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DBMS ASSIGNMENT 2

Note: All work was done on the original TPCH dataset.

Q1. Query:

```
select C_NAME from customer where C_MKTSEGMENT="HOUSEHOLD" and  
C_ACCTBAL>9000;
```

```
| MySQL | localhost:33060+ ssl | tpch | SQL > select C_NAME from customer where C_MKTSEGMENT="HOUSEHOLD" and C_ACCTBAL>9000;  
+-----+  
| C_NAME |  
+-----+  
| Customer#00000129 |  
| Customer#00000145 |  
| Customer#00000213 |  
| Customer#00000251 |  
| Customer#00000295 |  
| Customer#00000301 |  
| Customer#00000318 |  
| Customer#00000367 |  
| Customer#00000441 |  
| Customer#00000741 |  
| Customer#000001051 |  
| Customer#000001186 |  
| Customer#000001130 |  
| Customer#000001204 |  
| Customer#000001278 |  
| Customer#000001325 |  
| Customer#000001493 |  
| Customer#000001569 |  
| Customer#000001684 |  
| Customer#000001614 |  
| Customer#000001622 |  
| Customer#000001629 |  
| Customer#000001635 |  
| Customer#000001647 |  
| Customer#000001669 |  
| Customer#000001893 |  
| Customer#000002009 |  
| Customer#000002031 |  
| Customer#000002086 |  
| Customer#000002099 |  
| Customer#000002148 |  
| Customer#000002168 |  
| Customer#000002206 |  
| Customer#000002217 |  
| Customer#000002289 |  
| Customer#000002322 |  
| Customer#000002361 |  
| Customer#000002422 |  
| Customer#000002469 |  
| Customer#000002605 |  
| Customer#000002823 |
```

Q2.Query: select distinct P_PARTKEY, P_NAME from region as r, nation as n, supplier as s, part as p,
 partsupp as ps where n.N_NATIONKEY=r.R_REGIONKEY and s.S_NATIONKEY=n.N_NATIONKEY and ps.PS_SUPPKEY=s.S_SUPPKEY and
 ps.PS_PARTKEY=p
 P_PARTKEY order by P_PARTKEY;

```

-- mysql -u root -p
+-----+-----+
| 199780 | maroon khaki blush spring blanched
| 199809 | ghost midnight deep royal navajo
| 199816 | drab azure moccasin khaki lemon
| 199840 | brown indian green black azure
| 199841 | sienna sandy lemon tomato snow
| 199847 | hot black red powder smoke
| 199850 | sky rose ivory red brown
| 199856 | seashell yellow azure peach orange
| 199864 | ivory indian dim maroon papaya
| 199866 | maroon yellow floral blue chartreuse
| 199872 | frosted black almond brown gainsboro
| 199895 | ivory blush chocolate almond navajo
| 199904 | plum burlywood blush lime purple
| 199905 | blue seashell orchid puff honeydew
| 199907 | dark saddle powder burnished yellow
| 199915 | linen lime hot peru lace
| 199919 | cyan orange dim medium purple
| 199922 | aquamarine goldenrod navajo tan gainsboro
| 199924 | dodger orange green maroon coral
| 199927 | wheat tan linen papaya cornsilk
| 199928 | antique purple mint orchid green
| 199930 | azure spring smoke tan peru
| 199931 | chartreuse cream navajo smoke magenta
| 199940 | ghost tan bisque forest pale
| 199942 | lime cornflower floral peach lace
| 199944 | orange dodger slate dark wheat
| 199945 | salmon tan blue forest white
| 199946 | spring pink blue maroon navajo
| 199951 | rosy maroon lemon azure medium
| 199959 | slate sienna magenta metallic peru
| 199979 | sienna thistle sandy hot brown
| 199992 | blue cyan rosy firebrick dodger
| 199996 | cream navajo saddle dodger navy
| 200000 | peach royal cornsilk sky sandy
+-----+
31897 rows in set (0.7509 sec)

MySQL | localhost:33060+ ssl [tpch] SQL > select distinct P_PARTKEY,P_NAME from region as r, nation as n,supplier as s,part as p,
  partsupp as ps where n.N_NATIONKEY=r.R_REGIONKEY and s.S_NATIONKEY=n.N_NATIONKEY and ps.PS_SUPPKEY=s.S_SUPPKEY and ps.PS_PARTKEY=p
  .P_PARTKEY and r.R_NAME="MIDDLE EAST" order by P_PARTKEY;

