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## PROGRAM 5: 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)

EMPLOYEES(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.

## TABLES:

### 1.flights

The screenshot shows the MySQL Workbench interface. The 'Query Editor' window displays the following SQL code:

```
9      distance int,  
10     departs timestamp,  
11     arrives timestamp,  
12     price int  
13 );  
14  
15 desc flights;
```

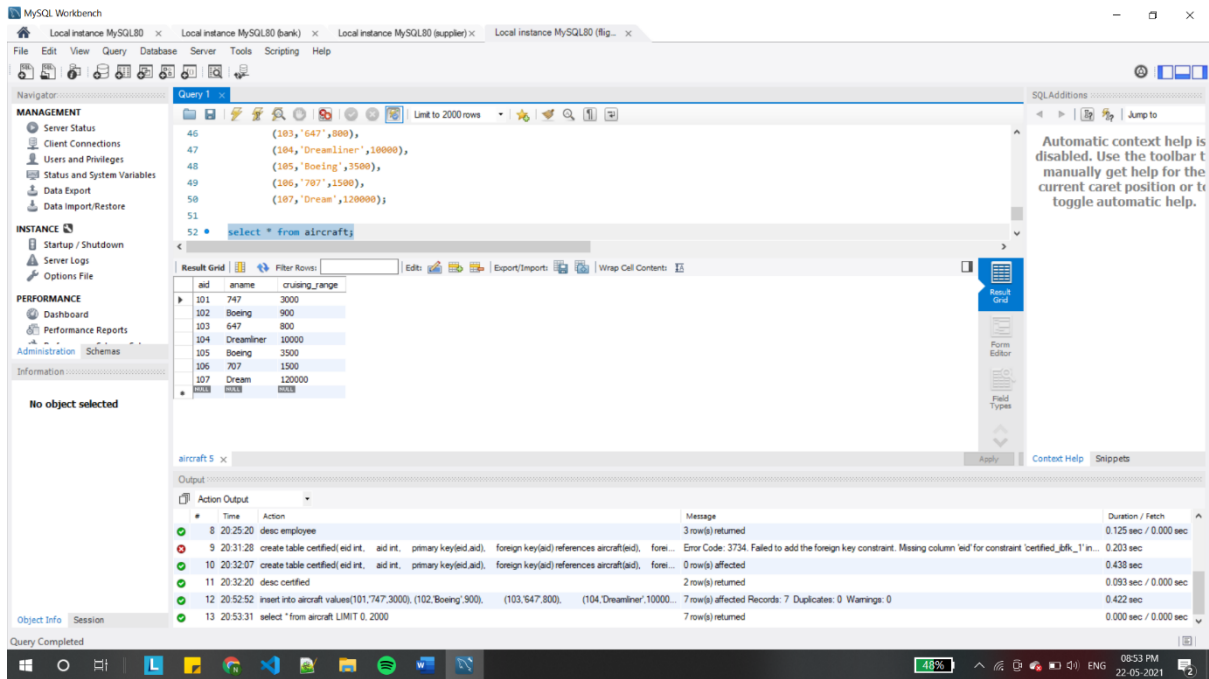
The 'Result Grid' shows the table structure for 'flights':

Field	Type	Null	Key	Default	Extra
flno	int	NO	PRI		UNSIGNED
from_	varchar(30)	NO			UNSIGNED
to_	varchar(30)	NO			UNSIGNED
distance	int	YES			UNSIGNED
departs	timestamp	YES			UNSIGNED
arrives	timestamp	YES			UNSIGNED
price	int	YES			UNSIGNED

