Name: **KUSUM M R**
USN: **1BM19CS077**
Date: **22-06-2021**

AIRLINE FLIGHT DATABASE

Consider the following database that keeps track of airline flight information:
FLIGHTS (flno: integer, from: string, to: string, distance: integer, departs: time, arrives: time, price: integer)
AIRCRAFT (aid: integer, aname: string, cruisingrange: integer)
CERTIFIED (eid: integer, aid: integer)
EMPLOYEE (eid: integer, ename: string, salary: integer)
Note that the Employees relation describes pilots and other kinds of employees as well; Every pilot is certified
for some aircraft, and only pilots are certified to fly.
Write each of the following queries in SQL.
i. Find the names of aircraft such that all pilots certified to operate them have salaries more than Rs.80,000.
ii. For each pilot who is certified for more than three aircrafts, find the eid and the maximum cruising range of
the aircraft for which she or he is certified.
iii. Find the names of pilots whose salary is less than the price of the cheapest route from Bengaluru to
Frankfurt.
iv. For all aircraft with cruising range over 1000 Kms, find the name of the aircraft and the average salary of
all pilots certified for this aircraft.
v. Find the names of pilots certified for some Boeing aircraft.
vi. Find the aids of all aircraft that can be used on routes from Bengaluru to New Delhi.
vii. A customer wants to travel from Madison to New York with no more than two changes of flight. List the
choice of departure times from Madison if the customer wants to arrive in New York by 6 p.m.
viii. Print the name and salary of every non-pilot whose salary is more than the average salary for pilots.

CODE:

```
create database airline;
use airline;
CREATE TABLE flights(
flno Int,
`from` Varchar(20),
`to` Varchar(20),
distance INT,
departs time,
arrives time,
```

```
price Int,
PRIMARY KEY(flno) );
 CREATE TABLE aircraft(
 aid INT,
 aname VARCHAR(20),
 cruisingrange INT,
PRIMARY KEY (aid) );

CREATE TABLE employees(
 eid INT,
 ename Varchar(20),
 salary INT,
 PRIMARY KEY (eid) );

CREATE TABLE certified(
eid INT,
aid INT,
PRIMARY KEY (eid,aid),
FOREIGN KEY (eid) REFERENCES employees (eid),
FOREIGN KEY (aid) REFERENCES aircraft (aid) );

show tables;

INSERT INTO flights (flno,`from`,`to`,distance,departs,arrives,price) VALUES
(1,'Bangalore','Chennai',360,'08:45','10:00',10000),
(2,'Bangalore','Delhi',1700,'12:15','15:00',37000),
(3,'Bangalore','Kolkata',1500,'15:15','05:25',30000),
(4,'Mumbai','Delhi',1200,'10:30','12:30',28000),
(5,'Bangalore','New york',14000,'05:45','02:30',90000),
(6,'Delhi','Chicago',12000,'10:00','05:45',95000),
(7,'Bangalore','Frankfurt',15000,'12:00','06:30',98000),
(8,'Madison','New york',1500,'10:15','14:25',30000);
SELECT * FROM flights;

INSERT INTO aircraft (aid,aname,cruisingrange) values
      (1,'Airbus 380',1000),
      (2,'Boeing 737',4000),
      (3,'Lockheed',5500),
      (4,'Airbus A220',9500),
      (5,'Boeing 747',800),
      (6,'Douglas DC3',900);
SELECT * FROM aircraft;

INSERT INTO employees (eid,ename,salary) VALUES
```

```
(1,'Zoya',95000),
(2,'Akshay',65000),
(3,'Niveditha',70000),
(4,'Safan',45000),
(5,'Peter',95000),
(6,'Nayan',100000),
(7,'Ajay',50000);
SELECT * FROM employees;

INSERT INTO certified (eid,aid) VALUES
(1,1),
(1,3),
(1,4),
(5,4),
(5,3),
(1,2),
 (2,6),
(2,5),
(4,5),
(6,4),
(6,3),
(3,6),
(3,2);
SELECT * FROM certified;
```

