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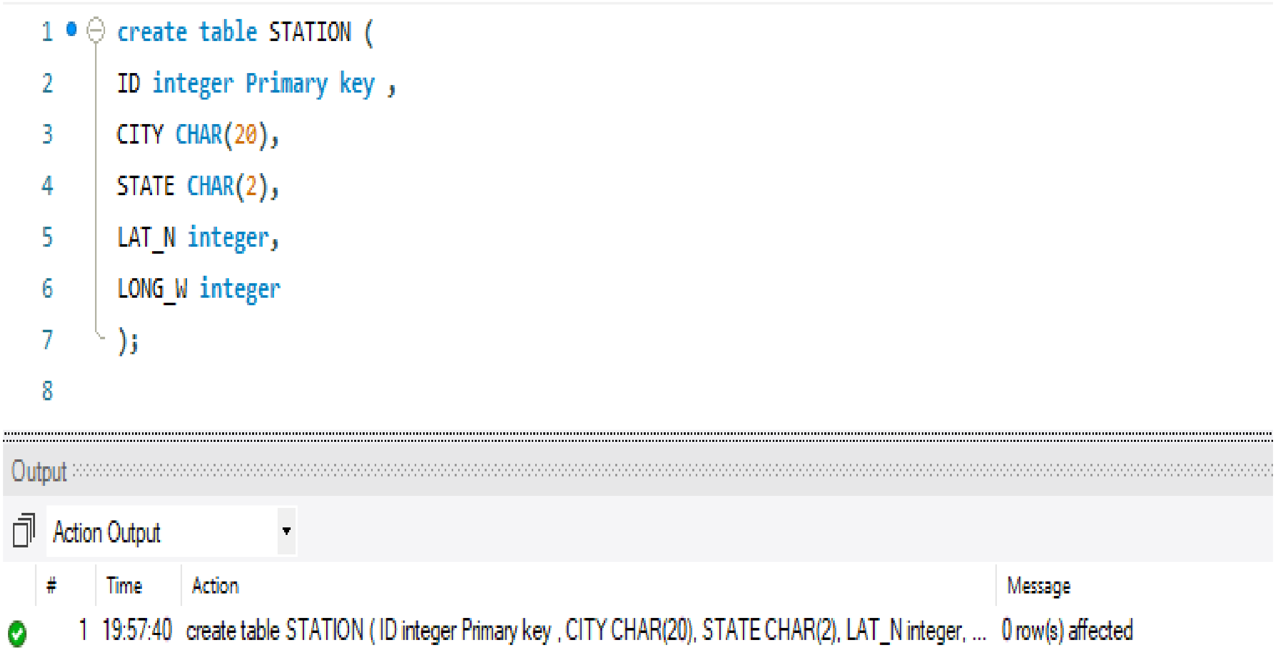
Data Science with Python Career Program (ChatGPT Included)

Assignment - SQL [Major]

Q1: Create a table “STATION” to store information about weather observation stations:

| ID | Number | Primary key |
|---|---|---|
| CITY | CHAR(20) | |
| STATE | CHAR(2) | |
| LAT_N | Number | |
| LONG_W | Number | |

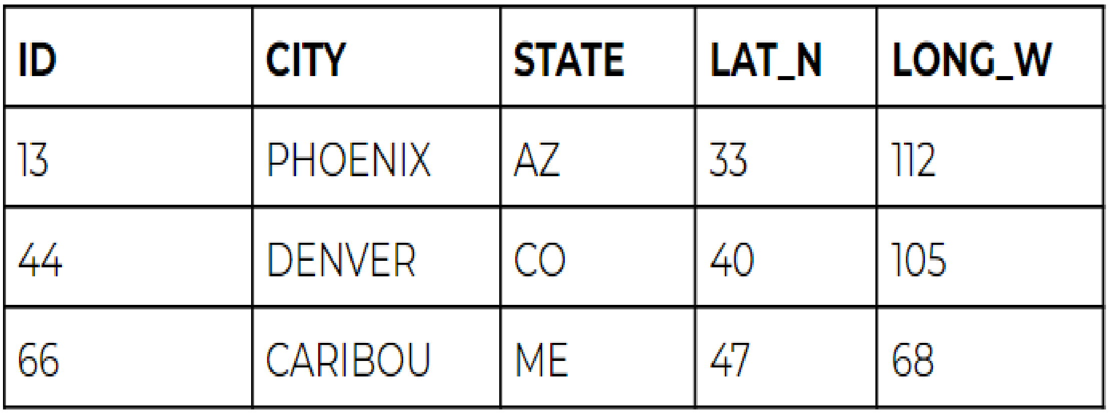
Answer:



```
create table STATION (
ID integer Primary key ,
CITY CHAR(20),
STATE CHAR(2),
LAT_N integer,
LONG_W integer
);
```