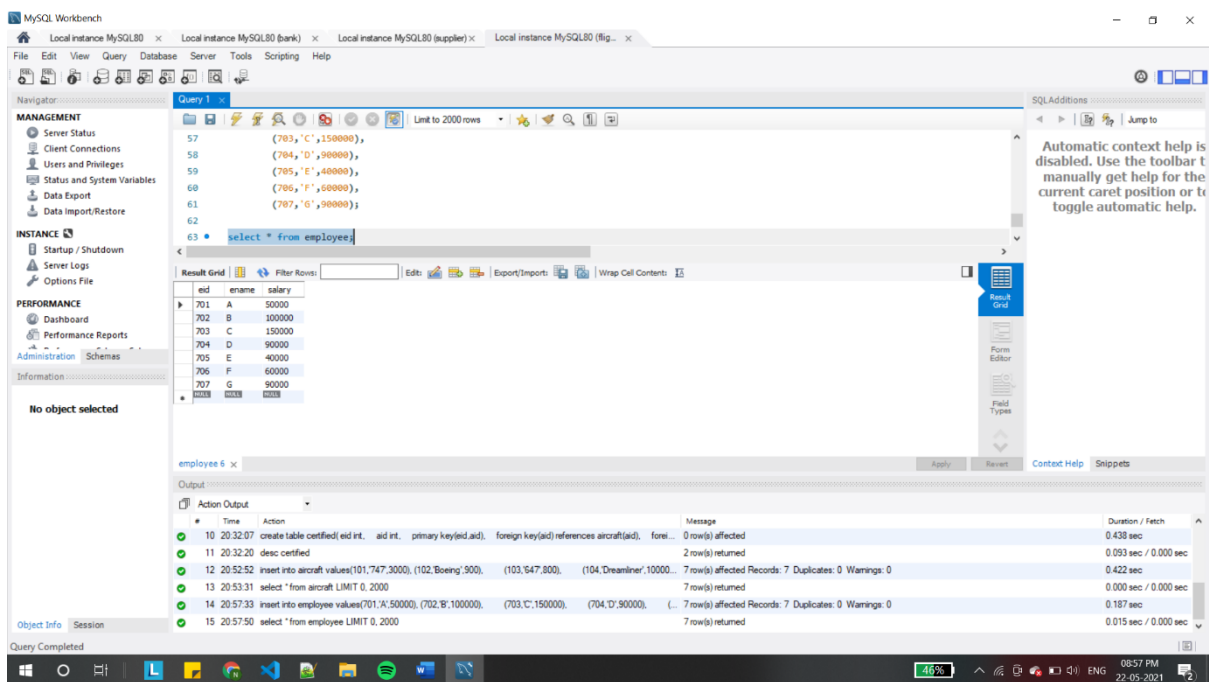
The 'Output' window shows the execution results:

#	Time	Action	Message	Duration / Fetch
1	19:59:30	create database flight	1 row(s) affected	0.562 sec
2	19:59:40	use flight	0 row(s) affected	0.031 sec
3	20:17:22	create table flights (flno int primary key, from_ varchar(30) not null, to_ varchar(30) not null, distance int, ...	0 row(s) affected	3.500 sec
4	20:18:54	desc flights	7 row(s) returned	0.140 sec / 0.000 sec