```

Q3. Query:

```
select count(distinct P_PARTKEY) from
region as r, nation as n, supplier as s, part as p,
partsupp as ps where n.N_NATIONKEY=r.R
_REGIONKEY and
s.S_NATIONKEY=n.N_NATIONKEY and ps.PS_SUPPKEY=s.S_SUPPKEY and
ps.PS_PARTKEY=p
•P_PARTKEY and r.R_NAME="EUROPE" order by P_PARTKEY;
```

```
~ -- mysql -u root -p
+-----+
| 199904 | plum burlywood blush lime purple
| 199905 | blue seashell orchid puff honeydew
| 199907 | dark saddle powder burnished yellow
| 199915 | linen lime hot peru lace
| 199919 | cyan orange dim medium purple
| 199922 | aquamarine goldenrod navajo tan gainsboro
| 199924 | dodger orange green maroon coral
| 199927 | wheat tan linen papaya cornsilk
| 199928 | antique purple mint orchid green
| 199930 | azure spring smoke tan peru
| 199931 | chartreuse cream navajo smoke magenta
| 199940 | ghost tan bisque forest pale
| 199942 | lime cornflower floral peach lace
| 199944 | orange dodger slate dark wheat
| 199945 | salmon tan blue forest white
| 199946 | spring pink blue maroon navajo
| 199951 | rosy maroon lemon azure medium
| 199959 | slate sienna magenta metallic peru
| 199979 | sienna thistle sandy hot brown
| 199992 | blue cyan rosy firebrick dodger
| 199996 | cream navajo saddle dodger navy
| 200000 | peach royal cornsilk sky sandy
+-----+
31097 rows in set (0.7589 sec)

MySQL | localhost:33060+ ssl tpch SQL > select count(distinct P_PARTKEY),P_NAME from region as r, nation as n,supplier as s,part as p,partsupp as ps where n.N_NATIONKEY=r.R_REGIONKEY and s.S_NATIONKEY=n.N_NATIONKEY and ps.PS_SUPPKEY=s.S_SUPPKEY and ps.PS_PARTKEY=p.P_PARTKEY and r.R_NAME="EUROPE" order by P_PARTKEY;
ERROR: 1140: In aggregated query without GROUP BY, expression #2 of SELECT list contains nonaggregated column 'tpch.p.P_NAME'; this is incompatible with sql_mode=only_full_group_by
MySQL | localhost:33060+ ssl tpch SQL > select count(distinct P_PARTKEY) from region as r, nation as n,supplier as s,part as p,partsupp as ps where n.N_NATIONKEY=r.R_REGIONKEY and s.S_NATIONKEY=n.N_NATIONKEY and ps.PS_SUPPKEY=s.S_SUPPKEY and ps.PS_PARTKEY=p.P_PARTKEY and r.R_NAME="EUROPE" order by P_PARTKEY;
+-----+
| count(distinct P_PARTKEY) |
+-----+
|          30985 |
+-----+
1 row in set (0.7492 sec)
MySQL | localhost:33060+ ssl tpch SQL > |
```

Q4. Query:

```
select distinct P_NAME from region as r, nation as n, supplier as s, part as p, partsupp as ps where n.N_NATIONKEY=r.R_REGIONKEY and s.S_NATIONKEY=n.N_NATIONKEY and ps.PS_SUPPKEY=s.S_SUPPKEY and ps.PS_PARTKEY=p.P_PARTKEY and r.R_NAME<>"EUROPE" ;
```

The screenshot shows two terminal windows side-by-side, both running MySQL. The left window is titled "mysql -u root -p" and the right window is titled "mysqlsh --sql -u root -p". Both windows display the same output of a SQL query.

```
| tomato sandy papaya black hot
| orange dodger slate dark wheat
| salmon tan blue forest white
| spring pink blue maroon navajo
| midnight ivory aquamarine light rose
| rosy maroon lemon azure medium
| lemon linen pink chocolate cornsilk
| chiffon azure sandy pink papaya
| red snow linen chocolate orange
| almond honeydew slate lime salmon
| slate sienna magenta metallic peru
| sandy lemon navajo blue violet
| gainsboro seashell chiffon goldenrod almond
| navy deep midnight slate cream
| cornflower cornsilk red pink cyan
| lime yellow turquoise chocolate orchid
| lawn orchid dodger burnished orange
| beige floral deep dodger tomato
| snow misty medium ivory peru
| medium dodger navy chartreuse deep
| linen magenta saddle slate turquoise
| sienna thistle sandy hot brown
| maroon aquamarine burnished lime violet
| blanched lime cyan thistle spring
| mint cornflower lavender goldenrod papaya
| indian turquoise metallic deep tomato
| lawn lemon moccasin frosted linen
| steel chartreuse navy ivory brown
| blue cyan rosy firebrick dodger
| blanched floral red maroon papaya
| cream navajo saddle dodger navy
| peru maroon snow grey chartreuse
| goldenrod drab brown salmon mint
| peach royal cornsilk sky sandy
+-----+
102743 rows in set (0.7445 sec)
```

In the bottom right corner of the left window, there is a small red box highlighting the text "MySQL | localhost:33060+ ssl tpch SQL >".

