Assignment - SQL [Major]- Arunesh Trivedi

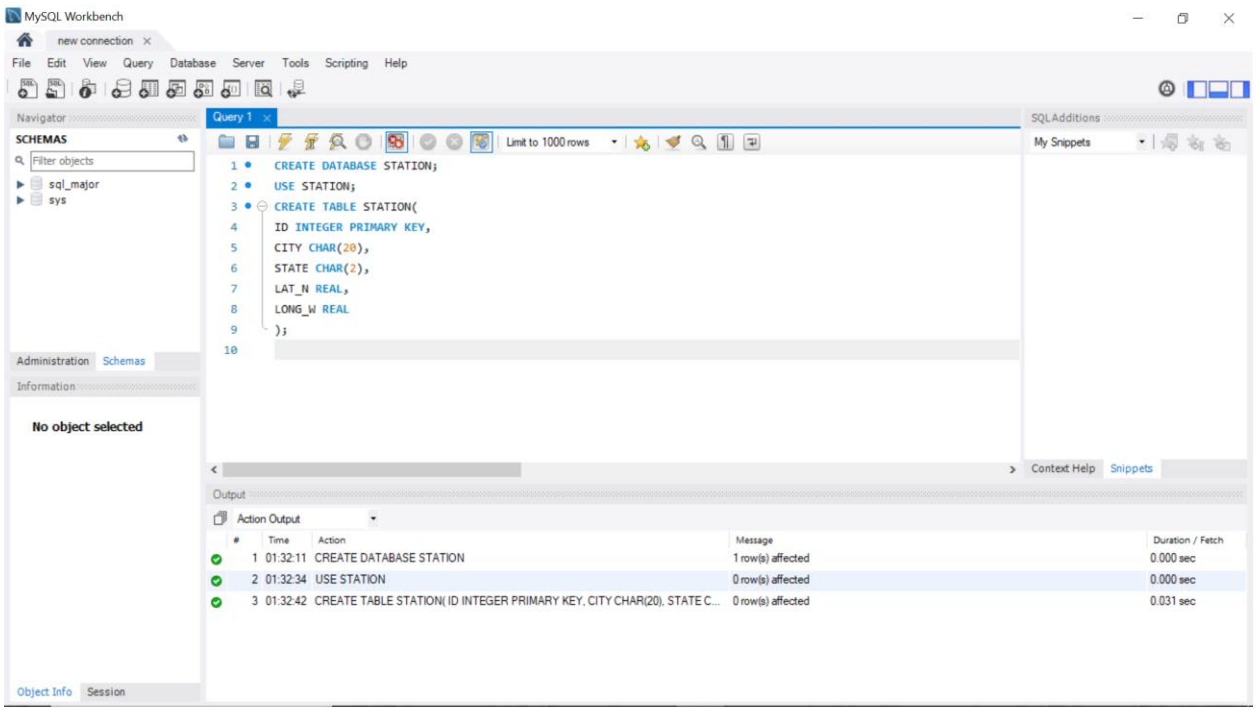
Q1) Create a table "**STATION** " to store information about weatherobservation stations:

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

CODE:-

```
CREATE TABLE STATION (
ID INTEGER PRIMARY KEY,
CITY CHAR(20),
STATE CHAR(2),
LAT_N REAL,
LONG_W REAL
);
```

SCREENSHOT:-



```
CREATE DATABASE STATION;
USE STATION;
CREATE TABLE STATION(
ID INTEGER PRIMARY KEY,
CITY CHAR(20),
STATE CHAR(2),
LAT_N REAL,
LONG_W REAL
);
```

```
#  Time      Action                                                              Message            Duration / Fetch
1  01:32:11  CREATE DATABASE STATION                                             1 row(s) affected  0.000 sec
2  01:32:34  USE STATION                                                         0 row(s) affected  0.000 sec
3  01:32:42  CREATE TABLE STATION( ID INTEGER PRIMARY KEY, CITY CHAR(20), STATE C...  0 row(s) affected  0.031 sec
```

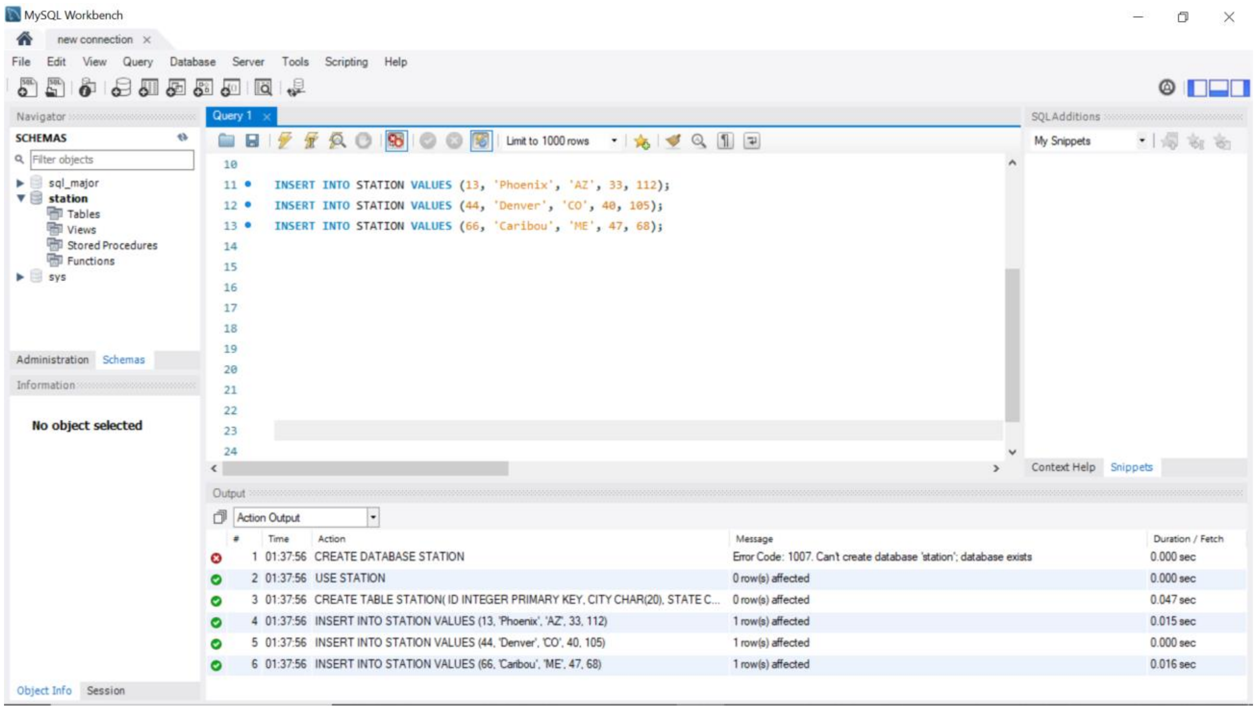
Q2) Insert the following records into the table:

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

CODE:-

```
INSERT INTO STATION VALUES (13, 'Phoenix', 'AZ', 33, 112);
INSERT INTO STATION VALUES (44, 'Denver', 'CO', 40, 105);
INSERT INTO STATION VALUES (66, 'Caribou', 'ME', 47, 68);
```

SCREENSHOT:-



```
INSERT INTO STATION VALUES (13, 'Phoenix', 'AZ', 33, 112);
INSERT INTO STATION VALUES (44, 'Denver', 'CO', 40, 105);
INSERT INTO STATION VALUES (66, 'Caribou', 'ME', 47, 68);
```

