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USN : 1BM19CS070

DATE : 23/06/21

DBMS LAB PROGRAM – 9

9. AIRLINES FLIGHT DATABASE

QUESTION :

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.

PROGRAM CODE :

```
CREATE DATABASE AIRLINES;
USE AIRLINES;
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) );

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);
```

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);

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);

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);

/* I. 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 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. FIND THE NAMES OF PILOTS WHOSE SALARY IS LESS THAN THE PRICE OF THE CHEAPEST ROUTE
FROM BENGALURU TO
FRANKFURT.*/

SELECT C.EID, MAX(A.CRUISINGRANGE)

```
FROM CERTIFIED C, AIRCRAFT A
WHERE C.AID = A.AID
GROUP BY C.EID
HAVING COUNT(*) > 3;
```

```
/* III. 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 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. FIND THE NAMES OF PILOTS CERTIFIED FOR SOME BOEING 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 AIDS OF ALL AIRCRAFT THAT CAN BE USED ON ROUTES FROM BENGALURU TO NEW
DELHI.*/
```

```
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. 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 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.* /

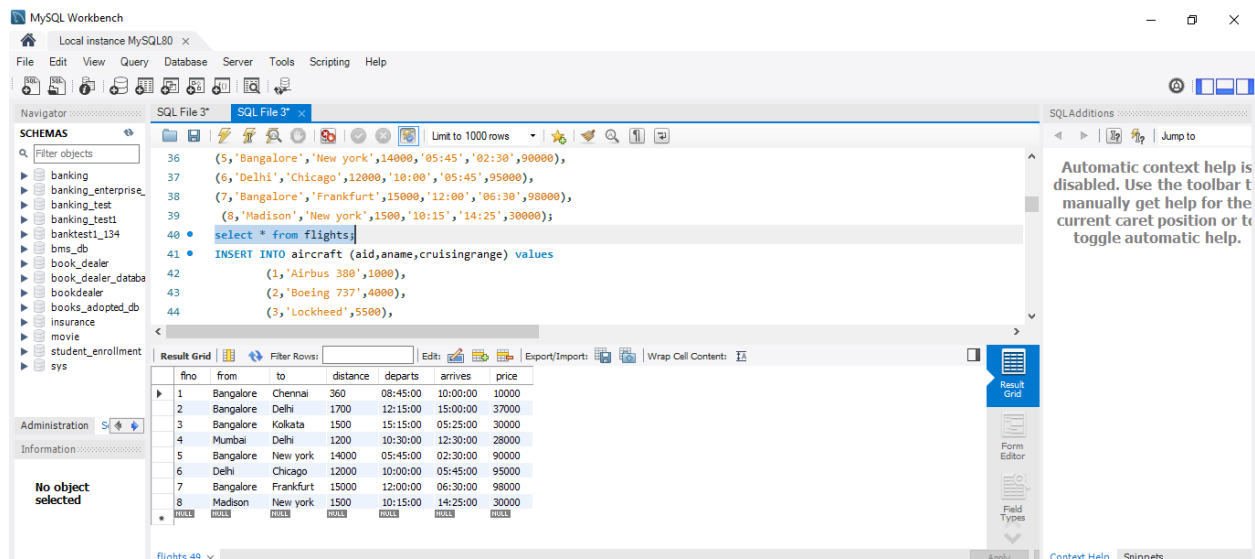
```
SELECT F.DEPARTS
FROM FLIGHTS F WHERE F.FLNO IN ( SELECT F0.FLNO
FROM FLIGHTS F0
WHERE F0.FROM = 'MADISON' AND F0.TO = 'NEW YORK' AND F0.ARRIVES < '18:00' );
```

/* VIII. PRINT THE NAME AND SALARY OF EVERY NON-PILOT WHOSE SALARY IS MORE THAN THE
AVERAGE SALARY FOR PILOTS.

