LAB-5 (program)

PROGRAM 5: AIRLINE FLIGHTS 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.

Create table:-

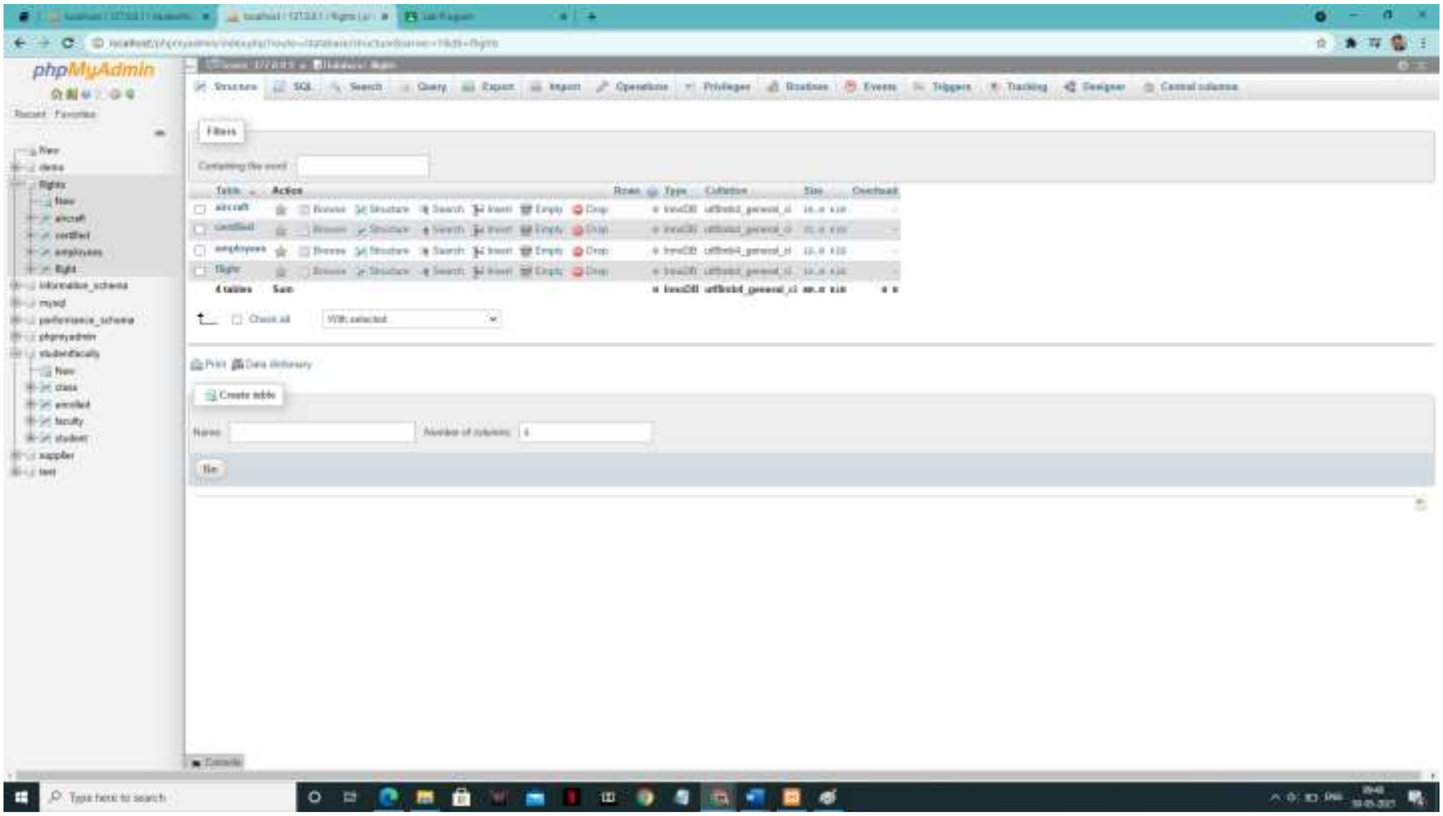
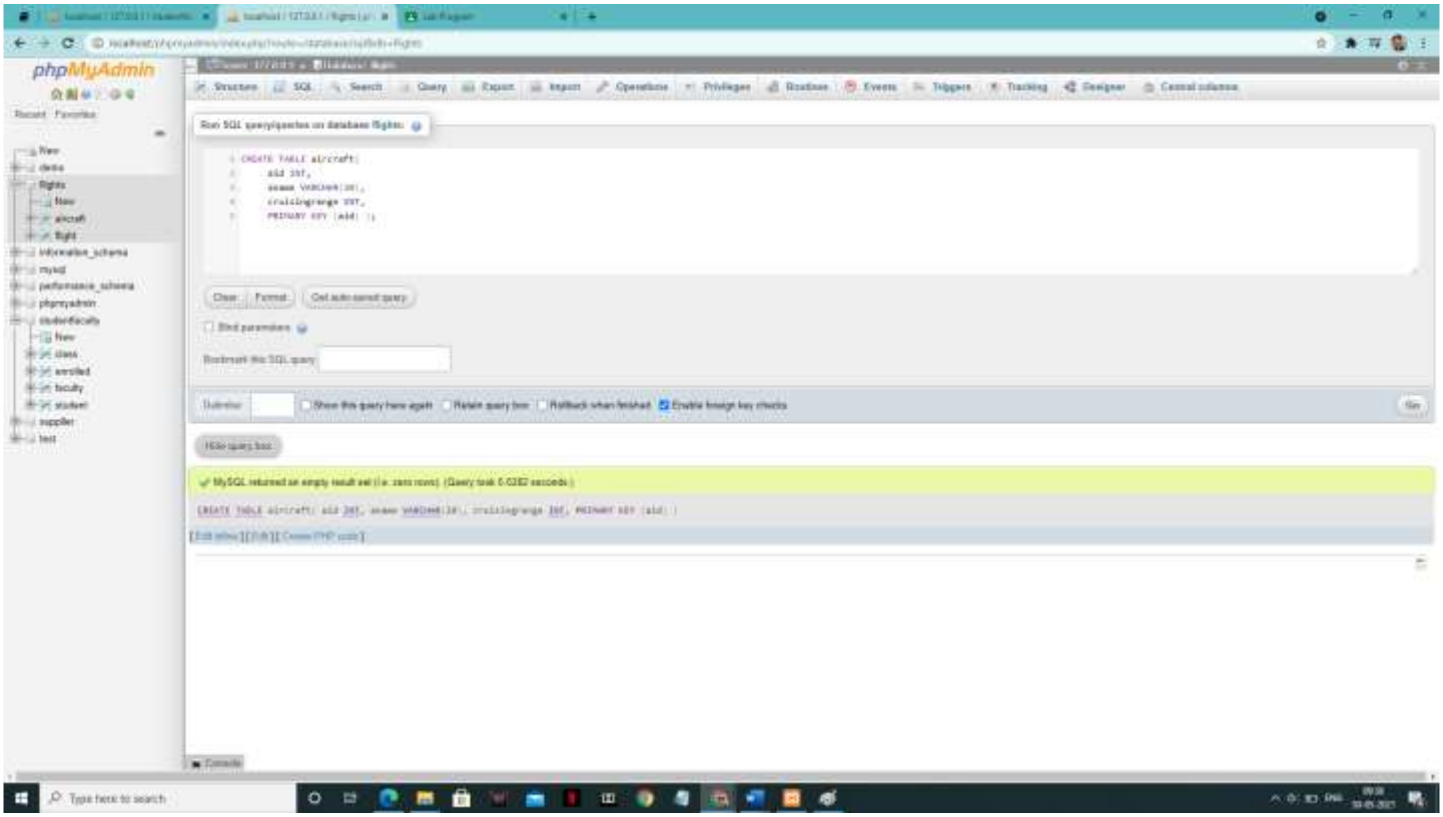