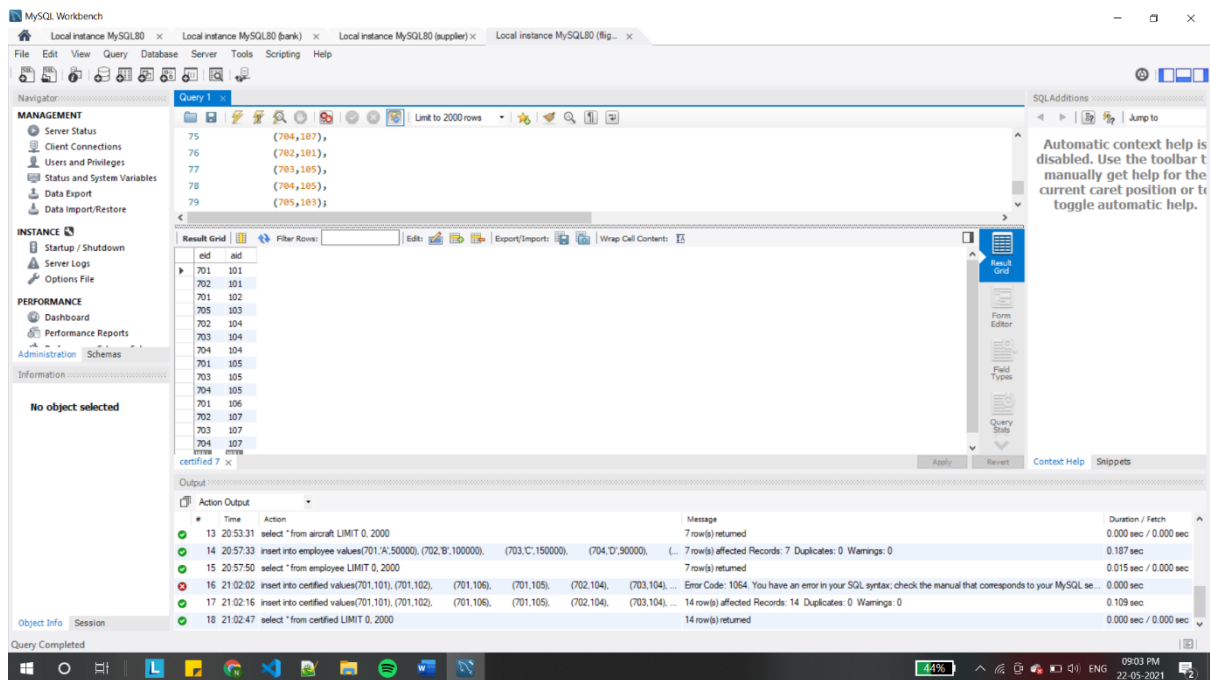
### 2.aircraft



### 3.employee



### 4.certified



## QUERIES:

1. 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

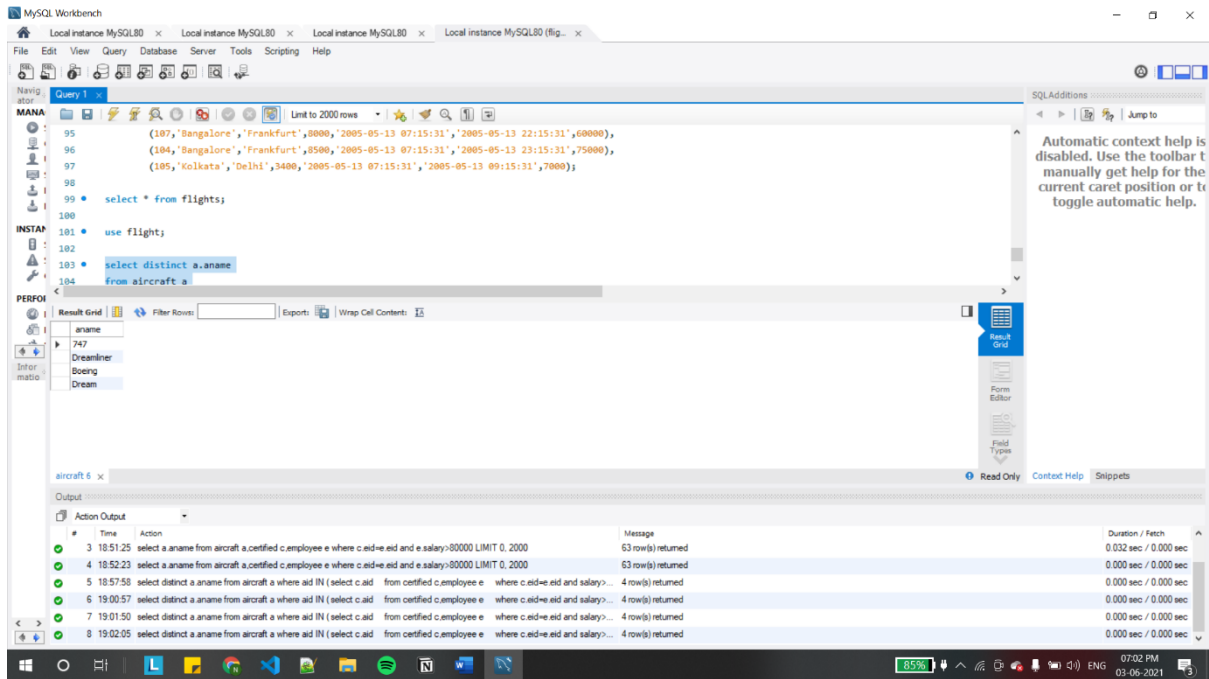
where aid IN (

select c.aid

from certified c,employee e

where c.eid=e.eid and salary>80000

);



**2. For each pilot who is certified for more than three aircrafts, find the eid and the maximum cruisingrange of the aircraft for which she or he is certified.**