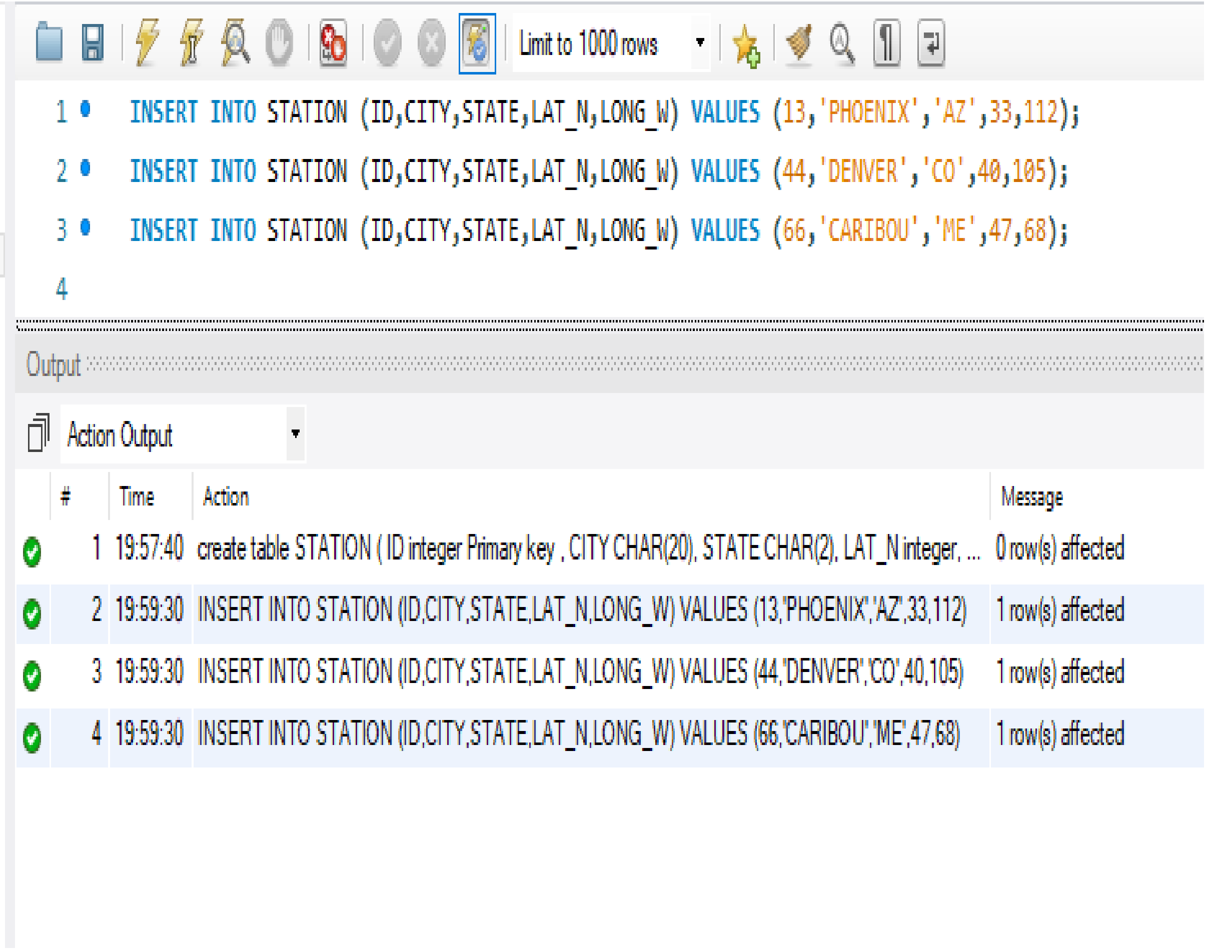
```
#   Time      Action                                                                                 Message
1   19:57:40  create table STATION ( ID integer Primary key , CITY CHAR(20), STATE CHAR(2), LAT_N integer, ...   0 row(s) affected
```

Q 2: Insert the following records into the table:



| ID | CITY | STATE | LAT_N | LONG_W |
|---|---|---|---|---|
| 13 | PHOENIX | AZ | 33 | 112 |
| 44 | DENVER | CO | 40 | 105 |
| 66 | CARIBOU | ME | 47 | 68 |

ANSWER:

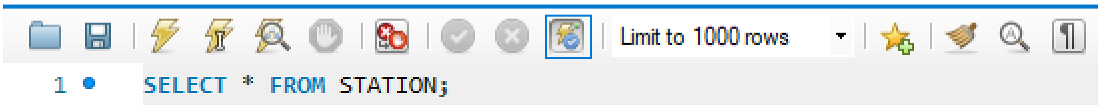


```
INSERT INTO STATION (ID,CITY,STATE,LAT_N,LONG_W) VALUES (13,'PHOENIX','AZ',33,112);
INSERT INTO STATION (ID,CITY,STATE,LAT_N,LONG_W) VALUES (44,'DENVER','CO',40,105);
INSERT INTO STATION (ID,CITY,STATE,LAT_N,LONG_W) VALUES (66,'CARIBOU','ME',47,68);
```

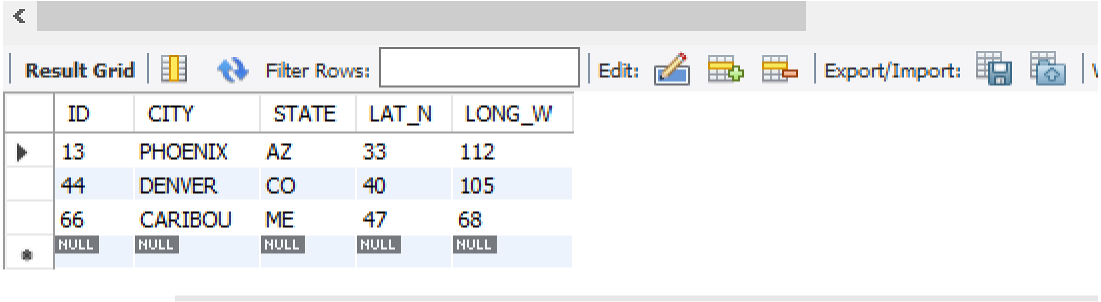
```
   #  Time      Action                                                                       Message
✓  1  19:57:40  create table STATION ( ID integer Primary key , CITY CHAR(20), STATE CHAR(2), LAT_N integer, ...  0 row(s) affected
✓  2  19:59:30  INSERT INTO STATION (ID,CITY,STATE,LAT_N,LONG_W) VALUES (13,'PHOENIX','AZ',33,112)    1 row(s) affected
✓  3  19:59:30  INSERT INTO STATION (ID,CITY,STATE,LAT_N,LONG_W) VALUES (44,'DENVER','CO',40,105)     1 row(s) affected
✓  4  19:59:30  INSERT INTO STATION (ID,CITY,STATE,LAT_N,LONG_W) VALUES (66,'CARIBOU','ME',47,68)     1 row(s) affected
```

Q3: Execute a query to look at table STATION in undefined order.