Table	Action	Rows	Type	Collation	Size	Overhead
aircraft	Browse Structure Search Insert Empty Drop	0	InnoDB	utf8mb4_general_ci	16.0 KiB	-
certified	Browse Structure Search Insert Empty Drop	0	InnoDB	utf8mb4_general_ci	16.0 KiB	-
employees	Browse Structure Search Insert Empty Drop	0	InnoDB	utf8mb4_general_ci	16.0 KiB	-
flight	Browse Structure Search Insert Empty Drop	0	InnoDB	utf8mb4_general_ci	16.0 KiB	-
4 tables	Sum	0	InnoDB	utf8mb4_general_ci	64.0 KiB	0 B

2) Enter tuples for each relation.

‘AIRCRAFT’ table:



Run SQL query/queries on database flights:

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

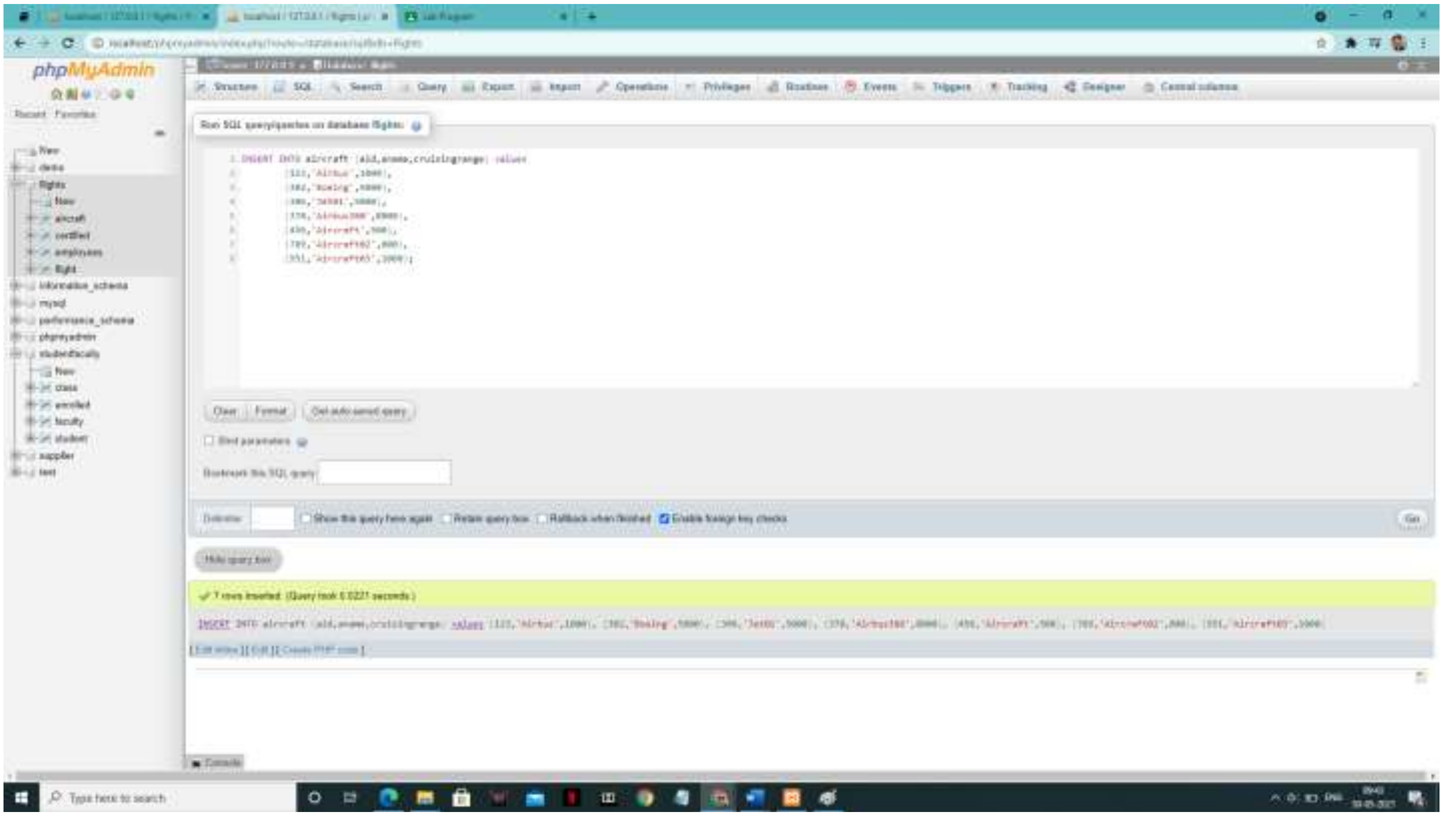
☐ Bind parameters

Delimiter ☐ Show this query here again ☐ Retain query box ☐ Rollback when finished ☑ Enable foreign key checks