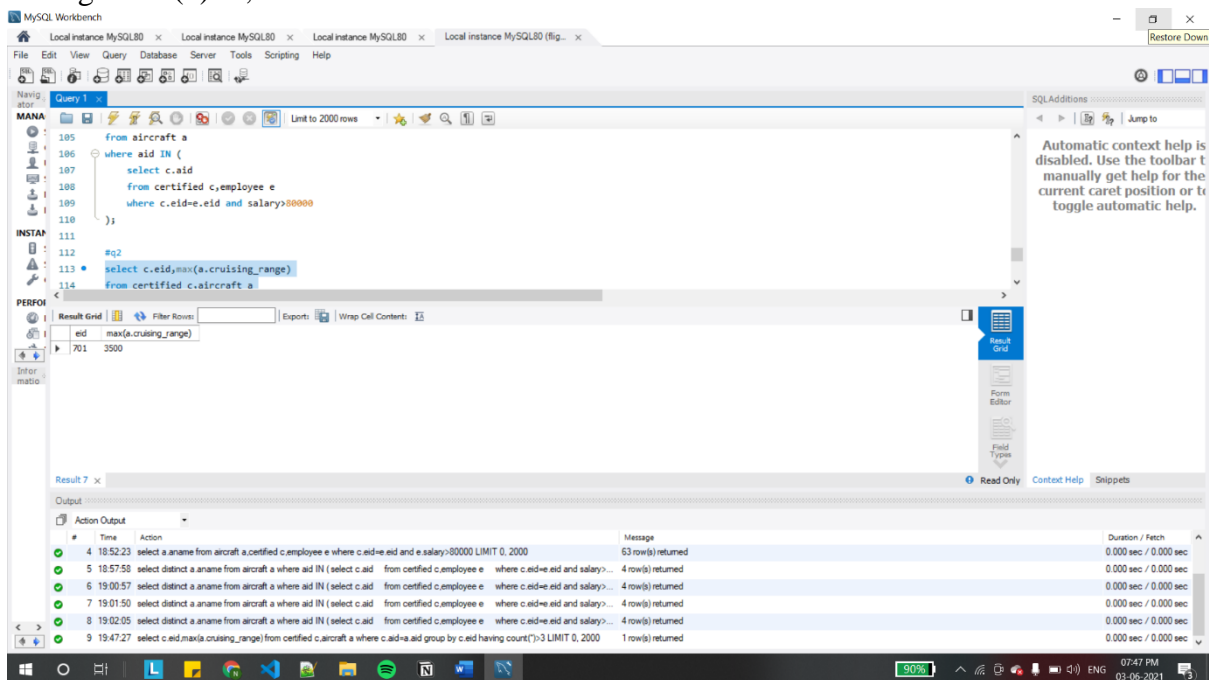
select c.eid,max(a.cruising\_range)