Answer



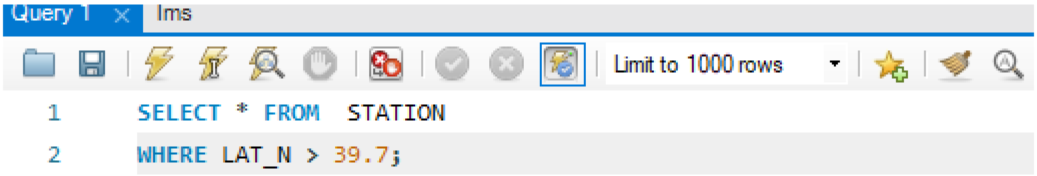
```sql
SELECT * FROM STATION;
```



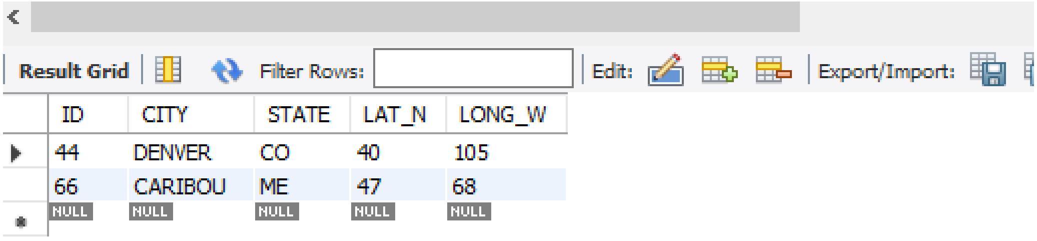
| ID | CITY | STATE | LAT_N | LONG_W |
|---|---|---|---|---|
| 13 | PHOENIX | AZ | 33 | 112 |
| 44 | DENVER | CO | 40 | 105 |
| 66 | CARIBOU | ME | 47 | 68 |
| NULL | NULL | NULL | NULL | NULL |

Q4: Execute a query to select Northern stations (Northern latitude >39.7).

Answer

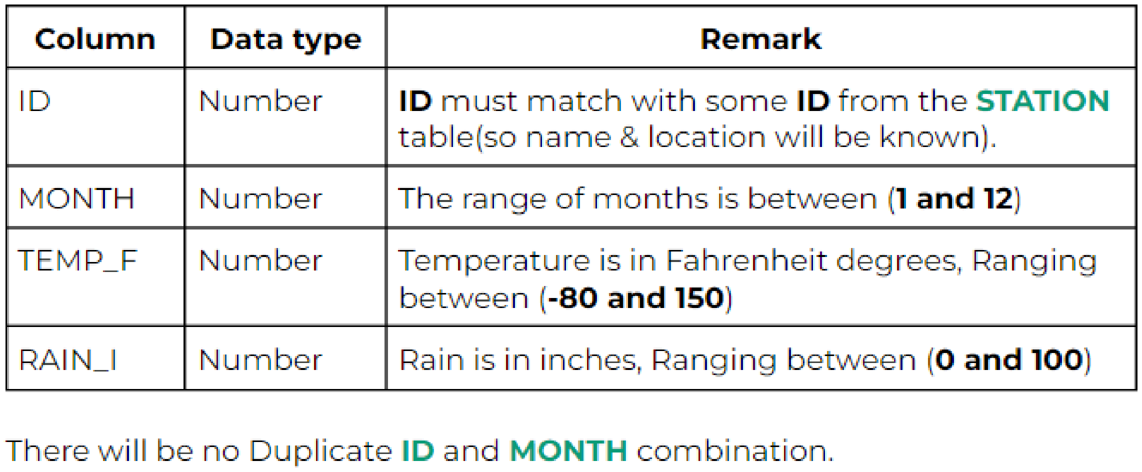


```sql
SELECT * FROM  STATION
WHERE LAT_N > 39.7;
```



| ID | CITY | STATE | LAT_N | LONG_W |
|---|---|---|---|---|
| 44 | DENVER | CO | 40 | 105 |
| 66 | CARIBOU | ME | 47 | 68 |
| NULL | NULL | NULL | NULL | NULL |

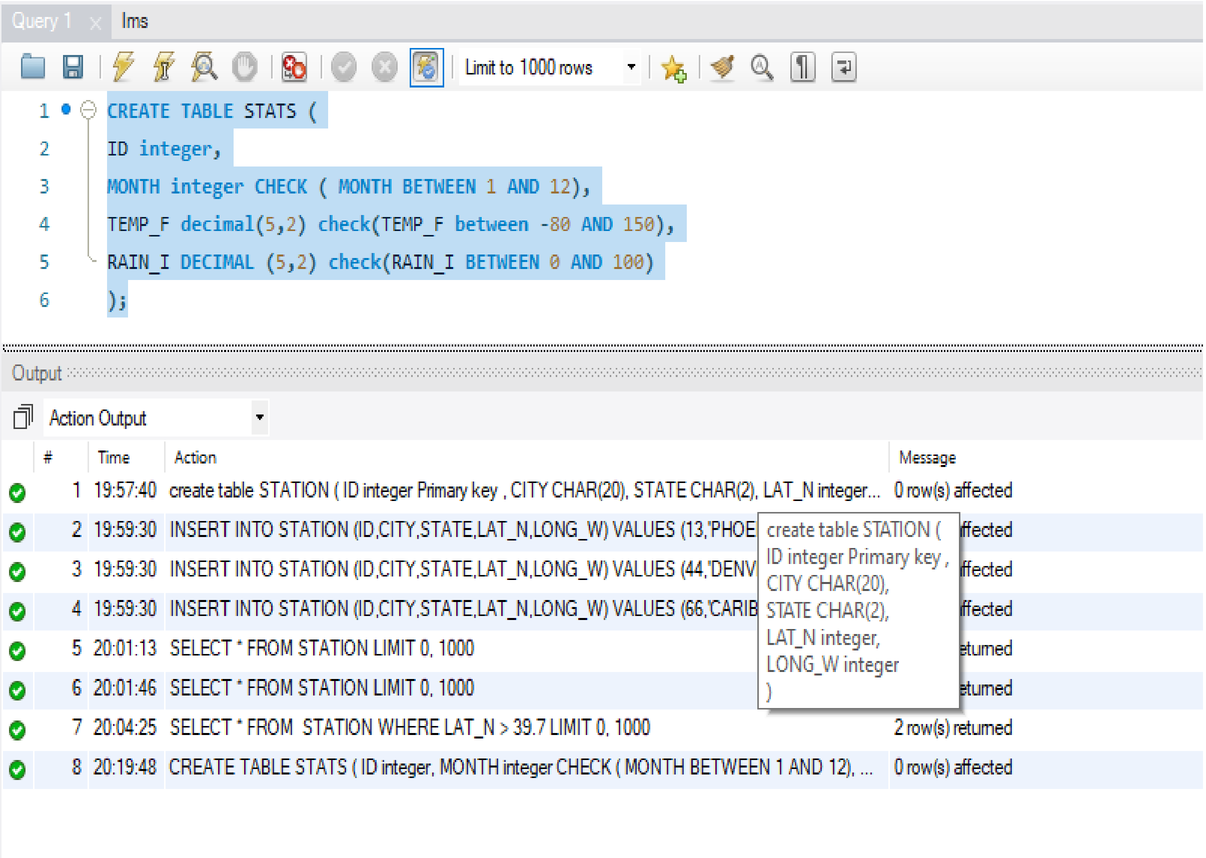
Q5: Create another table ‘STATS’ to store normalized temperature and precipitation data.



| Column | Data type | Remark |
|---|---|---|
| ID | Number | **ID** must match with some **ID** from the **STATION** table(so name & location will be known). |
| MONTH | Number | The range of months is between (**1 and 12**) |
| TEMP_F | Number | Temperature is in Fahrenheit degrees, Ranging between (**-80 and 150**) |
| RAIN_I | Number | Rain is in inches, Ranging between (**0 and 100**) |

There will be no Duplicate **ID** and **MONTH** combination.