#i. Find the names of aircraft such that all pilots certified to operate them have salaries more than Rs.80,000.

```
SELECT DISTINCT A.aname
FROM Aircraft A
WHERE A.Aid IN (SELECT C.aid
FROM Certified C, Employees E
WHERE C.eid = E.eid AND
NOT EXISTS ( SELECT *
FROM Employees E1
WHERE E1.eid = E.eid AND E1.salary < 80000 ));
```

#ii. For each pilot who is certified for more than three aircrafts, find the eid and the maximum cruising range of the aircraft for which she or he is certified.

```
SELECT C.eid, MAX(A.cruisingrange)
FROM Certified C, Aircraft A
WHERE C.aid = A.aid
GROUP BY C.eid
HAVING COUNT(*) > 3;
```

#iii. Find the names of pilots whose salary is less than the price of the cheapest route from Bengaluru toFrankfurt.

```
SELECT DISTINCT e.ename
FROM employees e
WHERE e.salary<
(SELECT MIN(f.price)
FROM flights f
WHERE f.from='Bangalore' AND f.to='Frankfurt');
```

#iv. For all aircraft with cruising range over 1000 Kms, find the name of the aircraft and the average salary of all pilots certified for this aircraft.

```
SELECT a.aid,a.aname,AVG(e.salary)
FROM aircraft a,certified c,employees e
WHERE a.aid=c.aid
AND c.eid=e.eid
AND a.cruisingrange>1000
GROUP BY a.aid,a.aname;
```

#v. Find the names of pilots certified for some Boeing aircraft.

```
SELECT distinct e.ename
FROM employees e,aircraft a,certified c
WHERE e.eid=c.eid AND c.aid=a.aid AND a.aname like 'Boeing%';
```

#vi. Find the aids of all aircraft that can be used on routes from Bengaluru to New Delhi.

```
SELECT a.aid
FROM aircraft a
WHERE a.cruisingrange>
(SELECT MIN(f.distance)
FROM flights f
WHERE f.from='Bangalore' AND f.to='Delhi');
```

#vii. A customer wants to travel from Madison to New York with no more than two changes of flight. List the choice of departure times from Madison if the customer wants to arrive in New York by 6 p.m.

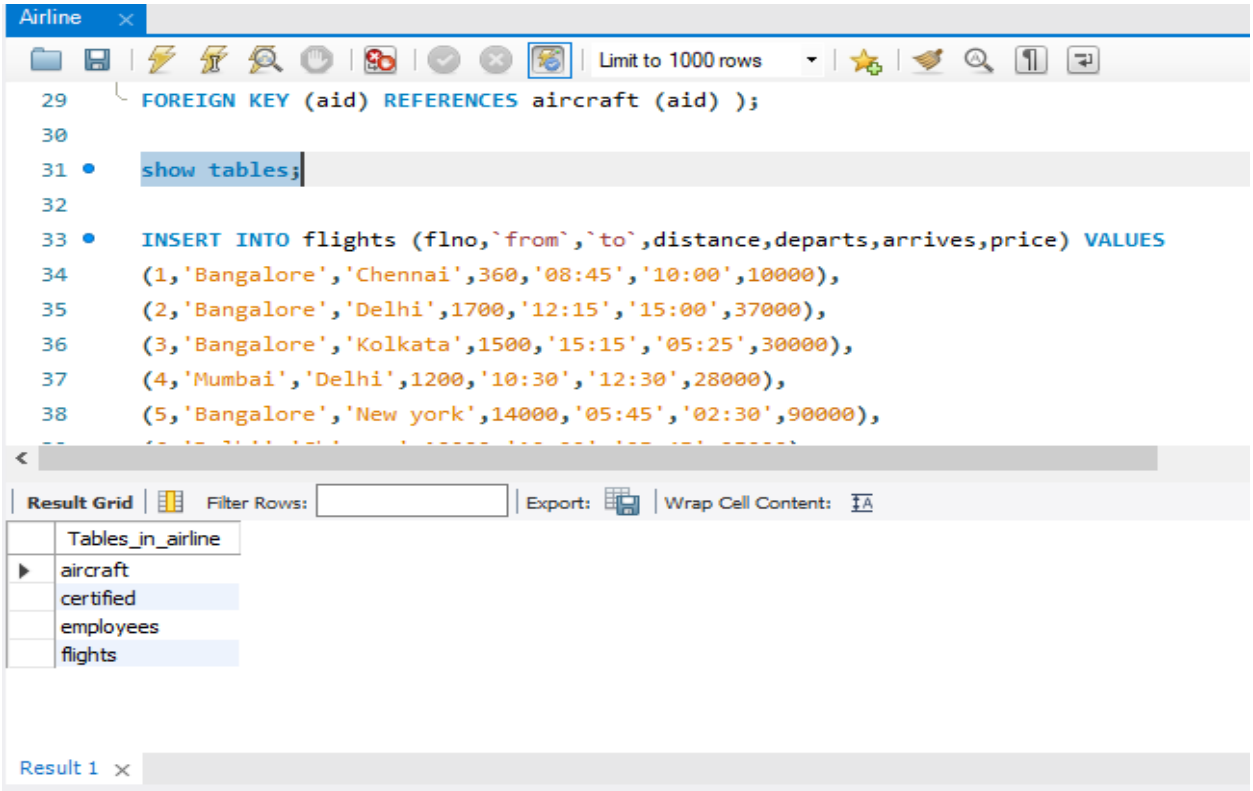
```
SELECT F.departs
FROM Flights F WHERE F.flno IN (  SELECT F0.flno
FROM Flights F0
WHERE F0.from = 'Madison' AND F0.to = 'New york' AND  F0.arrives < '18:00' );
```