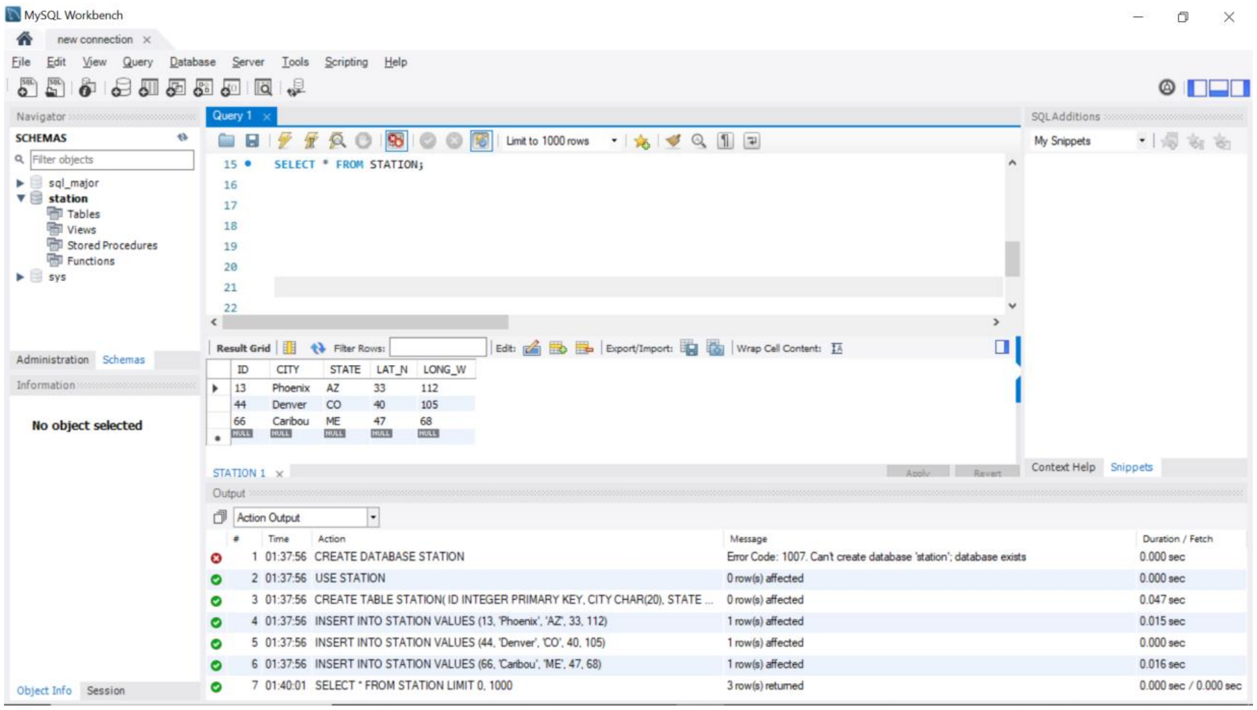
	#	Time	Action	Message	Duration / Fetch
✗	1	01:37:56	CREATE DATABASE STATION	Error Code: 1007. Can't create database 'station'; database exists	0.000 sec
✓	2	01:37:56	USE STATION	0 row(s) affected	0.000 sec
✓	3	01:37:56	CREATE TABLE STATION(ID INTEGER PRIMARY KEY, CITY CHAR(20), STATE C...	0 row(s) affected	0.047 sec
✓	4	01:37:56	INSERT INTO STATION VALUES (13, 'Phoenix', 'AZ', 33, 112)	1 row(s) affected	0.015 sec
✓	5	01:37:56	INSERT INTO STATION VALUES (44, 'Denver', 'CO', 40, 105)	1 row(s) affected	0.000 sec
✓	6	01:37:56	INSERT INTO STATION VALUES (66, 'Caribou', 'ME', 47, 68)	1 row(s) affected	0.016 sec

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

CODE:-

```
SELECT * FROM STATION;
```

SCREENSHOT:-



```
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

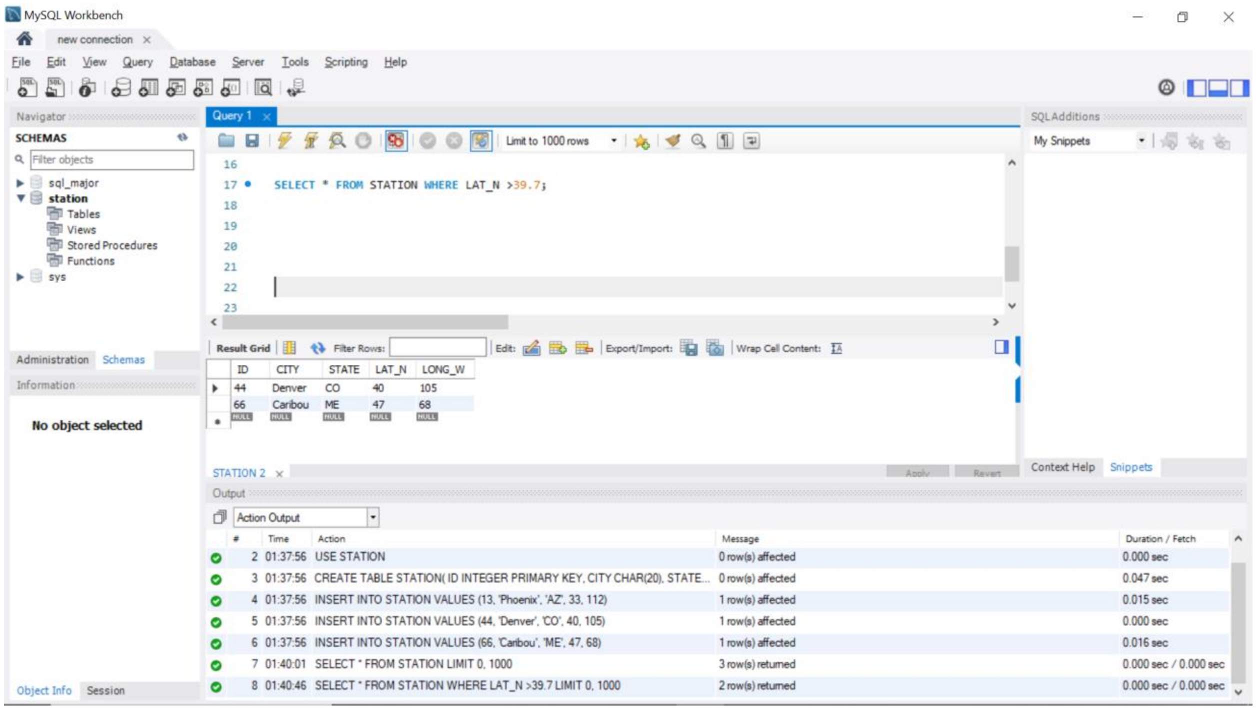
#	Time	Action	Message	Duration / Fetch
1	01:37:56	CREATE DATABASE STATION	Error Code: 1007. Can't create database 'station'; database exists	0.000 sec
2	01:37:56	USE STATION	0 row(s) affected	0.000 sec
3	01:37:56	CREATE TABLE STATION(ID INTEGER PRIMARY KEY, CITY CHAR(20), STATE ...	0 row(s) affected	0.047 sec
4	01:37:56	INSERT INTO STATION VALUES (13, 'Phoenix', 'AZ', 33, 112)	1 row(s) affected	0.015 sec
5	01:37:56	INSERT INTO STATION VALUES (44, 'Denver', 'CO', 40, 105)	1 row(s) affected	0.000 sec
6	01:37:56	INSERT INTO STATION VALUES (66, 'Caribou', 'ME', 47, 68)	1 row(s) affected	0.016 sec
7	01:40:01	SELECT * FROM STATION LIMIT 0, 1000	3 row(s) returned	0.000 sec / 0.000 sec

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

CODE:-

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

SCREENSHOT:-