Answer



```
CREATE TABLE STATS (
ID integer,
MONTH integer CHECK ( MONTH BETWEEN 1 AND 12),
TEMP_F decimal(5,2) check(TEMP_F between -80 AND 150),
RAIN_I DECIMAL (5,2) check(RAIN_I BETWEEN 0 AND 100)
);
```

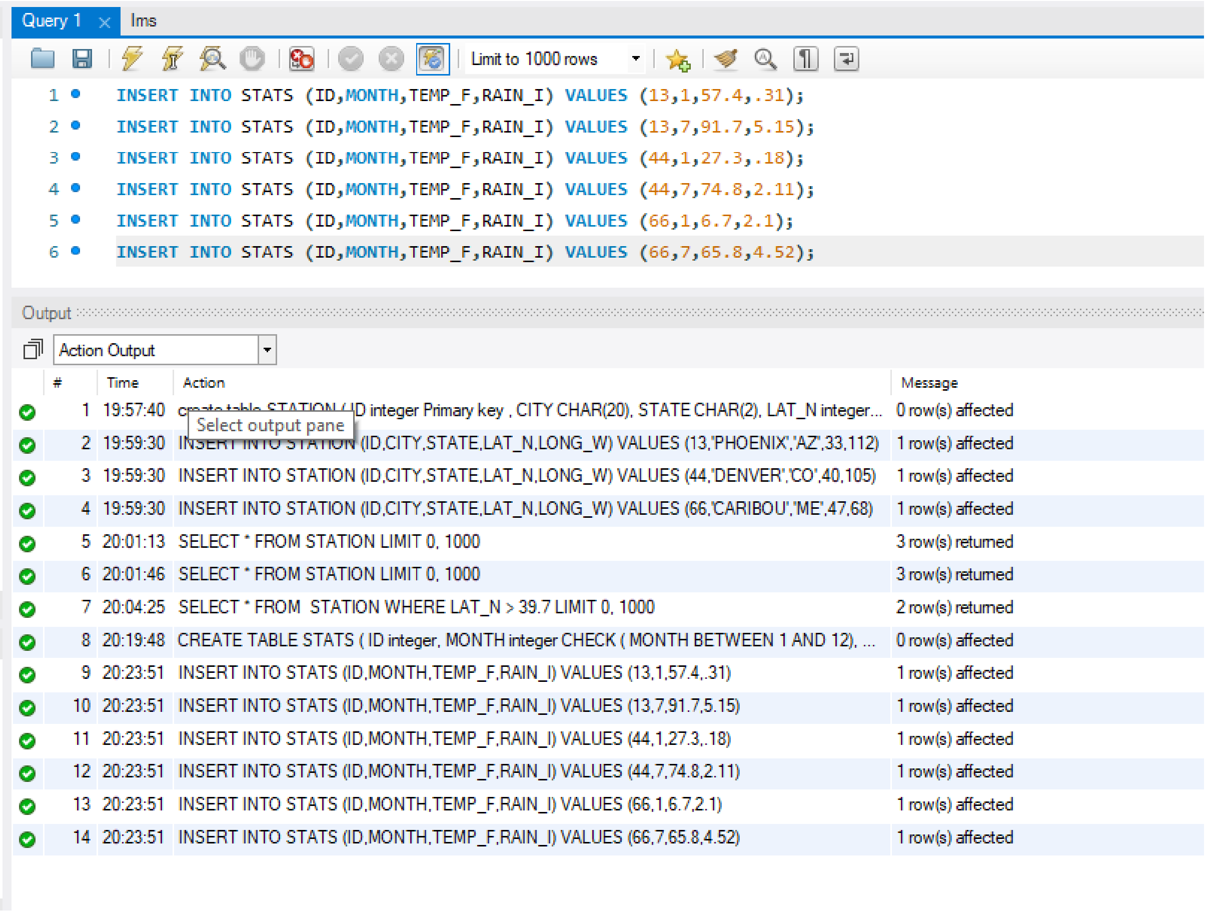
```
   #  Time      Action                                                                             Message
   1  19:57:40  create table STATION ( ID integer Primary key , CITY CHAR(20), STATE CHAR(2), LAT_N integer...  0 row(s) affected
   2  19:59:30  INSERT INTO STATION (ID,CITY,STATE,LAT_N,LONG_W) VALUES (13,'PHOE                ffected
   3  19:59:30  INSERT INTO STATION (ID,CITY,STATE,LAT_N,LONG_W) VALUES (44,'DENV                ffected
   4  19:59:30  INSERT INTO STATION (ID,CITY,STATE,LAT_N,LONG_W) VALUES (66,'CARIB               ffected
   5  20:01:13  SELECT * FROM STATION LIMIT 0, 1000                                              eturned
   6  20:01:46  SELECT * FROM STATION LIMIT 0, 1000                                              eturned
   7  20:04:25  SELECT * FROM  STATION WHERE LAT_N > 39.7 LIMIT 0, 1000                          2 row(s) returned
   8  20:19:48  CREATE TABLE STATS ( ID integer, MONTH integer CHECK ( MONTH BETWEEN 1 AND 12), ...  0 row(s) affected
```

```
create table STATION (
ID integer Primary key ,
CITY CHAR(20),
STATE CHAR(2),
LAT_N integer,
LONG_W integer
)
```

