TPC BENCHMARK™ H

(Decision Support)
Standard Specification
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2.4.3 Shipping Priority Query (Q3)

This query retrieves the 10 unshipped orders with the highest value.

2.4.3.1 Business Question

The Shipping Priority Query retrieves the shipping priority and potential revenue, defined as the sum of l_extendedprice * (1-l_discount), of the orders having the largest revenue among those that had not been shipped as of a given date. Orders are listed in decreasing order of revenue. If more than 10 unshipped orders exist, only the 10 orders with the largest revenue are listed.

2.4.3.2 Functional Query Definition

Return the first 10 selected rows

```
select
        l_orderkey,
        sum(l_extendedprice*(1-l_discount)) as revenue,
        o_orderdate,
        o_shippriority
from
        customer,
        orders,
        lineitem
where
        c_mktsegment = '[SEGMENT]'
        and c_custkey = o_custkey
        and l_orderkey = o_orderkey
        and o_orderdate < date '[DATE]'
        and l_shipdate > date '[DATE]'
group by
        l_orderkey,
        o_orderdate,
        o_shippriority
order by
        revenue desc,
        o_orderdate;
```

2.4.3.3 Substitution Parameters

Values for the following substitution parameters must be generated and used to build the executable query text:

1. SEGMENT is randomly selected within the list of values defined for Segments in Clause 4.2.2.13;
2. DATE is a randomly selected day within [1995-03-01 .. 1995-03-31].

2.4.3.4 Query Validation

For validation against the qualification database the query must be executed using the following values for substitution parameters and must produce the following output data:
Values for substitution parameters:

1. SEGMENT = BUILDING;
2. DATE = 1995-03-15.

2.4.3.5 Sample Output

L_ORDERKEY	REVENUE	O_ORDERDATE	O_SHIPPRIORITY
2456423	406181.01	1995-03-05	0

2.4.4 Order Priority Checking Query (Q4)

This query determines how well the order priority system is working and gives an assessment of customer satisfaction.

2.4.4.1 Business Question

The Order Priority Checking Query counts the number of orders ordered in a given quarter of a given year in which at least one lineitem was received by the customer later than its committed date. The query lists the count of such orders for each order priority sorted in ascending priority order.

2.4.4.2 Functional Query Definition

```
select
        o_orderpriority,
        count(*) as order_count
from
        orders
where
        o_orderdate >= date '[DATE]'
        and o_orderdate < date '[DATE]' + interval '3' month
        and exists (
                select
                        *
                from
                        lineitem
                where
                        l_orderkey = o_orderkey
                        and l_commitdate < l_receiptdate
        )
group by
        o_orderpriority
order by
        o_orderpriority;
```

2.4.4.3 Substitution Parameters

Values for the following substitution parameter must be generated and used to build the executable query text:

1. DATE is the first day of a randomly selected month between the first month of 1993 and the 10th month of 1997.

2.4.4.4 Query Validation

For validation against the qualification database the query must be executed using the following values for substitution parameters and must produce the following output data:
Values for substitution parameters:

1. DATE = 1993-07-01.

2.4.4.5 Sample Output

O_ORDERPRIORITY	ORDER_COUNT
1-URGENT	10594

2.4.5 Local Supplier Volume Query (Q5)

This query lists the revenue volume done through local suppliers.

2.4.5.1 Business Question

The Local Supplier Volume Query lists for each nation in a region the revenue volume that resulted from lineitem transactions in which the customer ordering parts and the supplier filling them were both within that nation. The query is run in order to determine whether to institute local distribution centers in a given region. The query considers only parts ordered in a given year. The query displays the nations and revenue volume in descending order by revenue. Revenue volume for all qualifying lineitems in a particular nation is defined as sum(l_extendedprice * (1 - l_discount)).

2.4.5.2 Functional Query Definition

```
select
        n_name,
        sum(l_extendedprice * (1 - l_discount)) as revenue
from
        customer,
        orders,
        lineitem,
        supplier,
        nation,
        region
where
        c_custkey = o_custkey
        and l_orderkey = o_orderkey
        and l_suppkey = s_suppkey
        and c_nationkey = s_nationkey
        and s_nationkey = n_nationkey
        and n_regionkey = r_regionkey
        and r_name = '[REGION]'
        and o_orderdate >= date '[DATE]'
        and o_orderdate < date '[DATE]' + interval '1' year
group by
        n_name
order by
        revenue desc;
```

2.4.5.3 Substitution Parameters

Values for the following substitution parameters must be generated and used to build the executable query text:

1. REGION is randomly selected within the list of values defined for R_NAME in C;aise 4.2.3;
2. DATE is the first of January of a randomly selected year within [1993 .. 1997].

2.4.5.4 Query Validation

For validation against the qualification database the query must be executed using the following values for substitution parameters and must produce the following output data:

Values for substitution parameters:

1. REGION = ASIA;
2. DATE = 1994-01-01.

2.4.5.5 Sample Output

N_NAME	REVENUE
INDONESIA	55502041.17

2.4.6 Forecasting Revenue Change Query (Q6)

This query quantifies the amount of revenue increase that would have resulted from eliminating certain company-wide discounts in a given percentage range in a given year. Asking this type of "what if" query can be used to look for ways to increase revenues.