#viii. Print the name and salary of every non-pilot whose salary is more than the average salary for pilots.0

```
SELECT E.ename, E.salary
FROM Employees E
```

```
WHERE E.eid NOT IN ( SELECT DISTINCT C.eid
FROM Certified C )
AND E.salary > ( SELECT AVG (E1.salary)
FROM Employees E1
WHERE E1.eid IN
( SELECT DISTINCT C1.eid
FROM Certified C1 ) );
```

OUTPUT:



Airline

```
35    (2,'Bangalore','Delhi',1700,'12:15','15:00',37000),
36    (3,'Bangalore','Kolkata',1500,'15:15','05:25',30000),
37    (4,'Mumbai','Delhi',1200,'10:30','12:30',28000),
38    (5,'Bangalore','New york',14000,'05:45','02:30',90000),
39    (6,'Delhi','Chicago',12000,'10:00','05:45',95000),
40    (7,'Bangalore','Frankfurt',15000,'12:00','06:30',98000),
41    (8,'Madison','New york',1500,'10:15','14:25',30000);
42    SELECT * FROM flights;
```

Result Grid | Filter Rows: | Edit: | Export/Import: | Wrap Cell Content:

flno	from	to	distance	departs	arrives	price
1	Bangalore	Chennai	360	08:45:00	10:00:00	10000
2	Bangalore	Delhi	1700	12:15:00	15:00:00	37000
3	Bangalore	Kolkata	1500	15:15:00	05:25:00	30000
4	Mumbai	Delhi	1200	10:30:00	12:30:00	28000
5	Bangalore	New york	14000	05:45:00	02:30:00	90000
6	Delhi	Chicago	12000	10:00:00	05:45:00	95000
7	Bangalore	Frankfurt	15000	12:00:00	06:30:00	98000
8	Madison	New york	1500	10:15:00	14:25:00	30000
NULL	NULL	NULL	NULL	NULL	NULL	NULL

flights 2

Airline

```
47            (3,'Lockheed',5500),
48            (4,'Airbus A220',9500),
49            (5,'Boeing 747',800),
50            (6,'Douglas DC3',900);
51    SELECT * FROM aircraft;
52
53    INSERT INTO employees (eid,ename,salary) VALUES
54    (1,'Zoya',95000),
```

Result Grid | Filter Rows: | Edit: | Export/Import: | Wrap Cell Content:

aid	aname	cruisingrange
1	Airbus 380	1000
2	Boeing 737	4000
3	Lockheed	5500
4	Airbus A220	9500
5	Boeing 747	800
6	Douglas DC3	900
NULL	NULL	NULL

aircraft 3

Airline

Limit to 1000 rows

```
56      (3,'Niveditha',70000),
57      (4,'Safan',45000),
58      (5,'Peter',95000),
59      (6,'Nayan',100000),
60      (7,'Ajay',50000);
61      SELECT * FROM employees;
62
63      INSERT INTO certified (eid,aid) VALUES
```