```
*/
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 ) );
```

SCREENSHOTS OF THE PROGRAM OUTPUT :

➔ CREATION AND INSERTION OF VALUES



The screenshot displays the MySQL Workbench interface. The SQL Editor window shows the following queries:

```

36 (5,'Bangalore','New york',14000,'05:45','02:30',90000),
37 (6,'Delhi','Chicago',12000,'10:00','05:45',95000),
38 (7,'Bangalore','Frankfurt',15000,'12:00','06:30',90000),
39 (8,'Madison','New york',1500,'10:15','14:25',30000);
40 select * from flights;
41 INSERT INTO aircraft (aid,aname,cruisingrange) values
42 (1,'Airbus 380',1000),
43 (2,'Boeing 737',4000),
44 (3,'Lockheed',5500),

```

The Result Grid shows the output of the first query, displaying flight details:

fno	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

The bottom of the grid shows a row of null values for the aircraft table.

MySQL Workbench

Local instance MySQL80

File Edit View Query Database Server Tools Scripting Help

Navigator

SCHEMAS

Filter objects

banking
banking_enterprise
banking_test
banking_test1
banktest1_134
bms_db
book_dealer
book_dealer_databa
bookdealer
books_adopted_db
insurance
movie
student_enrollment
sys

Administration

Information

No object selected

SQL File 3*

SQL File 3*

Limit to 1000 rows

```

41 • INSERT INTO aircraft (aid,aname,cruisingrange) values
42 • (1,'Airbus 380',1000),
43 • (2,'Boeing 737',4000),
44 • (3,'Lockheed',5500),
45 • (4,'Airbus A220',9500),
46 • (5,'Boeing 747',800),
47 • (6,'Douglas DC3',900);
48 • select * from aircraft;
49 • INSERT INTO employees (eid,ename,salary) VALUES

```

Result Grid

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

SQLAdditions

Automatic context help is disabled. Use the toolbar to manually get help for the current caret position or to toggle automatic help.

MySQL Workbench

Local instance MySQL80

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books_adopted_db
insurance
movie
student_enrollment
sys

Administration

Information

No object selected

SQL File 3*

SQL File 3*

Limit to 1000 rows

```

51 • (2,'Akshay',65000),
52 • (3,'Niveditha',70000),
53 • (4,'Safan',45000),
54 • (5,'Peter',95000),
55 • (6,'Nayan',100000),
56 • (7,'Ajay',50000);
57 • select * from employees;
58 • INSERT INTO certified (eid,aid) VALUES
59 • (1,1),

```

Result Grid

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

SQLAdditions

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MySQL Workbench

Local instance MySQL80

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SCHEMAS

Filter objects

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banking_enterprise
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banktest1_134
bms_db
book_dealer
book_dealer_databa
bookdealer
books_adopted_db
insurance
movie
student_enrollment
sys

Administration

Information

No object selected

SQL File 3*

SQL File 3*

Limit to 1000 rows

