmR0wLN0LBxm164Lz  
CMmALzOajn4kz7  
i4wjOICON11C51M7nCMx66SBRAQA

s\_acctbal 9032.15  
s\_name Supplier#000000959  
n\_name GERMANY  
p\_partkey 4958  
p\_mfgr Manufacturer#4

s\_address 205LNCzxMCnQ5gnz4n S3ynP6Mhnw  
s\_phone 17-108-642-3106  
s\_comment Px z7kOx56I7jQz NwBBQhky  
yM7kLgXRQw5zw6 426Bm551C6 OkQ7hQPLixjM7y47B  
NP16CRi0kjk354lghx

s\_acctbal 8702.02  
s\_name Supplier#000000333  
n\_name RUSSIA  
p\_partkey 11810  
p\_mfgr Manufacturer#3  
s\_address 5iwkgN5n2BN15OmQk2602h0N6NzxPyiPN5lnj  
s\_phone 32-508-202-6136  
s\_comment SgimAjmn3wL7RlXmh3LCwOPnhjyl 7xxzAN  
4ACx43y65NwQ7P

s\_acctbal 8615.50  
s\_name Supplier#000000812  
n\_name FRANCE  
p\_partkey 10551  
p\_mfgr Manufacturer#2  
s\_address h4i2M2O0 ky1g2mlBOmxjzj0hA2h6nkSNhP  
s\_phone 16-585-724-6633  
s\_comment 57i0NAyR0RP2jOh54C6B22OISL

s\_acctbal 8615.50  
s\_name Supplier#000000812  
n\_name FRANCE  
p\_partkey 13811  
p\_mfgr Manufacturer#4  
s\_address h4i2M2O0 ky1g2mlBOmxjzj0hA2h6nkSNhP  
s\_phone 16-585-724-6633  
s\_comment 57i0NAyR0RP2jOh54C6B22OISL

s\_acctbal 8488.53  
s\_name Supplier#000000367  
n\_name RUSSIA  
p\_partkey 6854  
p\_mfgr Manufacturer#4  
s\_address nkmQ2Qzgh0wA 3x Sn2S7N5gmSOj xwC  
COSn6  
s\_phone 32-458-198-9557  
s\_comment 35C2RROP C NIgi2N  
SxAj0hQkn7kP5z4wSxSwgMxj6k4MRmh0S2Qm7R3z4jB  
OOQBm  
1

s\_acctbal 8430.52  
s\_name Supplier#000000646  
n\_name FRANCE  
p\_partkey 11384  
p\_mfgr Manufacturer#3  
s\_address 61SjP6S y B0 32111  
s\_phone 16-601-220-5489  
s\_comment  
kiw4NSNBnxy5kywzwyx0PMM21xiMOhxR423Akkm  
Q7CNwRzQS23Nzz22 mnm6P377Q3M  
j7n 56BLm6lxwllh kSmN

s\_acctbal 8271.39  
s\_name Supplier#000000146  
n\_name RUSSIA  
p\_partkey 4637  
p\_mfgr Manufacturer#5  
s\_address wh yPSk6hNBIB4133iQ0wS0 RhBhQ4zQ3lz  
s\_phone 32-792-619-3155  
s\_comment jjwgljRO63  
n7OM2MP0hg3L1mlwBMLmMIS4Cgyn

LA5PwC2P0AS6g3C5mkOj072NPig  
731m

s\_acctbal 8096.98  
s\_name Supplier#000000574  
n\_name RUSSIA  
p\_partkey 323  
p\_mfgr Manufacturer#4  
s\_address hCOj4Cgx43xx jgP4QkL7gLN65  
s\_phone 32-866-246-8752  
s\_comment  
OhxNj6SIB56315B3k5SCBzwQyLk76zlj4Ow2Q  
BC2wACkxh3SORCyx6nARzSQR2010k0  
BCPhOg6yQm

s\_acctbal 7392.78  
s\_name Supplier#000000170  
n\_name UNITED KINGDOM  
p\_partkey 7655  
p\_mfgr Manufacturer#2  
s\_address PCxjjzNQihLNxgLw0SiMmQ  
s\_phone 33-803-340-5398  
s\_comment M116S1xzg54iC3k7OPLQi3Cimhghz2BCIQk  
g5Ag12QSBhlglANnw4MR MBS 72A

s\_acctbal 7205.20  
s\_name Supplier#000000477  
n\_name GERMANY  
p\_partkey 10956  
p\_mfgr Manufacturer#5  
s\_address Mimj6403h zmAzAgg Bjy05O 2z  
s\_phone 17-180-144-7991  
s\_comment yRlyR SnMxmhPjAmBw  
S02AxQ6yOhBRIOWzmlx00A2Sx075kjlAknn7z2  
O0S7hy0Bi  
knwOQm6Pmz3gL4gj2z7

s\_acctbal 6820.35  
s\_name Supplier#000000007  
n\_name UNITED KINGDOM  
p\_partkey 13217  
p\_mfgr Manufacturer#5  
s\_address z45m2jBRzI5iILNz4  
s\_phone 33-990-965-2201  
s\_comment 1PhngjmiSQI0RzRACP0I4S70xSL  
QPSBM16072SkMLCgm4OOMjARLNQk3g1P3BB32AgB  
M1462B0CP7Rh24

s\_acctbal 6721.70  
s\_name Supplier#000000954  
n\_name FRANCE  
p\_partkey 4191  
p\_mfgr Manufacturer#3  
s\_address OM7xnNxNnkgQ mzh2g3RQmg1g  
s\_phone 16-537-341-8517  
s\_comment 5ni3yCkmz5ymx0kCg74zhLA  
B516Si1w152AkiByx1NI NgghAkkmNz1jASj4mxzxznO  
ySg7hAyM3MRRnBj

s\_acctbal 6329.90  
s\_name Supplier#000000996  
n\_name GERMANY  
p\_partkey 10735  
p\_mfgr Manufacturer#2  
s\_address  
k6135gA3zPwNi7L3R145mlnACjngOQQBB300iyA  
s\_phone 17-447-811-3282  
s\_comment PBO7wjlQMm1h3AAA 1NQAI0kkijnkRNgQ0

mh1z6QS0gC5IP1 ykmzNR20OIN506ARSO  
z3j

s\_acctbal 6173.87  
s\_name Supplier#000000408  
n\_name RUSSIA  
p\_partkey 18139  
p\_mfgr Manufacturer#1  
s\_address Cni6 zR5C4lh104POx5h05  
mg53CQ2Sw4SAM2M2x  
s\_phone 32-858-724-2950  
s\_comment  
10SxMOwhjON3khzQ124gNnyw7B4nL7ml4L5IISR

s\_acctbal 5364.99  
s\_name Supplier#000000785  
n\_name RUSSIA  
p\_partkey 13784  
p\_mfgr Manufacturer#4  
s\_address 71OnPzQkC2P1hRNRgjyQP4n1  
s\_phone 32-297-653-2203  
s\_comment kiiPQ3ik7R ykAhRx43Rw70L1Ok  
7AMi3AjRw7lklwxwyL6S2O1COyS4QB46m5M167m  
jMwCm0w

s\_acctbal 5069.27  
s\_name Supplier#000000328  
n\_name GERMANY  
p\_partkey 16327  
p\_mfgr Manufacturer#1  
s\_address 5O4033xSgml  
s\_phone 17-231-513-5721  
s\_comment OMk3ALAPNmj6IBLMAS7M1nCAS  
4xLj51iy2klix3nP26gAxPgANmk6zSi6 3A7m 11  
1BOwiC6xLB4hBRIPM

s\_acctbal 4941.88  
s\_name Supplier#000000321  
n\_name ROMANIA  
p\_partkey 7320  
p\_mfgr Manufacturer#5  
s\_address hyLQ mg42S2kAMlj M3BwMSjS  
s\_phone 29-573-279-1406  
s\_comment  
y2644kMhOkPCm5P5y7Lmz7OR6mgSmBN631RggmC

s\_acctbal 4672.25  
s\_name Supplier#000000239  
n\_name RUSSIA  
p\_partkey 12238  
p\_mfgr Manufacturer#1  
s\_address y4ymj7B5BN1nMSkwPPggAl  
s\_phone 32-396-654-6826  
s\_comment Py3RA2gykmSCmj0z3ii7Rzxzh6OyR RxS  
C3S23LPQ

s\_acctbal 4586.49  
s\_name Supplier#000000680  
n\_name RUSSIA  
p\_partkey 5679  
p\_mfgr Manufacturer#3  
s\_address BP1Nlw5nPMxRnOAwM  
s\_phone 32-522-382-1620  
s\_comment kA0y25RNO1Al  
im7SyiPzSym3M5OS52I6S576kn0S2k  
0mPBLIAzL6Ax7CM6iNi4CgCy  
6BlN7hlhxmlRng

s\_acctbal 4518.31  
s\_name Supplier#000000149  
n\_name FRANCE  
p\_partkey 18344  
p\_mfgr Manufacturer#5  
s\_address 4B QSY5B12  
s\_phone 16-660-553-2456  
s\_comment  
hijkPhgLIg4L1Q27y0Q42wh0Qz3jPiL4NgkM4NNg1  
lIQ1yNNBk1C1QnlRO7 4ki

s\_acctbal 4315.15  
s\_name Supplier#000000509  
n\_name FRANCE  
p\_partkey 18972  
p\_mfgr Manufacturer#2  
s\_address B5 iPRn7L4yMllgwCnRPMA  
s\_phone 16-298-154-3365  
s\_comment ygiPh7ymP7jBznmR2lQLLgimi1wik

s\_acctbal 3526.53  
s\_name Supplier#000000553  
n\_name FRANCE  
p\_partkey 8036  
p\_mfgr Manufacturer#4  
s\_address ylLOx2gMw 5iB16AiNL60Q  
s\_phone 16-599-552-3755  
s\_comment L3ggShlRlyxmR4MNI7Rw7OQign6yO

s\_acctbal 3526.53  
s\_name Supplier#000000553  
n\_name FRANCE  
p\_partkey 17018  
p\_mfgr Manufacturer#3  
s\_address ylLOx2gMw 5iB16AiNL60Q  
s\_phone 16-599-552-3755  
s\_comment L3ggShlRlyxmR4MNI7Rw7OQign6yO

s\_acctbal 3294.68  
s\_name Supplier#000000350  
n\_name GERMANY  
p\_partkey 4841  
p\_mfgr Manufacturer#4  
s\_address x5kRLZz1BPg0 BO 2hi1iOyh 30RRg0OPj  
s\_phone 17-113-181-4017  
s\_comment BjQznni44OmQ7S16y13zxk2M6nM4M  
27yMPML

s\_acctbal 2972.26  
s\_name Supplier#000000016  
n\_name RUSSIA  
p\_partkey 1015  
p\_mfgr Manufacturer#4  
s\_address B7wLkSLRjNS MS1C  
s\_phone 32-822-502-4215  
s\_comment C7w6S6QzhAPQmMmNmMN1hA0lIQOA  
00m1NmC25wyQ461SA jy03zmRh22MLM00zhmi

s\_acctbal 2963.09  
s\_name Supplier#000000840  
n\_name ROMANIA  
p\_partkey 3080  
p\_mfgr Manufacturer#2  
s\_address lynwiQkNh0  
CMRRck41306M2ij0jykg6QNgSCAzy  
s\_phone 29-781-337-5584  
s\_comment  
S7NRMx43RmOjxML6hxLyN75LzxBwB0wjSLx3

S3Cwh52S6iSOLhQm0 6C1 yzx3jPm6  
Sjg 5By0BCPwOR32i1CQgxR0gB43gh

s\_acctbal 2221.25  
s\_name Supplier#000000771  
n\_name ROMANIA  
p\_partkey 13981  
p\_mfgr Manufacturer#2  
s\_address LAjCRj13nAMzzhmw0Sx1Mg  
s\_phone 29-986-304-9006  
s\_comment jhk0N7NlhS23iCngC52BBC  
0jilM0wByx0LB5R070R2iCx113iQIS7xNhBRA0xknLNxL  
iA

s\_acctbal 1381.97  
s\_name Supplier#000000104  
n\_name FRANCE  
p\_partkey 18103  
p\_mfgr Manufacturer#3  
s\_address i Qnl4 1 jiwM C2yxAYl5R4SBQh54N6  
s\_phone 16-434-972-6922  
s\_comment  
MwnBw1g71Pig2Am7nz0Mm5SNI7OwQLAkN56ji

s\_acctbal 906.07  
s\_name Supplier#000000138  
n\_name ROMANIA  
p\_partkey 8363  
p\_mfgr Manufacturer#4  
s\_address iBxSxL11Mh3 6LS6PILPNlMjCQh22z6n5  
s\_phone 29-533-434-6776  
s\_comment nLjQAmCw77R2jRMgz5LSyxx1QN1  
4jMMO3RAkxOkzRmwQl3Qm5236k72RRPnim0 Bkz  
QnBMM6A PMml2n

s\_acctbal 765.69  
s\_name Supplier#000000799  
n\_name RUSSIA  
p\_partkey 11276  
p\_mfgr Manufacturer#2  
s\_address Am7yihz47mg NkgQL w By4  
s\_phone 32-579-339-1495  
s\_comment MMRPNQ  
4l66mQQPNniAiiL0PQ2C4yyBRn1nRlxxkj5Ak45Pw  
mQk1ROhz66BRQiiL g  
PRQRy 56MyQ nS1N14R 7MI6xhl2IOS3

s\_acctbal 727.89  
s\_name Supplier#000000470  
n\_name ROMANIA  
p\_partkey 6213  
p\_mfgr Manufacturer#3  
s\_address gAySBM2N7 PgwP5kiP4n7BzOik0M  
s\_phone 29-165-289-1523  
s\_comment zCkPgn  
6wN5A3R47gljIQ3hNSLShP2RALxCiinkOy4wCwA1LCiB  
O5yiSC yBAA lii

s\_acctbal 683.07  
s\_name Supplier#000000651  
n\_name RUSSIA  
p\_partkey 4888  
p\_mfgr Manufacturer#4  
s\_address  
ymQ6PByCh4lzxBBPLB2wwOhRh47wQMOSPL  
s\_phone 32-181-426-4490  
s\_comment  
kx6jhQkwz6RkRgPLPM30BgL1R726l1m5AMk0MmMQ

BQ nCihLxhMgCgRih6MmMx0Pgl  
RQ7AQnl72g50

**C-3: Query 3**

-- QUERY 3 SHIPPING PRIORITY QUERY

```
select
FIRST 10
  l_orderkey,
  sum(l_extendedprice * (1 - l_discount)) as
revenue,
  o_orderdate,
  o_shippriority
from
  customer, order, lineitem
where
  c_mktsegment = 'BUILDING' and
  c_custkey = o_custkey and
  l_orderkey = o_orderkey and
  o_orderdate < date('1995-03-15') and
  l_shipdate > date('1995-03-15')
group by l_orderkey,o_orderdate,o_shippriority
order by revenue desc,o_orderdate;
```

l_orderkey	revenue	o_orderdate	o_shippriority
260930	320547.2525	1995-03-12	0
402497	298879.5320	1995-02-12	0
457859	296490.6754	1995-01-17	0
509889	294068.8736	1995-02-03	0
58117	292632.8325	1995-02-21	0
538311	279665.9960	1995-03-07	0
588421	275477.1172	1995-03-03	0
416167	273765.4530	1995-02-22	0
97830	273227.0610	1995-03-04	0
90276	272233.9174	1995-03-04	0

10 row(s) retrieved.

commit work;  
Data committed.

Query: 3 Date: 1997-08-13 Time: 16:28:46.218 16964.218

begin work;  
Started transaction.

-- using default substitutions

**C-4: Query 4**

-- QUERY 4 ORDER PRIORITY CHECKING QUERY

```
select
  o_orderpriority,
  count(*) as order_count
from order
where
  o_orderdate >= date('1993-07-01') and
  o_orderdate < date('1993-07-01') + interval (3)
month to month and
exists
(select
  *
```

```
from
  lineitem
where
  l_orderkey = o_orderkey and
  l_commitdate < l_receiptdate)
group by o_orderpriority
order by o_orderpriority;
```

o_orderpriority	order_count
1-URGENT	999
2-HIGH	1002
3-MEDIUM	1021
4-NOT SPECIFIED	997
5-LOW	1089

5 row(s) retrieved.

commit work;  
Data committed.

Query: 4 Date: 1997-08-13 Time: 16:28:09.343 16927.343

begin work;  
Started transaction.

-- using default substitutions

**C-5: Query 5**

-- QUERY 5 LOCAL SUPPLIER VOLUME QUERY

```
select
  n_name,
  sum(l_extendedprice * (1 - l_discount)) as
revenue
from
  customer, order, lineitem, supplier, nation, region
where
  c_custkey = o_custkey and
  o_orderkey = l_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 >= date('1994-01-01') and
  o_orderdate < date('1994-01-01') + interval (1)
year to year
group by n_name
order by revenue desc;
```

n_name	revenue
CHINA	7349391.4710
INDONESIA	6485853.4033
INDIA	5505346.8197
JAPAN	5388883.5941
VIETNAM	4728846.6018

5 row(s) retrieved.

commit work;  
Data committed.

Query: 5 Date: 1997-08-13 Time: 16:28:48.203 16966.203

begin work;  
Started transaction.

-- using default substitutions

**C-6: Query 6**

```
-- QUERY 6 FORECASTING REVENUE CHANGE
QUERY
select
    sum(l_extendedprice * l_discount) as revenue
from
    lineitem
where
    l_shipdate >= date('1994-01-01') and
    l_shipdate < date('1994-01-01') + interval (1) year
to year and
    l_discount between .06 - 0.01 and .06 + 0.01 and
    l_quantity < 24;

revenue

11450588.0434

1 row(s) retrieved.
```

commit work;  
Data committed.

Query: 6 Date: 1997-08-13 Time: 16:28:15.968 16932.968

begin work;  
Started transaction.

-- using default substitutions

**C-7: Query 7**

```
-- QUERY 7 VOLUME SHIPPING QUERY
select
    n1.n_name as supp_nation,
    n2.n_name as cust_nation,
    year(l_shipdate) as year,
    sum(l_extendedprice * (1 - l_discount)) as
revenue
from
    supplier, lineitem, order, 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 date('1995-01-01') and date('1996-
12-31')
group by n1.n_name,n2.n_name,3
order by n1.n_name,n2.n_name,3;
```

supp_nation	cust_nation	year
FRANCE	GERMANY	1995
4611421.4400		
FRANCE	GERMANY	1996
4828420.3721		
GERMANY	FRANCE	1995
6755766.8409		
GERMANY	FRANCE	1996
5810951.3958		

4 row(s) retrieved.

commit work;  
Data committed.

Query: 7 Date: 1997-08-13 Time: 16:28:52.265 16970.265

begin work;  
Started transaction.

-- using default substitutions

**C-8: Query 8**

```
-- QUERY 8 NATIONAL MARKET SHARE QUERY
select
    year(o_orderdate) as year,
    round(sum(case when n2.n_name= 'BRAZIL'
then (l_extendedprice * (1 -
l_discount))
else 0
end)/sum(l_extendedprice * (1 - l_discount)),2) as
mkt_share
from
    part, supplier, lineitem, order, 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 date('1995-01-01') and
date('1996-12-31') and
    p_type = 'ECONOMY ANODIZED STEEL'

group by 1
order by 1;
```

year	mkt_share
1995	0.05
1996	0.09

2 row(s) retrieved.

commit work;  
Data committed.

Query: 8 Date: 1997-08-13 Time: 16:28:25.421 16943.421

begin work;  
Started transaction.