from certified c,aircraft a

where c.aid=a.aid

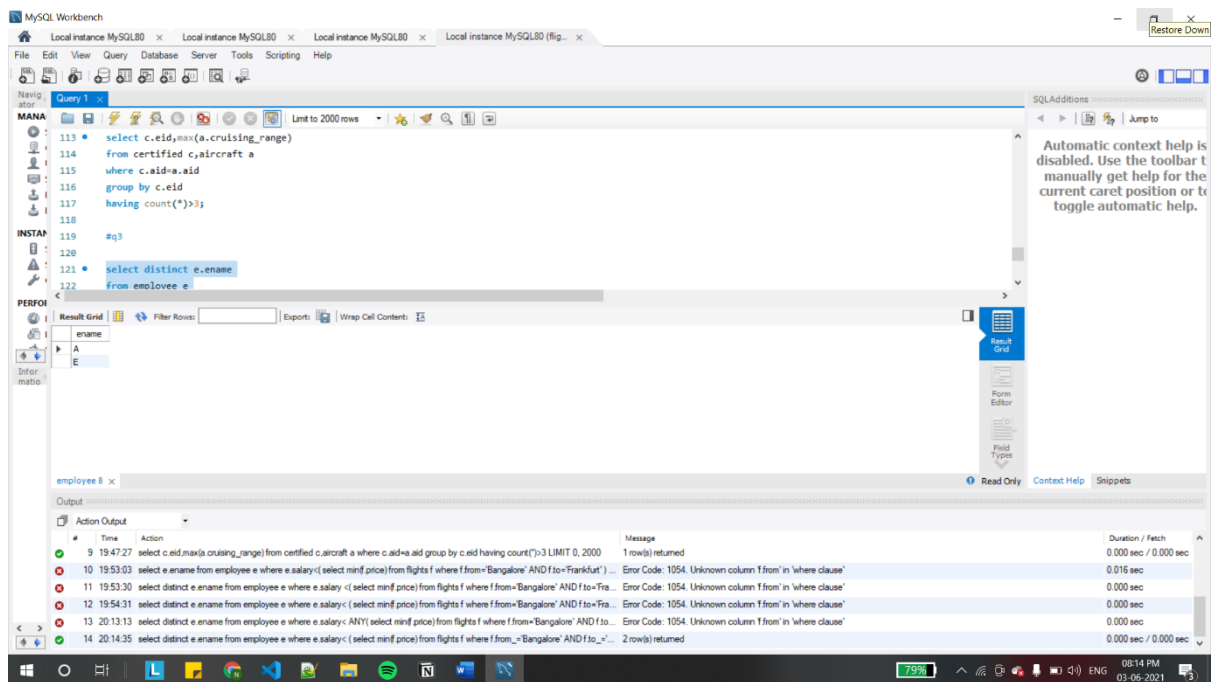
group by c.eid

having count(\*)>3;



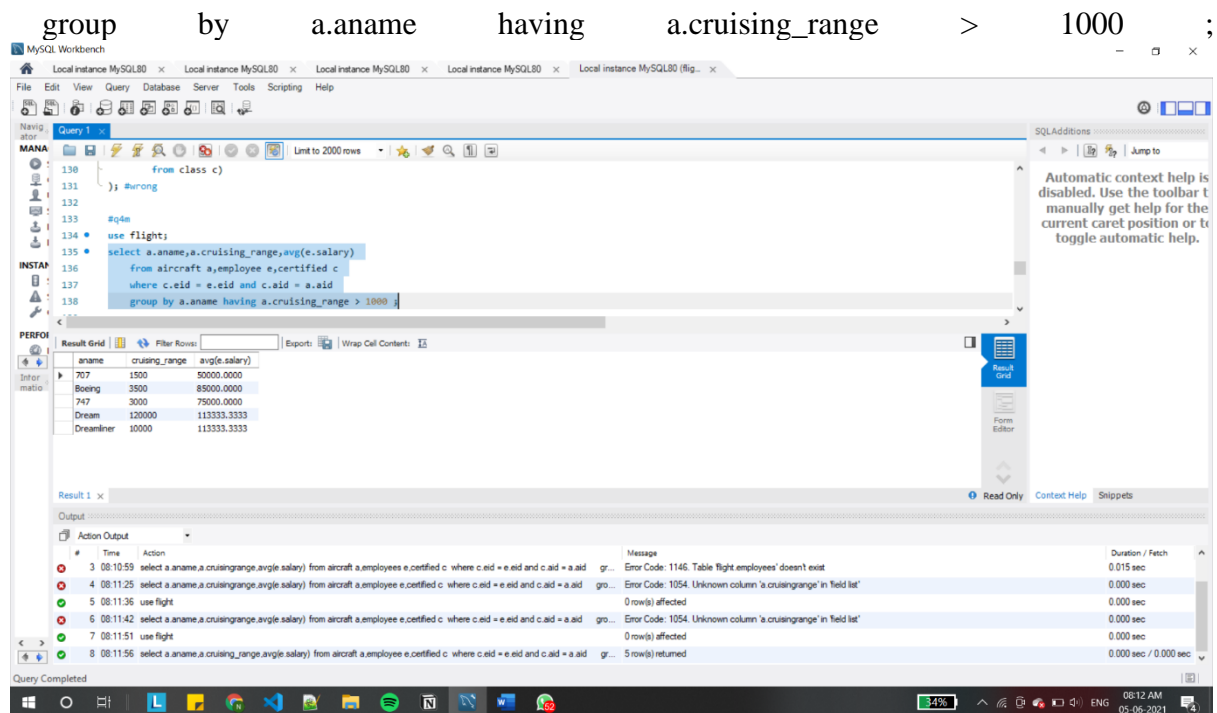
**3. Find the names of pilots whose salary is less than the price of the cheapest route from Bengaluru to Frankfurt.**

```
select distinct e.ename  
from employee e  
where e.salary < (  
    select min(f.price)  
    from flights f  
    where f.from_='Bengaluru' AND f.to_='Frankfurt'  
);
```



**4. For all aircraft with cruisingrange over 1000 Kms, find the name of the aircraft and the average salary of all pilots certified for this aircraft.**

```
select a.aname,a.cruising_range,avg(e.salary)  
from aircraft a,employee e,certified c  
where c.eid = e.eid and c.aid = a.aid
```