```

66 • (2,5),
67 • (4,5),
68 • (6,4),
69 • (6,3),
70 • (3,6),
71 • (3,2);
72 • select * from certified;
73 • /* i. For each pilot who is certified for more than three aircrafts, find the eid and the maximum cruising range of
74 • the aircraft for which she or he is certified*/

```

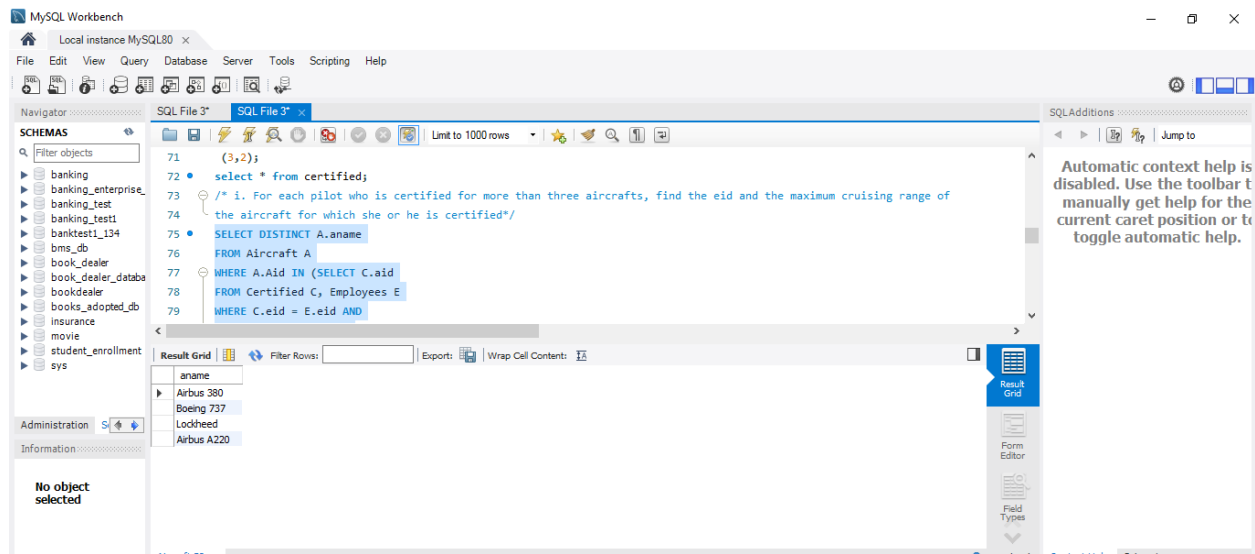
Result Grid

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

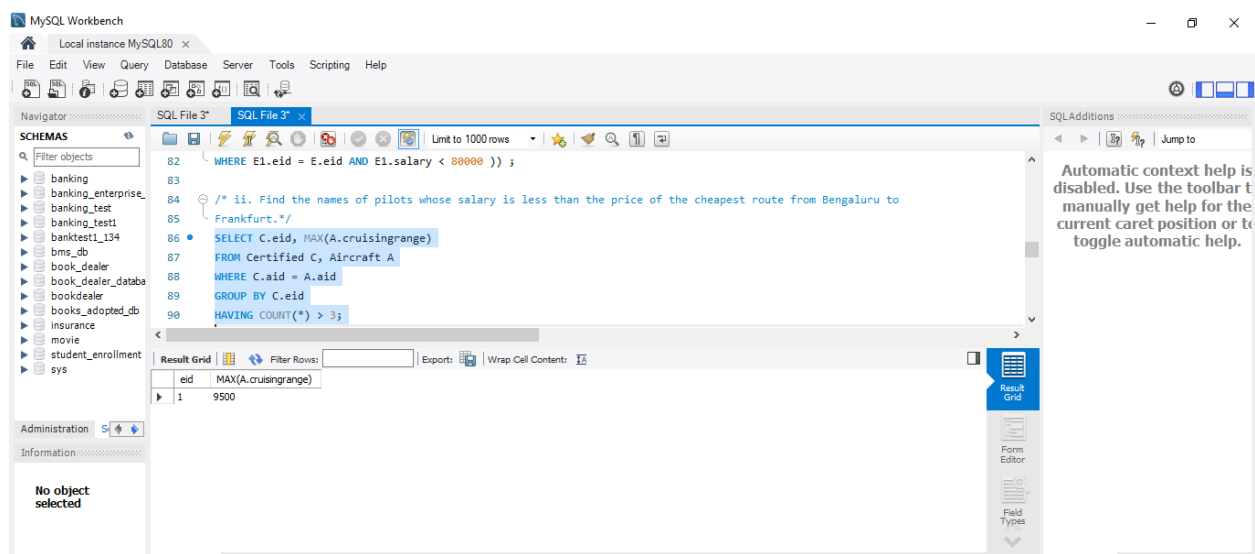
SQLAdditions

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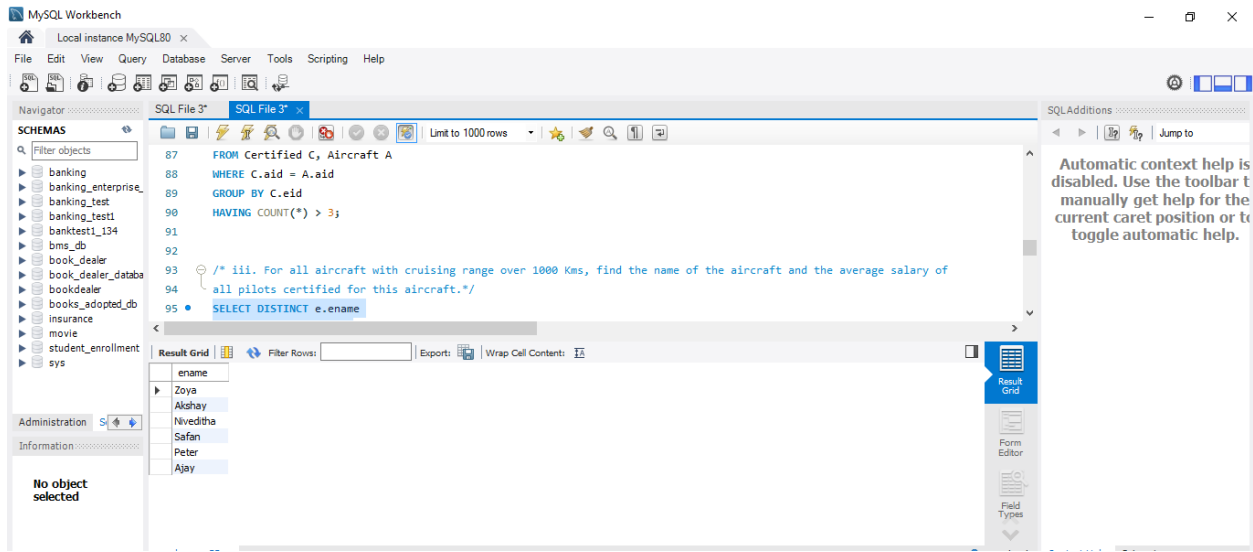
QUERY 1 = FIND THE NAMES OF AIRCRAFT SUCH THAT ALL PILOTS CERTIFIED TO OPERATE THEM HAVE SALARIES MORE THAN RS.80,000