2.4.6.1 Business Question

The Forecasting Revenue Change Query considers all the lineitems shipped in a given year with discounts between DISCOUNT-0.01 and DISCOUNT+0.01. The query lists the amount by which the total revenue would have increased if these discounts had been eliminated for lineitems with l_quantity less than quantity. Note that the potential revenue increase is equal to the sum of [l_extendedprice * l_discount] for all lineitems with discounts and quantities in the qualifying range.

2.4.6.2 Functional Query Definition

```
select
        sum(l_extendedprice*l_discount) as revenue
from
        lineitem
where
        l_shipdate >= date '[DATE]'
        and l_shipdate < date '[DATE]' + interval '1' year
        and l_discount between [DISCOUNT] - 0.01 and [DISCOUNT] + 0.01
        and l_quantity < [QUANTITY];
```

2.4.6.3 Substitution Parameters

Values for the following substitution parameters must be generated and used to build the executable query text:

1. DATE is the first of January of a randomly selected year within [1993 .. 1997];
2. DISCOUNT is randomly selected within [0.02 .. 0.09];
3. QUANTITY is randomly selected within [24 .. 25].

2.4.6.4 Query Validation

For validation against the qualification database the query must be executed using the following values for substitution parameters and must produce the following output data:
Values for substitution parameters:

1. DATE = 1994-01-01;
2. DISCOUNT = 0.06;
3. QUANTITY = 24.

2.4.6.5 Sample Output

REVENUE
123141078.23

2.4.7 Volume Shipping Query (Q7)

This query determines the value of goods shipped between certain nations to help in the re-negotiation of shipping contracts.

2.4.7.1 Business Question

The Volume Shipping Query finds, for two given nations, the gross discounted revenues derived from lineitems in which parts were shipped from a supplier in either nation to a customer in the other nation during 1995 and 1996. The query lists the supplier nation, the customer nation, the year, and the revenue from shipments that took place in that year. The query orders the answer by Supplier nation, Customer nation, and year (all ascending).

2.4.7.2 Functional Query Definition

```
select
        supp_nation,
        cust_nation,
        l_year, sum(volume) as revenue
from (
        select
                n1.n_name as supp_nation,
                n2.n_name as cust_nation,
                extract(year from l_shipdate) as l_year,
                l_extendedprice * (1 - l_discount) as volume
        from
                supplier,
                lineitem,
                orders,
                customer,
                nation n1,
                nation n2
        where
                s_suppkey = l_suppkey
                and o_orderkey = l_orderkey
                and c_custkey = o_custkey
                and s_nationkey = n1.n_nationkey
                and c_nationkey = n2.n_nationkey
                and (
                        (n1.n_name = '[NATION1]' and n2.n_name = '[NATION2]')
                        or (n1.n_name = '[NATION2]' and n2.n_name = '[NATION1]')
                )
                and l_shipdate between date '1995-01-01' and date '1996-12-31'
        ) as shipping
group by
        supp_nation,
        cust_nation,
        l_year
order by
        supp_nation,
        cust_nation,
        l_year;
```

2.4.7.3 Substitution Parameters

Values for the following substitution parameters must be generated and used to build the executable query text:

1. NATION1 is randomly selected within the list of values defined for N_NAME in Clause 4.2.3;
2. NATION2 is randomly selected within the list of values defined for N_NAME in Clause 4.2.3 and must be different from the value selected for NATION1 in item 1 above.

2.4.7.4 Query Validation

For validation against the qualification database the query must be executed using the following values for substitution parameters and must produce the following output data:

Values for substitution parameters:

1. NATION1 = FRANCE;
2. NATION2 = GERMANY.

2.4.7.5 Sample Output

SUPP_NATION	CUST_NATION	YEAR	REVENUE
FRANCE	GERMANY	1995	54639732.73

2.4.8 National Market Share Query (Q8)

This query determines how the market share of a given nation within a given region has changed over two years for a given part type.

2.4.8.1 Business Question

The market share for a given nation within a given region is defined as the fraction of the revenue, the sum of [l_extendedprice * (1-l_discount)], from the products of a specified type in that region that was supplied by suppliers from the given nation. The query determines this for the years 1995 and 1996 presented in this order.