✓ MySQL returned an empty result set (i.e. zero rows). (Query took 0.0282 seconds.)

```
CREATE TABLE aircraft( aid INT, aname VARCHAR(20), cruisingrange INT, PRIMARY KEY (aid) )
```

[Edit inline] [Edit] [Create PHP code]



Run SQL query/queries on database flights:

```
INSERT INTO aircraft (aid,aname,cruisingrange) values
        (123,'Airbus',1000),
        (302,'Boeing',5000),
        (306,'Jet01',5000),
        (378,'Airbus380',8000),
        (456,'Aircraft',500),
        (789,'Aircraft02',800),
        (951,'Aircraft03',1000);
```

□ Bind parameters

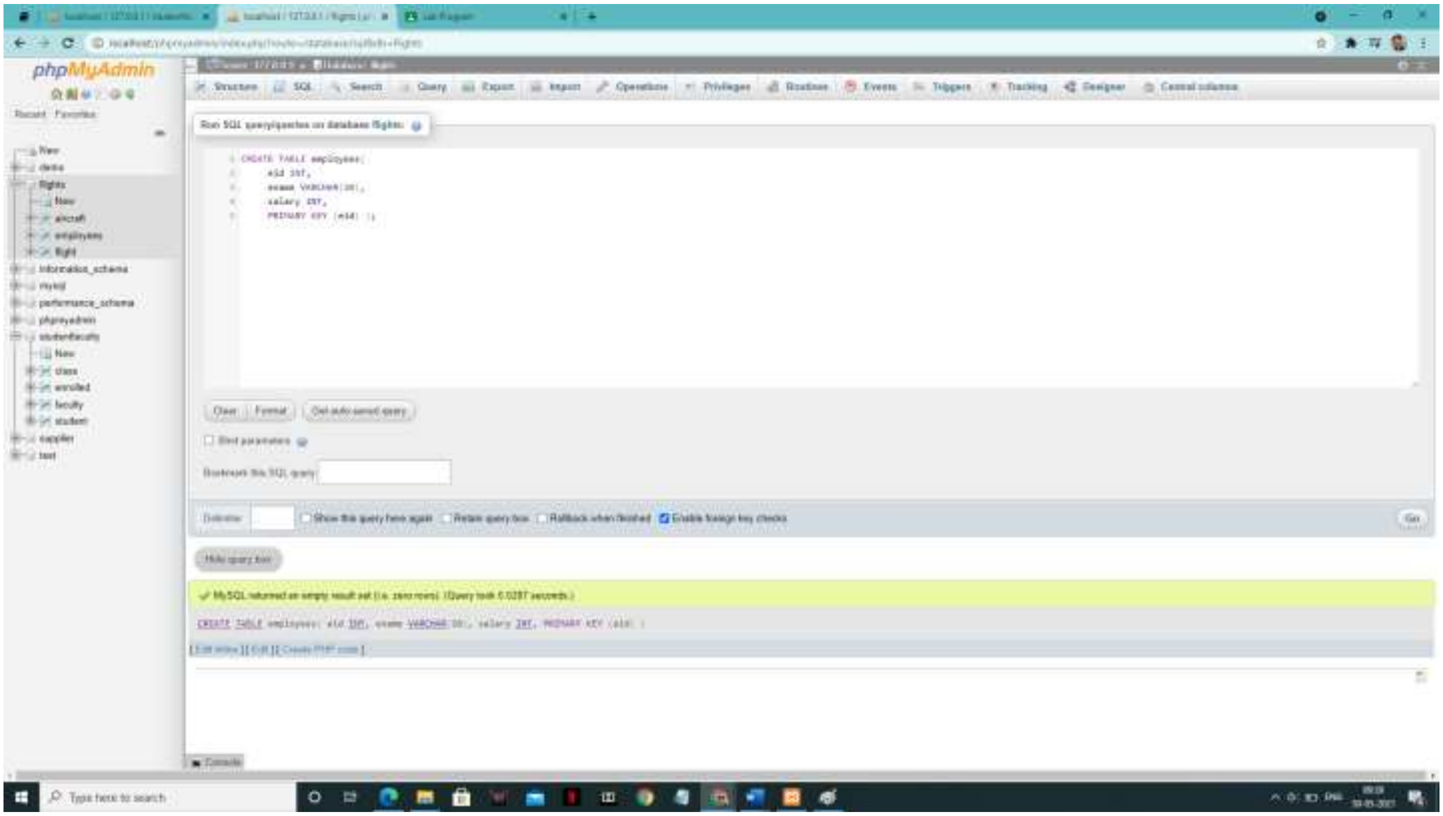
Delimiter □ Show this query here again □ Retain query box □ Rollback when finished ☑ Enable foreign key checks