## Q6: Populate the table STATS with some statistics for January and July

| ID | MONTH | TEMP_F | RAIN_I |
|---|---|---|---|
| 13 | 1 | 57.4 | .31 |
| 13 | 7 | 91.7 | 5.15 |
| 44 | 1 | 27.3 | .18 |
| 44 | 7 | 74.8 | 2.11 |
| 66 | 1 | 6.7 | 2.1 |
| 66 | 7 | 65.8 | 4.52 |

## Answer

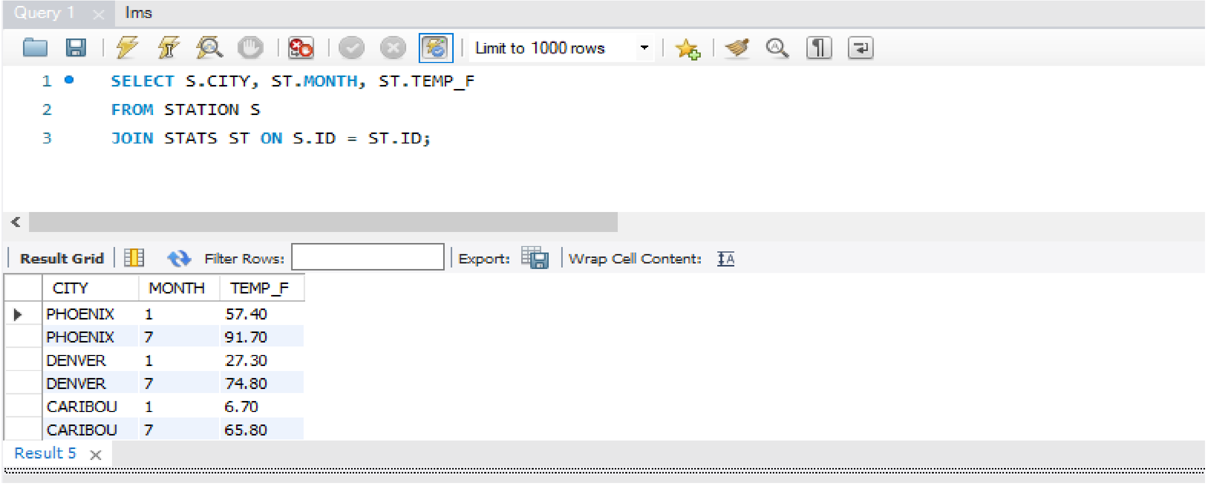


```sql
INSERT INTO STATS (ID,MONTH,TEMP_F,RAIN_I) VALUES (13,1,57.4,.31);
INSERT INTO STATS (ID,MONTH,TEMP_F,RAIN_I) VALUES (13,7,91.7,5.15);
INSERT INTO STATS (ID,MONTH,TEMP_F,RAIN_I) VALUES (44,1,27.3,.18);
INSERT INTO STATS (ID,MONTH,TEMP_F,RAIN_I) VALUES (44,7,74.8,2.11);
INSERT INTO STATS (ID,MONTH,TEMP_F,RAIN_I) VALUES (66,1,6.7,2.1);
INSERT INTO STATS (ID,MONTH,TEMP_F,RAIN_I) VALUES (66,7,65.8,4.52);
```

```
 #   Time      Action                                                                                  Message
 1   19:57:40  create table STATION (ID integer Primary key , CITY CHAR(20), STATE CHAR(2), LAT_N integer...  0 row(s) affected
 2   19:59:30  INSERT INTO STATION (ID,CITY,STATE,LAT_N,LONG_W) VALUES (13,'PHOENIX','AZ',33,112)      1 row(s) affected
 3   19:59:30  INSERT INTO STATION (ID,CITY,STATE,LAT_N,LONG_W) VALUES (44,'DENVER','CO',40,105)      1 row(s) affected
 4   19:59:30  INSERT INTO STATION (ID,CITY,STATE,LAT_N,LONG_W) VALUES (66,'CARIBOU','ME',47,68)      1 row(s) affected
 5   20:01:13  SELECT * FROM STATION LIMIT 0, 1000                                                     3 row(s) returned
 6   20:01:46  SELECT * FROM STATION LIMIT 0, 1000                                                     3 row(s) returned
 7   20:04:25  SELECT * FROM  STATION WHERE LAT_N > 39.7 LIMIT 0, 1000                                 2 row(s) returned
 8   20:19:48  CREATE TABLE STATS ( ID integer, MONTH integer CHECK ( MONTH BETWEEN 1 AND 12), ...     0 row(s) affected
 9   20:23:51  INSERT INTO STATS (ID,MONTH,TEMP_F,RAIN_I) VALUES (13,1,57.4,.31)                       1 row(s) affected
10   20:23:51  INSERT INTO STATS (ID,MONTH,TEMP_F,RAIN_I) VALUES (13,7,91.7,5.15)                      1 row(s) affected
11   20:23:51  INSERT INTO STATS (ID,MONTH,TEMP_F,RAIN_I) VALUES (44,1,27.3,.18)                       1 row(s) affected
12   20:23:51  INSERT INTO STATS (ID,MONTH,TEMP_F,RAIN_I) VALUES (44,7,74.8,2.11)                      1 row(s) affected
13   20:23:51  INSERT INTO STATS (ID,MONTH,TEMP_F,RAIN_I) VALUES (66,1,6.7,2.1)                        1 row(s) affected
14   20:23:51  INSERT INTO STATS (ID,MONTH,TEMP_F,RAIN_I) VALUES (66,7,65.8,4.52)                      1 row(s) affected
```

Q7: Execute a query to display temperature stats (from the **STATS** table) for each city (from the **STATION** table).