```
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

```
#  Time      Action                                                             Message            Duration / Fetch
2  01:37:56  USE STATION                                                        0 row(s) affected  0.000 sec
3  01:37:56  CREATE TABLE STATION( ID INTEGER PRIMARY KEY, CITY CHAR(20), STATE...  0 row(s) affected  0.047 sec
4  01:37:56  INSERT INTO STATION VALUES (13, 'Phoenix', 'AZ', 33, 112)          1 row(s) affected  0.015 sec
5  01:37:56  INSERT INTO STATION VALUES (44, 'Denver', 'CO', 40, 105)           1 row(s) affected  0.000 sec
6  01:37:56  INSERT INTO STATION VALUES (66, 'Caribou', 'ME', 47, 68)           1 row(s) affected  0.016 sec
7  01:40:01  SELECT * FROM STATION LIMIT 0, 1000                                3 row(s) returned  0.000 sec / 0.000 sec
8  01:40:46  SELECT * FROM STATION WHERE LAT_N >39.7 LIMIT 0, 1000              2 row(s) returned  0.000 sec / 0.000 sec
```

5. Create another table, **'STATS'**, to store normalized temperature and precipitation data:

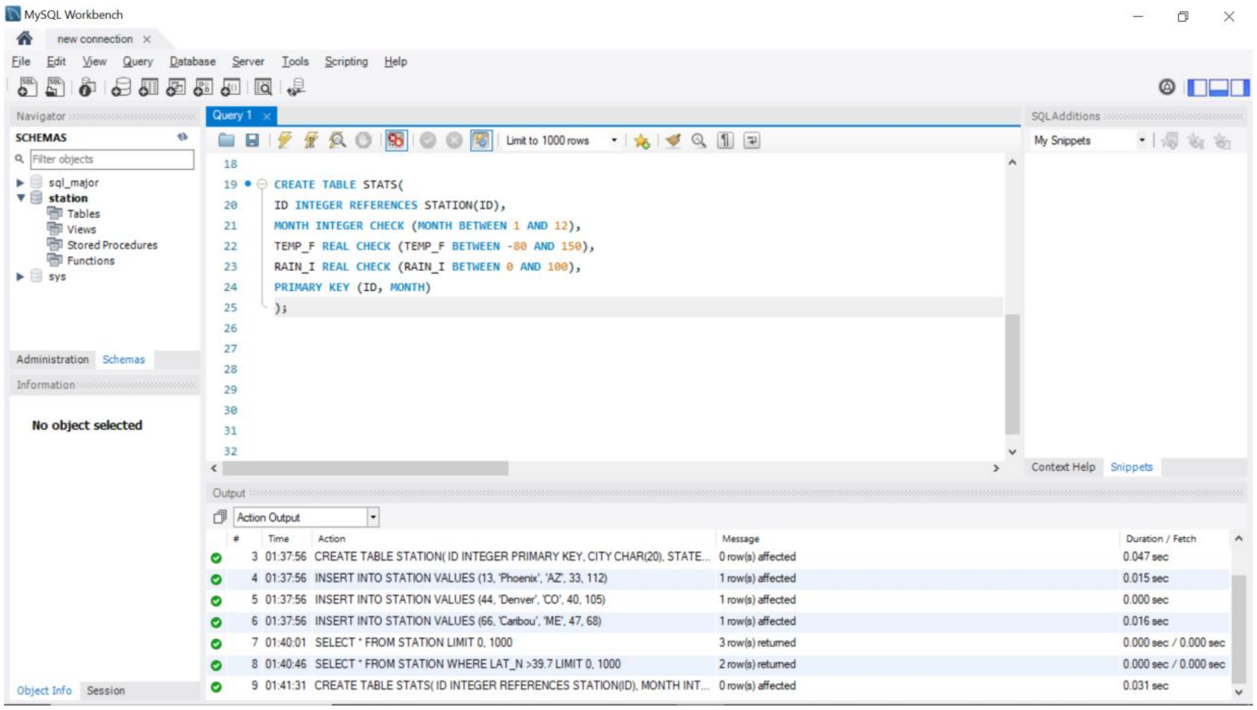
Column	**Data type**	**Remark**
ID	Number	**ID** must match with some **ID** from the **STATION** table(so name & location will be known).
MONTH	Number	The range of months is between (**1 and 12**)
TEMP_F	Number	Temperature is in Fahrenheit degrees, Ranging between (**80 and 150**)
RAIN_I	Number	Rain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

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

CODE:-

```
CREATE TABLE STATS(
ID INTEGER REFERENCES STATION(ID),
MONTH INTEGER CHECK (MONTH BETWEEN 1 AND 12),
TEMP_F REAL CHECK (TEMP_F BETWEEN -80 AND 150),
RAIN_I REAL CHECK (RAIN_I BETWEEN 0 AND 100),
PRIMARY KEY (ID, MONTH)
);
```

SCREENSHOT:-



```
CREATE TABLE STATS(
ID INTEGER REFERENCES STATION(ID),
MONTH INTEGER CHECK (MONTH BETWEEN 1 AND 12),
TEMP_F REAL CHECK (TEMP_F BETWEEN -80 AND 150),
RAIN_I REAL CHECK (RAIN_I BETWEEN 0 AND 100),
PRIMARY KEY (ID, MONTH)
);
```

```
#  Time      Action                                                                 Message             Duration / Fetch
3  01:37:56  CREATE TABLE STATION( ID INTEGER PRIMARY KEY, CITY CHAR(20), STATE...  0 row(s) affected   0.047 sec
4  01:37:56  INSERT INTO STATION VALUES (13, 'Phoenix', 'AZ', 33, 112)              1 row(s) affected   0.015 sec
5  01:37:56  INSERT INTO STATION VALUES (44, 'Denver', 'CO', 40, 105)               1 row(s) affected   0.000 sec
6  01:37:56  INSERT INTO STATION VALUES (66, 'Caribou', 'ME', 47, 68)               1 row(s) affected   0.016 sec
7  01:40:01  SELECT * FROM STATION LIMIT 0, 1000                                    3 row(s) returned   0.000 sec / 0.000 sec
8  01:40:46  SELECT * FROM STATION WHERE LAT_N >39.7 LIMIT 0, 1000                  2 row(s) returned   0.000 sec / 0.000 sec
9  01:41:31  CREATE TABLE STATS( ID INTEGER REFERENCES STATION(ID), MONTH INT...    0 row(s) affected   0.031 sec
```