-- using default substitutions

C-9: Query 9

-- QUERY 9 PRODUCT TYPE PROFIT MEASURE

QUERY

select

n\_name as nation,  
year(o\_orderdate) as year,  
sum(L\_extendedprice \*  
(1 - L\_discount) - ps\_supplycost \* L\_quantity) as  
sum\_profit

from

part, supplier, lineitem, partsupp, order, 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%'

group by n\_name,2

order by n\_name,2 desc;

nation	year	sum_profit
ALGERIA	1998	1946316.0053
ALGERIA	1997	2973825.6921
ALGERIA	1996	3308881.5165
ALGERIA	1995	3092227.2988
ALGERIA	1994	3406958.7104
ALGERIA	1993	3140744.0263
ALGERIA	1992	3330704.4066
ARGENTINA	1998	3045410.0081
ARGENTINA	1997	4255378.5927
ARGENTINA	1996	4651751.9367
ARGENTINA	1995	4897797.0030
ARGENTINA	1994	4823465.7691
ARGENTINA	1993	4499810.7131
ARGENTINA	1992	4764593.3861
BRAZIL	1998	2932051.3632
BRAZIL	1997	3784531.3499
BRAZIL	1996	3965665.6899
BRAZIL	1995	4063060.8607
BRAZIL	1994	4236277.3501
BRAZIL	1993	4363461.3131
BRAZIL	1992	4684749.2328
CANADA	1998	2217064.0383
CANADA	1997	2950110.6103
CANADA	1996	3184049.9686
CANADA	1995	3962540.1948
CANADA	1994	3365251.0225
CANADA	1993	3617013.3667
CANADA	1992	3407955.2491
CHINA	1998	3048192.0230
CHINA	1997	5001207.6910

CHINA	1996	4800958.3133
CHINA	1995	5154927.7284
CHINA	1994	5882634.5341
CHINA	1993	4733364.8206
CHINA	1992	5014704.0793
EGYPT	1998	1892538.7444
EGYPT	1997	3849220.0749
EGYPT	1996	3418656.5535
EGYPT	1995	3766170.6034
EGYPT	1994	3520025.5593
EGYPT	1993	4375424.7450
EGYPT	1992	4586034.3943
ETHIOPIA	1998	1860117.7283
ETHIOPIA	1997	3705722.3335
ETHIOPIA	1996	3577215.3925
ETHIOPIA	1995	3425219.5519
ETHIOPIA	1994	3428616.1848
ETHIOPIA	1993	3459815.4314
ETHIOPIA	1992	3280072.9080
FRANCE	1998	1592531.5484
FRANCE	1997	2746176.5385
FRANCE	1996	2505844.8797
FRANCE	1995	2902077.0045
FRANCE	1994	2532229.5603
FRANCE	1993	2305725.4424
FRANCE	1992	2955126.6886
GERMANY	1998	3538625.7338
GERMANY	1997	4425943.3995
GERMANY	1996	4266344.9555
GERMANY	1995	3952963.5162
GERMANY	1994	4462655.7983
GERMANY	1993	4435094.6575
GERMANY	1992	4521715.4116
INDIA	1998	3378369.3369
INDIA	1997	4186477.8481
INDIA	1996	5074383.9250
INDIA	1995	4487435.3793
INDIA	1994	4718312.6259
INDIA	1993	4499573.8099
INDIA	1992	4712930.3331
INDONESIA	1998	2902077.1015
INDONESIA	1997	4973644.2283
INDONESIA	1996	4977652.4887
INDONESIA	1995	5359380.1510
INDONESIA	1994	4854637.1996
INDONESIA	1993	4213131.4235
INDONESIA	1992	4999478.5062
IRAN	1998	2415763.1012
IRAN	1997	4227175.1094
IRAN	1996	4527365.0271
IRAN	1995	4139514.7174
IRAN	1994	4166316.3907
IRAN	1993	3366959.5882
IRAN	1992	3599399.7018
IRAQ	1998	2596922.6334
IRAQ	1997	3707054.1118
IRAQ	1996	3726138.3835
IRAQ	1995	4350503.8921
IRAQ	1994	4131512.7911
IRAQ	1993	3787196.4208
IRAQ	1992	4043738.1336
JAPAN	1998	2265666.9424
JAPAN	1997	3988819.2811
JAPAN	1996	4319004.5339
JAPAN	1995	4262698.6369
JAPAN	1994	3545212.6196
JAPAN	1993	4051565.9746
JAPAN	1992	3692137.4454

JORDAN	1998	1978591.7418
JORDAN	1997	3315454.2870
JORDAN	1996	3236531.9798
JORDAN	1995	2778207.9861
JORDAN	1994	2420301.0715
JORDAN	1993	3272130.9349
JORDAN	1992	2649126.0864
KENYA	1998	2265677.7268
KENYA	1997	3493019.3230
KENYA	1996	3346373.2964
KENYA	1995	3537360.3249
KENYA	1994	2800950.7159
KENYA	1993	3477468.3019
KENYA	1992	2719618.0405
MOROCCO	1998	2549499.9295
MOROCCO	1997	3891824.8983
MOROCCO	1996	3730777.7351
MOROCCO	1995	3469641.1344
MOROCCO	1994	3747593.2076
MOROCCO	1993	3620742.6983
MOROCCO	1992	4303609.2486
MOZAMBIQUE	1998	2024719.4607
MOZAMBIQUE	1997	3706003.0867
MOZAMBIQUE	1996	3376430.9303
MOZAMBIQUE	1995	2737631.6427
MOZAMBIQUE	1994	3373146.4811
MOZAMBIQUE	1993	3608300.3738
MOZAMBIQUE	1992	3551263.9502
PERU	1998	2142791.9724
PERU	1997	4664076.1540
PERU	1996	3623628.9338
PERU	1995	3908939.7912
PERU	1994	3386204.1565
PERU	1993	3877048.4889
PERU	1992	3768394.2488
ROMANIA	1998	1760625.7030
ROMANIA	1997	2707685.3292
ROMANIA	1996	2553345.4786
ROMANIA	1995	2715901.5896
ROMANIA	1994	3023644.0564
ROMANIA	1993	2873247.3205
ROMANIA	1992	2728060.7073
RUSSIA	1998	2975973.2167
RUSSIA	1997	3785806.4681
RUSSIA	1996	4217625.5866
RUSSIA	1995	3883445.5153
RUSSIA	1994	4395855.0063
RUSSIA	1993	3900944.1769
RUSSIA	1992	4691358.6091
SAUDI ARABIA	1998	2931482.8334
SAUDI ARABIA	1997	5498943.1556
SAUDI ARABIA	1996	4473723.7384
SAUDI ARABIA	1995	5939212.9339
SAUDI ARABIA	1994	4527695.7092
SAUDI ARABIA	1993	4928702.0169
SAUDI ARABIA	1992	5527261.5215
UNITED KINGDOM	1998	3198731.3729
UNITED KINGDOM	1997	4363882.7444
UNITED KINGDOM	1996	4730956.6742
UNITED KINGDOM	1995	4842014.5464
UNITED KINGDOM	1994	4912706.5567
UNITED KINGDOM	1993	4415255.9632
UNITED KINGDOM	1992	4375524.2303
UNITED STATES	1998	1892045.1604
UNITED STATES	1997	3102027.8595
UNITED STATES	1996	3334320.2579
UNITED STATES	1995	3168244.6043
UNITED STATES	1994	3296960.1009

UNITED STATES	1993	3558109.0546
UNITED STATES	1992	2755129.3878
VIETNAM	1998	2906627.0252
VIETNAM	1997	4544560.4478
VIETNAM	1996	4314258.9990
VIETNAM	1995	4365340.8614
VIETNAM	1994	3686987.7125
VIETNAM	1993	3764237.1787
VIETNAM	1992	3420922.0038

175 row(s) retrieved.

commit work;  
Data committed.

Query: 9 Date: 1997-08-13 Time: 16:29:02.546 16980.546

Database closed.

### C-10: Query 10

```
-- QUERY 10 RETURNED ITEM REPORTING QUERY
select
FIRST 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, order, lineitem, nation
where
    c_custkey = o_custkey and
    l_orderkey = o_orderkey and
    o_orderdate >= date('1993-10-01') and
    o_orderdate < date('1993-10-01') + interval (3)
month to month and
    l_returnflag = 'R' and
    c_nationkey = n_nationkey
group by
c_custkey,c_name,c_acctbal,c_phone,n_name,c_address,c_c
omment
order by revenue desc;

c_custkey 9722
c_name Customer#000009722
revenue 464618.2584
c_acctbal 474.04
n_name CANADA
c_address lMwzn4NAk6j
c_phone 13-518-602-8070
c_comment 5L 500y
RSgBAzPxmOSi5wk6xxOR7kh2nnPlgy7LBng2hOw5B01
RmCM120L24Pkg7PS
1zwC11BCnz4L6i15PkixP26166

c_custkey 12800
```

c\_name Customer#000012800  
revenue 444265.6422  
c\_acctbal 1900.84  
n\_name PERU  
c\_address 57zjB3CQx4P4OB2R2MBi2mwhSIIM4mn 4  
nC6  
c\_phone 27-142-205-3552  
c\_comment 0hwglS77RB56Rx436lQ0N16CxxOPnmyhgwz  
5z64wnj1kiC4jL350mM41y71hNxBIIPj  
yA4hiN1wzjjM7SCxAN244mk2A

c\_custkey 1025  
c\_name Customer#000001025  
revenue 442028.0224  
c\_acctbal 3363.46  
n\_name INDIA  
c\_address lkiSn154M5ROi  
c\_phone 18-588-456-4616  
c\_comment  
0BI45z233Rniw00064nPbgP16kimO0y74iLh73g1N4  
m310 jQ yQzPA50iC 3MA75g  
2Bj162Nw4P

c\_custkey 13028  
c\_name Customer#000013028  
revenue 441692.2402  
c\_acctbal -452.66  
n\_name UNITED KINGDOM  
c\_address yP714ORSNgNN2LA3L5B  
c\_phone 33-253-660-2127  
c\_comment xPkmnhL2BkhkNyww4khlxwwAymN  
h11PSjBCNMi50LkyOhO6CC 5nzOQCALzliOk2R66  
w 105hRPO3iSP

c\_custkey 3694  
c\_name Customer#000003694  
revenue 438180.0696  
c\_acctbal 2960.44  
n\_name UNITED KINGDOM  
c\_address 2CCkImCBOCC  
c\_phone 33-421-331-3127  
c\_comment MzLxQxLLx3MPxlAwg1B5kg61zxkPnk  
xiAm6PhMMAAQ2nzN3S6zzgP x70w0lhhPx4Q  
RzIMMy0204IAI3mBO7jh2jAP0N60wg367z

c\_custkey 976  
c\_name Customer#000000976  
revenue 435897.6317  
c\_acctbal 7772.85  
n\_name ROMANIA  
c\_address QzR 56Px1kgS wANnAz02RS 30n Pm  
c\_phone 29-436-660-4732  
c\_comment kzn32776  
gwzkMzzzO4yxOAnkR7hR4R4x2SMwilz3x6h  
nN7OnNLRMml3 kz5SLwi1yk  
lOxiwS4g0wmA5A 4hmgBSwRRiQ1

c\_custkey 8206  
c\_name Customer#000008206  
revenue 429905.1096  
c\_acctbal 6046.36  
n\_name ARGENTINA  
c\_address P yMg30BBBBx NMgC03AmzN2  
c\_phone 11-571-859-1370  
c\_comment  
hLi122RMPmLC36Oy0kxO71zz2wCR0QQCI7z26hlQ3mM

c\_custkey 13532

c\_name Customer#000013532  
revenue 427731.8043  
c\_acctbal -924.18  
n\_name KENYA  
c\_address  
6ij7M5PBMx2kwvwy62Oj4SL5S0mRCw13m1Rmw  
c\_phone 24-525-332-7244  
c\_comment 7ih7yRz214zO67AiNPx64nO515k  
yj6i3jLA5PCL15Q4QIA3ll60iM1P iBxCixg6 1h  
Ch2RCnjOzk5R OnO 1OhhC3m4631m5

c\_custkey 12745  
c\_name Customer#000012745  
revenue 422327.6927  
c\_acctbal 9691.33  
n\_name CHINA  
c\_address SgS1LMC4gB2NM3wh  
c\_phone 28-985-189-6174  
c\_comment ji72wjSw0 S6 7L4Cgxw PkyO5NI2LL7LBR

c\_custkey 2344  
c\_name Customer#000002344  
revenue 411240.1086  
c\_acctbal 5597.22  
n\_name MOROCCO  
c\_address O3PC7ikBgw OAzPAIm2P 426zm3BnBN6Q1O  
6N  
c\_phone 25-593-745-7663  
c\_comment 5NBn0wRNngLw2z5kyn1AhL0ASyg6SMhM  
i2kMOyxARAnlO0Q5j4CBNARix7ABIMAC

c\_custkey 2656  
c\_name Customer#000002656  
revenue 401185.9523  
c\_acctbal 8115.55  
n\_name ALGERIA  
c\_address On551AS3Rm5RxS m  
c\_phone 10-667-469-8092  
c\_comment 46ABx4jgni mBMPCLxRhyPQM4RNS  
5yO1L7zSOmk MhPxAxQQ6lQnLj 17LymOhi415  
  
innzOyB2Olxzmw3gmx0SxiyBN5CSMNgCkLCKmG0

c\_custkey 59  
c\_name Customer#000000059  
revenue 400759.1501  
c\_acctbal 3458.60  
n\_name ARGENTINA  
c\_address wP6CMyClly0IS4CAM1mzm  
c\_phone 11-355-584-3112  
c\_comment 11g7xBCxxC7SM  
5AkmmnAk00677O1MzA2R7A0Cx0Njixj56jL2iN  
PnkSNQiy55m6ki3  
OgnhM47mSR7B

c\_custkey 7069  
c\_name Customer#000007069  
revenue 396217.5195  
c\_acctbal 8198.94  
n\_name INDONESIA  
c\_address 55Cw7ChL4Bi5ONn2A4m2i2n4nSNQQMjml  
c\_phone 19-644-744-1798  
c\_comment  
6jNS624175zlxNli4lxO5zyPykPS1xniIS0NhkgOAKSx7P

c\_custkey 6553  
c\_name Customer#000006553  
revenue 385863.5946

c\_acctbal 8985.90  
 n\_name MOZAMBIQUE  
 c\_address R3LnnxONBjCLC0MRkxy7  
 c\_phone 26-166-724-4677  
 c\_comment S7CKnLwA3kh006j71lwAIC25Bw6AMQ6i  
 6C0OSS6O7ARNNny60Ogh 3642mRxyiAgy5  
 yk 3nPO4473wkNg5R6gzO4lz3zmM2m7MiLAILCC

c\_custkey 3095  
 c\_name Customer#000003095  
 revenue 384246.1083  
 c\_acctbal 8829.21  
 n\_name IRAQ  
 c\_address S1gMCnBLwzi mCgB664  
 ji00L11Snh1iPMgCgR5  
 c\_phone 21-847-218-8188  
 c\_comment 3LSx7Pxs  
 A4A5Cl3gAy3mg4Qj2xQlyx7xM1kA664AM7zmMmzORh  
 3C1h MO3nw6Mymilj  
 AMg65hOMB4Sn44kO w0lin7

c\_custkey 3391  
 c\_name Customer#000003391  
 revenue 382541.7762  
 c\_acctbal 7742.35  
 n\_name CANADA  
 c\_address m3 CORmQNLzkShymLS iMkCimRSI20 NB  
 c\_phone 13-592-494-2668  
 c\_comment ynMlmhMBA5ikC1nCghlmAhQ0  
 675S3y2R33yjkNPQOS

c\_custkey 13678  
 c\_name Customer#000013678  
 revenue 376280.5564  
 c\_acctbal 9030.40  
 n\_name MOROCCO  
 c\_address BMk77IQm1lwNA0LghAkg3hCwNI4  
 c\_phone 25-306-951-3937  
 c\_comment  
 mOS55RASx1wp136nQ5xBLznLhgw1kQ6PO6imNxQ7kR  
 0x71P0SzByMzh

c\_custkey 6062  
 c\_name Customer#000006062  
 revenue 374512.6544  
 c\_acctbal 1370.35  
 n\_name CANADA  
 c\_address n5zzil6zyxAlkzx7x1nihigPzR OBkR znMOMh  
 c\_phone 13-756-700-4918  
 c\_comment 4zAm4wNB  
 li4QRPGpZ2wM541x043hmLj4O3LBkALCP16hj2RQBO1O  
 MNly7ww1QP7w5i  
 SSn0jNhAR yQmzm1hi5j3

c\_custkey 554  
 c\_name Customer#00000554  
 revenue 373004.4702  
 c\_acctbal 8395.57  
 n\_name BRAZIL  
 c\_address jC5zhQky4zQB27IB5Sm AQhQ Px0  
 c\_phone 12-938-503-7317  
 c\_comment 0nxCl3 xSmiLQO 1M  
 2n0NCiRlnMMxP25j26x2igLhNOxjgMgmwwy7OkjzCACO  
 g0z2LA  
 jOm0RPRmOPiCAAQwLIQSG 1yS3  
 gLCM1M2BzjnSjPI3nwAkk

c\_custkey 13126

c\_name Customer#000013126  
 revenue 371722.0011  
 c\_acctbal 6172.91  
 n\_name INDIA  
 c\_address xPAS4MnPh40i5Q2h4NQ61zz4RkyAwANA  
 c\_phone 18-288-190-4145  
 c\_comment nniMkAN6C0CIQ0mMmPz27liz4hk6L  
 2MlwPxx42N110R2hRwxxzlwMkxO4MAyz7RCj43  
 NxLwQ3m6P27yAj

20 row(s) retrieved.

commit work;  
 Data committed.

Query: 10 Date: 1997-08-13 Time: 16:28:13.281 16931.281

begin work;  
 Started transaction.

-- using default substitutions

### C-11: Query 11

-- QUERY 11 IMPORTANT STOCK IDENTIFICATION  
 QUERY

```
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) *
    0.0010000000
    from
        partsupp, supplier, nation
    where
        ps_suppkey = s_suppkey and
        s_nationkey = n_nationkey and
        n_name = 'GERMANY')
order by value desc;
```

ps_partkey	value
12098	16227681.21
5134	15709338.52
13334	15023662.41
17052	14351644.20
3452	14070870.14
12552	13332469.18
1084	13170428.29
5797	13038622.72
12633	12892561.61
403	12856217.34
1833	12024581.72
2084	11502875.36
17349	11354213.05
18427	11282385.24

```

2860 11262529.95
17852 109347111.93
9871 10889253.68
12231 10841131.39
6366 10759786.81
12146 10257362.66
5043 10226395.88
12969 10125777.93

```

22 row(s) retrieved.

commit work;  
Data committed.

Query: 11 Date: 1997-08-13 Time: 16:28:14.421 16932.421

begin work;  
Started transaction.

-- using default substitutions

**C-12: Query 12**

-- QUERY 12 SHIPPING MODES AND ORDER  
PRIORITY QUERY  
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
    order, 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 >= date('1994-01-01') and
    l_receiptdate < date('1994-01-01') +
interval (1) year to year
group by l_shipmode
order by l_shipmode;

```

l\_shipmode high\_line\_count low\_line\_count

```

MAIL          654          950
SHIP          684         1004

```

2 row(s) retrieved.

commit work;  
Data committed.

Query: 12 Date: 1997-08-13 Time: 16:28:35.703 16952.703

begin work;  
Started transaction.

-- using default substitutions

**C-13: Query 13**

-- QUERY 13 SALES CLERK PERFORMANCE QUERY  
select

```

    year(o_orderdate) as year,
    sum(l_extendedprice * (1 - l_discount)) as
revenue
from
    lineitem, order
where
    o_orderkey = l_orderkey and
    o_clerk = 'Clerk#000000088' and
    l_returnflag = 'R'
group by 1
order by 1;

```

```

year    revenue
1992    1262855.7306
1993    964121.0328
1994    1750395.2936
1995    198820.2992

```

4 row(s) retrieved.

commit work;  
Data committed.

Query: 13 Date: 1997-08-13 Time: 16:28:49.140 16967.140

begin work;  
Started transaction.

-- using default substitutions

**C-14: Query 14**

-- QUERY 14 PROMOTION EFFECT QUERY  
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 >= date('1995-09-01') and
    l_shipdate < date('1995-09-01') + interval (1)
month to month;

```

```

promo_revenue
16.73

```

1 row(s) retrieved.

commit work;  
Data committed.