✓ 7 rows inserted. (Query took 0.0221 seconds.)

```
INSERT INTO aircraft (aid,aname,cruisingrange) values (123,'Airbus',1000), (302,'Boeing',5000), (306,'Jet01',5000), (378,'Airbus380',8000), (456,'Aircraft',500), (789,'Aircraft02',800), (951,'Aircraft03',1000)
```

[Edit inline] [Edit] [Create PHP code]

‘EMPLOYEES’ table:



Run SQL query/queries on database flights:

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

□ Bind parameters

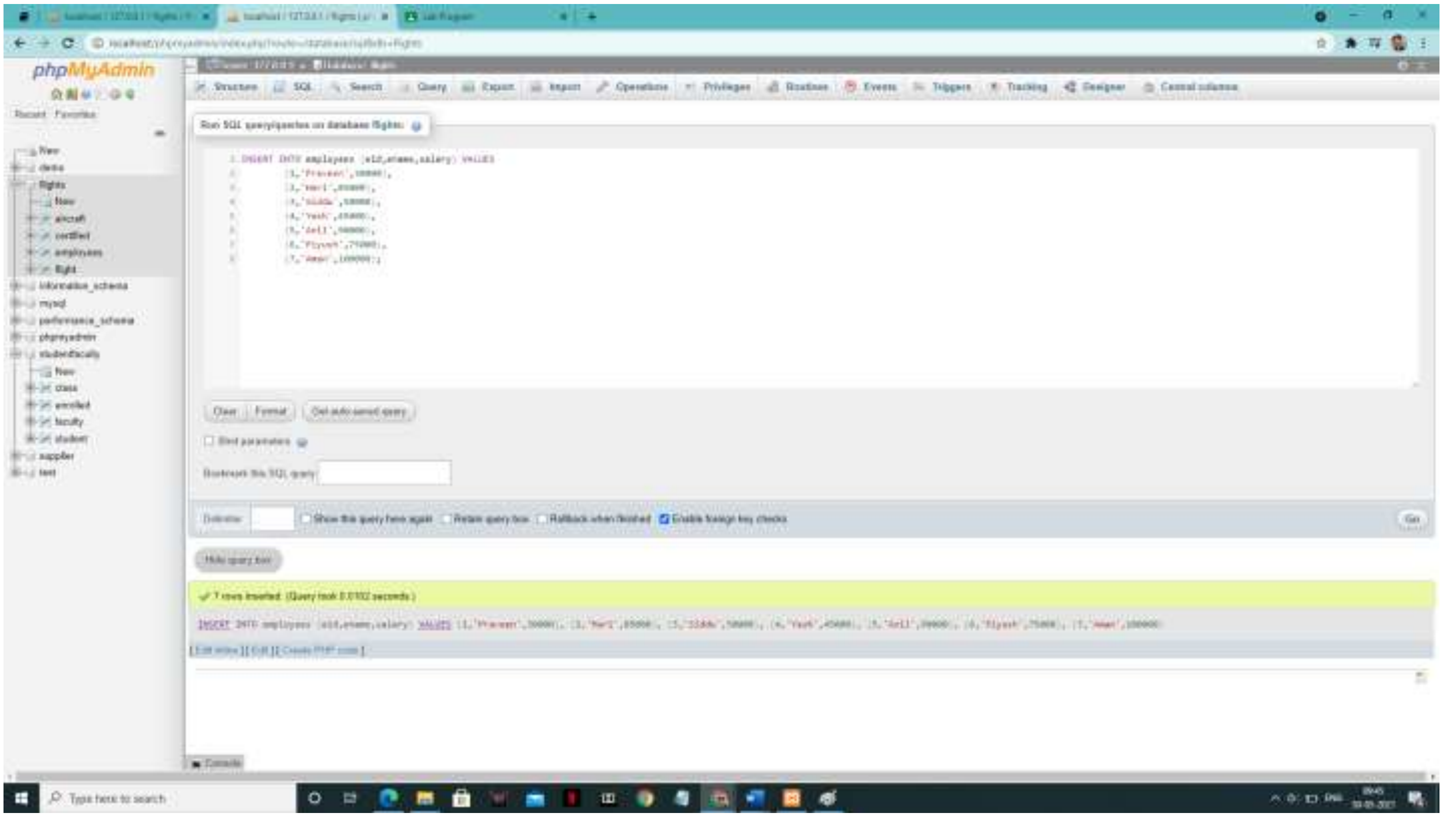
Bookmark this SQL query:

Delimiter ☐ □ Show this query here again □ Retain query box □ Rollback when finished ☑ Enable foreign key checks

✓ MySQL returned an empty result set (i.e. zero rows). (Query took 0.0287 seconds.)

```
CREATE TABLE employees( eid INT, ename VARCHAR(20), salary INT, PRIMARY KEY (eid) )
```

[Edit inline] [Edit] [Create PHP code]



Run SQL query/queries on database flights:

```
INSERT INTO employees (eid,ename,salary) VALUES
        (1,'Praveen',30000),
        (2,'Hari',85000),
        (3,'Siddu',50000),
        (4,'Yash',45000),
        (5,'Anil',90000),
        (6,'Piyush',75000),
        (7,'Aman',100000);
```

□ Bind parameters

Bookmark this SQL query:

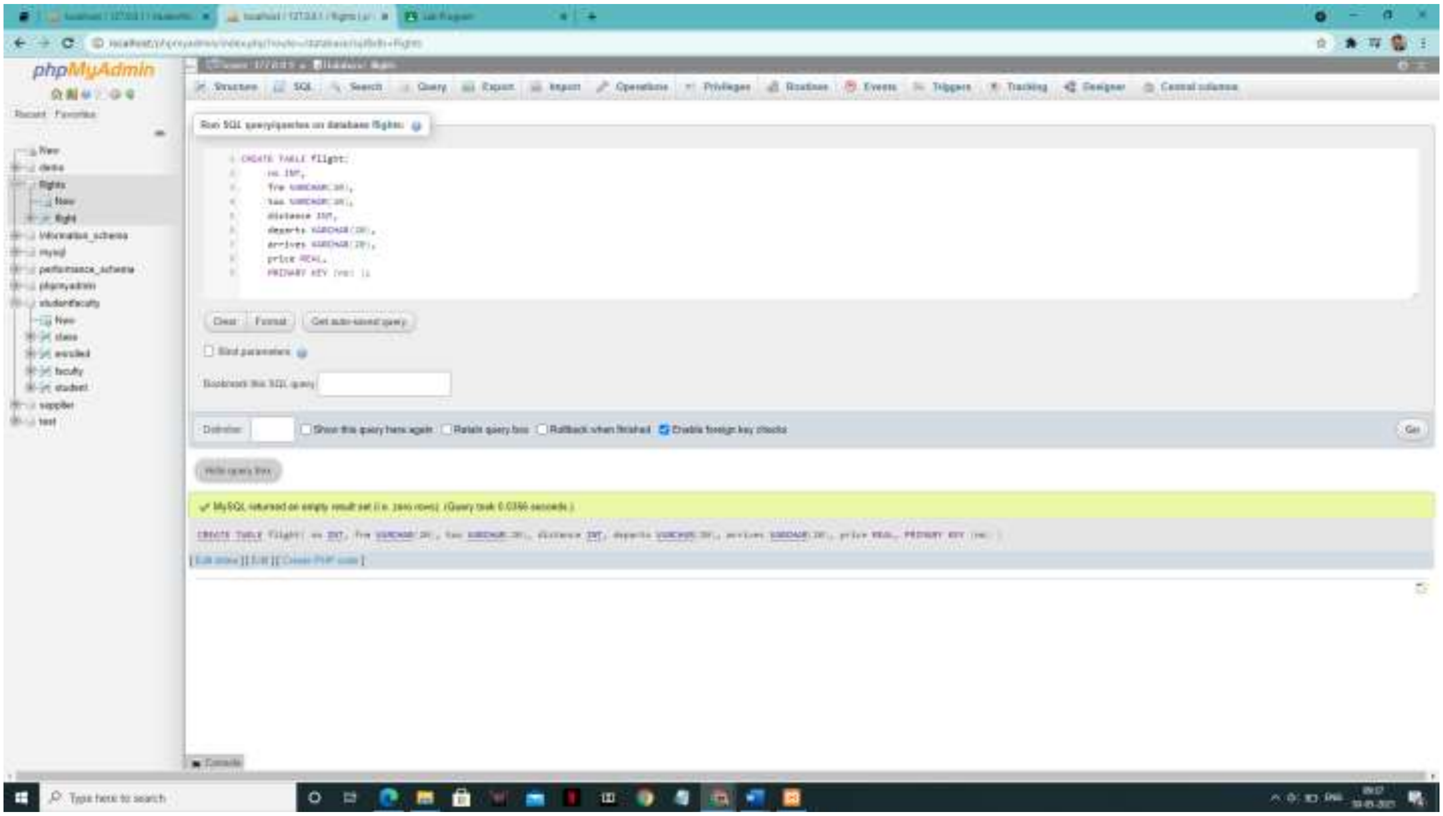
Delimiter ☐ □ Show this query here again □ Retain query box □ Rollback when finished ☑ Enable foreign key checks

✓ 7 rows inserted. (Query took 0.0102 seconds.)

```
INSERT INTO employees (eid,ename,salary) VALUES (1,'Praveen',30000), (2,'Hari',85000), (3,'Siddu',50000), (4,'Yash',45000), (5,'Anil',90000), (6,'Piyush',75000), (7,'Aman',100000)
```

[Edit inline] [Edit] [Create PHP code]

‘FLIGHT’ table:

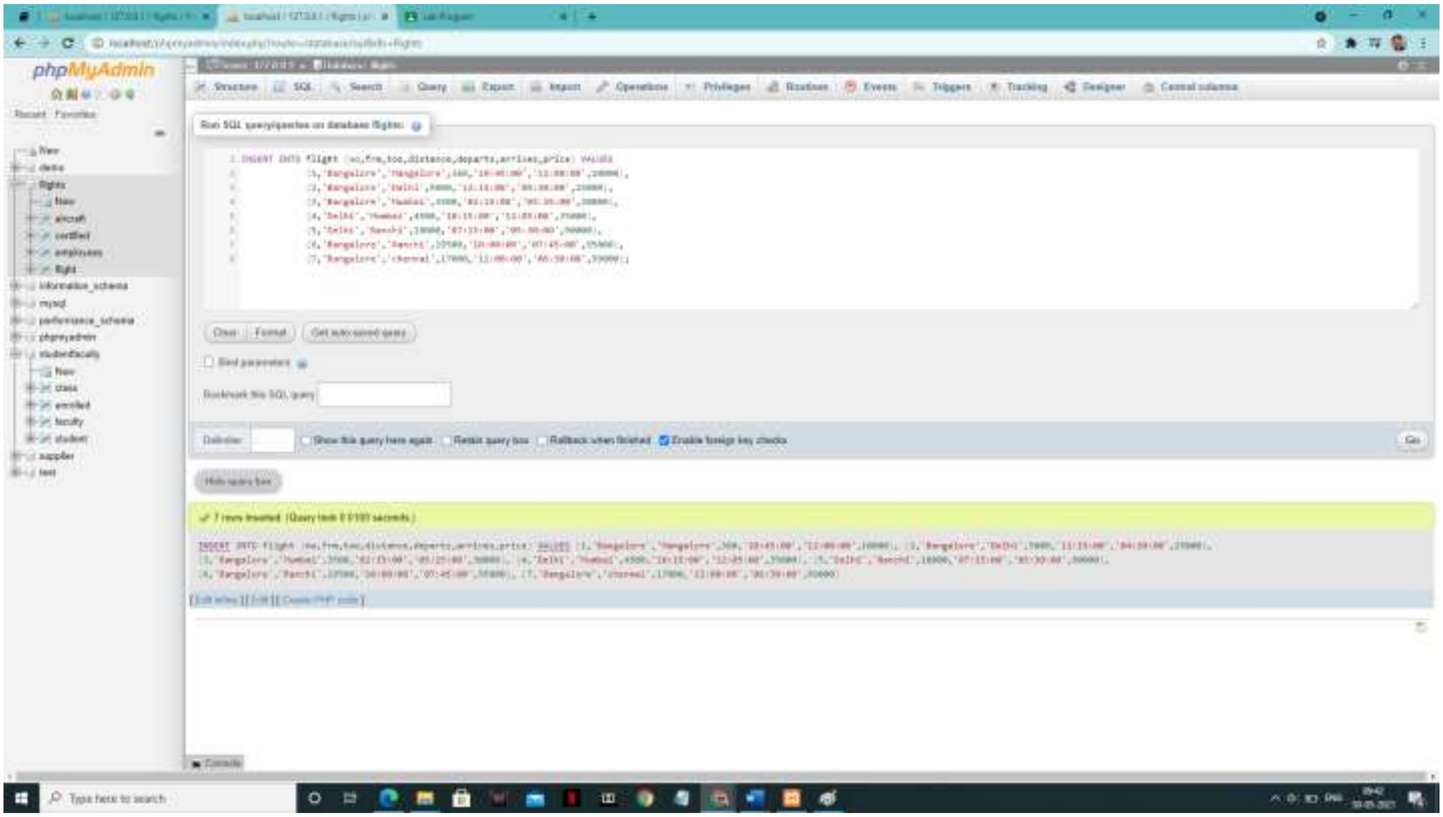


Run SQL query/queries on database flights:

```
CREATE TABLE flight(
    no INT,
    frm VARCHAR(20),
    too VARCHAR(20),
    distance INT,
    departs VARCHAR(20),
    arrives VARCHAR(20),
    price REAL,
    PRIMARY KEY (no) );
```

✓ MySQL returned an empty result set (i.e. zero rows). (Query took 0.0356 seconds.)

```
CREATE TABLE flight( no INT, frm VARCHAR(20), too VARCHAR(20), distance INT, departs VARCHAR(20), arrives VARCHAR(20), price REAL, PRIMARY KEY (no) )
```



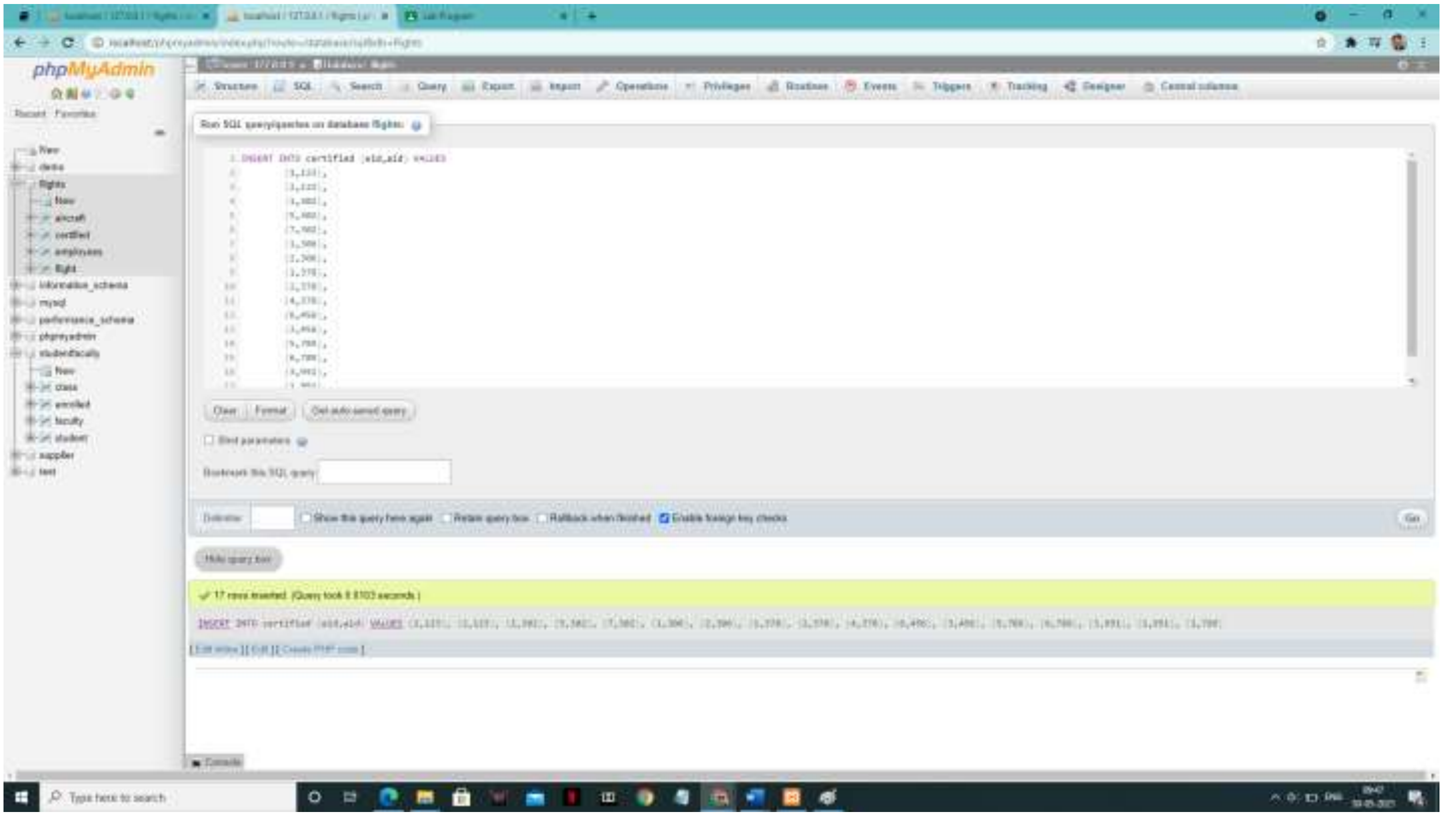
Run SQL query/queries on database flights:

```
INSERT INTO flight (no,frm,too,distance,departs,arrives,price) VALUES
            (1,'Bangalore','Mangalore',360,'10:45:00','12:00:00',10000),
            (2,'Bangalore','Delhi',5000,'12:15:00','04:30:00',25000),
            (3,'Bangalore','Mumbai',3500,'02:15:00','05:25:00',30000),
            (4,'Delhi','Mumbai',4500,'10:15:00','12:05:00',35000),
            (5,'Delhi','Ranchi',18000,'07:15:00','05:30:00',90000),
            (6,'Bangalore','Ranchi',22500,'10:00:00','07:45:00',55000),
            (7,'Bangalore','chennai',17000,'11:00:00','05:30:00',55000);
```