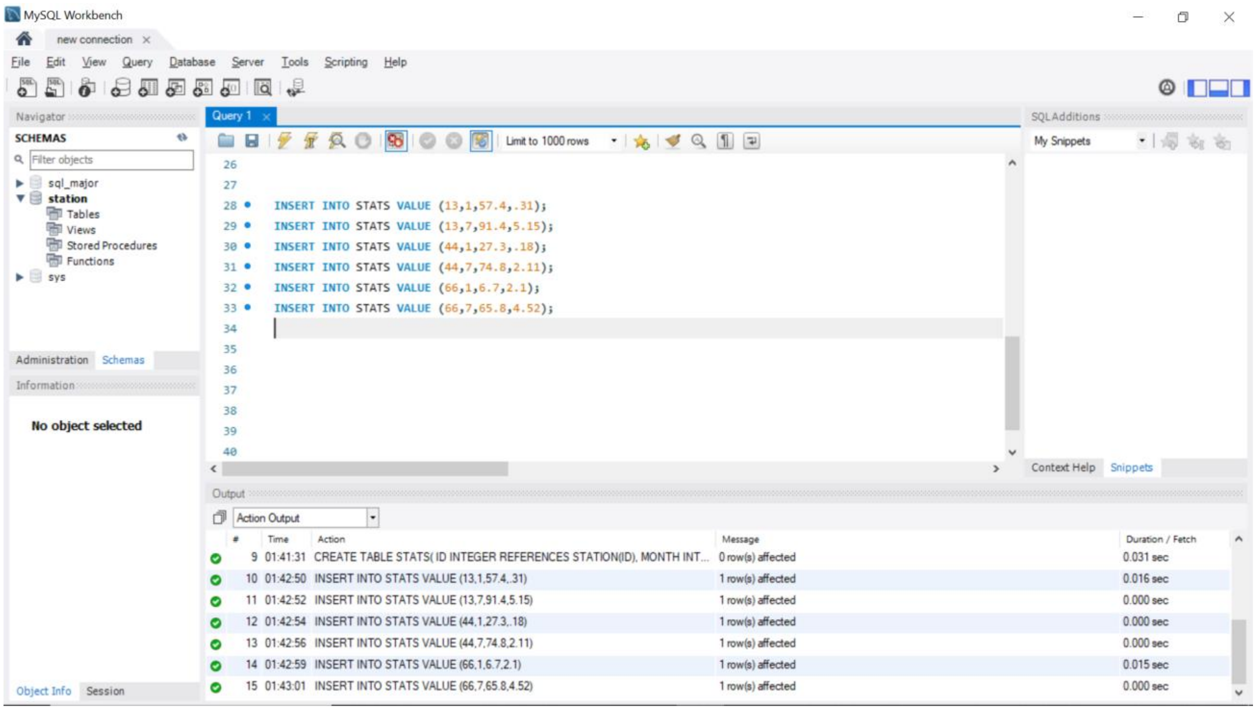
Q6) Populate the table **STATS** with some statistics for **January** and **July**:

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

CODE:-

```
INSERT INTO STATS VALUE (13,1,57.4,.31);
INSERT INTO STATS VALUE (13,7,91.4,5.15);
INSERT INTO STATS VALUE (44,1,27.3,.18);
INSERT INTO STATS VALUE (44,7,74.8,2.11);
INSERT INTO STATS VALUE (66,1,6.7,2.1);
INSERT INTO STATS VALUE (66,7,65.8,4.52);
```

SCREENSHOT:-



```
INSERT INTO STATS VALUE (13,1,57.4,.31);
INSERT INTO STATS VALUE (13,7,91.4,5.15);
INSERT INTO STATS VALUE (44,1,27.3,.18);
INSERT INTO STATS VALUE (44,7,74.8,2.11);
INSERT INTO STATS VALUE (66,1,6.7,2.1);
INSERT INTO STATS VALUE (66,7,65.8,4.52);
```

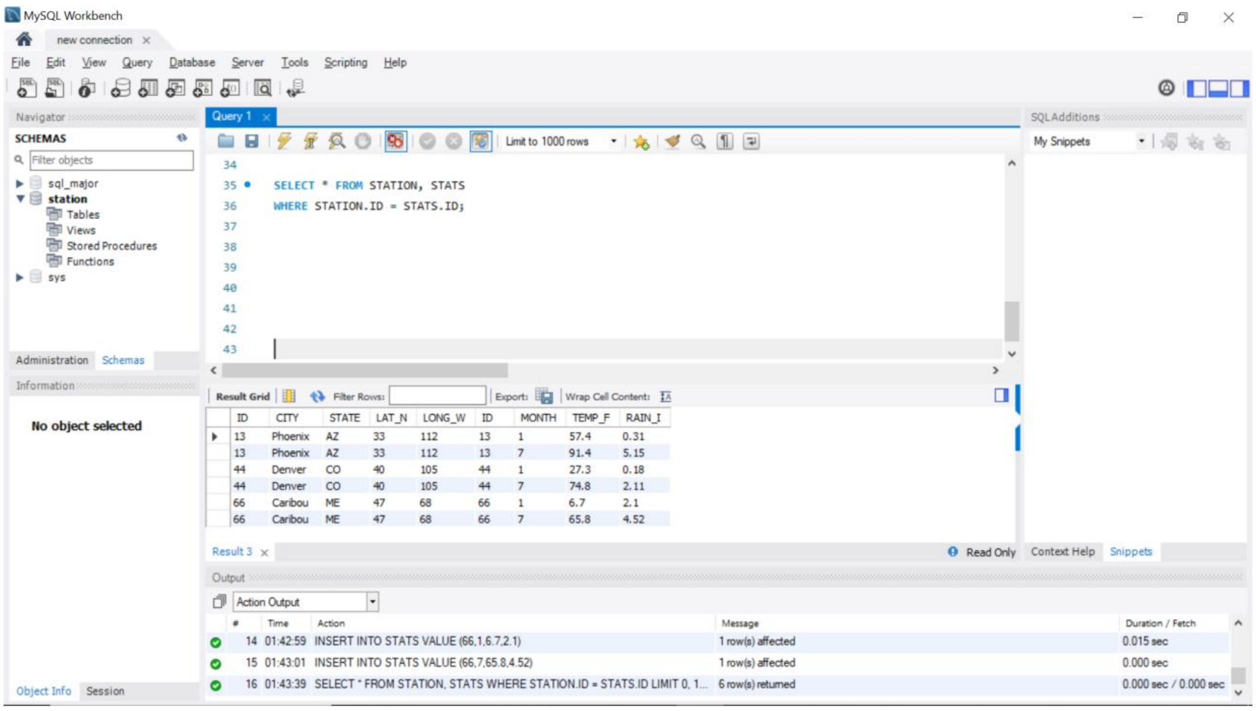
```
 #  Time      Action                                                               Message            Duration / Fetch
 9  01:41:31  CREATE TABLE STATS( ID INTEGER REFERENCES STATION(ID), MONTH INT...  0 row(s) affected  0.031 sec
10  01:42:50  INSERT INTO STATS VALUE (13,1,57.4,.31)                              1 row(s) affected  0.016 sec
11  01:42:52  INSERT INTO STATS VALUE (13,7,91.4,5.15)                             1 row(s) affected  0.000 sec
12  01:42:54  INSERT INTO STATS VALUE (44,1,27.3,.18)                              1 row(s) affected  0.000 sec
13  01:42:56  INSERT INTO STATS VALUE (44,7,74.8,2.11)                             1 row(s) affected  0.000 sec
14  01:42:59  INSERT INTO STATS VALUE (66,1,6.7,2.1)                               1 row(s) affected  0.015 sec
15  01:43:01  INSERT INTO STATS VALUE (66,7,65.8,4.52)                             1 row(s) affected  0.000 sec
```

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

CODE:-

```
SELECT * FROM STATION, STATS
WHERE STATION.ID = STATS.ID;
```

SCREENSHOT:-



```
SELECT * FROM STATION, STATS
WHERE STATION.ID = STATS.ID;
```

ID	CITY	STATE	LAT_N	LONG_W	ID	MONTH	TEMP_F	RAIN_I
13	Phoenix	AZ	33	112	13	1	57.4	0.31
13	Phoenix	AZ	33	112	13	7	91.4	5.15
44	Denver	CO	40	105	44	1	27.3	0.18
44	Denver	CO	40	105	44	7	74.8	2.11
66	Caribou	ME	47	68	66	1	6.7	2.1
66	Caribou	ME	47	68	66	7	65.8	4.52