QUERY 2 = 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.



QUERY 3 = FIND THE NAMES OF PILOTS WHOSE SALARY IS LESS THAN THE PRICE OF THE CHEAPEST ROUTE FROM BENGALURU TO FRANKFURT.



MySQL Workbench

Local instance MySQL80 x

File Edit View Query Database Server Tools Scripting Help

Navigator

SCHEMAS

Filter objects

banking

banking_enterprise

banking_test

banking_test1

banktest1_134

bms_db

book_dealer

book_dealer_data

bookdealer

books_adopied_db

insurance

movie

student_enrollment

sys

Administration S

Information

No object selected

SQL File 3*

SQL File 3*

Limit to 1000 rows

87 FROM Certified C, Aircraft A

88 WHERE C.aid = A.aid

89 GROUP BY C.aid

90 HAVING COUNT(*) > 3;

91

92

93 /* iii. For all aircraft with cruising range over 1000 Kms, find the name of the aircraft and the average salary of

94 all pilots certified for this aircraft.*/

95 SELECT DISTINCT e.name

Result Grid

ename

Zoya

Akshay

Niveditha

Safan

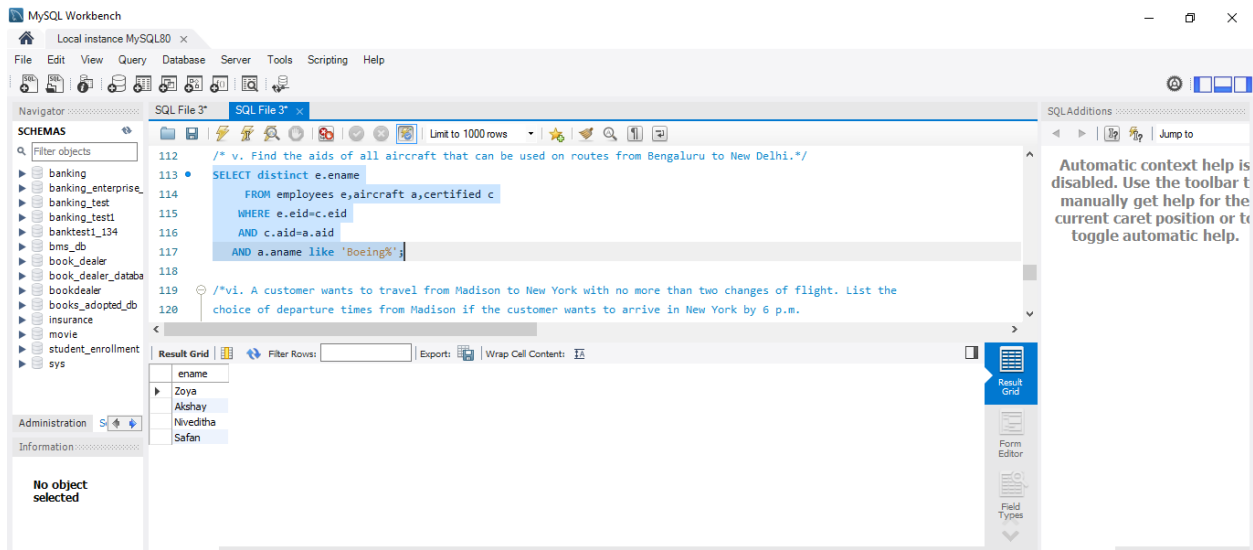
Peter

Ajay

SQLAdditions

Automatic context help is disabled. Use the toolbar to manually get help for the current caret position or to toggle automatic help.

QUERY 4 = 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



MySQL Workbench

Local instance MySQL80 x

File Edit View Query Database Server Tools Scripting Help

Navigator

SCHEMAS

Filter objects