Query: 14 Date: 1997-08-13 Time: 16:28:22.718 16939.718

begin work;  
Started transaction.

-- using default substitutions

**C-15: Query 15b**

-- QUERY 15b TOP SUPPLIER QUERY

create table revenue0  
(supplier\_no integer,  
total\_revenue decimal(13,3))  
fragment by round robin in o\_okey1;  
Table created.

insert into revenue0  
select  
    l\_suppkey,  
    sum(l\_extendedprice \* (1 - l\_discount))  
from lineitem  
where  
    l\_shipdate >= date('1996-01-01') and  
    l\_shipdate < date('1996-01-01') + interval (3)  
month to month  
group by l\_suppkey;  
1000 row(s) inserted.

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;

s\_suppkey 389  
s\_name Supplier#000000389  
s\_address PB1Lx0xx6LMz3h7Rx63m6j3QmMx  
s\_phone 34-885-883-5717  
total\_revenue 1418538.214

1 row(s) retrieved.

drop table revenue0;

Table dropped.

commit work;  
Data committed.

Query: 15b Date: 1997-08-13 Time: 16:28:11.656  
16929.656

begin work;  
Started transaction.

-- using default substitutions

**C-16: Query 16**

-- QUERY 16 PARTS/SUPPLIER RELATIONSHIP  
QUERY  
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 '%Better Business  
Bureau%Complaints%')  
group by p\_brand,p\_type,p\_size  
order by supplier\_cnt desc,p\_brand,p\_type,p\_size;

p_brand	p_type	p_size	supplier_cnt
Brand#14	SMALL ANODIZED NICKEL	12	45
Brand#22	SMALL BURNISHED BRASS	12	19
Brand#25	PROMO POLISHED COPPER	12	14
Brand#35	LARGE ANODIZED STEEL	12	45
Brand#35	PROMO BRUSHED COPPER	12	9
Brand#51	ECONOMY ANODIZED STEEL	12	9
Brand#53	LARGE BRUSHED NICKEL	12	45
Brand#11	ECONOMY POLISHED COPPER	8	14
Brand#11	LARGE PLATED STEEL	8	23
Brand#11	PROMO POLISHED STEEL	8	23
Brand#11	STANDARD ANODIZED COPPER	8	9
Brand#12	ECONOMY BURNISHED BRASS	8	9

8			
Brand#12	LARGE ANODIZED BRASS	14	
8			
Brand#12	SMALL ANODIZED TIN	23	
8			
Brand#12	SMALL BRUSHED NICKEL	23	
8			
Brand#12	STANDARD ANODIZED BRASS	3	
8			
Brand#12	STANDARD BURNISHED TIN	23	
8			
Brand#13	ECONOMY POLISHED BRASS	9	
8			
Brand#13	LARGE BURNISHED COPPER	45	
8			
Brand#13	MEDIUM ANODIZED STEEL	23	
8			
Brand#13	MEDIUM PLATED NICKEL	3	
8			
Brand#13	PROMO BURNISHED BRASS	9	
8			
Brand#13	PROMO POLISHED BRASS	3	
8			
Brand#13	PROMO POLISHED TIN	36	
8			
Brand#13	SMALL BURNISHED STEEL	23	
8			
Brand#13	STANDARD BRUSHED STEEL	9	
8			
Brand#14	ECONOMY BRUSHED TIN	3	
8			
Brand#14	ECONOMY BURNISHED TIN	23	
8			
Brand#14	PROMO BRUSHED STEEL	9	
8			
Brand#14	PROMO PLATED TIN	45	8
Brand#15	ECONOMY PLATED TIN	9	
8			
Brand#15	STANDARD BRUSHED COPPER	14	
8			
Brand#15	STANDARD PLATED TIN	3	
8			
Brand#21	ECONOMY POLISHED TIN	3	
8			
Brand#21	PROMO POLISHED COPPER	9	
8			
Brand#21	PROMO POLISHED TIN	49	
8			
Brand#21	STANDARD PLATED BRASS	49	
8			
Brand#21	STANDARD PLATED NICKEL	49	
8			
Brand#22	ECONOMY ANODIZED TIN	49	
8			
Brand#22	ECONOMY BRUSHED BRASS	14	
8			
Brand#22	LARGE BURNISHED TIN	36	
8			
Brand#22	MEDIUM ANODIZED STEEL	36	
8			
Brand#22	MEDIUM PLATED STEEL	9	
8			
Brand#22	PROMO POLISHED NICKEL	9	
8			
Brand#22	SMALL ANODIZED STEEL	19	
8			
Brand#22	STANDARD ANODIZED COPPER	23	
8			

Brand#23	ECONOMY BRUSHED NICKEL	23	
8			
Brand#23	LARGE ANODIZED BRASS	9	
8			
Brand#23	LARGE ANODIZED STEEL	23	
8			
Brand#23	SMALL BRUSHED COPPER	23	
8			
Brand#23	STANDARD BRUSHED TIN	3	
8			
Brand#23	STANDARD BURNISHED NICKEL	49	
8			
Brand#23	STANDARD PLATED NICKEL	36	
8			
Brand#24	ECONOMY ANODIZED BRASS	19	
8			
Brand#24	ECONOMY POLISHED BRASS	36	
8			
Brand#24	LARGE BURNISHED STEEL	14	
8			
Brand#24	MEDIUM PLATED NICKEL	36	
8			
Brand#25	ECONOMY BRUSHED STEEL	49	
8			
Brand#25	MEDIUM BURNISHED TIN	3	
8			
Brand#25	PROMO ANODIZED TIN	36	
8			
Brand#25	PROMO PLATED NICKEL	3	
8			
Brand#25	SMALL BURNISHED BRASS	3	
8			
Brand#31	LARGE ANODIZED BRASS	3	
8			
Brand#31	SMALL ANODIZED COPPER	3	
8			
Brand#31	SMALL ANODIZED NICKEL	9	
8			
Brand#31	SMALL ANODIZED STEEL	14	
8			
Brand#32	MEDIUM ANODIZED STEEL	49	
8			
Brand#32	MEDIUM BURNISHED COPPER	19	
8			
Brand#32	SMALL BURNISHED STEEL	23	
8			
Brand#32	STANDARD BURNISHED STEEL	45	
8			
Brand#34	ECONOMY ANODIZED NICKEL	49	
8			
Brand#34	LARGE BURNISHED TIN	49	
8			
Brand#34	PROMO ANODIZED TIN	3	
8			
Brand#34	SMALL BRUSHED TIN	3	
8			
Brand#34	STANDARD BURNISHED TIN	23	
8			
Brand#35	MEDIUM BRUSHED STEEL	45	
8			
Brand#35	PROMO BURNISHED STEEL	14	
8			
Brand#35	SMALL BURNISHED STEEL	23	
8			
Brand#35	SMALL POLISHED COPPER	14	
8			
Brand#35	STANDARD PLATED COPPER	9	
8			

Brand#41	ECONOMY BRUSHED BRASS	23
8		
Brand#41	LARGE BURNISHED STEEL	23
8		
Brand#41	PROMO BURNISHED TIN	14
8		
Brand#41	PROMO PLATED STEEL	36
8		
Brand#41	PROMO POLISHED TIN	19
8		
Brand#41	SMALL BURNISHED COPPER	23
8		
Brand#42	LARGE POLISHED TIN	14
8		
Brand#42	MEDIUM ANODIZED TIN	49
8		
Brand#42	MEDIUM BRUSHED TIN	14
8		
Brand#42	MEDIUM BURNISHED NICKEL	23
8		
Brand#42	MEDIUM PLATED COPPER	45
8		
Brand#42	MEDIUM PLATED TIN	45
8		
Brand#42	SMALL PLATED COPPER	36
8		
Brand#43	ECONOMY BRUSHED STEEL	45
8		
Brand#43	LARGE BRUSHED COPPER	19
8		
Brand#43	PROMO BRUSHED BRASS	36
8		
Brand#43	SMALL BURNISHED TIN	45
8		
Brand#43	SMALL PLATED COPPER	45
8		
Brand#44	PROMO POLISHED TIN	23
8		
Brand#44	SMALL POLISHED NICKEL	14
8		
Brand#44	SMALL POLISHED TIN	45
8		
Brand#44	STANDARD BURNISHED COPPER	3
8		
Brand#51	LARGE ANODIZED BRASS	19
8		
Brand#51	LARGE POLISHED COPPER	23
8		
Brand#51	MEDIUM ANODIZED TIN	9
8		
Brand#51	MEDIUM ANODIZED TIN	14
8		
Brand#51	MEDIUM BURNISHED NICKEL	23
8		
Brand#51	SMALL ANODIZED COPPER	45
8		
Brand#51	SMALL ANODIZED COPPER	49
8		
Brand#51	SMALL BRUSHED COPPER	45
8		
Brand#51	SMALL BRUSHED TIN	36
8		
Brand#51	STANDARD POLISHED TIN	3
8		
Brand#52	ECONOMY ANODIZED STEEL	3
8		
Brand#52	ECONOMY PLATED TIN	19
8		

Brand#52	LARGE PLATED TIN	3	8
Brand#52	MEDIUM ANODIZED TIN	19	
8			
Brand#52	MEDIUM BURNISHED COPPER	3	
8			
Brand#52	PROMO POLISHED BRASS	23	
8			
Brand#52	SMALL PLATED COPPER	36	
8			
Brand#52	SMALL POLISHED NICKEL	9	
8			
Brand#52	STANDARD POLISHED NICKEL	45	
8			
Brand#53	ECONOMY POLISHED STEEL	45	
8			
Brand#53	LARGE POLISHED NICKEL	3	
8			
Brand#53	SMALL BRUSHED COPPER	14	
8			
Brand#53	STANDARD PLATED STEEL	45	
8			
Brand#54	ECONOMY POLISHED BRASS	49	
8			
Brand#54	ECONOMY POLISHED TIN	23	
8			
Brand#54	MEDIUM BRUSHED STEEL	9	
8			
Brand#54	SMALL BURNISHED NICKEL	14	
8			
Brand#54	SMALL PLATED TIN	14	8
Brand#54	STANDARD BURNISHED STEEL	14	
8			
Brand#54	STANDARD PLATED BRASS	23	
8			
Brand#55	MEDIUM BURNISHED TIN	36	
8			
Brand#55	PROMO ANODIZED BRASS	14	
8			
Brand#55	STANDARD BURNISHED COPPER	45	
8			
Brand#15	STANDARD PLATED TIN	36	
7			
Brand#21	SMALL POLISHED STEEL	3	
7			
Brand#23	SMALL POLISHED BRASS	49	
7			
Brand#34	MEDIUM BURNISHED NICKEL	3	
7			
Brand#42	STANDARD PLATED COPPER	19	
7			
Brand#51	LARGE POLISHED NICKEL	14	
7			
Brand#54	LARGE ANODIZED NICKEL	49	
7			
Brand#11	ECONOMY ANODIZED BRASS	19	
4			
Brand#11	ECONOMY ANODIZED BRASS	45	
4			
Brand#11	ECONOMY ANODIZED NICKEL	36	
4			
Brand#11	ECONOMY BRUSHED COPPER	3	
4			
Brand#11	ECONOMY BRUSHED COPPER	9	
4			
Brand#11	ECONOMY BRUSHED STEEL	9	
4			
Brand#11	ECONOMY BRUSHED STEEL	36	
4			

Brand#11	ECONOMY BURNISHED BRASS	36	
4			
Brand#11	ECONOMY BURNISHED COPPER	9	
4			
Brand#11	ECONOMY BURNISHED COPPER	49	
4			
Brand#11	ECONOMY BURNISHED NICKEL	14	
4			
Brand#11	ECONOMY BURNISHED NICKEL	49	
4			
Brand#11	ECONOMY PLATED COPPER	19	
4			
Brand#11	ECONOMY PLATED NICKEL	45	
4			
Brand#11	ECONOMY PLATED TIN	9	
4			
Brand#11	ECONOMY POLISHED BRASS	3	
4			
Brand#11	ECONOMY POLISHED COPPER	3	
4			
Brand#11	ECONOMY POLISHED COPPER	45	
4			
Brand#11	ECONOMY POLISHED NICKEL	36	
4			
Brand#11	ECONOMY POLISHED STEEL	23	
4			
Brand#11	ECONOMY POLISHED TIN	14	
4			
Brand#11	LARGE ANODIZED COPPER	23	
4			
Brand#11	LARGE ANODIZED NICKEL	9	
4			
Brand#11	LARGE ANODIZED STEEL	9	
4			
Brand#11	LARGE BRUSHED STEEL	19	
4			
Brand#11	LARGE BRUSHED TIN	3	
4			
Brand#11	LARGE BRUSHED TIN	14	
4			
Brand#11	LARGE BURNISHED COPPER	9	
4			
Brand#11	LARGE BURNISHED COPPER	19	
4			
Brand#11	LARGE BURNISHED STEEL	23	
4			
Brand#11	LARGE BURNISHED TIN	9	
4			
Brand#11	LARGE PLATED COPPER	23	
4			
Brand#11	LARGE PLATED TIN	9	4
Brand#11	LARGE PLATED TIN	14	4
Brand#11	LARGE PLATED TIN	23	4
Brand#11	LARGE POLISHED NICKEL	49	
4			
Brand#11	MEDIUM ANODIZED BRASS	45	
4			
Brand#11	MEDIUM ANODIZED TIN	14	
4			
Brand#11	MEDIUM BRUSHED BRASS	14	
4			
Brand#11	MEDIUM BRUSHED BRASS	45	
4			
Brand#11	MEDIUM BRUSHED NICKEL	14	
4			
Brand#11	MEDIUM BRUSHED NICKEL	36	
4			
Brand#11	MEDIUM BRUSHED STEEL	19	

4			
Brand#11	MEDIUM BURNISHED COPPER	9	
4			
Brand#11	MEDIUM BURNISHED TIN	36	
4			
Brand#11	MEDIUM PLATED BRASS	3	
4			
Brand#11	MEDIUM PLATED TIN	19	
4			
Brand#11	PROMO ANODIZED BRASS	3	
4			
Brand#11	PROMO ANODIZED BRASS	19	
4			
Brand#11	PROMO ANODIZED BRASS	45	
4			
Brand#11	PROMO ANODIZED BRASS	49	
4			
Brand#11	PROMO ANODIZED STEEL	23	
4			
Brand#11	PROMO ANODIZED TIN	45	
4			
Brand#11	PROMO BRUSHED BRASS	23	
4			
Brand#11	PROMO BRUSHED STEEL	3	
4			
Brand#11	PROMO BURNISHED BRASS	23	
4			
Brand#11	PROMO BURNISHED BRASS	36	
4			
Brand#11	PROMO BURNISHED BRASS	49	
4			
Brand#11	PROMO BURNISHED TIN	9	
4			
Brand#11	PROMO PLATED BRASS	9	
4			
Brand#11	PROMO PLATED BRASS	45	
4			
Brand#11	PROMO PLATED NICKEL	19	
4			
Brand#11	PROMO POLISHED BRASS	3	
4			
Brand#11	PROMO POLISHED BRASS	9	
4			
Brand#11	PROMO POLISHED BRASS	19	
4			
Brand#11	PROMO POLISHED COPPER	14	
4			
Brand#11	PROMO POLISHED COPPER	45	
4			
Brand#11	PROMO POLISHED TIN	49	
4			
Brand#11	SMALL ANODIZED COPPER	36	
4			
Brand#11	SMALL ANODIZED NICKEL	3	
4			
Brand#11	SMALL ANODIZED NICKEL	14	
4			
Brand#11	SMALL ANODIZED TIN	14	
4			
Brand#11	SMALL ANODIZED TIN	19	
4			
Brand#11	SMALL ANODIZED TIN	45	
4			
Brand#11	SMALL BRUSHED TIN	14	
4			
Brand#11	SMALL BRUSHED TIN	23	
4			
Brand#11	SMALL BRUSHED TIN	45	

4					
Brand#11	SMALL BURNISHED BRASS	49			
4					
Brand#11	SMALL BURNISHED COPPER	23			
4					
Brand#11	SMALL PLATED COPPER	45			
4					
Brand#11	SMALL PLATED NICKEL	3			
4					
Brand#11	SMALL PLATED STEEL	36			
4					
Brand#11	SMALL PLATED TIN	19	4		
4					
Brand#11	SMALL POLISHED BRASS	14			
4					
Brand#11	SMALL POLISHED BRASS	23			
4					
Brand#11	SMALL POLISHED COPPER	14			
4					
Brand#11	SMALL POLISHED COPPER	36			
4					
Brand#11	SMALL POLISHED STEEL	9			
4					
Brand#11	STANDARD BRUSHED COPPER	23			
4					
Brand#11	STANDARD BRUSHED NICKEL	14			
4					
Brand#11	STANDARD BRUSHED TIN	14			
4					
Brand#11	STANDARD BURNISHED BRASS	3			
4					
Brand#11	STANDARD BURNISHED STEEL	23			
4					
Brand#11	STANDARD PLATED BRASS	19			
4					
Brand#11	STANDARD PLATED TIN	19			
4					
Brand#11	STANDARD POLISHED NICKEL	45			
4					
Brand#11	STANDARD POLISHED TIN	14			
4					
Brand#11	STANDARD POLISHED TIN	45			
4					
Brand#12	ECONOMY ANODIZED BRASS	23			
4					
Brand#12	ECONOMY ANODIZED COPPER	14			
4					
Brand#12	ECONOMY ANODIZED NICKEL	19			
4					
Brand#12	ECONOMY ANODIZED NICKEL	45			
4					
Brand#12	ECONOMY ANODIZED STEEL	9			
4					
Brand#12	ECONOMY BRUSHED COPPER	36			
4					
Brand#12	ECONOMY BRUSHED NICKEL	49			
4					
Brand#12	ECONOMY BRUSHED STEEL	49			
4					
Brand#12	ECONOMY BURNISHED COPPER	45			
4					
Brand#12	ECONOMY PLATED COPPER	23			
4					
Brand#12	ECONOMY PLATED STEEL	23			
4					
Brand#12	ECONOMY PLATED TIN	36			
4					
Brand#12	ECONOMY POLISHED BRASS	14			
4					
Brand#12	ECONOMY POLISHED COPPER	45			
4					
Brand#12	ECONOMY POLISHED NICKEL	9			
4					
Brand#12	ECONOMY POLISHED STEEL	36			
4					
Brand#12	ECONOMY POLISHED TIN	23	4		
4					
Brand#12	LARGE ANODIZED COPPER	9			
4					
Brand#12	LARGE ANODIZED COPPER	45			
4					
Brand#12	LARGE ANODIZED NICKEL	45			
4					
Brand#12	LARGE ANODIZED STEEL	49			
4					
Brand#12	LARGE ANODIZED TIN	36			
4					
Brand#12	LARGE ANODIZED TIN	45			
4					
Brand#12	LARGE BURNISHED BRASS	14			
4					
Brand#12	LARGE BURNISHED BRASS	19			
4					
Brand#12	LARGE BURNISHED COPPER	9			
4					
Brand#12	LARGE BURNISHED NICKEL	45			
4					
Brand#12	LARGE BURNISHED TIN	36			
4					
Brand#12	LARGE PLATED BRASS	3			
4					
Brand#12	LARGE PLATED STEEL	36			
4					
Brand#12	LARGE PLATED STEEL	45			
4					
Brand#12	LARGE PLATED TIN	23	4		
4					
Brand#12	LARGE POLISHED COPPER	14			
4					
Brand#12	LARGE POLISHED COPPER	19			
4					
Brand#12	LARGE POLISHED COPPER	49			
4					
Brand#12	LARGE POLISHED STEEL	3			
4					
Brand#12	MEDIUM ANODIZED COPPER	9			
4					
Brand#12	MEDIUM ANODIZED COPPER	45			
4					
Brand#12	MEDIUM ANODIZED NICKEL	45			
4					
Brand#12	MEDIUM BRUSHED BRASS	19			
4					
Brand#12	MEDIUM BRUSHED COPPER	9			
4					
Brand#12	MEDIUM BRUSHED COPPER	36			
4					
Brand#12	MEDIUM BRUSHED COPPER	49			
4					
Brand#12	MEDIUM BRUSHED NICKEL	3			
4					
Brand#12	MEDIUM BRUSHED NICKEL	14			
4					
Brand#12	MEDIUM BRUSHED NICKEL	23			
4					
Brand#12	MEDIUM BURNISHED BRASS	3			
4					
Brand#12	MEDIUM BURNISHED COPPER	36			
4					
Brand#12	MEDIUM BURNISHED NICKEL	19			
4					
Brand#12	MEDIUM BURNISHED TIN	14			
4					
Brand#12	MEDIUM PLATED BRASS	23			