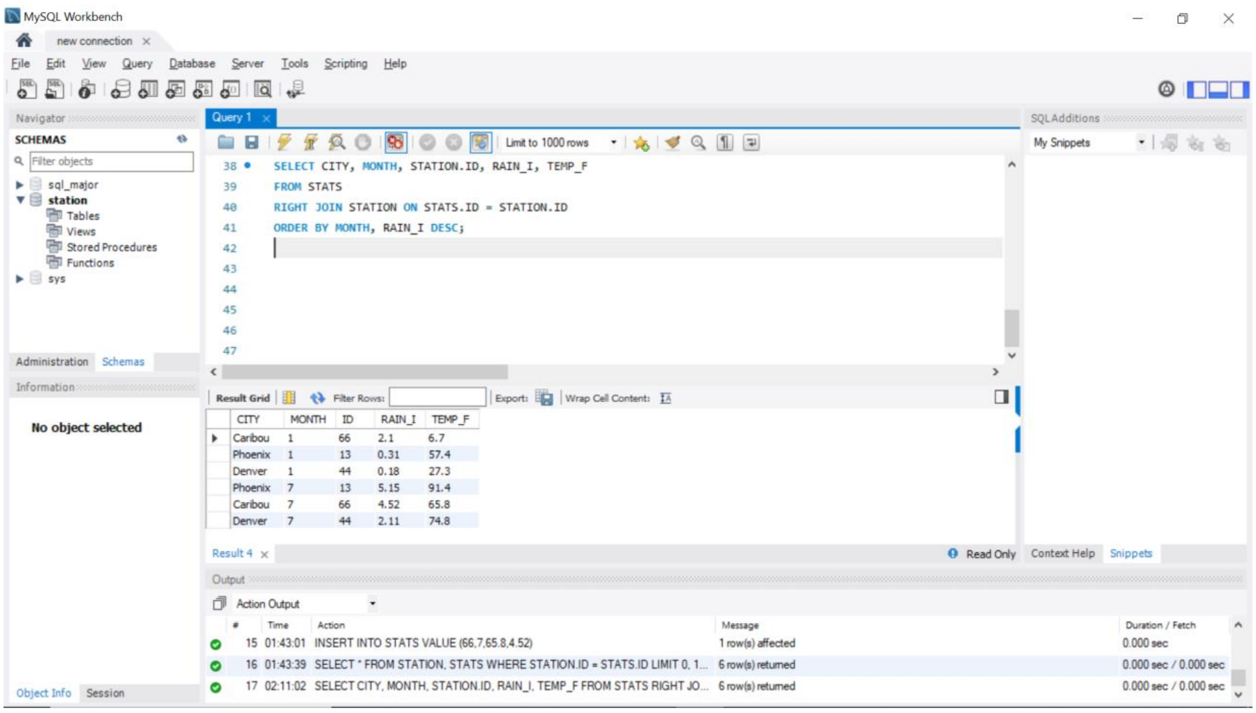
```
#   Time      Action                                                              Message            Duration / Fetch
14  01:42:59  INSERT INTO STATS VALUE (66,1,6.7,2.1)                              1 row(s) affected  0.015 sec
15  01:43:01  INSERT INTO STATS VALUE (66,7,65.8,4.52)                            1 row(s) affected  0.000 sec
16  01:43:39  SELECT * FROM STATION, STATS WHERE STATION.ID = STATS.ID LIMIT 0, 1...  6 row(s) returned  0.000 sec / 0.000 sec
```

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.

CODE:-

```
SELECT CITY, MONTH, STATION.ID, RAIN_I, TEMP_F
FROM STATS
RIGHT JOIN STATION ON STATS.ID = STATION.ID
ORDER BY MONTH, RAIN_I DESC;
```

SCREENSHOT:-



```
SELECT CITY, MONTH, STATION.ID, RAIN_I, TEMP_F
FROM STATS
RIGHT JOIN STATION ON STATS.ID = STATION.ID
ORDER BY MONTH, RAIN_I DESC;
```

CITY	MONTH	ID	RAIN_I	TEMP_F
Caribou	1	66	2.1	6.7
Phoenix	1	13	0.31	57.4
Denver	1	44	0.18	27.3
Phoenix	7	13	5.15	91.4
Caribou	7	66	4.52	65.8
Denver	7	44	2.11	74.8

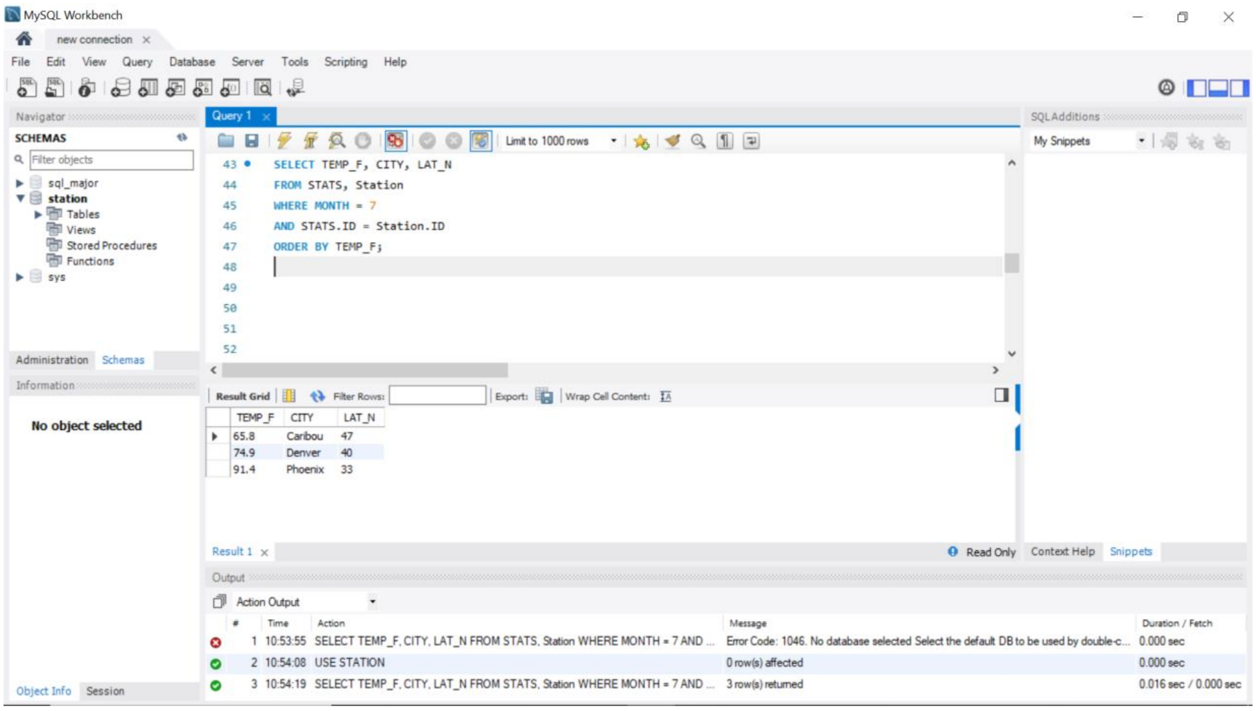
#	Time	Action	Message	Duration / Fetch
15	01:43:01	INSERT INTO STATS VALUE (66,7,65.8,4.52)	1 row(s) affected	0.000 sec
16	01:43:39	SELECT * FROM STATION, STATS WHERE STATION.ID = STATS.ID LIMIT 0, 1...	6 row(s) returned	0.000 sec / 0.000 sec
17	02:11:02	SELECT CITY, MONTH, STATION.ID, RAIN_I, TEMP_F FROM STATS RIGHT JO...	6 row(s) returned	0.000 sec / 0.000 sec