Result Grid | Filter Rows: | Edit: | Export/Import: | Wrap Cell Content:

eid	ename	salary
1	Zoya	95000
2	Akshay	65000
3	Niveditha	70000
4	Safan	45000
5	Peter	95000
6	Nayan	100000
7	Ajay	50000
NULL	NULL	NULL

employees 4

Airline

Limit to 1000 rows

```
74      (6,3),
75      (3,6),
76      (3,2);
77      SELECT * FROM certified;
78
```

Result Grid | Filter Rows: | Edit: | Export/Import: | Wrap Cell Content:

eid	aid
1	1
1	2
3	2
1	3
5	3
6	3
1	4
5	4
6	4
2	5
4	5
2	6
3	6
NULL	NULL

certified 5

Airline

```
80  #i. Find the names of aircraft such that all pilots certified to operate them have salaries more than Rs.80,000.
81  SELECT DISTINCT A.aname
82  FROM Aircraft A
83  WHERE A.Aid IN (SELECT C.aid
84  FROM Certified C, Employees E
85  WHERE C.eid = E.eid AND
86  NOT EXISTS ( SELECT *
87  FROM Employees E1
88  WHERE E1.eid = E.eid AND E1.salary < 80000 ));
89
90  #ii. For each pilot who is certified for more than three aircrafts, find the eid and the maximum cruising range of
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

aname
Airbus 380
Boeing 737
Lockheed
Airbus A220

Aircraft 6

Airline

```
89
90  #ii. For each pilot who is certified for more than three aircrafts, find the eid and
91  SELECT C.eid, MAX(A.cruisingrange)
92  FROM Certified C, Aircraft A
93  WHERE C.aid = A.aid
94  GROUP BY C.eid
95  HAVING COUNT(*) > 3;
96
97  #iii. Find the names of pilots whose salary is less than the price of the cheapest rc
98  SELECT DISTINCT e.ename
99  FROM employees e
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

eid	MAX(A.cruisingrange)
1	9500

Result 7

Airline

```
95    HAVING COUNT(*) > 3;
96
97    #iii. Find the names of pilots whose salary is less than the price of the cheapest route from Bengaluru toFrankfurt.
98    SELECT DISTINCT e.ename
99    FROM employees e
100   WHERE e.salary<
101   (SELECT MIN(f.price)
102   FROM flights f
103   WHERE f.from='Bangalore' AND f.to='Frankfurt');
104
105   #iv. For all aircraft with cruising range over 1000 Kms, find the name of the aircraft and the average salary of all
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

ename
Zoya
Akshay
Niveditha
Safan
Peter
Ajay

employees 8

Airline

```
104
105   #iv. For all aircraft with cruising range over 1000 Kms, find the name
106   SELECT a.aid,a.aname,AVG(e.salary)
107   FROM aircraft a,certified c,employees e
108   WHERE a.aid=c.aid
109   AND c.eid=e.eid
110   AND a.cruisingrange>1000
111   GROUP BY a.aid,a.aname;
112
113   #v. Find the names of pilots certified for some Boeing aircraft.
114   SELECT distinct e.ename
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

aid	aname	AVG(e.salary)
2	Boeing 737	82500.0000
3	Lockheed	96666.6667
4	Airbus A220	96666.6667