✓ 7 rows inserted. (Query took 0.0100 seconds.)

```
INSERT INTO flight (no,frm,too,distance,departs,arrives,price) VALUES (1,'Bangalore','Mangalore',360,'10:45:00','12:00:00',10000), (2,'Bangalore','Delhi',5000,'12:15:00','04:30:00',25000),
(3,'Bangalore','Mumbai',3500,'02:15:00','05:25:00',30000), (4,'Delhi','Mumbai',4500,'10:15:00','12:05:00',35000), (5,'Delhi','Ranchi',18000,'07:15:00','05:30:00',90000),
(6,'Bangalore','Ranchi',22500,'10:00:00','07:45:00',55000), (7,'Bangalore','chennai',17000,'11:00:00','05:30:00',55000)
```

CERTIFIED value: -

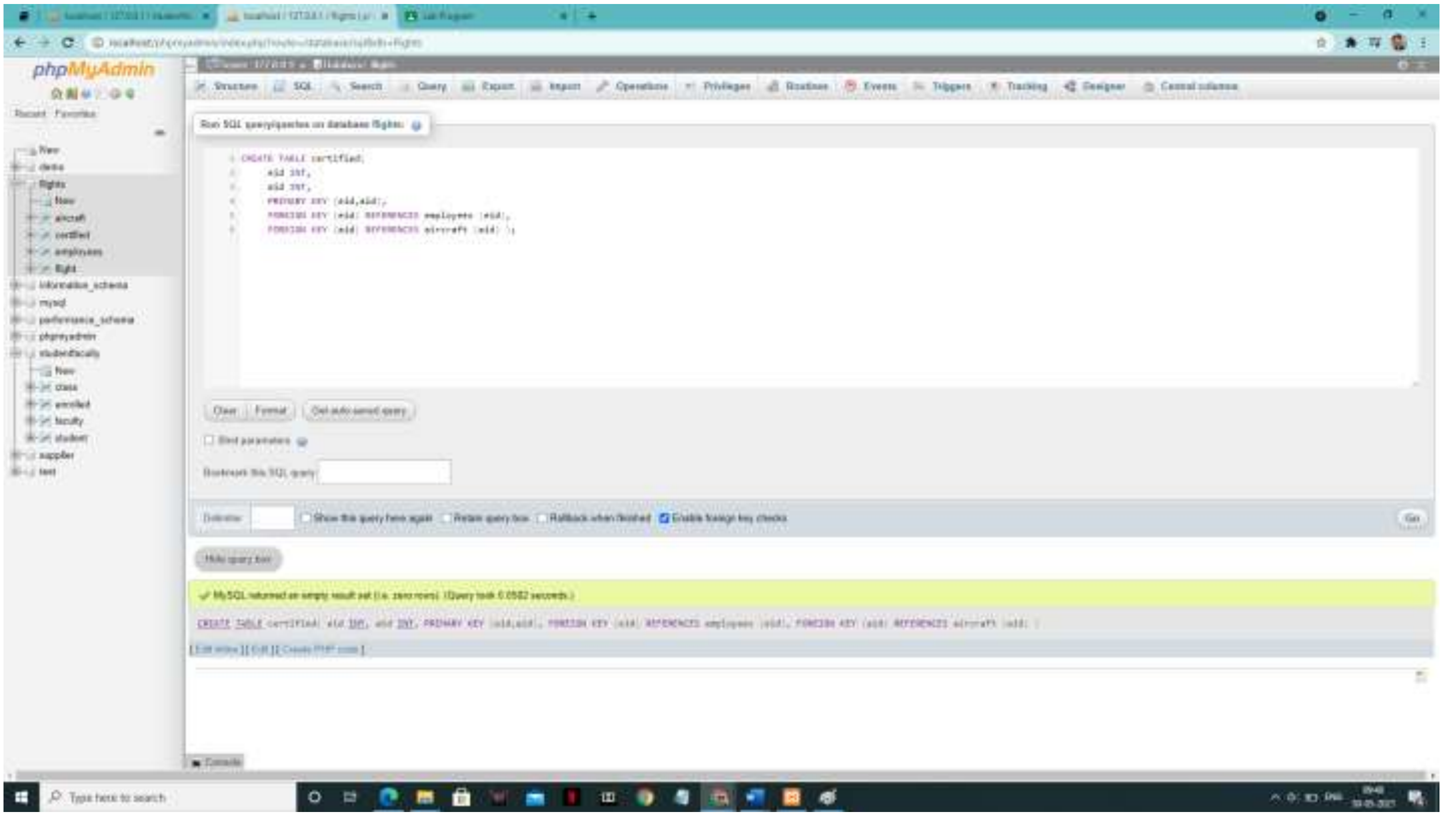


Run SQL query/queries on database flights:

```
INSERT INTO certified (eid,aid) VALUES
        (1,123),
        (2,123),
        (1,302),
        (5,302),