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

CODE:-

```
SELECT TEMP_F, CITY, LAT_N
FROM STATS, Station
WHERE MONTH = 7
AND STATS.ID = Station.ID
ORDER BY TEMP_F;
```

SCREENSHOT:-



```
SELECT TEMP_F, CITY, LAT_N
FROM STATS, Station
WHERE MONTH = 7
AND STATS.ID = Station.ID
ORDER BY TEMP_F;
```

TEMP_F	CITY	LAT_N
65.8	Caribou	47
74.9	Denver	40
91.4	Phoenix	33

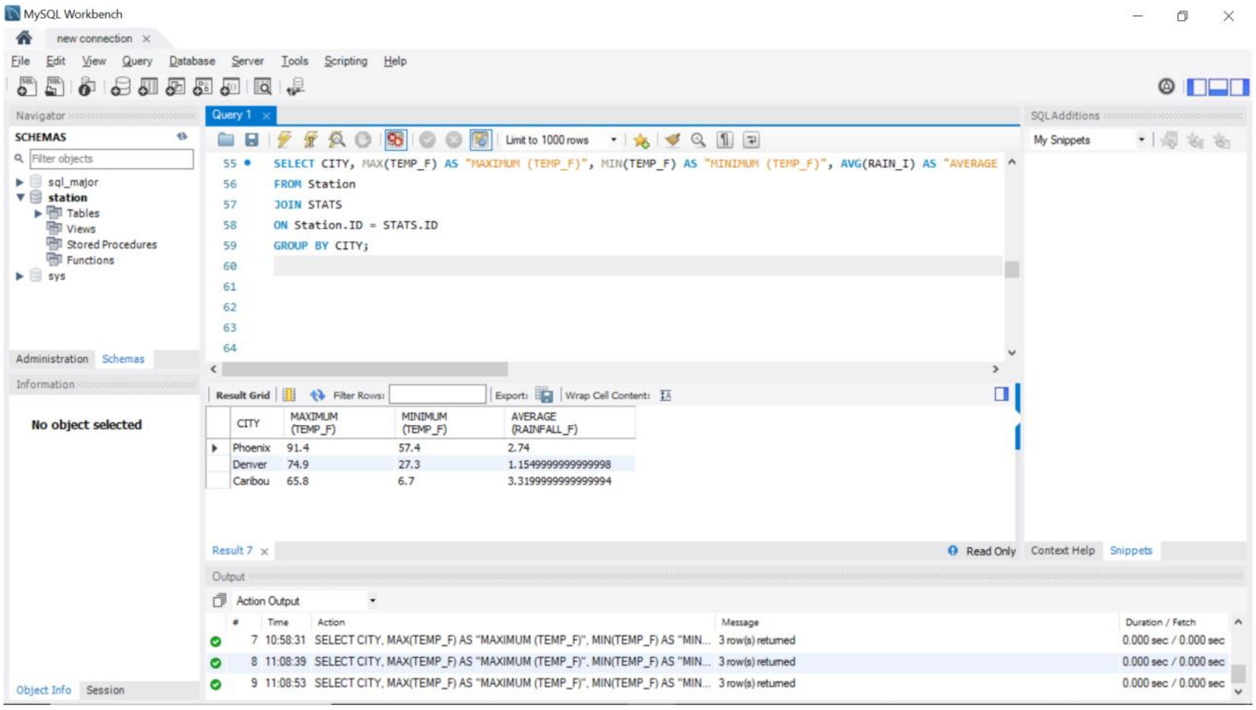
```
#  Time      Action                                                          Message                                                                        Duration / Fetch
1  10:53:55  SELECT TEMP_F, CITY, LAT_N FROM STATS, Station WHERE MONTH = 7 AND ...  Error Code: 1046. No database selected Select the default DB to be used by double-c...  0.000 sec
2  10:54:08  USE STATION                                                     0 row(s) affected                                                              0.000 sec
3  10:54:19  SELECT TEMP_F, CITY, LAT_N FROM STATS, Station WHERE MONTH = 7 AND ...  3 row(s) returned                                                              0.016 sec / 0.000 sec
```

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

CODE:-

```
SELECT CITY, MAX(TEMP_F) AS "MAXIMUM (TEMP_F)", MIN(TEMP_F)
AS "MINIMUM (TEMP_F)", AVG(RAIN_I) AS "AVERAGE (RAINFALL_F)"
FROM Station
JOIN STATS
ON Station.ID = STATS.ID
GROUP BY CITY;
```

SCREENSHOT:-



```
SELECT CITY, MAX(TEMP_F) AS "MAXIMUM (TEMP_F)", MIN(TEMP_F) AS "MINIMUM (TEMP_F)", AVG(RAIN_I) AS "AVERAGE
FROM Station
JOIN STATS
ON Station.ID = STATS.ID
GROUP BY CITY;
```

CITY	MAXIMUM (TEMP_F)	MINIMUM (TEMP_F)	AVERAGE (RAINFALL_F)
Phoenix	91.4	57.4	2.74
Denver	74.9	27.3	1.1549999999999998
Caribou	65.8	6.7	3.3199999999999994

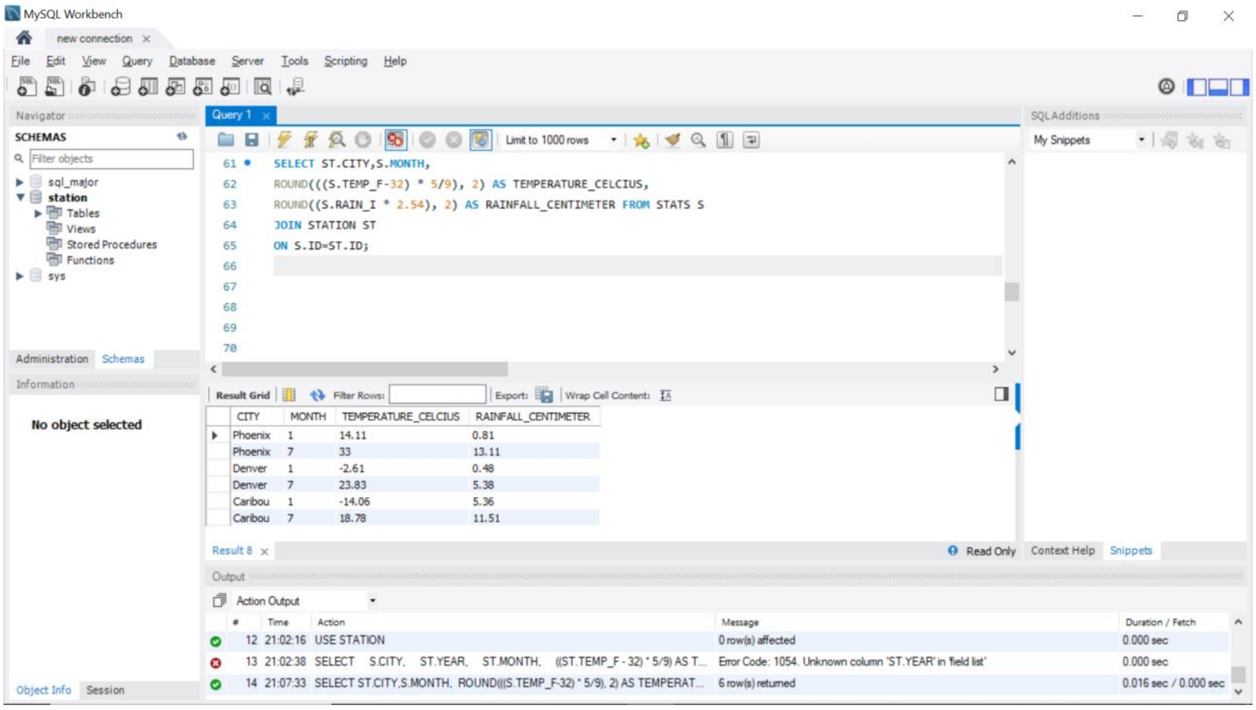
```
#  Time      Action                                                            Message           Duration / Fetch
7  10:58:31  SELECT CITY, MAX(TEMP_F) AS "MAXIMUM (TEMP_F)", MIN(TEMP_F) AS "MIN...  3 row(s) returned  0.000 sec / 0.000 sec
8  11:08:39  SELECT CITY, MAX(TEMP_F) AS "MAXIMUM (TEMP_F)", MIN(TEMP_F) AS "MIN...  3 row(s) returned  0.000 sec / 0.000 sec
9  11:08:53  SELECT CITY, MAX(TEMP_F) AS "MAXIMUM (TEMP_F)", MIN(TEMP_F) AS "MIN...  3 row(s) returned  0.000 sec / 0.000 sec
```