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bookdealer

books_adopied_db

insurance

movie

student_enrollment

sys

Administration S

Information

No object selected

SQL File 3*

SQL File 3*

Limit to 1000 rows

112 /* v. Find the aids of all aircraft that can be used on routes from Bengaluru to New Delhi.*/

113 SELECT distinct e.name

114 FROM employees e, aircraft a, certified c

115 WHERE e.aid=c.aid

116 AND c.aid=a.aid

117 AND a.name like 'Boeing%';

118

119 /*vi. A customer wants to travel from Madison to New York with no more than two changes of flight. List the

120 choice of departure times from Madison if the customer wants to arrive in New York by 6 p.m.

Result Grid

ename

Zoya

Akshay

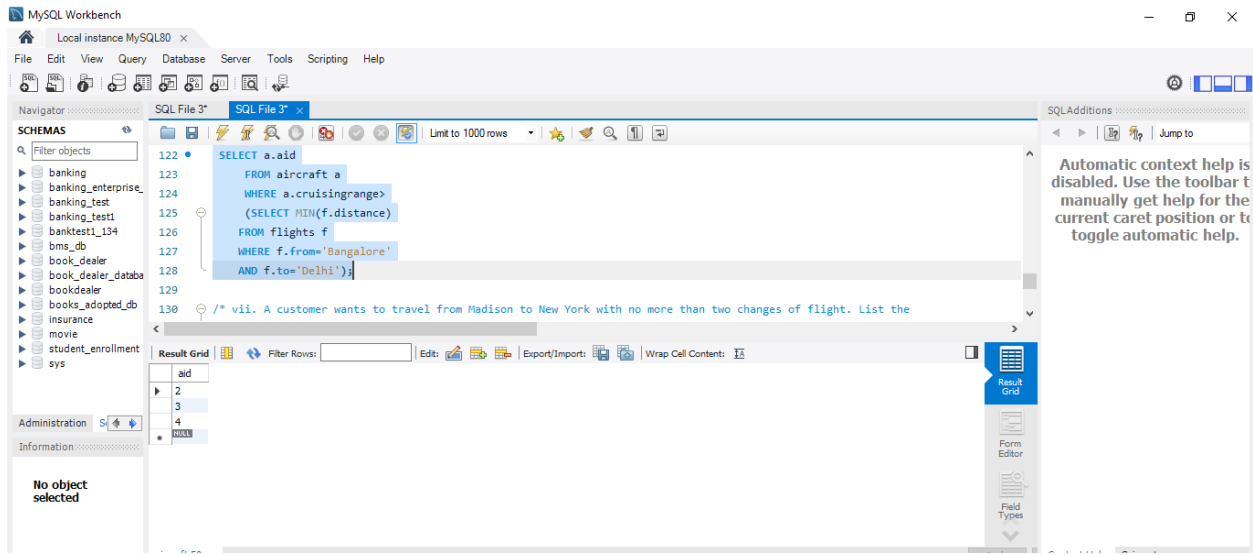
Niveditha

Safan

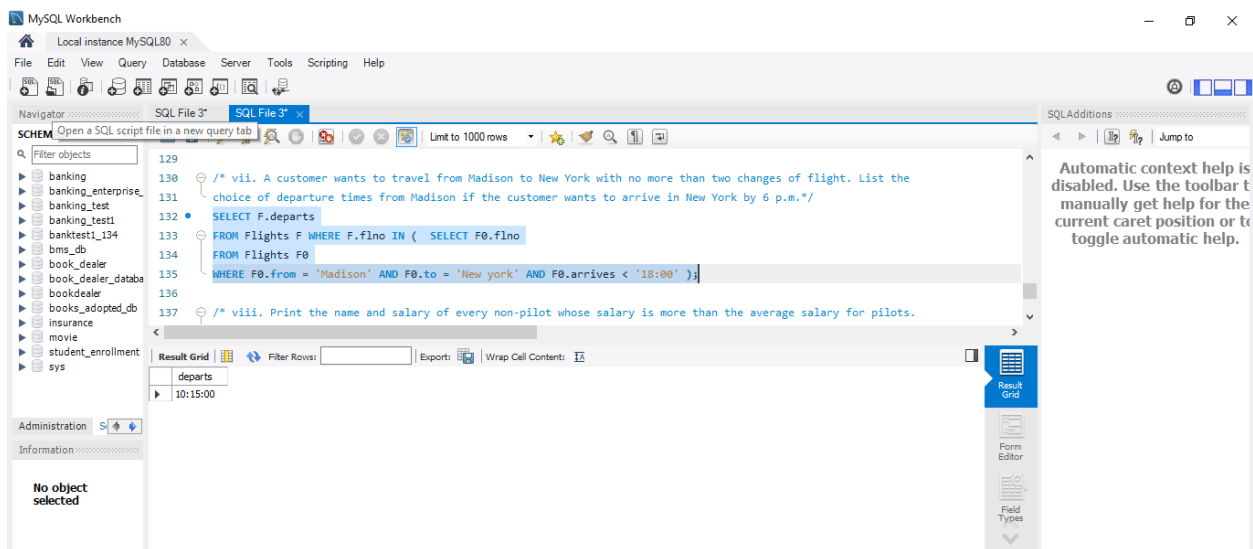
SQLAdditions

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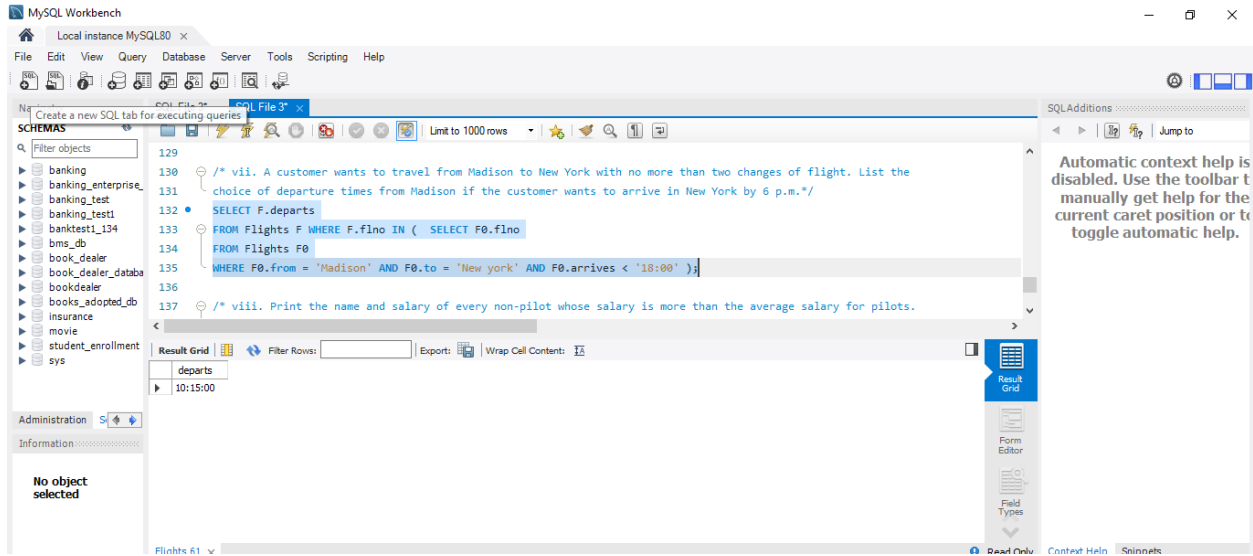
QUERY 5 = FIND THE NAMES OF PILOTS CERTIFIED FOR SOME BOEING AIRCRAFT.



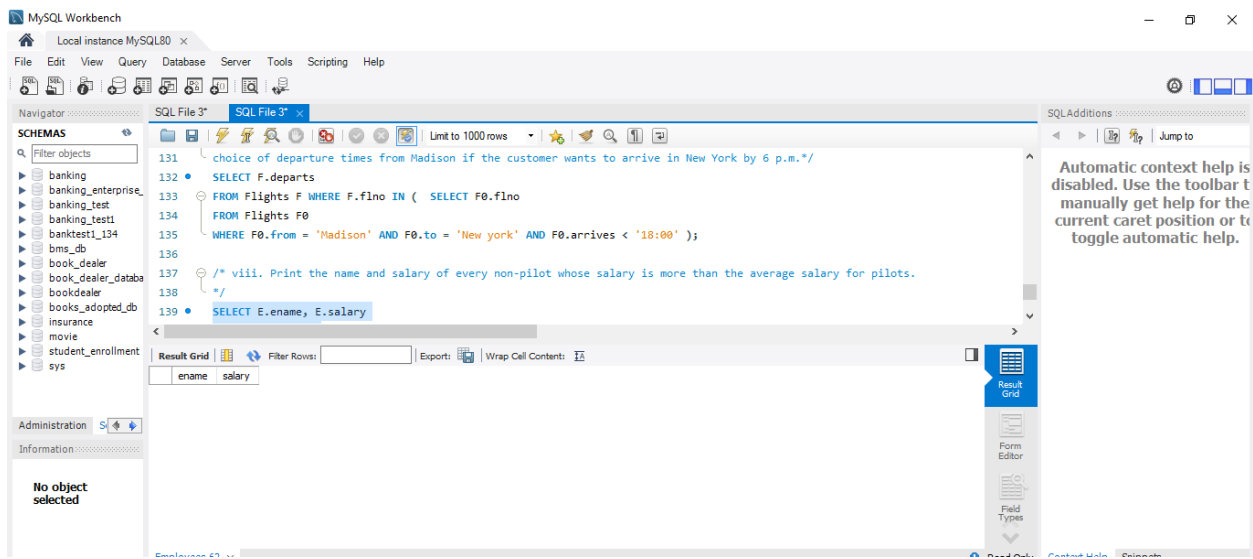
QUERY 6 = FIND THE AIDS OF ALL AIRCRAFT THAT CAN BE USED ON ROUTES FROM BENGALURU TO NEW DELHI.



QUERY 7 = 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.



QUERY 8 = PRINT THE NAME AND SALARY OF EVERY NON-PILOT WHOSE SALARY IS MORE THAN THE AVERAGE SALARY FOR PILOTS.



**** END OF WEEK 9 PROGRAM ****