Result 9

Airline

```
113     #v. Find the names of pilots certified for some Boeing aircraft.
114     SELECT distinct e.ename
115     FROM employees e,aircraft a,certified c
116     WHERE e.eid=c.eid AND c.aid=a.aid AND a.aname like 'Boeing%';
117
118     #vi. Find the aids of all aircraft that can be used on routes from Bengaluru
119     SELECT a.aid
120     FROM aircraft a
121     WHERE a.cruisingrange>
122     (SELECT MIN(f.distance)
123     FROM flights f
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

ename
Zoya
Niveditha
Akshay
Safan

Result 10

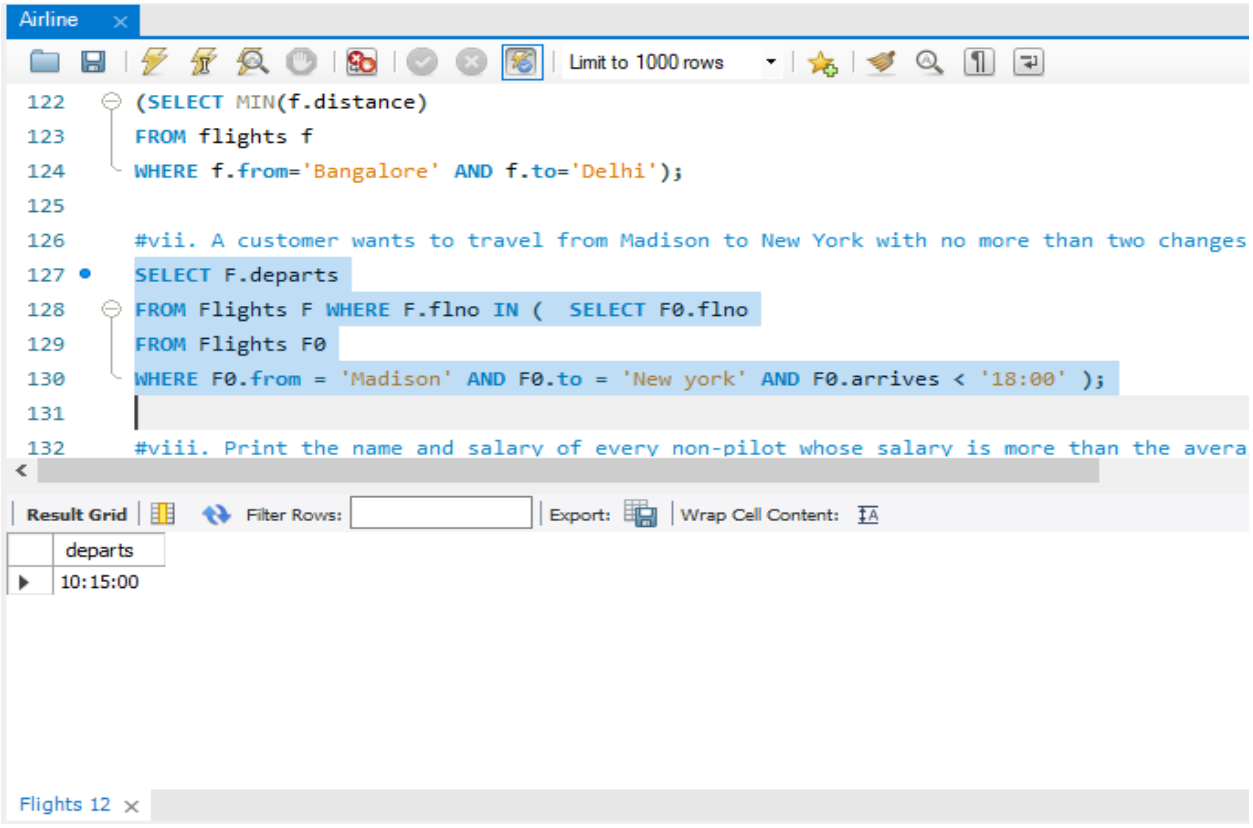
Airline

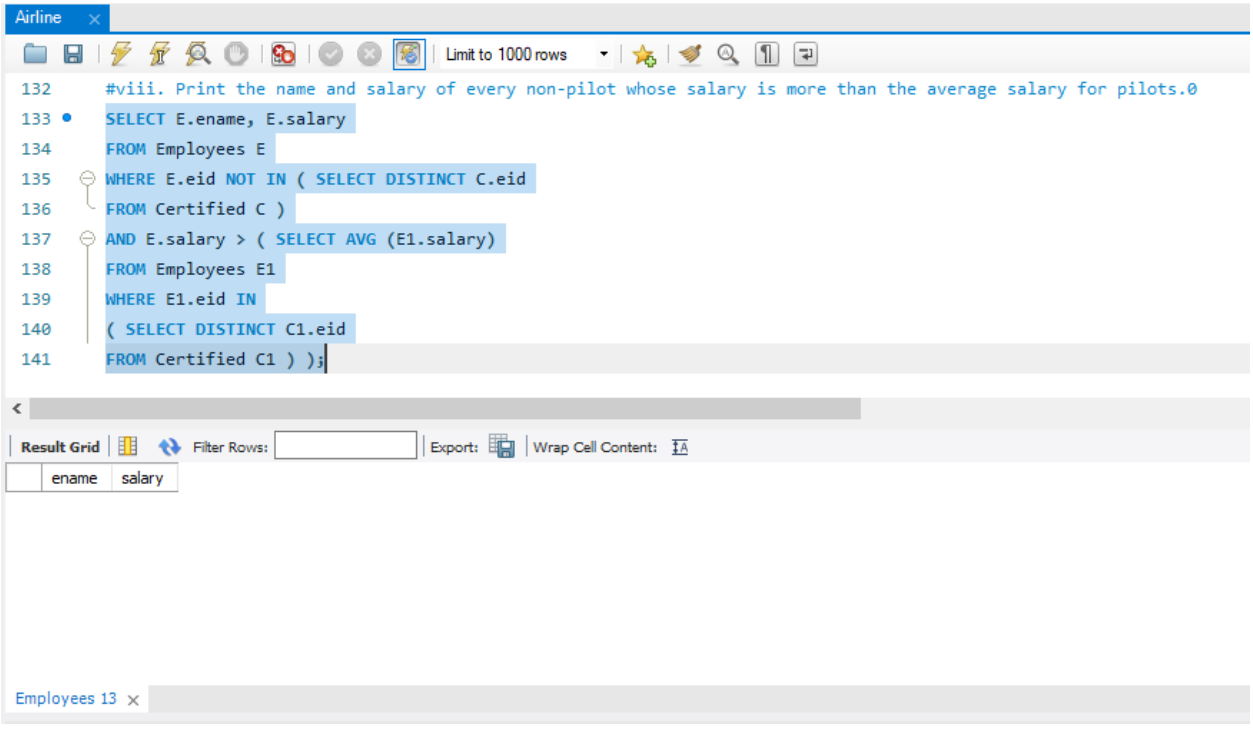
```
116     WHERE e.eid=c.eid AND c.aid=a.aid AND a.aname like 'Boeing%';
117
118     #vi. Find the aids of all aircraft that can be used on routes from Bengaluru to New Delhi.
119     SELECT a.aid
120     FROM aircraft a
121     WHERE a.cruisingrange>
122     (SELECT MIN(f.distance)
123     FROM flights f
124     WHERE f.from='Bangalore' AND f.to='Delhi');
125
126     #vii. A customer wants to travel from Madison to New York with no more than two changes of f