4			
Brand#12	MEDIUM PLATED TIN	19	
4			
Brand#12	MEDIUM PLATED TIN	23	
4			
Brand#12	PROMO ANODIZED BRASS	9	
4			
Brand#12	PROMO ANODIZED BRASS	45	
4			
Brand#12	PROMO ANODIZED NICKEL	14	
4			
Brand#12	PROMO ANODIZED STEEL	49	
4			
Brand#12	PROMO ANODIZED TIN	3	
4			
Brand#12	PROMO ANODIZED TIN	19	
4			
Brand#12	PROMO BRUSHED COPPER	14	
4			
Brand#12	PROMO BRUSHED COPPER	19	
4			
Brand#12	PROMO BRUSHED NICKEL	23	
4			
Brand#12	PROMO BRUSHED STEEL	23	
4			
Brand#12	PROMO BRUSHED STEEL	36	
4			
Brand#12	PROMO BURNISHED BRASS	49	
4			
Brand#12	PROMO BURNISHED TIN	9	
4			
Brand#12	PROMO BURNISHED TIN	14	
4			
Brand#12	PROMO PLATED BRASS	36	
4			
Brand#12	PROMO POLISHED COPPER	23	
4			
Brand#12	PROMO POLISHED NICKEL	3	
4			
Brand#12	PROMO POLISHED NICKEL	9	
4			
Brand#12	PROMO POLISHED STEEL	14	
4			
Brand#12	PROMO POLISHED TIN	23	
4			
Brand#12	PROMO POLISHED TIN	36	
4			
Brand#12	SMALL ANODIZED BRASS	36	
4			
Brand#12	SMALL ANODIZED COPPER	23	
4			
Brand#12	SMALL ANODIZED STEEL	36	
4			
Brand#12	SMALL ANODIZED TIN	14	
4			
Brand#12	SMALL BRUSHED COPPER	19	
4			
Brand#12	SMALL BRUSHED COPPER	36	
4			
Brand#12	SMALL BRUSHED TIN	36	
4			
Brand#12	SMALL BURNISHED BRASS	14	
4			
Brand#12	SMALL BURNISHED COPPER	9	
4			
Brand#12	SMALL BURNISHED COPPER	36	
4			
Brand#12	SMALL PLATED BRASS	9	

4			
Brand#12	SMALL POLISHED BRASS	49	
4			
Brand#12	SMALL POLISHED NICKEL	19	
4			
Brand#12	SMALL POLISHED TIN	3	4
Brand#12	STANDARD ANODIZED BRASS	19	
4			
Brand#12	STANDARD ANODIZED NICKEL	19	
4			
Brand#12	STANDARD ANODIZED STEEL	19	
4			
Brand#12	STANDARD BRUSHED COPPER	36	
4			
Brand#12	STANDARD BRUSHED NICKEL	23	
4			
Brand#12	STANDARD BRUSHED STEEL	49	
4			
Brand#12	STANDARD BURNISHED BRASS	23	
4			
Brand#12	STANDARD BURNISHED COPPER	14	
4			
Brand#12	STANDARD BURNISHED NICKEL	45	
4			
Brand#12	STANDARD BURNISHED NICKEL	49	
4			
Brand#12	STANDARD BURNISHED TIN	3	
4			
Brand#12	STANDARD BURNISHED TIN	14	
4			
Brand#12	STANDARD PLATED BRASS	19	
4			
Brand#12	STANDARD PLATED NICKEL	45	
4			
Brand#12	STANDARD PLATED STEEL	36	
4			
Brand#12	STANDARD PLATED STEEL	45	
4			
Brand#12	STANDARD PLATED TIN	9	
4			
Brand#12	STANDARD POLISHED BRASS	49	
4			
Brand#12	STANDARD POLISHED COPPER	3	
4			
Brand#12	STANDARD POLISHED NICKEL	23	
4			
Brand#12	STANDARD POLISHED TIN	14	
4			
Brand#13	ECONOMY ANODIZED NICKEL	14	
4			
Brand#13	ECONOMY ANODIZED NICKEL	19	
4			
Brand#13	ECONOMY ANODIZED STEEL	45	
4			
Brand#13	ECONOMY ANODIZED STEEL	49	
4			
Brand#13	ECONOMY BRUSHED BRASS	3	
4			
Brand#13	ECONOMY BURNISHED STEEL	14	
4			
Brand#13	ECONOMY BURNISHED TIN	19	
4			
Brand#13	ECONOMY BURNISHED TIN	45	
4			
Brand#13	ECONOMY PLATED COPPER	19	
4			
Brand#13	ECONOMY PLATED NICKEL	3	
4			

```

Brand#13 ECONOMY PLATED STEEL      23
4
Brand#13 ECONOMY PLATED TIN        3
4
Brand#13 ECONOMY POLISHED BRASS    3
4
Brand#13 ECONOMY POLISHED COPPER    9
4
Brand#13 ECONOMY POLISHED COPPER   49
4
Brand#13 ECONOMY POLISHED STEEL    23
4
Brand#13 ECONOMY POLISHED STEEL    49
4
Brand#13 LARGE ANODIZED BRASS      23
4
Brand#13 LARGE ANODIZED COPPER     19
4
Brand#13 LARGE ANODIZED NICKEL     9
4
Brand#13 LARGE ANODIZED STEEL      45
4
Brand#13 LARGE ANODIZED TIN        19
4
Brand#13 LARGE BRUSHED BRASS       3
4
Brand#13 LARGE BRUSHED BRASS       9
4
Brand#13 LARGE BRUSHED BRASS      19
4
Brand#13 LARGE BRUSHED COPPER       9
4
Brand#13 LARGE BRUSHED COPPER     36
4
Brand#13 LARGE BRUSHED NICKEL       3
4
Brand#13 LARGE BRUSHED NICKEL      9
4
Brand#13 LARGE BRUSHED NICKEL     14
4

```

**C-17: Query 17a**

```

-- QUERY 17a MINIMUM COST SUPPLIER QUERY
create table avg_quantity0
(partkey integer,
avgqty decimal(13,3)
) fragment by round robin in o_okey1;
Table created.

```

```

insert into avg_quantity0
select
  p_partkey,
  0.2 * avg(l_quantity)
from
  part, lineitem
where
  p_partkey=l_partkey and
  p_brand= 'Brand#23' and
  p_container= 'MED BOX'
group by p_partkey;
18 row(s) inserted.

```

```

select
  sum(l_extendedprice)/7.0 as avg_yearly
from
  lineitem, avg_quantity0
where
  partkey = l_partkey and
  l_quantity < avgqty;

  avg_yearly
      24436.88

1 row(s) retrieved.

drop table avg_quantity0;
Table dropped.

commit work;
Data committed.

Query: 17a Date: 1997-08-13 Time: 16:28:41.906
16958.906

begin work;
Started transaction.

-- using default substitutions

```

## Appendix D: Substitution Parameters and Seeds

---

### D-1: Query Substitution Parameters

```
1      80
4      1994-09-01
15     1994-09-01
10     1993-10-01
11     INDIA  0.0000010000
6      1994-01-01      0.04      24
2      18      STEEL  AMERICA
16     Brand#22 SMALL BRUSHED 18      35
      19      44      10      31      17
      40
14     1994-10-01
8      INDIA  ASIA      SMALL PLATED STEEL
12     RAIL   AIR      1994-01-01
17     Brand#22 LG PACK
3      BUILDING      1995-03-09
5      AMERICA      1994-01-01
13     Clerk#000000341
7      INDIA  FRANCE
9      ghost
```

### D-2: RNG Seed

Note: The following is an excerpt from the EQT submitted to DBACCESS. It includes the DBGEN-generated comment with the seed used for the performance runs.

```
database dssf100;
set pdqpriority 100;
set isolation repeatable read;
begin work;
-- using 69599 as a seed to the RNG
-- QUERY 1 PRICING SUMMARY REPORT QUERY
```

## Appendix E: Implementation Specific Layer and Drivers

### E-1: driver.sh

```
#!/sh

if [ $# != 4 ]
then
    echo "Usage: $0 run_id seed pv scale"
    echo "    Use Database Load Completion
Timestamp for seed"
    exit
fi

TOP="/tpcd"

runid=$1
INFORMIXDIR="e:/informix"
SQEXPLN="${INFORMIXDIR}/sqexpln/informix.out"
DBGENDIR="dbgen"
AUDIT_TAG=""
DSS_QUERY="$TOP/queries2"
DSS_CONFIG="$TOP/${DBGENDIR}"
QUERY_DIR="$TOP/queries_mj"
RES_DIR="$TOP/results/res_${1}"
PATH="$TOP/bin;$TOP;$PATH;$INFORMIXDIR/bin" ;
export PATH
QGEN="$TOP/${DBGENDIR}/qgen"
QUERIES="1 4 15b 10 11 6 2 16 14 8 12 17a 3 5 13 7 9"
SEED=$2
SCALE=$4
export DSS_QUERY DSS_CONFIG
if [ -f $SQEXPLN ]
then
    rm $SQEXPLN
fi

if [ ! -d $RES_DIR ]
then
    mkdir $RES_DIR
else rm $RES_DIR/*
fi
# echo "Perf/Validate? [P/V]: "
# read type
type=$3
if [ $type = "p" -o $type = "P" ]
then
    type=P
    dbname=dssf$SCALE
else
    type=V
    dbname=dssfq
    SCALE=0.1
    flags="-d"
fi

echo "database $dbname;" > ${RES_DIR}/session_input
echo "set pdqpriority 100;" >> ${RES_DIR}/session_input
echo "set isolation repeatable read;" >>
${RES_DIR}/session_input

# generate new EQT
for q in $QUERIES
do
```

```
cat ${DSS_QUERY}/Start_query >>
${RES_DIR}/session_input
QGEN -c -s $SCALE -r $SEED $flags \
    -l ${RES_DIR}/params $q >
${QUERY_DIR}/${q}.sql
cat ${QUERY_DIR}/${q}.sql >>
${RES_DIR}/session_input
cat ${DSS_QUERY}/End_query >>
${RES_DIR}/session_input
echo "!timer $q" >> ${RES_DIR}/session_input

done

# execut performance tests runs
for run in 1
do
    echo "-- SF $SCALE" >> ${RES_DIR}/Timing
    timer Stream1 >> ${RES_DIR}/Timing

    if [ $type != "V" ]
    then uf1.bat $SCALE > ${RES_DIR}/uf1.out 2>&1
    fi
    sleep 5
    timer UF1 >> ${RES_DIR}/Timing

    cat ${RES_DIR}/session_input | e:/informix/bin/dbaccess
    -e - - > ${RES_DIR}/session_out 2>&1
    if [ $type != "V" ]
        then uf2.bat $SCALE > ${RES_DIR}/uf2.out
    2>&1
    fi
    sleep 5
    timer UF2 >> $RES_DIR/Timing

# Calculate TPCD Numbers
head -1 $RES_DIR/Timing > $RES_DIR/tpcdcalc.in
grep Stream1 $RES_DIR/Timing >>
$RES_DIR/tpcdcalc.in
grep UF1 $RES_DIR/Timing >> $RES_DIR/tpcdcalc.in
grep Time: $RES_DIR/session_out >>
$RES_DIR/tpcdcalc.in
grep UF2 $RES_DIR/Timing >> $RES_DIR/tpcdcalc.in
tpcdcalc < ${RES_DIR}/tpcdcalc.in >
${RES_DIR}/result
cat ${RES_DIR}/result

cat ${RES_DIR}/session_out | awk -f postproc.awk
DIR=$RES_DIR

for q in $QUERIES
do
    head -400 ${RES_DIR}/${q}.out >
${RES_DIR}/m${runid}pqry${q}
done

if [ $type != "V" ]
then
    uf1_reset.bat $SCALE > ${RES_DIR}/uf1_reset.out
2>&1
    uf2_reset.bat $SCALE > ${RES_DIR}/uf2_reset.out
2>&1
fi
done
```

**E-2: calc.c**

```

#include <stdio.h>
#include <math.h>
#define N 19
#define QUERIES 17
main()
{
    int i;
    float time, sum, SF, UF1, UF2, qppd, qthd, qts;
    char qid[128];

    sum = 0.0;
    qts = 0.0;
    scanf ("SF %f\n", &SF);
    scanf ("UF1 %f\n", &UF1);
    printf ("\nScale Factor = %.2f\n", SF);
    printf ("Query\t Time (secs)\n");
    printf ("-----\n");
    printf ("UF1\t %8.2f\n", UF1);
    qts += UF1 ;
    sum += log(UF1);
    for (i = 1; i <= QUERIES; i++)
    {
        scanf ("query %s %f\n",&qid, &time);
        sum += log (time);
        qts += time ;
        printf ("%3s\t %8.2f\n",qid, time);
    }

    scanf ("UF2 %f\n", &UF2);
    printf ("UF2\t %8.2f\n", UF2);
    qts += UF2 ;
    sum += log(UF2);
    qppd = 3600 * SF * exp (sum/-N);
    qthd = ( SF * 17 * 3600) / qts ;
    printf ("\n=====");
    printf ("QppD@%.2f = %.2f\n", SF, qppd);
    printf ("QthD@%.2f = %.2f\n", SF, qthd);
}

```

**E-3: postproc.awk**

```

BEGIN {output=""}
$1 == "--" && $2 == "QUERY" {if (output != "")
{close(output);
                                output=DIR "/"
$3 ".out" }
output != "" {print >> output}

```

**E-4: UF1.bat**

```

@echo off
if "%1" == "" goto Usage
dbaccess dssf%1 uf1.sql
goto end

:Usage
echo Usage: uf1 dbname

:end
echo on

```

**E-5: uf1.sql**

```

begin work;
set pdqpriority 100;
set isolation repeatable read;
create external table orderupd_ext
sameas order
using ( format "delimited",
datafiles ("disk:1:W:\update\order.tbl.u1"),
rejectfile "W:\update\pf1_o_reject%c",
deluxe
);
insert into order
select * from orderupd_ext;

create external table lineupd_ext
sameas lineitem
using (
format "delimited",
datafiles ("disk:1:W:\update\lineitem.tbl.u1"),
rejectfile "W:\update\pf1_l_reject%c",
deluxe
);
insert into lineitem
select * from lineupd_ext;

drop table orderupd_ext;
drop table lineupd_ext;
commit work;

```

**E-6: uf1\_reset.sql**

```

set pdqpriority 100;
begin work;
-- Hold the order keys we need to delete
create scratch table orderkey_tmp
(d_orderkey integer)
fragment by hash (d_orderkey) in o_okey1;
-- This table points to order rows that were inserted
create external table orderkey_ext
sameas order
using ( format "delimited",
datafiles ("disk:1:W:\update\order.tbl.u1"),
rejectfile "W:\update\uf1_reset_reject%c",
express
);
insert into orderkey_tmp (d_orderkey)
select o_orderkey from orderkey_ext order by 1;

update statistics medium for table orderkey_tmp resolution
0.1 0.95;

delete from order where o_orderkey in
(select d_orderkey from orderkey_tmp);

delete from lineitem where l_orderkey in
(select d_orderkey from orderkey_tmp);
drop table orderkey_tmp;
drop table orderkey_ext;
commit work;

```

**E-7: UF2.bat**

```

@echo off
if "%1" == "" goto Usage
dbaccess dssf%1 uf2.sql
goto end

```

```
:Usage
echo Usage: uf2 dbsize
```

```
:end
echo on
```

### **E-8: uf2.sql**

```
begin work;
set pdqpriority 100;
set isolation repeatable read;
create scratch table okey_tmp
(d_orderkey integer)
fragment by hash (d_orderkey) in o_okey1;
create external table order_delete_ext
sameas okey_tmp
using ( format "delimited",
datafiles ("disk:1:W:\update\delete.0"), express );
insert into okey_tmp select * from order_delete_ext order by
1;
```

```
update statistics medium for table okey_tmp resolution 0.1
0.95;
```

```
delete from order where
o_orderkey in (select d_orderkey from okey_tmp);
```

```
delete from lineitem where l_orderkey in (select d_orderkey
from okey_tmp);
drop table okey_tmp;
drop table order_delete_ext;
commit work;
```

### **E-9: uf2\_reset.bat**

```
set pdqpriority 100;
begin work;
create external table orderrei_ext
sameas order
using ( format "delimited",
datafiles ("disk:1:W:\update\order_reinsert"),
rejectfile "W:\update\o_reins%c.rej",
deluxe
);
insert into order
select * from orderrei_ext;
drop table orderrei_ext;
```

```
create external table linerei_ext
sameas lineitem
using (
format "delimited",
datafiles ("disk:1:W:\update\line_reinsert"),
rejectfile "W:\update\l_reins%c.rej",
deluxe
);
```

```
insert into lineitem
select * from linerei_ext;
```

```
drop table linerei_ext;
commit work;
```

### **E-10: Start\_query**

```
begin work;
```

### **E-11: End\_query**

```
commit work;
```

### **E-12: timer.cpp**

```
#include <afx.h>
#include <winbase.h>
#include <time.h>
#include <stdio.h>
#include <stdlib.h>
#include <string.h>

void main(int argc, char **argv)
{
    char    q[80];
    DWORD  tickCount, s, ms;
    CTime  time; /*valid data and time from
1/1/1970 to 2/5/2036.*/
    int    yy, mon, d, h, min, sec;

    if(argc > 2) {
        printf("Usage: %s [query number]\n",
argv[0]);
    }
    if(argc == 2) strcpy(q, argv[1]);
    else strcpy(q, "");

    tickCount = GetTickCount();
    time = CTime::GetCurrentTime();
    yy = time.GetYear();
    mon = time.GetMonth();
    d = time.GetDay();
    h = time.GetHour();
    min = time.GetMinute();
    sec = time.GetSecond();

    s = tickCount / 1000L;
    ms = tickCount - s*1000L;

    if (argc == 2)
        printf("Query: %s Date: %04d-%02d-
%02d Time: %d:%02d:%02d.%02d %ld.%03d\n", q, yy,
mon, d, h, min, sec, ms, s, ms);
    else
        printf("Date: %04d-%02d-%02d
Time: %d:%02d:%02d.%02d %ld.%03d\n", yy, mon, d, h,
min, sec, ms, s, ms);

    exit(0);
}
```