Q5. Query:

```
SELECT DISTINCT
    c.C_NAME AS customer_name,
    c.C_PHONE AS customer_phone,
    r.R_NAME AS customer_region
FROM
    customer AS c
JOIN
    nation AS n1 ON c.C_NATIONKEY = n1.N_NATIONKEY
JOIN
    region AS r ON r.R_REGIONKEY = n1.N_NATIONKEY
JOIN
    orders AS o ON c.C_CUSTKEY = o.O_CUSTKEY
JOIN
    lineitem AS l ON o.O_ORDERKEY = l.L_ORDERKEY
JOIN
    partsupp AS ps ON l.L_PARTKEY = ps.PS_PARTKEY AND l.L_SUPPKEY =
ps.PS_SUPPKEY
JOIN
    supplier AS s ON ps.PS_SUPPKEY = s.S_SUPPKEY
JOIN
    nation AS n2 ON s.S_NATIONKEY = n2.N_NATIONKEY
WHERE
    NOT EXISTS (
        SELECT 1
        FROM
            partsupp AS ps2
        JOIN
            supplier AS s2 ON ps2.PS_SUPPKEY = s2.S_SUPPKEY
        JOIN
            nation AS n3 ON s2.S_NATIONKEY = n3.N_NATIONKEY
        WHERE
            ps2.PS_PARTKEY = ps.PS_PARTKEY
            AND n3.N_REGIONKEY != n1.N_REGIONKEY
    );
```

```
~ -- mysqlsh --mysql -u root -p ...22035/DAA/IIT2022035_A4 -- mysqlsh -u root -p ...s/IIT2022035/CN/IIT2022035_A2/Q3/A -- zsh ...ms/IIT2022035/CN/Assignment_2/Q3/A -- zsh +  
ERROR: 1054: Unknown column 'n1.N_NATIONKEY' in 'on clause'  
MySQL | localhost:33060+ ssl | tpch SQL > SELECT DISTINCT  
-->     c.C_NAME AS customer_name,  
-->     c.C_PHONE AS customer_phone,  
-->     r.R_NAME AS customer_region  
--> FROM  
-->     customer AS c  
--> JOIN  
-->     nation AS n1 ON c.C_NATIONKEY = n1.N_NATIONKEY  
--> JOIN  
-->     region AS r ON r.R_REGIONKEY = n1.N_NATIONKEY  
--> JOIN  
-->     orders AS o ON c.C_CUSTKEY = o.O_CUSTKEY  
--> JOIN  
-->     lineitem AS l ON o.O_ORDERKEY = l.L_ORDERKEY  
--> JOIN  
-->     partsupp AS ps ON l.L_PARTKEY = ps.PS_PARTKEY AND l.L_SUPPKEY = ps.PS_SUPPKEY  
--> JOIN  
-->     supplier AS s ON ps.PS_SUPPKEY = s.S_SUPPKEY  
--> JOIN  
-->     nation AS n2 ON s.S_NATIONKEY = n2.N_NATIONKEY  
--> WHERE  
-->     NOT EXISTS (  
-->         SELECT 1  
-->         FROM  
-->             partsupp AS ps2  
-->         JOIN  
-->             supplier AS s2 ON ps2.PS_SUPPKEY = s2.S_SUPPKEY  
-->         JOIN  
-->             nation AS n3 ON s2.S_NATIONKEY = n3.N_NATIONKEY  
-->         WHERE  
-->             ps2.PS_PARTKEY = ps.PS_PARTKEY  
-->             AND n3.N_REGIONKEY != n1.N_REGIONKEY  
-->     );  
+-----+-----+-----+  
| customer_name | customer_phone | customer_region |  
+-----+-----+-----+  
| Customer#000018011 | 12-695-688-9827 | ASIA  
| Customer#000096611 | 14-502-345-4861 | MIDDLE EAST  
| Customer#000072883 | 12-531-366-9783 | ASIA  
| Customer#000121888 | 14-138-158-3595 | MIDDLE EAST  
| Customer#000036100 | 14-443-907-2884 | MIDDLE EAST  
| Customer#000076348 | 14-781-183-6598 | MIDDLE EAST  
| Customer#000116792 | 13-487-237-6134 | EUROPE  
| Customer#000069839 | 12-130-925-6224 | ASIA  
| Customer#000026782 | 10-335-953-5068 | AFRICA  
| Customer#000137839 | 11-901-287-1414 | AMERICA  
| Customer#000098789 | 14-714-243-7539 | MIDDLE EAST
```

```
ps2.PS_PARTKEY = ps.PS_PARTKEY  
AND n3.N_REGIONKEY != n1.N_REGIONKEY  
);
```