Answer

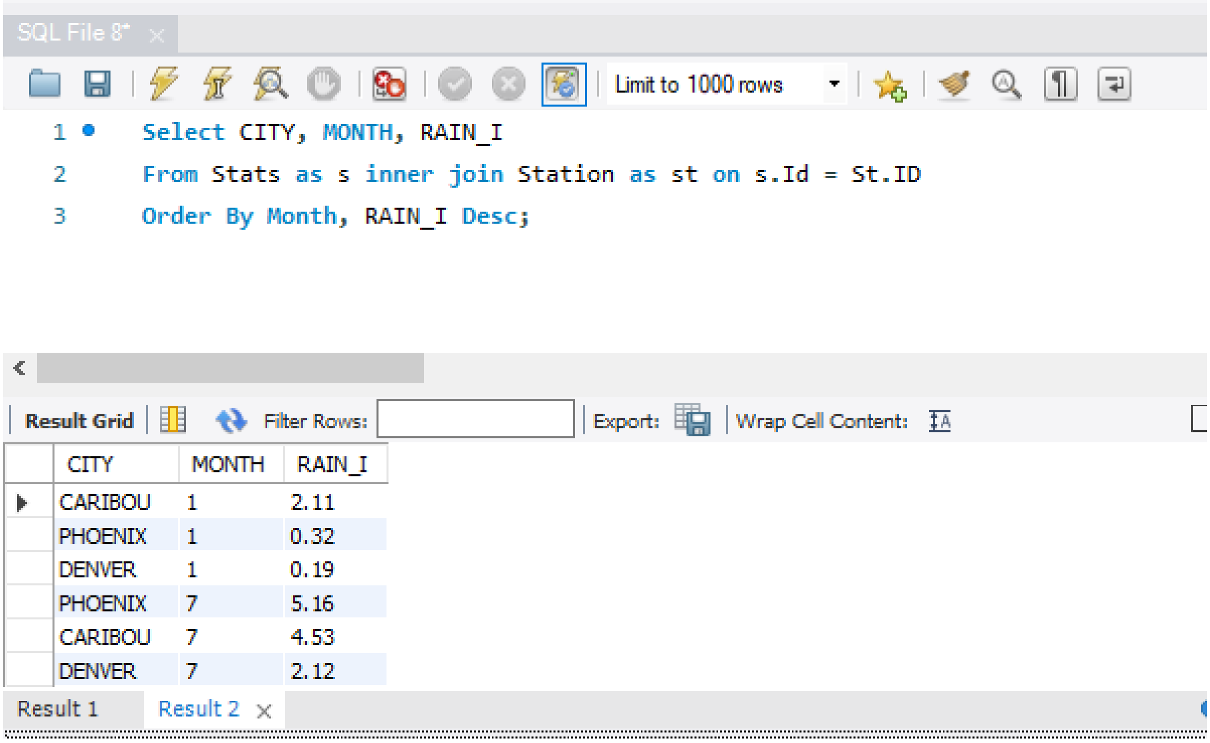


```
SELECT S.CITY, ST.MONTH, ST.TEMP_F
FROM STATION S
JOIN STATS ST ON S.ID = ST.ID;
```

| CITY | MONTH | TEMP_F |
|---|---|---|
| PHOENIX | 1 | 57.40 |
| PHOENIX | 7 | 91.70 |
| DENVER | 1 | 27.30 |
| DENVER | 7 | 74.80 |
| CARIBOU | 1 | 6.70 |
| CARIBOU | 7 | 65.80 |

Q8: Execute a query to look at the table **STATS**, ordered by month and greatest rainfall, with columns rearranged. It should also show the corresponding cities.

Answer

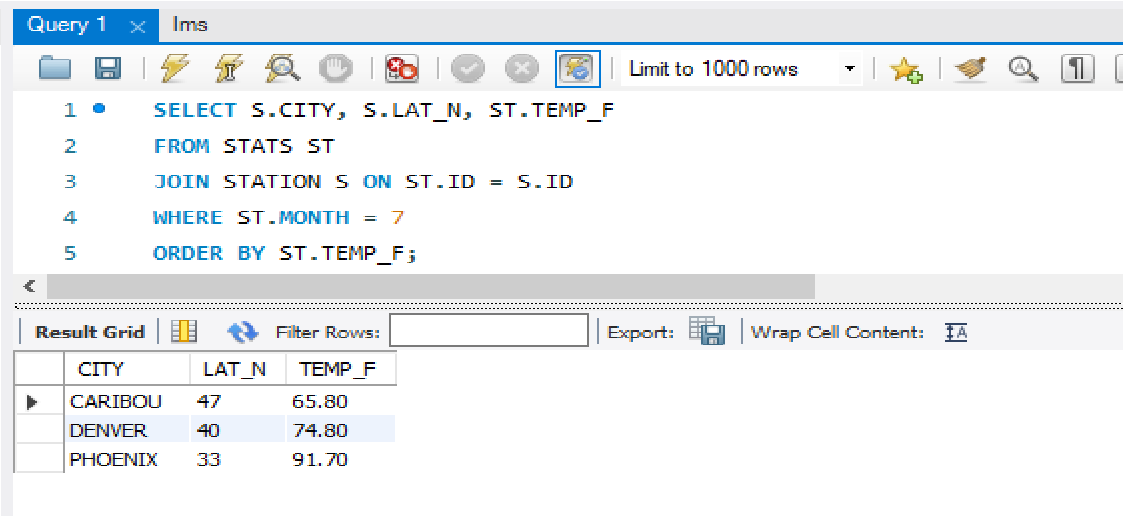


```
Select CITY, MONTH, RAIN_I
From Stats as s inner join Station as st on s.Id = St.ID
Order By Month, RAIN_I Desc;
```

| CITY | MONTH | RAIN_I |
|---|---|---|
| CARIBOU | 1 | 2.11 |
| PHOENIX | 1 | 0.32 |
| DENVER | 1 | 0.19 |
| PHOENIX | 7 | 5.16 |
| CARIBOU | 7 | 4.53 |
| DENVER | 7 | 2.12 |

Q9: Execute a query to look at temperatures for **July** from table **STATS**, lowest temperatures first, picking up **city name** and **latitude.**