## Appendix F: ACID Test Source Code

```

/*
 * Sccsid:  @(#)acid.ec      9.1.2.5  8/16/95
20:56:46
 * ACID test implementation for TPC-D
 *
 *
 * this routine acutally does twice the required number of
transactions,
 * one set to alter the data and another to unroll the changes
after things
 * have completed. It relies on semop() for synchronization.
 */

#define DECLARER
/*#define _XOPEN_SOURCE*/
#include "config.h"
#include <stdio.h>
#include <signal.h>
#include <time.h>

#ifdef WIN32
#include <windows.h>
#include <string.h>
#include <fcntl.h>
#include <io.h>
#else
#include <sys/wait.h>
#include <sys/sem.h>
#include <sys/types.h>
#include <sys/ipc.h>
#include <unistd.h>
#include <sys/time.h>
#endif /*WIN*/

#include "dss.h"
#include "acid.h"
#ifdef WIN32
#include "nt.h"
#else
#include "unix.h"
#endif /*WIN32*/

/*
 * status file macros:
 * SET_FILE(tgt) -- redirect status messages to tgt, unless
overridden
 *                on the command line
 * DEC_DBL      -- convert a dec_t to a dbl; -1 == error
 * NEW_SUCCESS  -- force the start of a new success file
 * TIMESTAMP    -- generate a timestamped status
message
 */

#define NEW_SUCCESS      sfp = HFILE_ERROR
#define SET_FILE(str) \
    if ((flags & FL_DEBUG) == 0) \
    { \
        if (ofp != NULL) fclose(ofp); \
        if ((ofp = fopen(str, "a")) == NULL) \
        { \
            fprintf(stderr, "open failed for %s\n", \
str); \
            exit(1); \

```

```

        } \
        else ofp=stdout
#define DEC_DBL(src, tgt) \
    if (dectodbl(&src, &tgt)) \
        tgt = -1
#define TIMESTAMP(note) \
    { \
        time(&t_tmp); \
        fprintf(ofp, "%-40s TIME: %s", note, ctime(&t_tmp)); \
        fflush(ofp); \
    }

/*
 * general defines
 */
#define ORDER_PER_SF      150000L
// #define STATUS(stmt) if (flags & FL_DEBUG) fprintf
stmt; else fprintf(stderr, "")
#define STATUS(stmt) if (flags & FL_DEBUG) fprintf stmt

#include sqlca;
#include sqlda;
#include decimal;
#include datetime;

$ typedef struct TRAN_T {
    long o;
    int l;
    int d;
    dec_t rprice;
    dec_t qty;
    dec_t tax;
    dec_t disc;
    dec_t eprice;
    dec_t tprice;
} tran_t;

int c_cnt, t_cnt;
int nprocs; /* number of active children */
HFILE sfp = HFILE_ERROR;
char keyfile[80] = "";
char logfile[80] = "";
$ char dbname[80];
FILE *ofp = NULL;
int phase2 = 0;
double flt_scale;
time_t t_tmp;
int flags = 0;
$ tran_t work[1000];
long seed;
extern long Seed[];
int undo = 0; /* used to turn
undo_transaction on/off */
int child_flg = 0;
char *spawn_args[25];
int childcnt;
$ char connName[11][80];

static void process_options(int ac, char **av);
void c_check();
void pick_keys(void);
void parallel_tran(int, int*, int);
void usage(char *);
void post_proc(int);
void do_testa(void);

```

```

void do_testc(void);
void do_testi(void);
void do_testd(void);
CHILD_ROUTINE testc_child(CHILD_PARAM);
CHILD_ROUTINE testi_child(CHILD_PARAM);
CHILD_ROUTINE testd_child(CHILD_PARAM);
void do_semop(int, int);
void build_tran(int);
void init(int);
void wrapup(void);
void do_tran(int, int);
void undo_tran(int);
void prt_history(int); /* print the history records */
void dump_row(int, char *); /* print the named rows for
o/I */
long UnifInt PROTO((long, long, long));

main(int ac, char **av)
{
    int i;
    int chnum;
#ifdef WIN32
    tid_primary = GetCurrentThreadId();
    STATUS((stderr, "Thread%d, main(): ac=%d \n",
tid_primary, ac));
#endif

    process_options(ac, av);
    if (child_flg == 0)
    {
        MAKESEMS;
    }
    else
    {
        OPENSEMS;
    }

    chnum = child_flg - 1;

    if (flags & FL_TESTC)
    {
        if (child_flg != 0)
            testc_child(chnum);
        else
            do_testc();
    }
    if (flags & FL_TESTI)
    {
        if (child_flg != 0)
            testi_child(chnum);
        else
            do_testi();
    }
    if (flags & FL_TESTA)
        do_testa();
    if (flags & FL_TESTD)
    {
        if (child_flg != 0)
            testd_child(chnum);
        else
            do_testd();
    }

    ALLGO; /* to clear anyone who's left */
    DROPSEMS;

    exit(0);
}

```

```

void
c_check(int tnum)
{
    double t1, t2;
    $int okey;
    int i = 0;
    $decimal otot,
        res;

    $begin work;
    $ whenever not found continue;
    $ whenever error call do_error;
    okey = work[tnum].o;
    $execute o_stmt into $otot using $okey;
    if (SQLCODE == SQLNOTFOUND)
    {
        fprintf(ofp, "%ld is not a valid orderkey\n", okey);
        return;;
    }
    $execute l_stmt into $res using $okey;
    if (SQLCODE == SQLNOTFOUND)
    {
        fprintf(ofp, "%ld has no lines!\n", okey);
        return;
    }
    dectodbl(&otot, &t1);
    dectodbl(&res, &t2);
    fprintf(ofp, "%s orderkey #%%ld: wanted %8.2f, got
%8.2f\n",
        (deccmp(&otot, &res))?"ERROR: Bad":"success
for", okey, t1, t2);

    $commit work;
    return;
}

static void
process_options(int cnt, char **vector)
{
    extern int optind, opterr;
    extern char *optarg;
    int flg,
        i;

    flags |= FL_TESTALL;
    seed = Seed[0];
    while ((flg = getopt(cnt, vector, "C:uDd:hk:l:n:r:s:t:T:K:")
!= -1)
    {
        switch (flg)
        {
            case 'd':
                strcpy(dbname, optarg);
                flags |= FL_DBNAME;
                break;
            case 'D':
                flags |= FL_DEBUG;
                break;
            case 'C':
                children = atoi(optarg);
                flags |= FL_STREAMS;
                break;
            case 'h':
                usage(vector[0]);
                exit(0);
                break;
            case 'k':

```

```

        if (strlen(optarg) > 79)
        {
            printf("pathname %s' exceeds 80
character limit\n", optarg);
            exit(1);
        }
        strcpy(keyfile, optarg);
        flags |= FL_KEY;
        break;
    case 'l':
        if (strlen(optarg) > 79)
        {
            printf("pathname %s' exceeds 80
character limit\n", optarg);
            exit(1);
        }
        strcpy(logfile, optarg);
        flags |= FL_LOG;
        break;
    case 'n':
        c_cnt = atoi(optarg);
        flags |= FL_COUNT;
        break;
    case 'r':
        seed = atol(optarg);
        flags |= FL_SEED;
        break;
    case 's':
        flt_scale = atof(optarg);
        flags |= FL_SCALE;
        break;
    case 't':
        t_cnt = atoi(optarg);
        if (t_cnt >= 1000)
        {
            printf("-t upper bound is 1000\n");
            t_cnt = 999;
        }
        flags |= FL_TRANS;
        break;
    case 'u':
        undo = 1;
        break;
    case 'T':
        flags &= ~FL_TESTALL;
        if (*optarg == 'A' || *optarg == 'a')
            flags |= FL_TESTA;
        if (*optarg == 'C' || *optarg == 'c')
            flags |= FL_TESTC;
        if (*optarg == 'I' || *optarg == 'i')
            flags |= FL_TESTI;
        if (*optarg == 'D' || *optarg == 'd')
            flags |= FL_TESTD;
        break;
    case 'K':
        child_flg = atoi(optarg);
        break;
}
}
if ((flags & FL_SCALE) == 0)
    flt_scale = 0.1;
if ((flags & FL_COUNT) == 0)
    c_cnt = 10;
if ((flags & FL_TRANS) == 0)
    t_cnt = 100;
if ((flags & FL_STREAMS) == 0)
    children = 1;

```

```

        if ((flags & FL_DBNAME) == 0)
            if (flt_scale < 0) sprintf(dbname, "dssf%3.0f");
            else sprintf(dbname, "dssf%3.0f", flt_scale);
        if ((flags & FL_SEED) == 0)
            for (i=0; i < DSS_PROC; i++)
                UnifInt(1L, 100L, 0);
        #if (defined(WIN32)&&!defined(_POSIX_))
        if (child_flg == 0) {
            for (i=0; i < cnt; i++)
            {
                spawn_args[i] = malloc((strlen(vector[i]) + 1) *
sizeof(char));
                MALLOC_CHECK(spawn_args[i]);
                strcpy(spawn_args[i], vector[i]);
            }
            spawn_args[cnt] = malloc(3 * sizeof(char));
            MALLOC_CHECK(spawn_args[cnt]);
            strcpy(spawn_args[cnt], "-K");

            spawn_args[cnt+1] = malloc(2 * sizeof(char));
            MALLOC_CHECK(spawn_args[cnt+1]);
            strcpy(spawn_args[cnt+1], "0");
            spawn_args[cnt+2] = NULL;
        }
        childcnt = cnt + 1;
        #endif
        return;
    }

    void
    pick_keys(void)
    {
        int *res, i, j;
        FILE *kfp;

        if (strlen(keyfile) != 0)
        {
            if ((kfp = fopen(keyfile, "r")) == (FILE *)NULL)
            {
                printf("Unable to open key file %s\n",
keyfile);
                exit(1);
            }
            fscanf(kfp, "%d\n", &c_cnt);
            for (i=0; i < c_cnt; i++)
                fscanf(kfp, "%d\n", work[i].o);
            fclose(kfp);
        }
        else
        {
            res = (int *)malloc(sizeof(int) * (c_cnt + 1));
            MALLOC_CHECK(res);
            for (i=0; i < c_cnt; i++)
                work[i].o =
                    MK_SPARSE(UnifInt(1L,
(long)(ORDER_PER_SF * flt_scale), 0L), 0);
        }

        return;
    }

    void
    usage(char *prog)
    {
        printf("USAGE: %s
[options]\n\n\tOptions\n\t=====
\n", prog);
        printf("\t-d <name>\t-- run against database <name>\n");
        printf("\t-h\t\t-- generate this usage message\n");
    }

```

```

printf("\t-C <procs>\t-- run <procs> transaction
streams\n");
printf("\t-k <file>\t-- read keys from <file>\n");
printf("\t-l <file>\t-- use <file> as the OnLine log file\n");
printf("\t-n <keycount>\t-- use <keycount> random keys
for verification\n");
printf("\t-s <SF>\t\t-- assume scale factor SF\n");
printf("\t-t <trans>\t-- issues <trans> transactions per
stream\n");
printf("\t-u\t\t-- undo any updates to database\n");
printf("\t-D\t\t-- output results to stdout\n");

return;
}

void
post_proc(c)
$parameter int c;
{
char n[80];
int i;
$int pkey, skey, okey, lkey, delta, child;
$time_t d_time;

sprintf(n, "Transactions from stream #%d\n", c);
TIMESTAMP(n);
fprintf(ofp, "%-10s%-2s%-3s%-8s%-6s\n",
"order", "l", "dlt", "part", "supp", "time");
$begin work;
$open h_crsr using :c;
$fetch h_crsr
into :pkey, :skey, :okey, :lkey, :delta, :d_time,
:child;
while (!SQLCODE)
{
dttoasc(&d_time, n);
fprintf(ofp, "%-10d%-2d%-3d%-8d%-6d\n",
okey, lkey, delta, pkey, skey, n);
$fetch h_crsr
into :pkey, :skey, :okey, :lkey, :delta, :d_time,
:child;
}
$close h_crsr;
$commit work;
fflush(ofp);

return;
}

void
do_testa(void)
{
int i;

init(0);
undo_tran(-99);

$delete from history;
SET_FILE("atome");
fprintf(ofp, "ATOMICITY TEST ONE\n");
dump_row(0, "Initial State:");
TIMESTAMP("Committed Transaction (History Table)");
prt_history(0);
$begin work;
do_tran(0, 0);
$commit work;
dump_row(0, "Final State:");
TIMESTAMP("Committed Transaction (History Table)");

```

```

prt_history(0);
/*TIMESTAMP("atomicity/commit success file
entries");*/
system("cat success.0 >> atome1");
undo_tran(0);
NEW_SUCCESS;

$delete from history;
SET_FILE("atome");
fprintf(ofp, "ATOMICITY TEST TWO\n");
dump_row(1, "Initial State:");
TIMESTAMP("Committed Transaction (History Table)");
prt_history(1);
$begin work;
do_tran(1, 1);
fprintf(ofp, "\n");
TIMESTAMP("Requesting Rollback");
$rollback work;
TIMESTAMP("Rollback Complete");
fprintf(ofp, "\n");
dump_row(1, "Final State:");
TIMESTAMP("Committed Transaction (History Table)");
prt_history(1);
/*TIMESTAMP("atomicity/commit success file
entries");*/
system("cat success.1 >> atome1");

wrapup();

return;
}

void
do_testc(void)
{
int *p, i, c_pid, j, status;
tran_t *damage;
char cmd[80];

nprocs = children;
for (i = 0; i < children; i++)
{
*spawn_args[childcnt]++;
switch (c_pid = SPAWN())
{
case -1:
fprintf(ofp, "Fork failed for child #%d\n", i);
for (j=0; j < i; j++)
KILL(pids[j]);
exit(1);
break;
case 0: /* CHILD */
testc_child(i);
exit(0);
break;
default:
pids[i] = c_pid;
break;
}
}

init(0);
STATUS((stderr, "Parent: do_testc(): init(0) done\n"));

undo_tran(-99);
if (children != 0 )
$delete from history;
SET_FILE("consb");
$set isolation to repeatable read;

```

```

        TIMESTAMP("Initial State");
        for (i=0; i < c_cnt; i++)
            c_check(i);

if (children == 0)
    exit(0);

        SET_FILE("conskpt");
TIMESTAMP("Allow Transactions");
        ALLREADY; /* everyone is ready */
        ALLGO;
        sleep(CKPT_WAIT);
        system("onmode -c >> conskpt1");
        system("onstat -m >> conskpt1");
        ALLREADY; /* everyone is done */

        SET_FILE("consa");
TIMESTAMP("Final State");
        for (i=0; i < c_cnt; i++)
            c_check(i);

        for (i=0; i < children; i++)
        {
            ONEGO; /* allow them to post process in turn
*/
            sleep(5);
        }
        ALLGO; /* allow them to terminate */
        sleep(5);
        wrapup();

return;
}

void
do_testi(void)
{
    double cost;
    int delta1, delta2, hold;
    int i, j, c_pid;

    $char comment[199];
    $char stmt_buf1[1000];
    $char stmt_buf2[1000];
    $decimal supplycost;
    $int availqty;
    $long max_partkey, max_suppkey, partkey, supkey;
    char buf[1024];

    nprocs = 1; /* these are $all 1 parent / 1 child tests */
/* JMS
    hold = c_cnt;
    c_cnt = 1;
*/
        *spawn_args[childcnt]+=1;
        switch (c_pid = SPAWN())
        {
        case -1:
            fprintf(ofp, "Fork failed for child #%d\n", i);
            for (j=0; j < i; j++)
                KILL(pids[j]);
            exit(1);
            break;
        case 0: /* CHILD */
            testi_child(i);
            exit(0);
            break;

```

```

        default: /* PARENT */
            init(0);

            /*
            * iso1: read-only isolation in the face of a
commit
            */
            SET_FILE("iso1");
            $set isolation to committed read;
            ALLREADY; /* process one is waiting to
commit */
            ALLGO;
            sleep(5);
            TIMESTAMP("T2: Initiate Read Query");
            dump_row(0, "T2: Query Complete");

            /*
            * iso2: read-only isolation in the face of a
rollback
            */
            ALLREADY; /* make sure child is ready
for test 2 */
            ALLGO; /* let him set up */
            SET_FILE("iso2");
            $set isolation to committed read;
            ALLREADY; /* process one is waiting to
commit */
            ALLGO;
            sleep(5);
            TIMESTAMP("T2: Initiate Read Query");
            dump_row(1, "T2: Query Complete");

            /*
            * iso3: update isolation in the face of a commit
            */
            ALLREADY; /* process 1 is ready for the
test */
            ALLGO; /* let him set up */
            work[4].o = work[2].o;
            work[4].l = work[2].l;
            SET_FILE("iso3");
            $set isolation to repeatable read;
            ALLREADY; /* process 1 is ready to
commit */
            ALLGO;
            fprintf(ofp, "\n");
            sprintf(buf, "T2: Initiate Update (%d,%d)",
work[4].o, work[4].l);
            TIMESTAMP(buf);
            fprintf(ofp, "\n");
            $begin work;
            do_tran(4, 6);
            TIMESTAMP("T2: Requesting Commit");
            $commit work;
            TIMESTAMP("T2: Commit Complete");
            dump_row(4, "T2: Final State.");
            TIMESTAMP("T2: Committed Transaction
(History Table)");
            prt_history(6);
            fflush(ofp);

            /*
            * iso4: update isolation in the face of a
rollback
            */
            NEW_SUCCESS;
            ALLREADY; /* process 1 is ready for the
test */

```

```

ALLGO;          /* let him set up */
work[5].o = work[3].o;
work[5].l = work[3].l;
SET_FILE("iso4");
$set isolation to repeatable read;
sleep(5);
ALLREADY;      /* process 1 is ready to
commit */
ALLGO;
fprintf(ofp, "\n");
sprintf(buf, "T2: Initiate Update (%d,%d)",
work[5].o, work[5].l);
TIMESTAMP(buf);
fprintf(ofp, "\n");
$begin work;
do_tran(5, 7);
TIMESTAMP("T2: Requesting Commit");
$commit work;
TIMESTAMP("T2: Commit Complete");
dump_row(5, "T2: Final State:");
TIMESTAMP("T2: Committed Transaction
(History Table)");
prt_history(7);
fflush(ofp);

/*
* : concurrent read/write transactions against
* different tables
*/
ALLREADY;
ALLGO;
SET_FILE("iso5");
$set isolation to repeatable read;
sleep(2);
TIMESTAMP("T2: Initiate Query");

$begin work;
$select max(ps_partkey) into :max_partkey
from partsupp where l = 1;
$select max(ps_suppkey) into :max_suppkey
from partsupp where l = 1;
partkey = UnifInt(1L, max_partkey, 1L);
suppkey = UnifInt(1L, max_suppkey, 1L);
$open ps_csr using :partkey, :suppkey;
$fetch ps_csr into
:partkey, :suppkey, :availqty, :supplycost,
:comment;
while (SQLCODE)
{
$close ps_csr;
partkey = UnifInt(1L, max_partkey, 1L);
suppkey = UnifInt(1L, max_suppkey, 1L);
$open ps_csr using :partkey, :suppkey;
$fetch ps_csr into
:partkey, :suppkey, :availqty, :supplycost,
:comment;
}
$close ps_csr;

if (dectodbl(&supplycost, &cost))
cost = -999.99;
TIMESTAMP("T2: Query Results:");
fprintf(ofp, "\n%8s |%8s |%5s |%8s |%s\n",
"p_key", "s_key", "avqty", "cost",
"comment");
fprintf(ofp, "%8d |%8d |%5d |%8.2f |%s\n\n",
partkey, suppkey, availqty, cost, comment);
$commit work;