Q11) Execute a query to display each city's monthly temperature in Celcius and rainfall in Centimeter.

CODE:-

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

SCREENSHOT:-



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

CITY	MONTH	TEMPERATURE_CELCIUS	RAINFALL_CENTIMETER
Phoenix	1	14.11	0.81
Phoenix	7	33	13.11
Denver	1	-2.61	0.48
Denver	7	23.83	5.38
Caribou	1	-14.06	5.36
Caribou	7	18.78	11.51

```
#   Time      Action                                                          Message                                               Duration / Fetch
12  21:02:16  USE STATION                                                     0 row(s) affected                                     0.000 sec
13  21:02:38  SELECT   S.CITY,   ST.YEAR,   ST.MONTH,   ((ST.TEMP_F - 32) * 5/9) AS T...   Error Code: 1054. Unknown column 'ST.YEAR' in 'field list'   0.000 sec
14  21:07:33  SELECT ST.CITY,S.MONTH,  ROUND(((S.TEMP_F-32) * 5/9), 2) AS TEMPERAT...   6 row(s) returned                                     0.016 sec / 0.000 sec
```

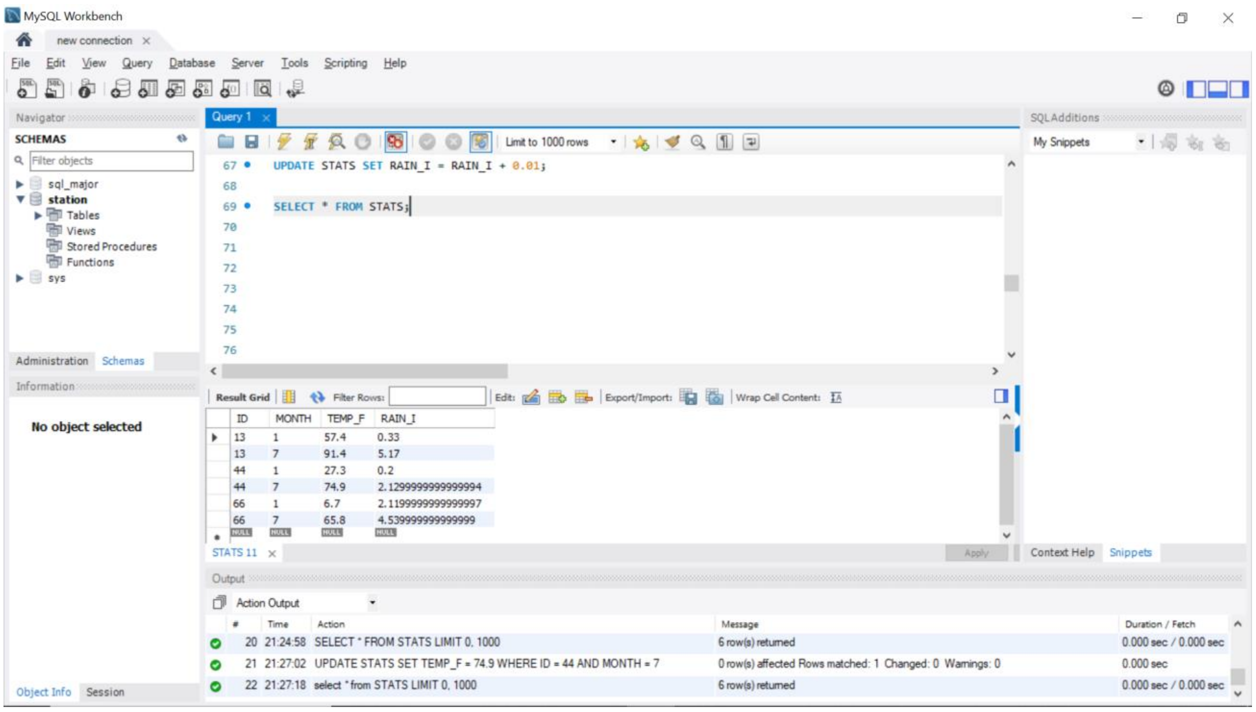
Q12) Update all rows of table **STATS** to compensate for faulty rain gauges known to read 0.01 inches low.

CODE:-

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

SELECT * FROM STATS;
```

SCREENSHOT:-

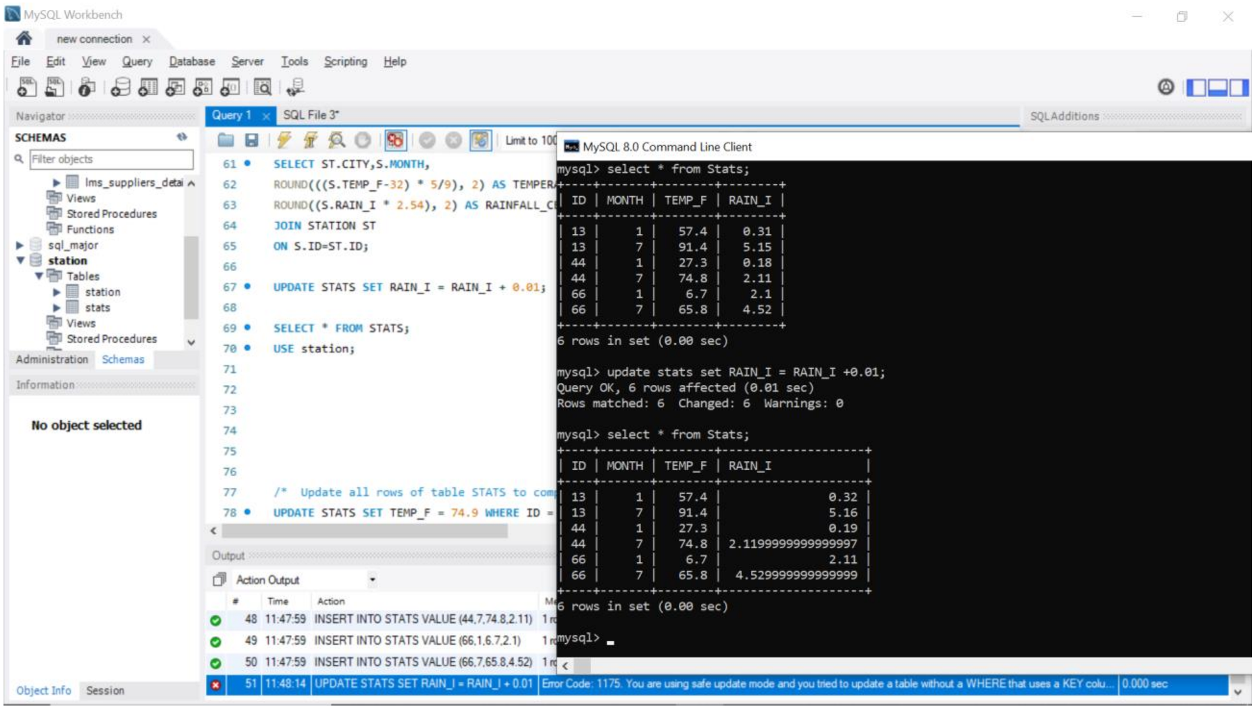


```
UPDATE STATS SET RAIN_I = RAIN_I + 0.01;