2.4.8.2 Functional Query Definition

```
select
        o_year,
        sum(case
                when nation = '[NATION]'
                then volume
                else 0
        end) / sum(volume) as mkt_share
from (
        select
                extract(year from o_orderdate) as o_year,
                l_extendedprice * (1-l_discount) as volume,
                n2.n_name as nation
        from
                part,
                supplier,
                lineitem,
                orders,
                customer,
                nation n1,
                nation n2,
                region
        where
                p_partkey = l_partkey
                and s_suppkey = l_suppkey
                and l_orderkey = o_orderkey
                and o_custkey = c_custkey
                and c_nationkey = n1.n_nationkey
                and n1.n_regionkey = r_regionkey
                and r_name = '[REGION]'
                and s_nationkey = n2.n_nationkey
                and o_orderdate between date '1995-01-01' and date '1996-12-31'
                and p_type = '[TYPE]'
        ) as all_nations
group by
        o_year
order by
        o_year;
```

2.4.8.3 Substitution Parameters

Values for the following substitution parameters must be generated and used to build the executable query text:

1. NATION is randomly selected within the list of values defined for N_NAME in Clause 4.2.3;
2. REGION is the value defined in Clause 4.2.3 for R_NAME where R_REGIONKEY corresponds to N_REGIONKEY for the selected NATION in item 1 above;
3. TYPE is randomly selected within the list of 3-syllable strings defined for Types in Clause 4.2.2.13.

2.4.8.4 Query Validation

For validation against the qualification database the query must be executed using the following values for substitution parameters and must produce the following output data:
Values for substitution parameters:

1. NATION = BRAZIL;
2. REGION = AMERICA;
3. TYPE = ECONOMY ANODIZED STEEL.

2.4.8.5 Sample Output

YEAR	MKT_SHARE
1995	.03

2.4.9 Product Type Profit Measure Query (Q9)

This query determines how much profit is made on a given line of parts, broken out by supplier nation and year.

2.4.9.1 Business Question

The Product Type Profit Measure Query finds, for each nation and each year, the profit for all parts ordered in that year that contain a specified substring in their names and that were filled by a supplier in that nation. The profit is defined as the sum of [(l_extendedprice*(1-l_discount)) - (ps_supplycost * l_quantity)] for all lineitems describing parts in the specified line. The query lists the nations in ascending alphabetical order and, for each nation, the year and profit in descending order by year (most recent first).

2.4.9.2 Functional Query Definition

```
select
        nation,
        o_year,
        sum(amount) as sum_profit
from (
        select
                n_name as nation,
                extract(year from o_orderdate) as o_year,
                l_extendedprice * (1 - l_discount) - ps_supplycost * l_quantity as amount
        from
                part,
                supplier,
                lineitem,
                partsupp,
                orders,
                nation
        where
                s_suppkey = l_suppkey
                and ps_suppkey = l_suppkey
                and ps_partkey = l_partkey
                and p_partkey = l_partkey
                and o_orderkey = l_orderkey
                and s_nationkey = n_nationkey
                and p_name like '%[COLOR]%'
        ) as profit
group by
        nation,
        o_year
order by
        nation,
        o_year desc;
```

2.4.9.3 Substitution Parameters

Values for the following substitution parameter must be generated and used to build the executable query text:

1. COLOR is randomly selected within the list of values defined for the generation of P_NAME in Clause 4.2.3.

2.4.9.4 Query Validation

For validation against the qualification database the query must be executed using the following values for substitution parameters and must produce the following output data:
Values for substitution parameters:

1. COLOR = green.

2.4.9.5 Sample Output

NATION	YEAR	SUM_PROFIT
ALGERIA	1998	31342867.24

2.4.10 Returned Item Reporting Query (Q10)

The query identifies customers who might be having problems with the parts that are shipped to them.

2.4.10.1 Business question

The Returned Item Reporting Query finds the top 20 customers, in terms of their effect on lost revenue for a given quarter, who have returned parts. The query considers only parts that were ordered in the specified quarter. The query lists the customer's name, address, nation, phone number, account balance, comment information and revenue lost. The customers are listed in descending order of lost revenue. Revenue lost is defined as sum(l_extendedprice*(1-l_discount)) for all qualifying lineitems.

2.4.10.2 Functional Query Definition

Return the first 20 selected rows

```
select
        c_custkey,
        c_name,
        sum(l_extendedprice * (1 - l_discount)) as revenue,
        c_acctbal,
        n_name,
        c_address,
        c_phone,
        c_comment
from
        customer,
        orders,
        lineitem,
        nation
where
        c_custkey = o_custkey
        and l_orderkey = o_orderkey
        and o_orderdate >= date '[DATE]'
        and o_orderdate < date '[DATE]' + interval '3' 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_comment
order by
        revenue desc;
```

2.4.10.3 Substitution Parameters

Values for the following substitution parameter must be generated and used to build the executable query text:

1. DATE is the first day of a randomly selected month from the second month of 1993 to the first month of 1995.

2.4.10.4 Query Validation

For validation against the qualification database the query must be executed using the following values for substitution parameters and must produce the following output data:
Values for substitution parameters:

1. DATE = 1993-10-01.

2.4.10.5 Sample Output

C_CUSTKEY	C_NAME	REVENUE	C_ACCTBAL	N_NAME
57040	Customer#000057040	734235.24	632.87	JAPAN

C_ADDRESS	C_PHONE	C_COMMENT
Eioyzjf4pp	22-895-641-3466	sits. slyly regular requests sleep alongside of the regular inst