```

```

fflush(ofp);

ALLREADY; /* process 1 is ready to commit */
ALLGO;
ALLREADY; /* process 1 is complete */
ALLGO;

/*
* iso6: test to see that update transactions are
* not delayed indefinitely when run concurrently
* with arbitrary read-only queries
*/
SET_FILE("iso6");

$set isolation to repeatable read;
sleep(3);

delta1 = UnifInt((long) 0, (long) 2159, (long) 0);

sprintf(stmt_buf1, "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 <= date('1998-12-01') - interval (%d) day
(4) to day \
group by 1, 2 \
order by 1, 2 into temp temp%d;", delta1, delta1);

TIMESTAMP("T1: Initiating Q1");
$begin work;
$execute immediate :stmt_buf1;
$commit work;
TIMESTAMP("T1: Q1 Complete");

ALLREADY;
ALLGO;

delta2 = UnifInt((long) 0, (long) 2159, (long) 0);
while (delta1 == delta2)
delta2 = UnifInt((long) 0, (long) 2159, (long) 0);

sprintf(stmt_buf2, "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 <= date('1998-12-01') - interval (%d) day
(4) to day \
group by 1, 2 \
order by 1, 2 into temp temp%d;", delta2, delta2);

TIMESTAMP("T1: Initiating Q1");

```

```

    $begin work;
    $execute immediate :stmt_buf2;
    $commit work;
    TIMESTAMP("T1: Q1 Complete");
    /* dump_row(7, "Final State:");
    TIMESTAMP("Committed Transaction
(History Table)");
    prt_history(9); */

    ALLREADY;
    ALLGO; /* allow him to cleanup */
    sleep(10);

    wrapup();
    break;
}
/* JMS
c_cnt = hold;
*/
return;
}

void
do_testd(void)
{
    int c_pid, o, l, d;
#ifdef WIN32
    int pids[MAX_CHILDREN];
#endif /*WIN32*/
    int i, count = 0;

    nprocs = children;
    for (i=0; i < children; i++)
    {
        *spawn_args[childcnt]++;
        switch(c_pid = SPAWN())
        {
            case -1:
                perror("fork error: durability");
                exit(1);
                break;
            case 0:
                /* child process/thread runs child routine */
                testd_child(i);
                exit(0);
                break;
            default:
                break;
        }
    }
    /* parent process/thread continues here */
    init(0);
    undo_tran(-99);
    $delete from history;
    ALLREADY;
    ALLGO;
    exit(0);
}

#ifdef WIN32
void
do_semop(int s, int v)
{
    struct sembuf sop;

    sop.sem_num = s;
    sop.sem_op = v;
    sop.sem_flg = 0;

```

```

    if (semop(semid, &sop, 1) == -1)
    {
        perror("tpcd: semop");
        exit(1);
    }
    return;
}
#endif /*WIN32*/

void
build_tran(int cnt)
{
    int i, good_key;
    static int init = 0;
    $int lnum;

    for (i = 0; i < cnt; i++)
    {
        good_key = 0;
        if (i >= c_cnt)
            work[i].o =
                MK_SPARSE(UnifInt(1L,
(long)(ORDER_PER_SF * flt_scale), 0L), 0);
        while (!good_key)
        {
            $execute get_lnum into :lnum using :work[i].o;
            if (lnum >= 0)
                good_key = 1;
            else
                work[i].o =
                    MK_SPARSE(UnifInt(1L,
(long)(ORDER_PER_SF * flt_scale), 0L), 0);
            work[i].l= UnifInt(O_LCNT_MIN, (long)lnum, 0L);
            work[i].d= UnifInt((long)1, (long)100, (long)0);
        }
        return;
    }

    void
    wrapup(void)
    {
        $delete from history;

#ifdef WIN32
        $disconnect $connName[PARENTCONN];
#else
        $close database;
        $free get_lnum;
        $free l_stmt;
        $free o_stmt;
        $free h_stmt;
        free h_crsr;
        $free ps_stmt;
        if (flags & FL_TESTI)
            free ps_crsr;
#endif
    }

    return;
}

void
init(childnum)
int childnum;

```

```

{
    DWORD tid;
#ifdef WIN32
    int idx;
    tid = GetCurrentThreadId();
    if(tid == tid_primary)
        idx = PARENTCONN;
    else
    {
        idx = 0;
        while (tid != dwChildId[idx] && idx <10) idx++;
        if (idx == 10)
        {
            printf("Thread #%d, init(): Error ThreadId not
matched!!\n", tid);
            exit(-1);
        }
    }
    sprintf(connName[idx], "conn%d", tid);

    $connect to $dbname as $connName[idx];

    STATUS((stderr, "Thread #%d Connected to Database %s
as %s\n",
            tid, dbname, connName[idx]));
#else
    $database $dbname;
    tid = childnum;
#endif /*WIN32*/

    $set pdqpriority 100;
    $whenever error call do_error;
    $set lock mode to wait;
    $set isolation to repeatable read;
    $prepare get_lnum from
        "select max(l_linenum) from lineitem where
l_orderkey = ?";
    /*
    * since the underlying calculation for DBGEN relies on
integer math and money
    * expressed in pennies, while the schema requires a more
standard dollars and
    * cents representation, it is necessary to apply the truncation
that integer
    * math enforces, rather than the rounding that is informix's
default behavior
    */
    STATUS((stderr, "ThreadId: #%d, get_lnum
prepared\n", tid));
    $prepare l_stmt from
        "select sum( trunc( trunc(l_extendedprice * (1 -
l_discount),2) * (1 + l_tax), 2)) from lineitem where
l_orderkey = ?";
    STATUS((stderr, "ThreadId: #%d, l_stmt
prepared\n", tid));
    $prepare o_stmt from
        "select o_totalprice from order where
o_orderkey = ?";
    STATUS((stderr, "ThreadId: #%d, o_stmt
prepared\n", tid));
    $prepare h_stmt from
        "select * from history where h_child =
? order by h_date";
    STATUS((stderr, "ThreadId: #%d, h_stmt
prepared\n", tid));

    $declare h_crsr cursor for h_stmt;
    STATUS((stderr, "ThreadId: #%d, h_crsr

```

```

prepared\n", tid));

    $prepare ps_stmt from
        "select * from partsupp where ps_partkey = ? and
ps_suppkey = ?";

    STATUS((stderr, "ThreadId: #%d, ps_stmt
prepared\n", tid));
    $declare ps_crsr cursor for ps_stmt;

    /* Seed[0] = seed; */
    STATUS((stderr, "ThreadId: #%d, Setting
Seed\n", tid));
    /* work around for Francois 7-22 */
    Seed[0] = seed + ( childnum * 201 );
    if (flags & FL_TESTI)
        Seed[0] = seed;

    STATUS((stderr, "ThreadId: #%d, Entering
pick_keys()\n", tid));
    pick_keys();
    STATUS((stderr, "ThreadId: #%d, Entering
build_tran()\n", tid));
    $begin work;
    build_tran(t_cnt);
    $commit work;
    STATUS((stderr, "ThreadId: #%d, build_tran()
done\n", tid));
    return;
}

void
do_transaction(work_unit, c)
$tran_t *work_unit;
$int c;

{

    $decimal cost, disc, e, new_ototal, otot, ototal_delta, q,
rprice, tax;
    $decimal num1, result1, result2, result3;
    $datetime year to fraction cur_dt;
    $int pkey, skey;

    $set isolation to repeatable read;
    if (flags & FL_DEBUG)
        $set explain on;

    $select o_totalprice into :otot from order
        where o_orderkey = :work_unit->o;

    $select l_quantity, l_extendedprice, l_partkey, l_suppkey,
l_tax, l_discount
        into :q, :e, :pkey, :skey, :tax, :disc from lineitem
        where l_orderkey = :work_unit->o and l_linenum =
:work_unit->l;

    //STATUS((stderr, "ThreadId: #%d, Start trans\n", c));
    //Sleep(40);

    deccvint(1, &num1);

    /* 1 - disc */
    decsub(&num1, &disc, &result1);

    /* e times (1-disc) */
    decmul(&e, &result1, &result2);

```

```

/* trunc (e times (1-disc)) */
dectrunc(&result2, 2);

/* 1 + tax */
decadd(&num1, &tax, &result1);

/* (e times (1-disc)) times (1+tax) */
decmul(&result2, &result1, &result3);

/* trunc (e times (1-disc)) times (1+tax) */
dectrunc(&result3, 2);

/* otot - ((e times (1-disc)) times (1+tax)) */
decsub(&otot, &result3, &work_unit->tprice);

/* e divided by q */
decdiv(&e, &q, &work_unit->rprice);

/* trunc (e divided by q) */
dectrunc(&work_unit->rprice, 2);

deccvint(work_unit->d, &num1);

/* d times rprice */
decmul(&num1, &work_unit->rprice, &cost);

/* trunc (d times rprice) */
dectrunc(&cost, 2);

if (flags & FL_DEBUG)
{
    char buf[1024];
    sprintf(buf, "(%d) Updating Lineitem (key =
%d,%d)",
            c, work_unit->o, work_unit->l);
    TIMESTAMP(buf);
}

$update lineitem
set (l_extendedprice, l_quantity) =
(e + :cost, :q + :work_unit->d)
where l_orderkey = :work_unit->o and l_linenum =
:work_unit->l;

if (flags & FL_DEBUG)
{
    char buf[1024];
    sprintf(buf, "(%d) Done Updating Lineitem", c);
    TIMESTAMP(buf);
}

if (flags & FL_DEBUG)
{
    char buf[1024];
    sprintf(buf, "(%d) Updating Order (key = %d)", c,
work_unit->o);
    TIMESTAMP(buf);
}

$update order
set o_totalprice =
:work_unit->tprice + trunc(trunc((e+:cost)*(1-
:disc),2)*(1+:tax),2)
where o_orderkey = :work_unit->o;

if (flags & FL_DEBUG)
{

```

```

    char buf[1024];
    sprintf(buf, "(%d) Done Updating Order", c);
    TIMESTAMP(buf);
}

$select o_totalprice into :new_ototal from order
where o_orderkey = :work_unit->o;

decsub(&new_ototal, &otot, &ototal_delta);

dcurrent(&cur_dt);
if (work_unit->d > 0) {
    $insert into history values
        (:pkey, :skey, :work_unit->o, :work_unit->l, :work_unit-
>d,
        :cur_dt, :cost, :ototal_delta, :c);
}
}

/*
* transaction specifics:
* do_tran(n, mode, child) -- execute (mode == 0) or undo
(mode == 1) the
* n-th transaction
*/
void
do_tran(n, child)
int n;
$parameter int child;
{
    double r, q, t, d, e, x;
    char name[20];
    int good_key = 0;
    $ int l_num;
    char buf[512];

    if (sfp == -1)
    {
        sprintf(name, "success.%d", child);
        //sfp = _open(name,
        _O_CREAT|_O_WRONLY|O_BINARY);
        sfp = _lcreat(name, 0);
        sprintf(buf, "%-10s%-2s%-3s%-10s%-4s%-
4s%-4s%-10s%-10s\n",
            "order", "l", "dlt", "rprice", "qty", "tax",
            "dsc", "eprice", "tprice");
        _lwrite(sfp, buf, strlen(buf));
        FlushFileBuffers(sfp);
    }

    do_transaction(&work[n], child);

    DEC_DBL(work[n].rprice, r);
    DEC_DBL(work[n].qty, q);
    DEC_DBL(work[n].tax, t);
    DEC_DBL(work[n].disc, d);
    DEC_DBL(work[n].eprice, e);
    DEC_DBL(work[n].tprice, x);

    sprintf(buf, "% 10d|% 2ld|% 3ld|% 10.2f|% 4.0f|% 4.2f|% 4.2f|
10.2f|10.2f\n",
            work[n].o, work[n].l, work[n].d, r, q, t, d, e, x);
    _lwrite(sfp, buf, strlen(buf));
    FlushFileBuffers(sfp);
    sleep(1);
}

```

```

    return;
}

void
undo_tran(child)
$parameter int child;

{

    $decimal cost, ototal_delta;
    $dtime_t h_date;
    $int p_key, s_key, o_key, l_key, delta, h_child;

    if (undo == 0) {
        return;
    }

    /*$begin work;*/

    if (child >= 0)
    {
        $open h_crsr using :child;
        $fetch h_crsr into
            $p_key, $s_key, $o_key, $l_key, $delta, $h_date,
            $cost, $ototal_delta, $h_child;
    }
    else
    {
        $prepare hall_stmt from
            "select * from history";
        $declare hall_crsr cursor for hall_stmt;
        $open hall_crsr;
        $fetch hall_crsr into
            $p_key, $s_key, $o_key, $l_key, $delta, $h_date,
            $cost, $ototal_delta, $h_child;
    }

    while (!SQLCODE)
    {
        $update lineitem
            set (l_extendedprice, l_quantity) =
                (l_extendedprice - :cost, l_quantity - :delta)
            where l_orderkey = :o_key and l_linenum = :l_key;

        $update order
            set (o_totalprice) =
                (o_totalprice - :ototal_delta)
            where o_orderkey = :o_key;

        if (child >= 0)
            $fetch h_crsr into
                $p_key, $s_key, $o_key, $l_key, $delta, $h_date,
                $cost, $ototal_delta, $h_child;
        else
            $fetch hall_crsr into
                $p_key, $s_key, $o_key, $l_key, $delta, $h_date,
                $cost, $ototal_delta, $h_child;
    }

    if (child >= 0)
        $close h_crsr;
    else
        $close hall_crsr;

    /*$commit work;*/

return;

```

```

}

void
prt_history(h)
$parameter int h;
{
    $decimal cost, ototal_delta;
    $int p_key, s_key, o_key, l_key, delta, h_child;
    $dtime_t h_date;
    char dstr[40];

    $begin work;
    $open h_crsr using :h;
    $fetch h_crsr into
        $p_key, $s_key, $o_key, $l_key, $delta, $h_date,
        $h_child;

    if (!SQLCODE) {
        fprintf(ofp, "\n\t%8s |%8s |%9s |%2s |%3s |%s\n",
            "p_key", "s_key", "o_key", "l", "d", "
date");
    } else {
        fprintf(ofp, "\n\tNo rows returned\n");
    }

    while (!SQLCODE)
    {
        if (dtoasc(&h_date, dstr))
            strepy(dstr, "error");

        fprintf(ofp, "\t%8d |%8d |%9d |%2d |%3d |%s\n",
            p_key, s_key, o_key, l_key, delta, dstr);

        $fetch h_crsr into
            $p_key, $s_key, $o_key, $l_key, $delta, $h_date,
            $h_child;
    }

    $close h_crsr;
    $commit work;

    fprintf(ofp, "\n");
    fflush(ofp);

    return;
}

void
dump_row(tnum, which_tran)
    int tnum;
    char *which_tran;
{
    $int linenum, okey;
    $dec_t qty, eprice, otot;
    static int init = 0;
    double d;
    char msgbuf[40];

    if (init == 0)
    {
        $prepare d_stmt from
            "select l_quantity, l_extendedprice, l_linenum
from lineitem where l_orderkey = ? order by l_linenum";
        $declare d_crsr cursor for d_stmt;
        //init = 1;
    }

```

```

okey = work[tnum].o;
STATUS((stderr, "\n\trandomly selected order key =
%d\n\n", okey));
fprintf(ofp, "\n");
$open d_crsr using $okey;
STATUS((stderr, "\n\d_crsr opened for order key =
%d\n\n", okey));
$fetch d_crsr into $qty, $eprice, $linenumber;
STATUS((stderr, "\n\d_crsr fetched for order key =
%d\n\n", okey));

TIMESTAMP(which_tran);

fprintf(ofp, "\n\t%8s %10s %11s \n", "line", "quantity",
"ext price");

while (!SQLCODE)
{
    if (dectodbl(&qty, &d))
        d = -1;

    if (work[tnum].l == linenumber) {
        fprintf(ofp, "\t*%7d %10.2f |",
linenumber, d);
    } else {
        fprintf(ofp, "\t%8d %10.2f |",
linenumber, d);
    }
    if (dectodbl(&eprice, &d))
        d = -1;
    fprintf(ofp, "%11.2f \n", d);
    $fetch d_crsr into $qty, $eprice, $linenumber;
}
$execute o_stmt into $otot using $okey;
if (dectodbl(&otot, &d))
    d = -1;
fprintf(ofp, "\n\t%8s %10.2f\n\n", "Total:", d);
fflush(ofp);
$close d_crsr;
$free d_crsr;
$free d_stmt;

return;
}

CHILD_ROUTINE testc_child(CHILD_PARAM lpPara)
{
    int i, j;
    DWORD tid;
    tid = lpPara;
    STATUS((stderr, "testc_child: child started,
ThreadId: #%d\n", tid));

    i = (int) lpPara;
    SET_FILE("stderr");
    init(0);
    STATUS((stderr, "testc_child, ThreadId: #%d,
init0 done\n", tid));

    NEW_SUCCESS;
    $set isolation to repeatable read;
    CHILDSYNC;
    STATUS((stderr, "testc_child, ThreadId: #%d,
starting trans \n", tid));
    for (j=0; j < t_cnt; j++)
        if ((j+1) % children == i)

```

```

{
    $begin work;
    $set lock mode to wait;
    do_tran(j, i);
    $commit work;
}

STATUS((stderr, "testc_child, ThreadId: #%d,
end trans \n", tid));
CHILDSYNC;
SET_FILE("constrte");
post_proc(i);
undo_tran(i);
CHILDSYNC;
return(0);
}

CHILD_ROUTINE testi_child(CHILD_PARAM lpPara)
{
    char buf[1024];
    int i;

    i = (int) lpPara;

    init(0);
    undo_tran(-99);
    $delete from history;

    /*
     * iso1: read-only isolation in the face of a
commit
     */
    SET_FILE("iso1");
    fprintf(ofp, "ISOLATION TEST ONE\n\n");
    $set isolation to repeatable read;
    dump_row(0, "Initial State:");
    TIMESTAMP("History table Contents:");
    prt_history(2);

    sprintf(buf, "T1: Initiate Update (%d,%d)",
work[0].o, work[0].l);
    TIMESTAMP(buf);

    $begin work;
    do_tran(0, 2);
    TIMESTAMP("T1: Suspending");
    fprintf(ofp, "\n");
    CHILDSYNC;
    sleep(20); /* sleep to be *sure* there is overlap */
    TIMESTAMP("T1: Requesting Commit");
    $commit work;
    TIMESTAMP("T1: Commit Done");
    fprintf(ofp, "\n");
    sleep(5); /* sleep to be *sure* trace file is obvious
*/

    dump_row(0, "Final State:");
    TIMESTAMP("Committed Transaction (History
Table)");
    prt_history(2);
    undo_tran(2);
    CHILDSYNC;
    fflush(ofp);

    /*
     * iso2: read-only isolation in the face of a
rollback
     */
    $delete from history;