Answer

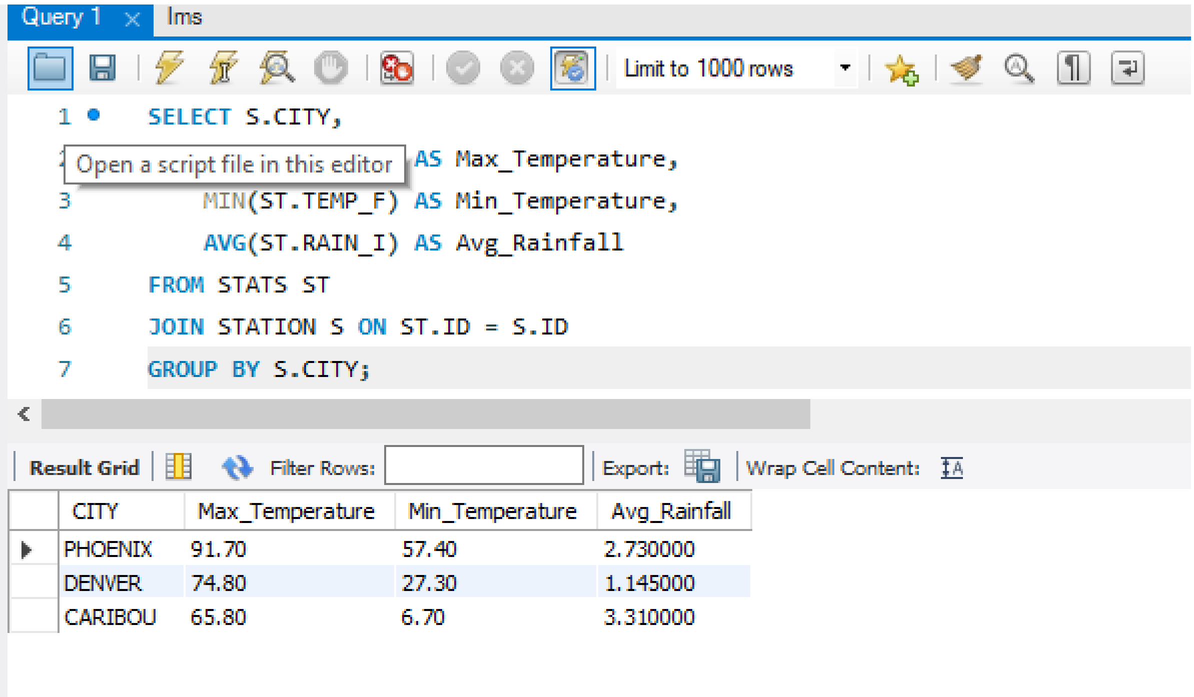


```
SELECT S.CITY, S.LAT_N, ST.TEMP_F
FROM STATS ST
JOIN STATION S ON ST.ID = S.ID
WHERE ST.MONTH = 7
ORDER BY ST.TEMP_F;
```

| CITY | LAT_N | TEMP_F |
|---|---|---|
| CARIBOU | 47 | 65.80 |
| DENVER | 40 | 74.80 |
| PHOENIX | 33 | 91.70 |

**Q10:** Execute a query to show **MAX** and **MIN** temperatures as well as average rainfall for each city.

Answer

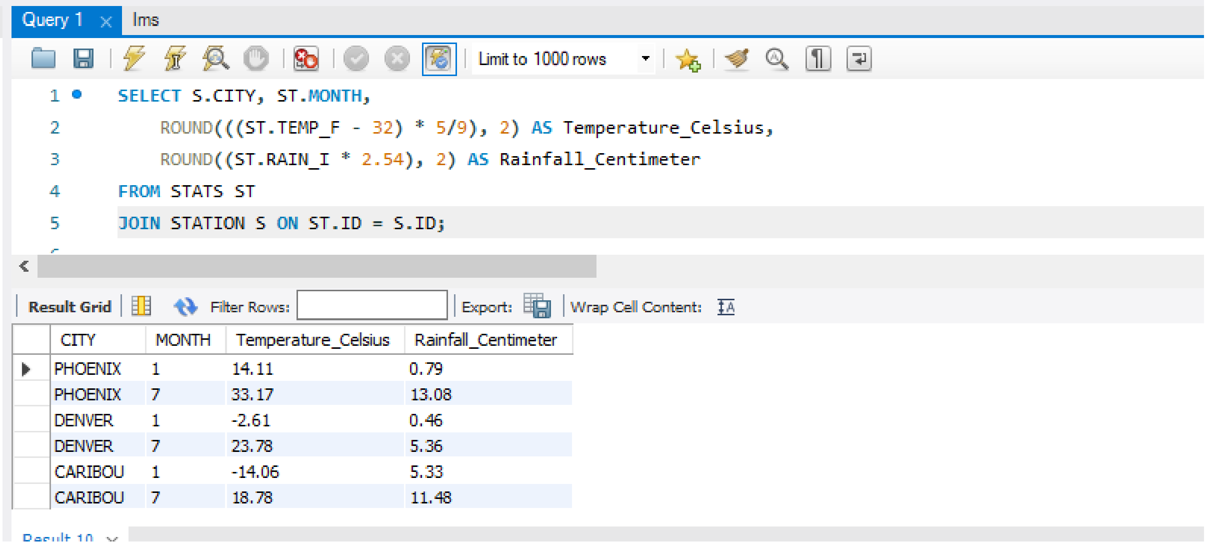


```
SELECT S.CITY,
                      AS Max_Temperature,
       MIN(ST.TEMP_F) AS Min_Temperature,
       AVG(ST.RAIN_I) AS Avg_Rainfall
FROM STATS ST
JOIN STATION S ON ST.ID = S.ID
GROUP BY S.CITY;
```

| CITY | Max_Temperature | Min_Temperature | Avg_Rainfall |
|---|---|---|---|
| PHOENIX | 91.70 | 57.40 | 2.730000 |
| DENVER | 74.80 | 27.30 | 1.145000 |
| CARIBOU | 65.80 | 6.70 | 3.310000 |

Q11: Execute a query to display each city's monthly temperature in **Celsius** and rainfall in Centimetres.