Q6. Query:

```
SELECT MAX(L_EXTENDEDPRICE) AS highest_extended  
-> FROM lineitem  
→ WHERE L_DISCOUNT > L_TAX;
```

```
MySQL localhost:33060+ ssl tpch SQL > SELECT MAX(L_EXTENDEDPRICE) AS highest_extended  
_price  
-> FROM lineitem  
-> WHERE L_DISCOUNT > L_TAX;  
+-----+  
| highest_extended_price |  
+-----+  
| 104899.50 |  
+-----+  
1 row in set (2.2949 sec)  
MySQL localhost:33060+ ssl tpch SQL > ]
```

Q7. Query:

```
WITH OrderLineitemDiff AS (
    SELECT
        o.O_ORDERKEY,
        DATEDIFF (MIN(1.L_SHIPDATE), MAX (1.L_COMMITDATE)) AS max_diff
    FROM
        orders o
    JOIN
        lineitem 1 ON o.O_ORDERKEY = 1.L_ORDERKEY
    GROUP BY
        o.O_ORDERKEY
)
SELECT
    COUNT (O_ORDERKEY) AS num_orders
FROM
    OrderLineitemDiff
WHERE
    max_diff <= 14;
```

The screenshot shows a terminal window with a MySQL session. The user has entered a complex SQL query using a WITH clause to calculate the maximum difference between ship date and commit date for each order key, and then counts the number of orders where this difference is less than or equal to 14. The output shows a single row with the value 1386570.

```
mysqlsh --mysql -u root -p
...22035/DAA/IIT2022035_A4 -- mysqlsh -u root -p ...
...s/IIT2022035/CN/IIT2022035_A2/Q3/A -- zsh
...ms/IIT2022035/CN/Assignment_2/Q3/A -- zsh +
```

```
MySQL | localhost:33060+ ssl | tpch | SQL > WITH OrderLineitemDiff AS (
    SELECT
        o.O_ORDERKEY,
        DATEDIFF(MIN(1.L_SHIPDATE), MAX(1.L_COMMITDATE)) AS max_diff
    FROM
        orders o
    JOIN
        lineitem 1 ON o.O_ORDERKEY = 1.L_ORDERKEY
    GROUP BY
        o.O_ORDERKEY
)
SELECT
    COUNT(O_ORDERKEY) AS num_orders
FROM
    OrderLineitemDiff
WHERE
    max_diff <= 14;
```

num_orders
1386570

```
1 row in set (4.9491 sec)
```

```
MySQL | localhost:33060+ ssl | tpch | SQL > |
```

Q8. Query:

```
SELECT COUNT(DISTINCT C_CUSTKEY) AS num_custo!
rs_without_american_parts FROM customer AS e WHERE C.C_CUSTKEY IN (
SELECT DISTINCT
-O_CUSTKEY
FROM orders AS o
JOIN lineitem AS L ON 0.0_ORDERKEY = 1. L_ORDERKEY
JOIN partsupp AS ps ON 1.L_PARTKEY = ps.PS_PARTKEY AND 1.L_SUPPKEY =
ps.PS_SUPPKEY
OIN supplier AS s ON ps.PS_SUPPKEY = S. S_SUPPKEY
JOIN nation AS n ON n.N_NATIONKEY =
S. S_NATIONKEY
WHERE n.N_NAME <>
"UNITED STATES");
```

```
[ MySQL | localhost:33060+ ssl tpch SQL ]> SELECT COUNT(DISTINCT C_CUSTKEY) AS num_custo!
rs_without_american_parts FROM customer AS e WHERE C.C_CUSTKEY IN (
SELECT DISTINCT
-O_CUSTKEY
FROM orders AS o
JOIN lineitem AS L ON 0.0_ORDERKEY = 1. L_ORDERKEY
JOIN partsupp AS ps ON 1.L_PARTKEY = ps.PS_PARTKEY AND 1.L_SUPPKEY = ps.PS_SUPPKEY
JOIN supplier AS s ON ps.PS_SUPPKEY = S. S_SUPPKEY
JOIN nation AS n ON n.N_NATIONKEY = S. S_NATIONKEY
WHERE n.N_NAME <> 'UNITED STATES');
+-----+
| num_customers_without_american_parts |
+-----+
| 99996 |
+-----+
1 row in set (33.7668 sec)
[ MySQL | localhost:33060+ ssl tpch SQL ]>
```