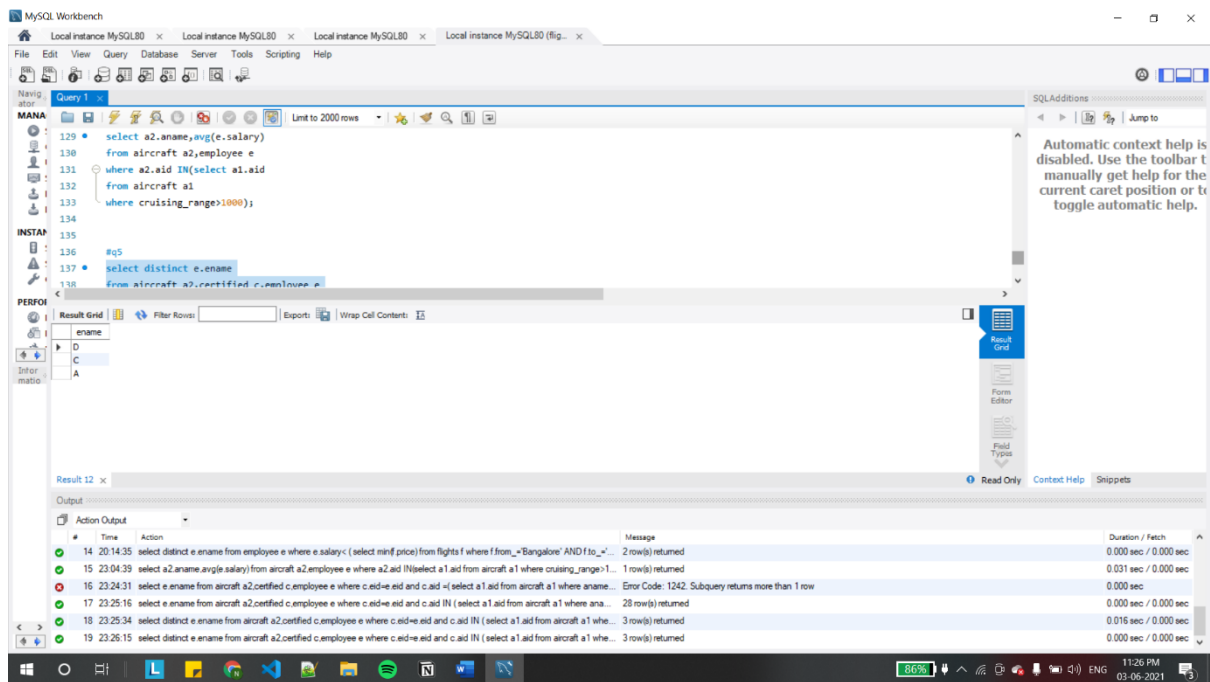


## 5. Find the names of pilots certified for some Boeing aircraft.

```

select distinct e.ename
from aircraft a2, certified c, employee e
where c.eid=e.eid and c.aid IN (
    select a1.aid
    from aircraft a1
    where aname like 'Boeing%'
);