SELECT * FROM STATS;
```

ID	MONTH	TEMP_F	RAIN_I
13	1	57.4	0.33
13	7	91.4	5.17
44	1	27.3	0.2
44	7	74.9	2.1299999999999994
66	1	6.7	2.1199999999999997
66	7	65.8	4.539999999999999
NULL	NULL	NULL	NULL

#	Time	Action	Message	Duration / Fetch
20	21:24:58	SELECT * FROM STATS LIMIT 0, 1000	6 row(s) returned	0.000 sec / 0.000 sec
21	21:27:02	UPDATE STATS SET TEMP_F = 74.9 WHERE ID = 44 AND MONTH = 7	0 row(s) affected Rows matched: 1 Changed: 0 Warnings: 0	0.000 sec
22	21:27:18	select * from STATS LIMIT 0, 1000	6 row(s) returned	0.000 sec / 0.000 sec



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

UPDATE STATS SET RAIN_I = RAIN_I + 0.01;

SELECT * FROM STATS;
USE station;

/*  Update all rows of table STATS to com
UPDATE STATS SET TEMP_F = 74.9 WHERE ID =
```

```
mysql> select * from Stats;
+----+-------+--------+--------+
| ID | MONTH | TEMP_F | RAIN_I |
+----+-------+--------+--------+
| 13 |     1 |   57.4 |   0.31 |
| 13 |     7 |   91.4 |   5.15 |
| 44 |     1 |   27.3 |   0.18 |
| 44 |     7 |   74.8 |   2.11 |
| 66 |     1 |    6.7 |    2.1 |
| 66 |     7 |   65.8 |   4.52 |
+----+-------+--------+--------+
6 rows in set (0.00 sec)

mysql> update stats set RAIN_I = RAIN_I +0.01;
Query OK, 6 rows affected (0.01 sec)
Rows matched: 6  Changed: 6  Warnings: 0

mysql> select * from Stats;
+----+-------+--------+--------------------+
| ID | MONTH | TEMP_F | RAIN_I             |
+----+-------+--------+--------------------+
| 13 |     1 |   57.4 |               0.32 |
| 13 |     7 |   91.4 |               5.16 |
| 44 |     1 |   27.3 |               0.19 |
| 44 |     7 |   74.8 | 2.1199999999999997 |
| 66 |     1 |    6.7 |               2.11 |
| 66 |     7 |   65.8 |  4.529999999999999 |
+----+-------+--------+--------------------+
6 rows in set (0.00 sec)

mysql> _
```

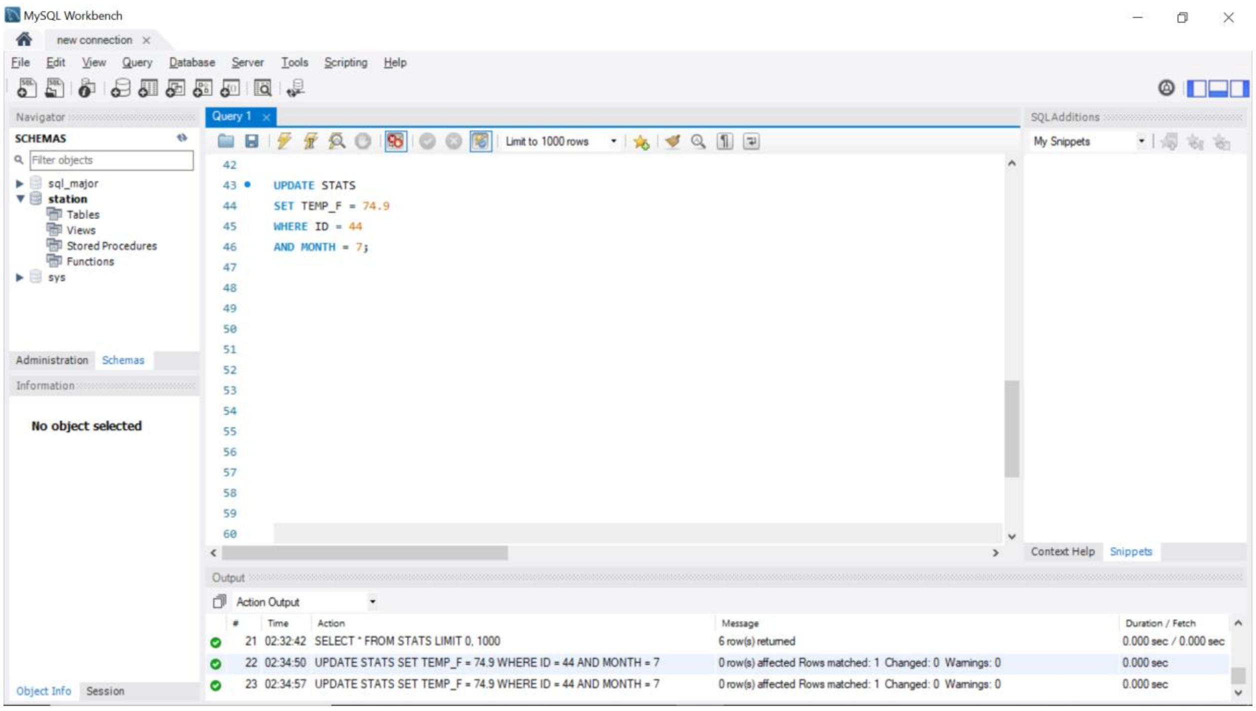
#	Time	Action	Message	Duration / Fetch
48	11:47:59	INSERT INTO STATS VALUE (44,7,74.8,2.11)	1 r	
49	11:47:59	INSERT INTO STATS VALUE (66,1,6.7,2.1)	1 r	
50	11:47:59	INSERT INTO STATS VALUE (66,7,65.8,4.52)	1 r	
51	11:48:14	UPDATE STATS SET RAIN_I = RAIN_I + 0.01	Error Code: 1175. You are using safe update mode and you tried to update a table without a WHERE that uses a KEY colu...	0.000 sec

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

CODE:-

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

SCREENSHOT:-



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

```
#   Time      Action                                                      Message                                                        Duration / Fetch
21  02:32:42  SELECT * FROM STATS LIMIT 0, 1000                           6 row(s) returned                                              0.000 sec / 0.000 sec
22  02:34:50  UPDATE STATS SET TEMP_F = 74.9 WHERE ID = 44 AND MONTH = 7  0 row(s) affected Rows matched: 1  Changed: 0  Warnings: 0  0.000 sec
23  02:34:57  UPDATE STATS SET TEMP_F = 74.9 WHERE ID = 44 AND MONTH = 7  0 row(s) affected Rows matched: 1  Changed: 0  Warnings: 0  0.000 sec
```