Q9. Query:

```
SELECT _NAME FROM nation as n,
custom
as
FROM
WHERE c.C_NATIONKEY=n.N_NATIONKEY AND c. C_ACCTBAL=(SELECT max
(C_ACCTBAL) customer);
```

```
[ MySQL | localhost:33060+ ssl tpch SQL ]> SELECT N_NAME FROM nation as n, custom
er as c WHERE c.C_NATIONKEY=n.N_NATIONKEY AND c.C_ACCTBAL=(SELECT max(C_ACCTBAL)
FROM customer);
+-----+
| N_NAME |
+-----+
| MOROCO |
+-----+
1 row in set (0.1017 sec)
[ MySQL | localhost:33060+ ssl tpch SQL ]>
```

Q10. Query:

```

SELECT DISTINCT
n.N_NAME AS country_name FROM
nation AS n JOIN
customer AS c
ON n.N_NATIONKEY = c.C_NATIONKEY JOIN
Orders AS o ON c.C_CUSTKEY = o.O_CUSTKEY JOIN
lineitem AS l ON o.O_ORDERKEY = l.L_ORDERKEY JOIN
partsupp AS ps ON l.L_PARTKEY = ps.PS_PARTKEY AND l.L_SUPPKEY =
ps.PS_SUPPKEY JOIN
supplier AS s ON ps.PS_SUPPKEY =
s.S_SUPPKEY WHERE
DATEDIFF(l.L_SHIPDATE, l.L_COMMITDATE) > 29
AND n.N_NATIONKEY = s.S_NATIONKEY;

```

```

-- mysqlsh --mysql -u root -p      ...22035/DAA/IT2022035_A4 -- mysqlsh -u root -p      ...s/it2022035/CN/IT2022035_A2/Q3/A -- zsh      ...ms/it2022035/CN/Assignment_2/Q3/A -- zsh +  

GROUP BY          o.O_ORDERKEY ) SELECT      COUNT(O_ORDERKEY) AS num_orders FROM      OrderLineitemDiff WHERE ;^C  

MySQL localhost:33060+ ssl tpch SQL > ^C  

MySQL localhost:33060+ ssl tpch SQL > ^C  

MySQL localhost:33060+ ssl tpch SQL > ^C  

MySQL localhost:33060+ ssl tpch SQL > SELECT DISTINCT      n.N_NAME AS country_name FROM      nation AS n JOIN      customer AS c  

ON n.N_NATIONKEY = c.C_NATIONKEY JOIN      Orders AS o ON c.C_CUSTKEY = o.O_CUSTKEY JOIN      lineitem AS l ON o.O_ORDERKEY = l.L_ORDERKEY JOIN
partsupp AS ps ON l.L_PARTKEY = ps.PS_PARTKEY AND l.L_SUPPKEY = ps.PS_SUPPKEY JOIN      supplier AS s ON ps.PS_SUPPKEY =
s.S_SUPPKEY WHERE      DATEDIFF(l.L_SHIPDATE, l.L_COMMITDATE) > 29      AND n.N_NATIONKEY = s.S_NATIONKEY;  

+-----+  

| country_name |  

+-----+
| JORDAN          |
| CANADA         |
| KENYA          |
| UNITED STATES  |
| IRAQ           |
| PERU            |
| ALGERIA         |
| BRAZIL          |
| ROMANIA         |
| SAUDI ARABIA   |
| INDIA           |
| IRAN            |
| ARGENTINA       |
| GERMANY         |
| RUSSIA          |
| MOROCCO         |
| UNITED KINGDOM |
| MOZAMBIQUE      |
| JAPAN           |
| FRANCE          |
| ETHIOPIA        |
| VIETNAM         |
| EGYPT           |
| INDONESIA       |
| CHINA           |
+-----+
25 rows in set (11.9037 sec)
MySQL localhost:33060+ ssl tpch SQL > 

```