```



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

select a.aid

from aircraft a

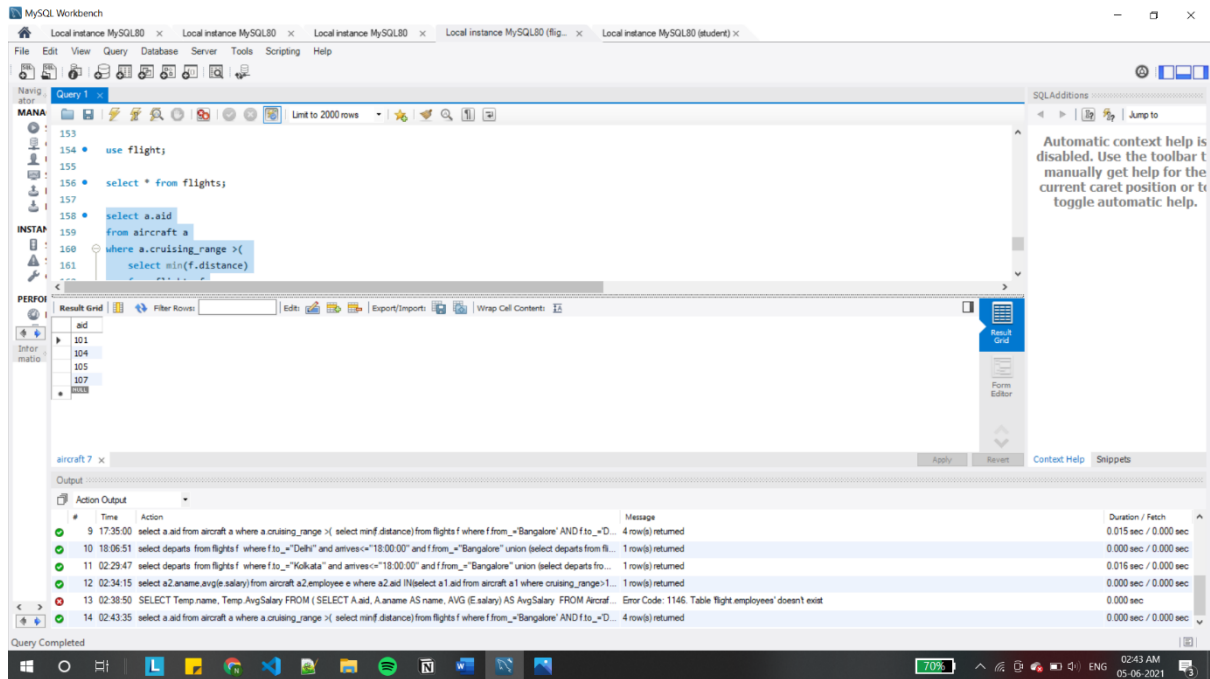
where a.cruising\_range >(

select min(f.distance)

from flights f

where f.from\_='Bengalore' AND f.to\_='Delhi'

);



**7.A customer wants to travel from Bangalore to Kolkata with no more than two changes of flight. List the choice of departure times if the customer wants to arrive in Kolkata by 6 p.m.**

select departs

from flights f

where f.to\_="Kolkata" and arrives<="18:00:00" and f.from\_="Bangalore" union (select departs from flights

where from\_="Bangalore" and to\_ in(select from\_ from flights where flno in(select flno from flights f where f.to\_="Delhi" and f.from\_ in(select distinct(f.to\_)



from flights f where f.from\_="Bangalore") and arrives<="18:00:00"))));

MySQL Workbench

Local instance MySQL80 x Local instance MySQL80 x Local instance MySQL80 (fig... x Local instance MySQL80 (student) x

File Edit View Query Database Server Tools Scripting Help

Query 1

Limit to 2000 rows

MANA

154 select min(f.distance)  
155 from flights f  
156 where f.from\_="Bangalore" AND f.to\_="Delhi"  
157 );  
158  
159 #q7

INSTAN

161 select departs  
162 from flights f  
163 where f.to\_="Kolkata" and arrives<="18:00:00" and f.from\_="Bangalore" union (select departs from flights  
164 where from\_="Bangalore" and to\_ in(select from\_ from flights where f.fno in(select f.fno from flights f where f.to\_="Delhi" and f.from\_ in(select distinct(f.to\_)  
165 from flights f where f.from\_="Bangalore") and arrives<="18:00:00"))));  
166

PERFOR

Result Grid

departs

2005-05-13 07:15:31

Result 5 x

Read Only Context Help Snippets

Output

Action Output

#	Time	Action	Message	Duration / Fetch
6	17:28:08	select "from flights LIMIT 0, 2000	5 row(s) returned	0.016 sec / 0.000 sec
7	17:29:18	select "from flights LIMIT 0, 2000	6 row(s) returned	0.000 sec / 0.000 sec
8	17:29:25	select a aid from aircraft a where a.cruising_range > (select min(f.distance) from flights f where f.from_="Bangalore" AND f.to_="...	Error Code: 1054. Unknown column "Bangalore" in 'where clause'	0.000 sec
9	17:35:00	select a aid from aircraft a where a.cruising_range > (select min(f.distance) from flights f where f.from_="Bangalore" AND f.to_="D...	4 row(s) returned	0.015 sec / 0.000 sec
10	18:06:51	select departs from flights f where f.to_="Delhi" and arrives<="18:00:00" and f.from_="Bangalore" union (select departs from fl...	1 row(s) returned	0.000 sec / 0.000 sec
11	02:29:47	select departs from flights f where f.to_="Kolkata" and arrives<="18:00:00" and f.from_="Bangalore" union (select departs from ...	1 row(s) returned	0.016 sec / 0.000 sec

Query Completed

02:29 AM  
05-06-2021