Answer

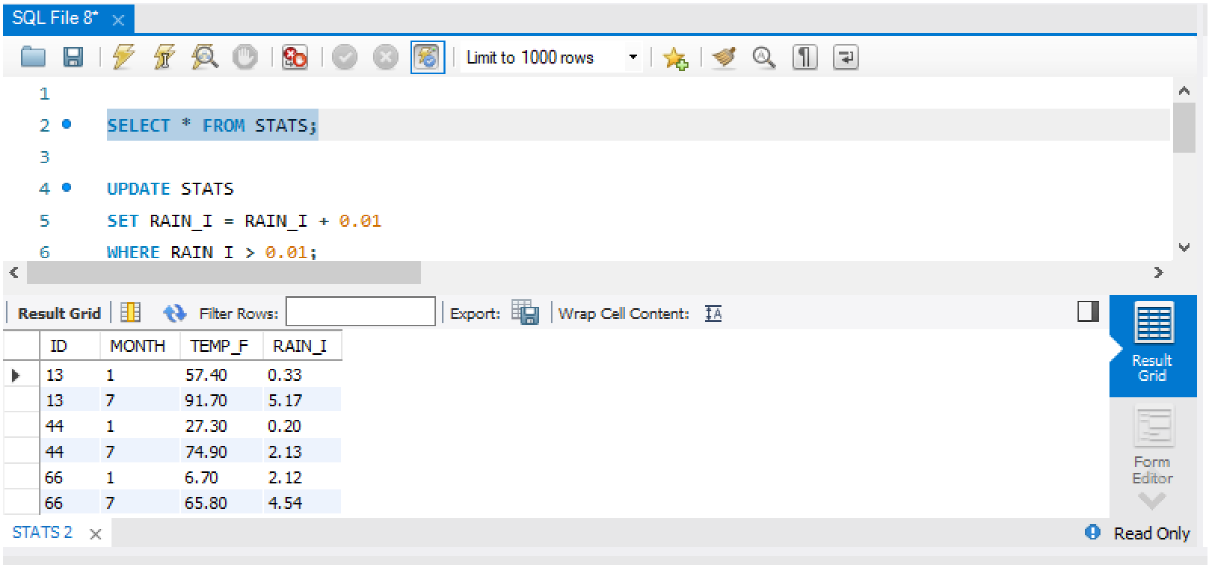


```
SELECT S.CITY, ST.MONTH,
    ROUND(((ST.TEMP_F - 32) * 5/9), 2) AS Temperature_Celsius,
    ROUND((ST.RAIN_I * 2.54), 2) AS Rainfall_Centimeter
FROM STATS ST
JOIN STATION S ON ST.ID = S.ID;
```

| CITY | MONTH | Temperature_Celsius | Rainfall_Centimeter |
|---|---|---|---|
| PHOENIX | 1 | 14.11 | 0.79 |
| PHOENIX | 7 | 33.17 | 13.08 |
| DENVER | 1 | -2.61 | 0.46 |
| DENVER | 7 | 23.78 | 5.36 |
| CARIBOU | 1 | -14.06 | 5.33 |
| CARIBOU | 7 | 18.78 | 11.48 |

Q12: Update all rows of table **STATS** to compensate for faulty rain gauges known to read 0.01 inches low.

Answer

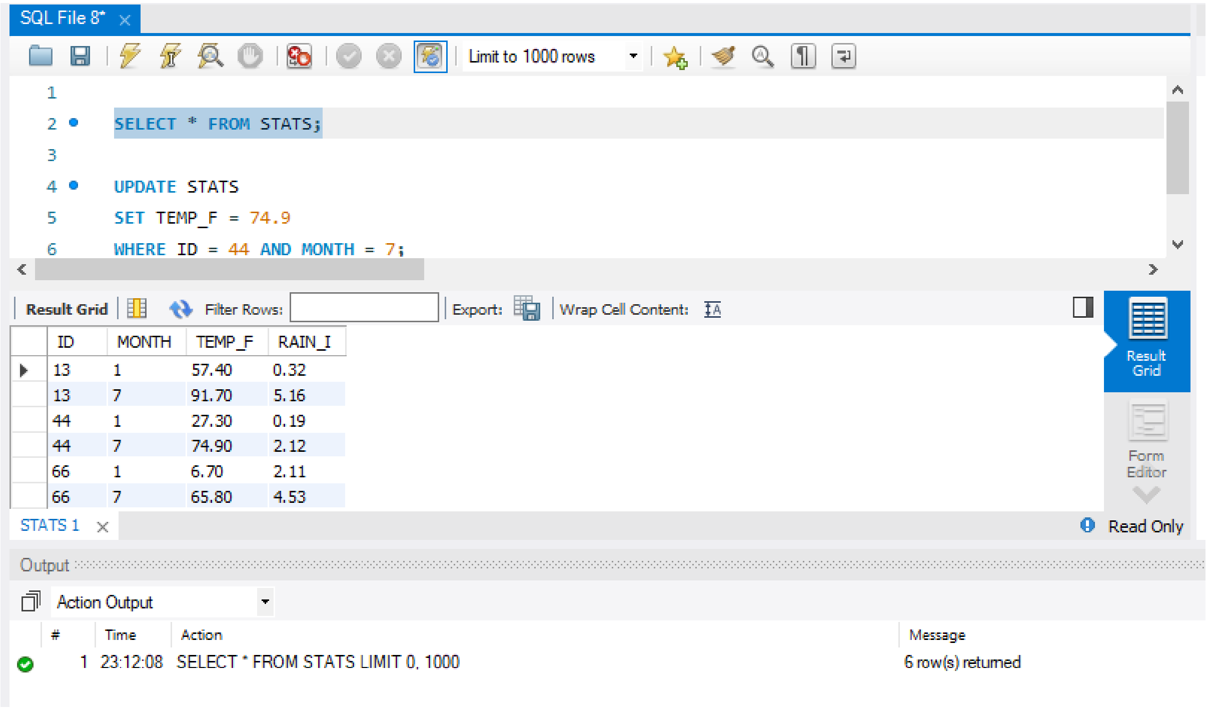


```

SELECT * FROM STATS;

UPDATE STATS
SET RAIN_I = RAIN_I + 0.01
WHERE RAIN_I > 0.01;
```

| ID | MONTH | TEMP_F | RAIN_I |
|---|---|---|---|
| 13 | 1 | 57.40 | 0.33 |
| 13 | 7 | 91.70 | 5.17 |
| 44 | 1 | 27.30 | 0.20 |
| 44 | 7 | 74.90 | 2.13 |
| 66 | 1 | 6.70 | 2.12 |
| 66 | 7 | 65.80 | 4.54 |

Q13: Update **Denver's July** temperature reading as **74.9.**

Answer



```
SELECT * FROM STATS;

UPDATE STATS
SET TEMP_F = 74.9
WHERE ID = 44 AND MONTH = 7;
```

| ID | MONTH | TEMP_F | RAIN_I |
|---|---|---|---|
| 13 | 1 | 57.40 | 0.32 |
| 13 | 7 | 91.70 | 5.16 |
| 44 | 1 | 27.30 | 0.19 |
| 44 | 7 | 74.90 | 2.12 |
| 66 | 1 | 6.70 | 2.11 |
| 66 | 7 | 65.80 | 4.53 |

| # | Time | Action | Message |
|---|---|---|---|
| 1 | 23:12:08 | SELECT * FROM STATS LIMIT 0, 1000 | 6 row(s) returned |

# THANK YOU