```

```
NEW_SUCCESS;  
SET_FILE("iso2");  
fprintf(ofp, "
```

```

ISOLATION TEST TWO\n");
    $set isolation to repeatable read;
    dump_row(1, "Initial State:");
    TIMESTAMP("Committed Transaction (History
Table)");
    prt_history(3);
    sprintf(buf, "T1: Initiate Update (%d,%d)",
work[1].o, work[1].l);
    TIMESTAMP(buf);
    $begin work;
    do_tran(1, 3);
    TIMESTAMP("T1: Suspending");
    CHILDSYNC;
    sleep(10); /* sleep to be *sure* there is overlap */
    TIMESTAMP("T1: Requesting Rollback");
    $rollback work;
    TIMESTAMP("T1: Rollback Complete");
    sleep(10); /* sleep to be *sure* trace file is
obvious */
    dump_row(1, "Final State:");
    TIMESTAMP("Committed Transaction (History
Table)");
    prt_history(3);
    CHILDSYNC;
    fflush(ofp);

    /*
    * iso3: update isolation in the face of a commit
    */
    $delete from history;
    NEW_SUCCESS;
    SET_FILE("iso3");
    fprintf(ofp, "

```

```

ISOLATION TEST THREE\n");
    $set isolation to repeatable read;
    dump_row(2, "Initial State");
    TIMESTAMP("Committed Transaction (History
Table)");
    prt_history(4);
    sprintf(buf, "T1: Initiate Update (%d,%d)",
work[2].o, work[2].l);
    TIMESTAMP(buf);
    $begin work;
    do_tran(2, 4);
    TIMESTAMP("T1: Suspending");
    CHILDSYNC;
    sleep(10); /* sleep to be *sure* there is overlap */
    TIMESTAMP("T1: Requesting Commit");
    $commit work;
    TIMESTAMP("T1: Commit Complete");
    fprintf(ofp, "\n");
    /* sleep(10); sleep to be *sure* trace file is
obvious */
    dump_row(2, "T1: Final State:");
    TIMESTAMP("T1: Committed Transaction
(History Table)");
    prt_history(4);
    CHILDSYNC;
    fflush(ofp);

    /*
    * iso4: update isolation in the face of a rollback
    */
    $delete from history;
    NEW_SUCCESS;
    SET_FILE("iso4");
    fprintf(ofp, "

```

```

ISOLATION TEST FOUR\n");
    $set isolation to repeatable read;
    dump_row(3, "Initial State");
    TIMESTAMP("Committed Transaction (History
Table)");
    prt_history(5);
    sprintf(buf, "T1: Initiate Update (%d,%d)",
work[3].o, work[3].l);
    TIMESTAMP(buf);
    $begin work;
    do_tran(3, 5);
    TIMESTAMP("T1: Suspending");
    CHILDSYNC;
    sleep(10); /* sleep to be *sure* there is overlap */
    TIMESTAMP("T1: Requesting Rollback");
    $rollback work;
    TIMESTAMP("T1: Rollback Complete");
    /* sleep(10); sleep to be *sure* trace file is
obvious */
    dump_row(3, "T1: Final State:");
    TIMESTAMP("T1: Committed Transaction
(History Table)");
    prt_history(5);
    fflush(ofp);
    CHILDSYNC;

    /*
    * iso5: concurrent read/write transactions against
    *   different tables
    */
    $delete from history;
    NEW_SUCCESS;
    SET_FILE("iso5");
    fprintf(ofp, "

```

```

ISOLATION TEST FIVE\n");
    $set isolation to repeatable read;
    dump_row(6, "Initial State");
    TIMESTAMP("Committed Transaction (History
Table)");
    prt_history(8);
    sprintf(buf, "T1: Initiate Update (%d,%d)",
work[6].o, work[6].l);
    TIMESTAMP(buf);
    $begin work;
    do_tran(6,8);
    TIMESTAMP("T1: waiting to commit");
    CHILDSYNC;
    TIMESTAMP("T1: Requesting Commit");
    $commit work;
    TIMESTAMP("T1: Commit Complete");
    dump_row(6, "Final State:");
    TIMESTAMP("Committed Transaction (History
Table)");
    prt_history(8);
    fflush(ofp);
    CHILDSYNC;

    /*
    * iso6: test to see that update transactions are
    * not delayed indefinitely when run
concurrently
    * with arbitrary read-only queries
    */
    NEW_SUCCESS;
    SET_FILE("iso6");
    fprintf(ofp, "

```

```

ISOLATION TEST SIX\n");
    fflush(ofp);
    $set isolation to repeatable read;
    dump_row(7, "Initial State");
    TIMESTAMP("Committed Transaction (History
Table)");
    prt_history(9);
    sleep(3);
    sprintf(buf, "T2: Initiate Update (%d,%d)",
work[7].o, work[7].l);
    TIMESTAMP(buf);
    $begin work;
    do_tran(7,9);
    CHILDSYNC;
    sleep(3);
    TIMESTAMP("T2: Requesting Commit");
    $commit work;
    TIMESTAMP("T2: Commit Complete");
    dump_row(7, "Final State:");
    TIMESTAMP("Committed Transaction (History
Table)");
    prt_history(9);
    CHILDSYNC;
    fflush(ofp);

    return(0);
}

CHILD_ROUTINE testd_child(CHILD_PARAM lpPara)
{
    int i, count = 0;
    nprocs = children;
    i = (int) lpPara;

    sleep(i);
    init(i);
    SET_FILE("durrate");
    CHILDSYNC;
    while(1)
    {
        TIMESTAMP("Begin Transaction");
        $begin work;
        do_tran(count % t_cnt, i);
        $commit work;
        TIMESTAMP("End Transaction");
        if (++count % 100 == 0)
        {
            char msg[60];
            sprintf(msg, "Stream %d:
Batch of 100 transactions complete", i);
            TIMESTAMP(msg);
        }
        if (count % t_cnt == 0)
        {
            char msg[60];
            sprintf(msg, "Stream %d:
%d transactions complet e", i, t_cnt);
            TIMESTAMP(msg);
            build_tran(t_cnt);
        }
    }
    return(0);
}
F-2: nt.h
/*

```

```

* Synchroniztion
macros:

* MAKESEMS() --
create the semaphores

* ALLREADY() --
delete the semaphores

*

* synchronization
scheme:

* sem[0] -- number
of children ready to
go

* sem[1] -- number
of children allowed to
go

* sem[2] -- ???

* CHILDSYNC() --
this child registers as
ready, then waits for
permission,

* to
continue

* ALLREADY() --
parent will wait here
until all children are
ready

* ALLGO() --
parent allows all
children to proceed

* ONEGO() --
parent allows *a*
child to proceed

*/

#define MAKESEMS
\

if(( semid[0] =
CreateSemaphore(NU
LL,0,10,"sem-0")) ==
NULL)\

```

```

fprintf(stderr,
"CreateSemaphore-0
FAILS\n"); \

    if(( semid[1] =
CreateSemaphore(NU
LL,0,10,"sem-1")) ==
NULL) \

fprintf(stderr,
"CreateSemaphore-1
FAILS\n"); \

    if(( semid[2] =
CreateSemaphore(NU
LL,1,10,"sem-2")) ==
NULL) \

fprintf(stderr,
"CreateSemaphore-2
FAILS\n");

#define DROPSEMS
\

    CloseHandle
(semid[0]); \

    CloseHandle
(semid[1]); \

    CloseHandle
(semid[2])

#define CHILDSYNC
\

ReleaseSemaphore(se
mid[0], 1, NULL); \

WaitForSingleObject(
semid[1], INFINITE)

#define ALLREADY
\

for(sem_index=0;

```

```

sem_index < nprocs;
sem_index++) \

WaitForSingleObject(
semid[0], INFINITE)

#define ALLGO
ReleaseSemaphore(se
mid[1], nprocs,
NULL)

#define ONEGO
ReleaseSemaphore(se
mid[1], 1, NULL)

/*

* datatype defines to
map routines/objects
to and from NT/Unix

*

*/

#define
THREAD_DECL
__declspec(thread)

#define PID int

#define
CHILD_ROUTINE
DWORD WINAPI

#define
CHILD_PARAM
LPVOID

/*

* process
creation/destruction
macros

*

*
CHILD_START(<rou

```

```

tine>) creates
<nprocs>
processes/threads to

*
execute <routine>

* KILL_CHILD
clean up after the
child is done

*/

#define
KILL_CHILD for (i =
0; i < nprocs; i++)
CloseHandle(pids[i])

#define
CHILD_START(routi
ne) \

    for (i = 0; i <
nprocs; i++) \

        { \

            threadPara =
i; \

            pids[i]=Creat
eThread(NULL,0,rout
ine,threadPara,0,
&dwChildId[i]); \

            if(pids[i]==N
ULL) \

                { \

                    lastError =
GetLastError(); \

                    fprintf(ofp,
"CreateThread Error:
%d, Instance: %d\n", \

```

```

        lastError, i);
\

        exit(1); \

    } \

}

/*

* miscellaneous
defines and
declarations

*/

#define
LOCKCONNNAME
WaitForSingleObject(
semid[2], INFINITE)

#define
UNLOCKCONNNAM
E
ReleaseSemaphore(se
mid[2], 1, NULL)

#define sleep(s)
Sleep(s*1000)

#define
PARENTCONN 11

int    sem_index;

HANDLE semid[3];
/* timing control
semaphores */

HANDLE
pids[MAX_CHILDR
EN];

DWORD
dwChildId[10];

```

```
DWORD  
tid_primary;  
  
DWORD lastError;  
  
int threadPara;  
  
$ char  
connName[11][80];
```

## Appendix G: Database Contents

### G-1: Lineitem contents

l\_orderkey 1  
 l\_partkey 15518935  
 l\_suppkey 768951  
 l\_linenumbr 1  
 l\_quantity 17.00  
 l\_extendedprice 33203.72  
 l\_discount 0.04  
 l\_tax 0.02  
 l\_returnflag N  
 l\_linestatus O  
 l\_shipdate 1996-03-13  
 l\_commitdate 1996-02-12  
 l\_receiptdate 1996-03-22  
 l\_shipinstruct DELIVER IN PERSON  
 l\_shipmode TRUCK  
 l\_comment iPbw4mMm7w7kQ zNPL i261OPP

l\_orderkey 1  
 l\_partkey 6730908  
 l\_suppkey 730909  
 l\_linenumbr 2  
 l\_quantity 36.00  
 l\_extendedprice 69788.52  
 l\_discount 0.09  
 l\_tax 0.06  
 l\_returnflag N  
 l\_linestatus O  
 l\_shipdate 1996-04-12  
 l\_commitdate 1996-02-28  
 l\_receiptdate 1996-04-20  
 l\_shipinstruct TAKE BACK RETURN  
 l\_shipmode MAIL  
 l\_comment 5wM04SNyl0AnghCP2nx lAi

l\_orderkey 1  
 l\_partkey 6369978  
 l\_suppkey 369979  
 l\_linenumbr 3  
 l\_quantity 8.00  
 l\_extendedprice 16381.28  
 l\_discount 0.10  
 l\_tax 0.02  
 l\_returnflag N  
 l\_linestatus O  
 l\_shipdate 1996-01-29  
 l\_commitdate 1996-03-05  
 l\_receiptdate 1996-01-31  
 l\_shipinstruct TAKE BACK RETURN  
 l\_shipmode REG AIR  
 l\_comment SQC2C 5PNCy4mM

l\_orderkey 1  
 l\_partkey 213150  
 l\_suppkey 463151  
 l\_linenumbr 4  
 l\_quantity 28.00  
 l\_extendedprice 29767.92  
 l\_discount 0.09  
 l\_tax 0.06  
 l\_returnflag N

l\_linestatus O  
 l\_shipdate 1996-04-21  
 l\_commitdate 1996-03-30  
 l\_receiptdate 1996-05-16  
 l\_shipinstruct NONE  
 l\_shipmode AIR  
 l\_comment Om0L65CSAwSj5k6k

l\_orderkey 1  
 l\_partkey 2402664  
 l\_suppkey 152671  
 l\_linenumbr 5  
 l\_quantity 24.00  
 l\_extendedprice 37596.96  
 l\_discount 0.10  
 l\_tax 0.04  
 l\_returnflag N  
 l\_linestatus O  
 l\_shipdate 1996-03-30  
 l\_commitdate 1996-03-14  
 l\_receiptdate 1996-04-01  
 l\_shipinstruct NONE  
 l\_shipmode FOB  
 l\_comment C2gOQj OB6RLk1BS15 igN

l\_orderkey 1  
 l\_partkey 1563445  
 l\_suppkey 63448  
 l\_linenumbr 6  
 l\_quantity 32.00  
 l\_extendedprice 48267.84  
 l\_discount 0.07  
 l\_tax 0.02  
 l\_returnflag N  
 l\_linestatus O  
 l\_shipdate 1996-01-30  
 l\_commitdate 1996-02-07  
 l\_receiptdate 1996-02-03  
 l\_shipinstruct DELIVER IN PERSON  
 l\_shipmode MAIL  
 l\_comment CB0SnyOL PQ32B70wB75k 6Aw10m0wh

l\_orderkey 2  
 l\_partkey 16818625  
 l\_suppkey 818626  
 l\_linenumbr 1  
 l\_quantity 24.00  
 l\_extendedprice 37026.72  
 l\_discount 0.00  
 l\_tax 0.08  
 l\_returnflag N  
 l\_linestatus O  
 l\_shipdate 1997-03-05  
 l\_commitdate 1997-02-09  
 l\_receiptdate 1997-03-11  
 l\_shipinstruct COLLECT COD  
 l\_shipmode AIR  
 l\_comment O52M70MRgRNnmm476mNm

l\_orderkey 3  
 l\_partkey 10616973  
 l\_suppkey 116994  
 l\_linenumbr 1  
 l\_quantity 38.00  
 l\_extendedprice 71798.72  
 l\_discount 0.00  
 l\_tax 0.05  
 l\_returnflag A

l\_linestatus F  
 l\_shipdate 1993-12-11  
 l\_commitdate 1993-11-27  
 l\_receiptdate 1993-12-16  
 l\_shipinstruct TAKE BACK RETURN  
 l\_shipmode RAIL  
 l\_comment 3AR yMS771Q12kR  
  
 l\_orderkey 3  
 l\_partkey 19450826  
 l\_suppkey 700846  
 l\_linenumbr 2  
 l\_quantity 30.00  
 l\_extendedprice 53275.50  
 l\_discount 0.05  
 l\_tax 0.01  
 l\_returnflag A  
 l\_linestatus F  
 l\_shipdate 1994-02-05  
 l\_commitdate 1993-12-29  
 l\_receiptdate 1994-02-18  
 l\_shipinstruct TAKE BACK RETURN  
 l\_shipmode FOB  
 l\_comment 6wQnO0Llg6y  
  
 l\_orderkey 3  
 l\_partkey 10016338  
 l\_suppkey 16339  
 l\_linenumbr 3  
 l\_quantity 44.00  
 l\_extendedprice 55168.52  
 l\_discount 0.07  
 l\_tax 0.03  
 l\_returnflag R  
 l\_linestatus F  
 l\_shipdate 1994-01-19  
 l\_commitdate 1993-12-23  
 l\_receiptdate 1994-02-15  
 l\_shipinstruct TAKE BACK RETURN  
 l\_shipmode SHIP  
 l\_comment LhiA7wygz0k4g4zRhMLBAM

10 row(s) retrieved.

**G-2: Order contents**

o\_orderkey 1  
 o\_custkey 3689999  
 o\_orderstatus O  
 o\_totalprice 224560.83  
 o\_orderdate 1996-01-02  
 o\_orderpriority 5-LOW  
 o\_clerk Clerk#000095055  
 o\_shippriority 0  
 o\_comment A0xCm5ARNL  
 mxjChn2kC64xA4L6zBg2O5jhg M42izyPO  
 QlymN1ky5kmSiSg  
 BAQA  
  
 o\_orderkey 2  
 o\_custkey 7800163  
 o\_orderstatus O  
 o\_totalprice 39988.85  
 o\_orderdate 1996-12-01  
 o\_orderpriority 1-URGENT  
 o\_clerk Clerk#000087916  
 o\_shippriority 0

o\_comment 5PRxL1nM7xhQNzP2hnhjy1zz ykhg4P2A  
 MMg5Px3OCN 0B0iyCRgiC2  
  
 o\_orderkey 3  
 o\_custkey 12331391  
 o\_orderstatus F  
 o\_totalprice 306426.43  
 o\_orderdate 1993-10-14  
 o\_orderpriority 5-LOW  
 o\_clerk Clerk#000095426  
 o\_shippriority 0  
 o\_comment nm0kygQBnw7RS3AAA4k  
  
 o\_orderkey 4  
 o\_custkey 13677602  
 o\_orderstatus O  
 o\_totalprice 7884.05  
 o\_orderdate 1995-10-11  
 o\_orderpriority 5-LOW  
 o\_clerk Clerk#000012340  
 o\_shippriority 0  
 o\_comment CP42CySQLz64n3mCyjm17 4B0CL  
 L5772m4k2Ai4h1nPySwSmNyCl4jOAOx5y4  
 Rjx36nhO1x2x4Qw  
  
 o\_orderkey 5  
 o\_custkey 5562202  
 o\_orderstatus F  
 o\_totalprice 184997.17  
 o\_orderdate 1994-07-30  
 o\_orderpriority 5-LOW  
 o\_clerk Clerk#000092480  
 o\_shippriority 0  
 o\_comment 3PNC7zMP534MSizgy34Bxj6210C7n6PBk7  
  
 o\_orderkey 6  
 o\_custkey 3913430  
 o\_orderstatus F  
 o\_totalprice 4195.11  
 o\_orderdate 1992-02-21  
 o\_orderpriority 4-NOT SPECIFIED  
 o\_clerk Clerk#000005798  
 o\_shippriority 0  
 o\_comment 1CN00NA0z75SwwCxMNB0MLNL  
  
 o\_orderkey 7  
 o\_custkey 13005694  
 o\_orderstatus O  
 o\_totalprice 205492.90  
 o\_orderdate 1996-01-10  
 o\_orderpriority 2-HIGH  
 o\_clerk Clerk#000046961  
 o\_shippriority 0  
 o\_comment gmiC6hj5L4 0ixCAQkmB6giC16l4L16g  
  
 o\_orderkey 32  
 o\_custkey 6695788  
 o\_orderstatus O  
 o\_totalprice 214045.34  
 o\_orderdate 1995-07-16  
 o\_orderpriority 2-HIGH  
 o\_clerk Clerk#000061561  
 o\_shippriority 0  
 o\_comment 7ihNSz00NCxA31PPx6RM4ih  
 BPPlz417SLk3SRA1zxOnlikRgjx  
  
 o\_orderkey 33

o\_custkey 6100004  
o\_orderstatus F  
o\_totalprice 107296.91  
o\_orderdate 1993-10-27  
o\_orderpriority 3-MEDIUM  
o\_clerk Clerk#000040860  
o\_shippriority 0  
o\_comment jkACLh 0igMiy72n Sky0h0B6NB70j7Q

o\_orderkey 34  
o\_custkey 8611441  
o\_orderstatus O  
o\_totalprice 128003.89  
o\_orderdate 1998-07-21  
o\_orderpriority 3-MEDIUM  
o\_clerk Clerk#000022278  
o\_shippriority 0  
o\_comment 05k 2x242klm jyA  
wB0CBzzQnz5P1 1nAml5AL5jC lg5

10 row(s) retrieved.