```

Result Grid | Filter Rows: | Edit: | Export/Import: | Wrap Cell Content:

aid
2
3
4
NULL

aircraft 11


Airline
Limit to 1000 rows
(SELECT MIN(f.distance)
FROM flights f
WHERE f.from='Bangalore' AND f.to='Delhi');
#vii. A customer wants to travel from Madison to New York with no more than two changes
SELECT F.departs
FROM Flights F WHERE F.flno IN (SELECT F0.flno
FROM Flights F0
WHERE F0.from = 'Madison' AND F0.to = 'New york' AND F0.arrives < '18:00');
#viii. Print the name and salary of every non-pilot whose salary is more than the avera
Result Grid
Filter Rows:
Export:
Wrap Cell Content:
departs
10:15:00
Flights 12


Airline
Limit to 1000 rows
#viii. Print the name and salary of every non-pilot whose salary is more than the average salary for pilots.0
SELECT E.ename, E.salary
FROM Employees E
WHERE E.eid NOT IN (SELECT DISTINCT C.eid
FROM Certified C)
AND E.salary > (SELECT AVG (E1.salary)
FROM Employees E1
WHERE E1.eid IN
(SELECT DISTINCT C1.eid
FROM Certified C1));
Result Grid
Filter Rows:
Export:
Wrap Cell Content:
ename
salary
Employees 13