**G-3: Part contents**

p\_partkey 1  
p\_name goldenrod lace spring chartreuse ivory  
p\_mfgr Manufacturer#1  
p\_brand Brand#13  
p\_type PROMO BURNISHED COPPER  
p\_size 7  
p\_container JUMBO PKG  
p\_retailprice 901.00  
p\_comment zMg1PACmQ 7RCCC7

p\_partkey 2  
p\_name snow ghost azure burnished lemon  
p\_mfgr Manufacturer#1  
p\_brand Brand#13  
p\_type LARGE BRUSHED BRASS  
p\_size 1  
p\_container LG CASE  
p\_retailprice 902.00  
p\_comment Bxg4RIO6051n7NjN zn

p\_partkey 3  
p\_name cornflower navajo salmon lemon orchid  
p\_mfgr Manufacturer#4  
p\_brand Brand#42  
p\_type STANDARD POLISHED BRASS  
p\_size 21  
p\_container WRAP CASE  
p\_retailprice 903.00  
p\_comment 4241RR3By

p\_partkey 4  
p\_name olive dim lemon light khaki  
p\_mfgr Manufacturer#3  
p\_brand Brand#34  
p\_type SMALL PLATED BRASS  
p\_size 14  
p\_container MED DRUM  
p\_retailprice 904.00  
p\_comment z1n7znz6

p\_partkey 5  
p\_name lavender cornsilk linen seashell lemon  
p\_mfgr Manufacturer#3

p\_brand Brand#32  
p\_type STANDARD POLISHED TIN  
p\_size 15  
p\_container SM PKG  
p\_retailprice 905.00  
p\_comment gj4Lg5BhBk12iS

p\_partkey 6  
p\_name cornsilk beige chartreuse medium blue  
p\_mfgr Manufacturer#2  
p\_brand Brand#24  
p\_type PROMO PLATED STEEL  
p\_size 4  
p\_container MED BAG  
p\_retailprice 906.00  
p\_comment yNjzS Njyh4mgLx Om

p\_partkey 7  
p\_name honeydew purple cream mint coral  
p\_mfgr Manufacturer#1  
p\_brand Brand#11  
p\_type SMALL PLATED COPPER  
p\_size 45  
p\_container SM BAG  
p\_retailprice 907.00  
p\_comment PSNg0L

p\_partkey 8  
p\_name puff blush tomato papaya navy  
p\_mfgr Manufacturer#4  
p\_brand Brand#44  
p\_type PROMO BURNISHED TIN  
p\_size 41  
p\_container LG DRUM  
p\_retailprice 908.00  
p\_comment k042AL4y21N1yNPC77

p\_partkey 9  
p\_name burnished violet pink rose drab  
p\_mfgr Manufacturer#4  
p\_brand Brand#43  
p\_type SMALL BURNISHED STEEL  
p\_size 12  
p\_container WRAP CASE  
p\_retailprice 909.00  
p\_comment 37PLkwhgiAP0xCkxO

p\_partkey 10  
p\_name slate dark white lavender purple  
p\_mfgr Manufacturer#5  
p\_brand Brand#54  
p\_type LARGE BURNISHED STEEL  
p\_size 44  
p\_container LG CAN  
p\_retailprice 910.01  
p\_comment wPP74M1Lwj1

10 row(s) retrieved.

**G-4: Partsupp contents**

ps\_partkey 1  
ps\_suppkey 2  
ps\_availqty 3325  
ps\_supplycost 771.64  
ps\_comment  
00PL56QkQRSkz7MANNj4i1h2zLQQLiQnAIML1S6

k4hg3hP5hk3ywMLwy 7gjR  
3 4Q7S1Qmzx2jOS37Mk61n  
yCg4Q7k522P0055wg23B0Mw3BOWSy6z5Q6xIjABx3  
LAj6R6CmM  
l4jjMzQ02LkiiyCCwBk7w465kLBz7QICk26ARLOxk7z2h  
C0jw7

ps\_partkey 1  
ps\_suppkey 250002  
ps\_availqty 8076  
ps\_supplycost 993.49  
ps\_comment  
nSO7Mln4N7LlxgAyM2MzNnO7k0NlhjyShgCy30A  
27QML0S077CPPgkCQAQCwz5M  
3MmSSAQ  
LxMLMC0Bj4CNN276SmQRSIjPxz5z3  
L2mLMQSBghjLnCOR4NI 156OMP  
C76QL  
xiyw0kSQy1w6ygAxOA4hx7Ngihi5NAPNI2LQ4SRnNhn7  
mygOB0z

ps\_partkey 1  
ps\_suppkey 750002  
ps\_availqty 4069  
ps\_supplycost 357.84  
ps\_comment 234OCA5ghw0P0gS3n2jCS35yAm  
3L5C7iB k7 w1 R52LLOACQ6i606OB 2MP1x0

wC23ik2Omk4NnxzmS6z5z5il661l2l2g0P3OLk66jzQxjSSA  
nwSnQ3xz QBQR2j1  
0hNmmyQ14hl4514x5C B5Qz  
Lk26yhQNmS54A2O7wLC POC57CyxSL3

ps\_partkey 1  
ps\_suppkey 500002  
ps\_availqty 3956  
ps\_supplycost 337.09  
ps\_comment 6215k  
jLCizNIOB162nP4ILQy431kOzyzn2M6L3h73lCljhlx3x5ghj1  
OyL76A0h  
zPk2CS2jKxN gAN3gnk652 Cj4k4

ps\_partkey 2  
ps\_suppkey 3  
ps\_availqty 8895  
ps\_supplycost 378.49  
ps\_comment MMNOM3BnMM6NBzjB 2mg i jALB  
nQhBM5ROi5N7A5w4B4S2k1506OzMgh6SRB7n

P1hQCjgjR17SBA77g6niCwi0L6Pghh1S004mlSL1OShrk  
yxQS7NNQj

ps\_partkey 2  
ps\_suppkey 250003  
ps\_availqty 4969  
ps\_supplycost 915.27  
ps\_comment  
6S66zNlykhii26wwAxz1PRMxggAy446yyIPBS5wP  
Rl6ggNkyikyhxymMShNgQm  
Bim1N60  
00NSjwPw02lhPPSmn3yRSCn105llnPBk2MIRlxxQAmR  
mO2kxiRh5Pk4  
x2OnS40nnQRm  
16L6NC2RSaKl36g6w64L5w4w74Lnz5wROSOQningx4i  
mSnPwz5N  
hSxNg

ps\_partkey 2

ps\_suppkey 750003  
ps\_availqty 3025  
ps\_supplycost 306.39  
ps\_comment  
y5BNy3Aw02nxyMxgzP5BS14gg7MCnLlSkih56gOMOy4  
QyNj5P3iM jOmkRQhRR3h  
y1Cn4jN LlgSxyPigjRLgBygM  
RR4CL3Pjx6CRMNI1iA7w2ALwkn06khOOzyQNB  
63wP4BLSk wPNk4My

ps\_partkey 2  
ps\_suppkey 500003  
ps\_availqty 8539  
ps\_supplycost 438.37  
ps\_comment BPOgj3k MgQR2  
x6kn3BR6lkmhMzjQk6S343LmN6lz2Qh512MSi4nQ5Bghx  
lh401

yyn463mxOh7Bxgx1PR60jwSMQ661OCA6mPO33R05R2S  
6N330in0Qx0AC4QhBnOkz  
4NIQkMR2gh3 k1xk Sjn40C77hm2Qlh01jAkSP

ps\_partkey 3  
ps\_suppkey 4  
ps\_availqty 4651  
ps\_supplycost 920.92  
ps\_comment P7 437MmnM0Pik  
lAwBj0gSnm1z1zAMA6417zgS154nLCC0Q6BC1lgxyB6B  
kOj6Q  
CC6n4mw2w7jgCNP zz5AMw37 z

ps\_partkey 3  
ps\_suppkey 250004  
ps\_availqty 4093  
ps\_supplycost 498.13  
ps\_comment  
PyRmlwO76kO3igxhS64h5x6PBLM2Pxo0j3NMRgzP6S1  
ghhw4Nnn04my03lzCyQQ  
4M3gS2kO2iOmxPzLCM330zN1yPnzml1ixgB

10 row(s) retrieved.

### G-5: Customer contents

c\_custkey 1  
c\_name Customer#000000001  
c\_address ANhzAAh6R3 gLS4Sx  
c\_nationkey 15  
c\_phone 25-989-741-2988  
c\_acctbal 711.56  
c\_mktsegment BUILDING  
c\_comment  
j5S37kk6zkOzkM5NOz6jwwimkN66CmOhM5ySy  
w6PAj2xjOAmhkW6ChSR 21BMRkL  
0kLM5zXg654CRIB3 1Lxm3S

c\_custkey 2  
c\_name Customer#000000002  
c\_address MN0L3OzNgyLx2  
c\_nationkey 13  
c\_phone 23-768-687-3665  
c\_acctbal 121.65  
c\_mktsegment AUTOMOBILE  
c\_comment M4QB23ixkg0yk6m3gwm6zi32PS7lJ2

c\_custkey 3  
c\_name Customer#000000003

c\_address PSL74SNCwwN2ON66lxgnw7mR4hLP2k  
c\_nationkey 1  
c\_phone 11-719-748-3364  
c\_acctbal 7498.12  
c\_mktsegment AUTOMOBILE  
c\_comment mSC13MBj4n0P6Mgh0ml02zOBlyjw3NzB1

c\_custkey 4  
c\_name Customer#000000004  
c\_address mknn1Sh0NPMz1k5Lw2OB mO  
c\_nationkey 4  
c\_phone 14-128-190-5944  
c\_acctbal 2866.83  
c\_mktsegment MACHINERY  
c\_comment  
MN6ChhSMwPwzOkyww7C5ROlhMS0C4iR2nC6kQmywx  
3yim62QNySOmQRQnwizihMOg

c\_custkey 5  
c\_name Customer#000000005  
c\_address yOww5znhPNI5OIQNPChkLx2BLPxNSB  
c\_nationkey 3  
c\_phone 13-750-942-6364  
c\_acctbal 794.47  
c\_mktsegment HOUSEHOLD  
c\_comment 24BOSzG 03m710wll  
iNxnwQ0OmzzgO7A3ykBj2  
g755hhCyMO7QnARx5Pg3kyA  
QA35  
i0CS1MSLg0xN2iyg0liwnMwnOx52nj5iQkNQPP

c\_custkey 6  
c\_name Customer#000000006  
c\_address nS70ykL4n k51ik3R5wlNzjnjBL2N51ki  
c\_nationkey 20  
c\_phone 30-114-968-4951  
c\_acctbal 7638.57  
c\_mktsegment AUTOMOBILE  
c\_comment hPMLmxPw05R1mz126jjiRAj1kOP7xLC6  
yS3ALCRBR5B3im650BLm4O3SwBP7xlwOk  
lmPRS31RNN0gMkkPm4COigCRMlniz27jwg63yz

c\_custkey 7  
c\_name Customer#000000007  
c\_address ChljB04OgAizN6kQhRi7LjjNiCM0A AS  
c\_nationkey 18  
c\_phone 28-190-982-9759  
c\_acctbal 9561.95  
c\_mktsegment AUTOMOBILE  
c\_comment QM63L2miSw3hy34iQ11235  
011mkgk0SkCRC73L1CgiLROzNwjO4PQSBx2n2iQg5h

c\_custkey 8  
c\_name Customer#000000008  
c\_address kCRz0CknMw7mh4P50QjBnxSLRxQCMOAh  
yNn  
c\_nationkey 17  
c\_phone 27-147-574-9335  
c\_acctbal 6819.74  
c\_mktsegment BUILDING  
c\_comment x1Rh1P5M73Lix xyM  
Lmng0RO4MBQyLlI7wzwyOLCxi2yCLgLiZ04yOiAPj

c\_custkey 9  
c\_name Customer#000000009  
c\_address L4z65g2RNgN6PxM5kRjnPB7k2kwL62  
c\_nationkey 8  
c\_phone 18-338-906-3675

c\_acctbal 8324.07  
c\_mktsegment FURNITURE  
c\_comment  
7zRiSzjmj4Ak7L6N7RljhM5437B6CPmP54RC1x1x7C6hzi  
N6l

c\_custkey 10  
c\_name Customer#000000010  
c\_address L3jg3xAwi6A0B103B0Aymm  
c\_nationkey 5  
c\_phone 15-741-346-9870  
c\_acctbal 2753.54  
c\_mktsegment HOUSEHOLD  
c\_comment 7Lm  
LiCwwxQMykgNOR6kzCyP1B21QyA57hBISOPnx6m53iS  
OP6w44M3CP MnP7Alk  
y4OwkOwSh20341

10 row(s) retrieved.

### G-6: Supplier contents

s\_suppkey 1  
s\_name Supplier#000000001  
s\_address N kw4gn1OM Ahw3Sg70BBgQw57lgjzj55R  
s\_nationkey 17  
s\_phone 27-918-335-1736  
s\_acctbal 5755.94  
s\_comment lLniMi51QPmO1 C2hy27wkN21mmg53  
BhQBB1O2x4OmiR4kO5kN1BS 4PwMhk Pk2n  
RnA2 k

s\_suppkey 2  
s\_name Supplier#000000002  
s\_address ji3yh016B5  
s\_nationkey 5  
s\_phone 15-679-861-2259  
s\_acctbal 4032.68  
s\_comment B32z0yzh2lPyOwQkA704yM2R7llRik2  
xClly41QNmqn0RNi0OQ4jgMy3kSRBLzy  
w25CB5 lk0A 54

s\_suppkey 3  
s\_name Supplier#000000003  
s\_address mxBQbnxO3CSw17  
s\_nationkey 1  
s\_phone 11-383-516-1199  
s\_acctbal 4192.40  
s\_comment  
BS0Ozji01yM6Rgl4mxLNhjsMPB37Sw7ym3R7ll2n4SSCil  
z6nlL5SBOig

s\_suppkey 4  
s\_name Supplier#000000004  
s\_address 7zR323R73NMB77wi1  
s\_nationkey 15  
s\_phone 25-843-787-7479  
s\_acctbal 4641.08  
s\_comment w  
lQn6QyOSSxhw10C6gz2BngiLRAMngnRxiLiO3

s\_suppkey 5  
s\_name Supplier#000000005  
s\_address AmMQ7Mg  
10ByLCP52M13xN31jh5hzOgnm00B  
s\_nationkey 11  
s\_phone 21-151-690-3663

s\_acctbal -283.84  
s\_comment PAziBQQixjwS7P4iQhn10i74050M  
AzkxACnOAYjnSm3CQ26SOx5kynSR0nLSzi3y  
3nzPPNikNI3P3 kLwwOP7AM30CO0ymAh

s\_suppkey 6  
s\_name Supplier#000000006  
s\_address QQL6hxmMkkgMwgm7CB5B 30Lz  
s\_nationkey 14  
s\_phone 24-696-997-4969  
s\_acctbal 1365.79  
s\_comment giSki24 gRNAmB  
1yOzPR6Q2kiNCQ0h3LLyxmROA5O7OOi5zlzy

s\_suppkey 7  
s\_name Supplier#000000007  
s\_address z45m2jBRz15iILNz4  
s\_nationkey 23  
s\_phone 33-990-965-2201  
s\_acctbal 6820.35  
s\_comment IPhngjmiSQI0RzRACP0I4S70xSL  
QPSBM16072SkMLCgm4O0MjARLNQk3g1P3BB32A  
gBML462B0CP7Rh24

s\_suppkey 8  
s\_name Supplier#000000008  
s\_address xz5m4C A4AAj0kANQ  
s\_nationkey 17  
s\_phone 27-498-742-3860  
s\_acctbal 7627.85  
s\_comment lz57Mw6RNwCSCzmAShwN7S45w20C5zS6zi  
5A11ORMwnQmjS5SgBnRhQ11CkyBlhN  
6MP7 kAzNw3gSjyyLMiNzhCmPn0 g5x23Q

s\_suppkey 9  
s\_name Supplier#000000009  
s\_address m7k7Cn3wIP  
s\_nationkey 10  
s\_phone 20-403-398-8662  
s\_acctbal 5302.37  
s\_comment xPLzNgk5nzA jm3PLmySlm PS  
zANRjSgh2njAg

s\_suppkey 10  
s\_name Supplier#000000010  
s\_address wN1S4mQOg7Px5Lj34xw6kS4Li4NzB4mO  
s\_nationkey 24  
s\_phone 34-852-489-8585  
s\_acctbal 3891.91  
s\_comment 5xwg6AOz0NzhONL6kC43zR3AhzO6njCiwPg7k6MxwP1  
mN2 Rg 5Q426

10 row(s) retrieved.

### G-7: Nation contents

n\_nationkey 0  
n\_name ALGERIA  
n\_regionkey 0  
n\_comment 2Cxl7  
L1iwk6hMh300izngN32CPwCikyLk6khMzSRA

n\_nationkey 1  
n\_name ARGENTINA  
n\_regionkey 1

n\_comment  
zQn3Okwz1wLn7PLS3OhCgn56kP5PyRikgi1B7IL

n\_nationkey 2  
n\_name BRAZIL  
n\_regionkey 1  
n\_comment  
gLmS0nACAmnBCj2kiki7RCPNgPxnCOjNg4k  
OiAg57COSOm1NwCnOyLx40R SC y20

gPPAkNk5hxRhR5OmgS1iPQQzNAXPL30n67OgyC  
l617Sh4LS

n\_nationkey 3  
n\_name CANADA  
n\_regionkey 1  
n\_comment 4yMO AhnQ5Lh  
wzQAM662Aw1ByC17CxmzRwNR5nAIO4 x

n\_nationkey 4  
n\_name EGYPT  
n\_regionkey 4  
n\_comment 1Iim5126 Cxj  
NMQmLxOikni02j2m3Ah4yNR1QQiL507j2QSIyN

n\_nationkey 5  
n\_name ETHIOPIA  
n\_regionkey 0  
n\_comment NS7n LSOP Oz5n1AIB2S02nN0IMh4SBxP  
iRhBO 047R26 2BIM

n\_nationkey 6  
n\_name FRANCE  
n\_regionkey 3  
n\_comment 3mjimizl S 3L3k2hNNhNIP4w370xRxyN15wn

n\_nationkey 7  
n\_name GERMANY  
n\_regionkey 3  
n\_comment z nOP4RkwO CmzBB 516mAg  
lByw4OM3QyNPA

n\_nationkey 8  
n\_name INDIA  
n\_regionkey 2  
n\_comment MNIR5RCiRMj1111wjN7Myn  
M11y1NIMmBQI7PL4C kxxQkqPQ7i3w6B67R2QkOO40  
xl4Q2iw76jRL7ilhR5Q  
0xC7RRm5iQ2NAX2LiBm3QiO27j

n\_nationkey 9  
n\_name INDONESIA  
n\_regionkey 2  
n\_comment SjPmQO71Lj  
7ABj6Mx1AQk3nLwi73BPxzCwjzMn4zILzgg6nnz0j0w  
zxC66gP6ykR  
PMg

10 row(s) retrieved.

### G-8: Region contents

r\_regionkey 0  
r\_name AFRICA  
r\_comment  
xSx31zz31Cl1z4OAnmm05AjiOxC3AMMNOgC0kACgwn  
gg3gIP7LLLylwIQY7R

r\_regionkey 1  
r\_name AMERICA  
r\_comment  
kgyh3LSnC72k6z1Az0LP3k2L4QB1QL1O673OjO1SPj0ng  
Q7CO100SBgmgRQ4lgPCMk  
21A425iklyAR4yBRAwR4Cm5miNw  
4jl13mMnxw17B

r\_regionkey 2  
r\_name ASIA  
r\_comment NSg6xIMIA1lzm6mOR0Ajx  
nhRA77NgRxBwL1M6Py RjySB3RLwkyPkwMM2R1BQ  
xAz

kOgkjml10gAghinP5inmNmR76MlijMS3S2zxONR15

r\_regionkey 3  
r\_name EUROPE  
r\_comment  
zlSL7Qwg12hMBL5lhlz0M45QkjShwSyiO04MLOh7wn1A  
RLQPyPAyAii157611Li7Al  
nR1S RQ4SLny7B2Ryj5P66MLhn  
NxbwB4C3ig0SO

r\_regionkey 4  
r\_name MIDDLE EAST  
r\_comment RllxmhPLz3Cy2mNlg4QMBnNASM ACKi  
MPki7Oi

5 row(s) retrieved.