        (7,302),
        (1,306),
        (2,306),
        (1,378),
        (2,378),
        (4,378),
        (6,456),
        (3,456),
        (5,789),
        (6,789),
        (3,951),
        (1,951),
```

✓ 17 rows inserted. (Query took 0.0103 seconds.)

```
INSERT INTO certified (eid,aid) VALUES (1,123), (2,123), (1,302), (5,302), (7,302), (1,306), (2,306), (1,378), (2,378), (4,378), (6,456), (3,456), (5,789), (6,789), (3,951), (1,951), (1,789)
```



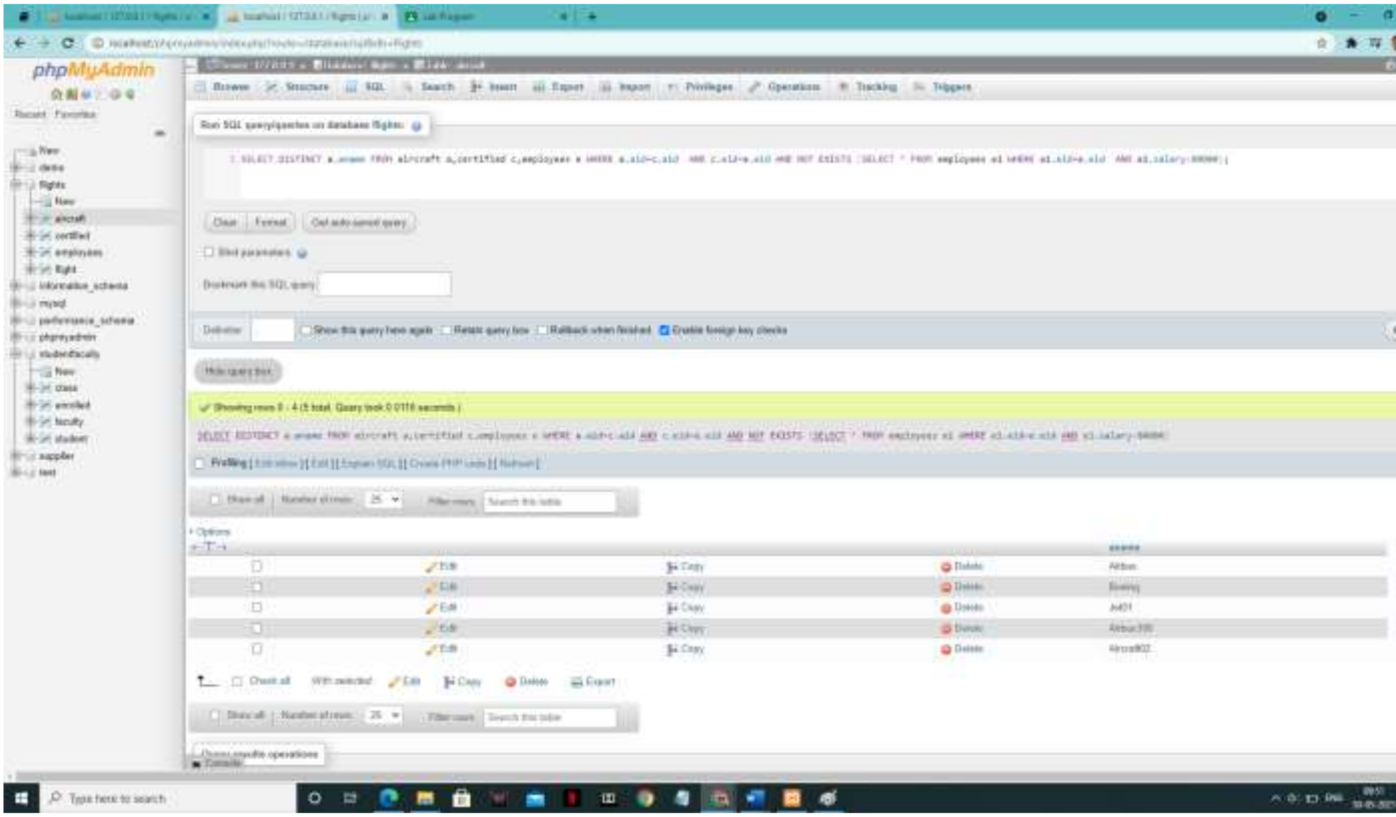
Run SQL query/queries on database flights:

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

✓ MySQL returned an empty result set (i.e. zero rows). (Query took 0.0582 seconds.)

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

1:-



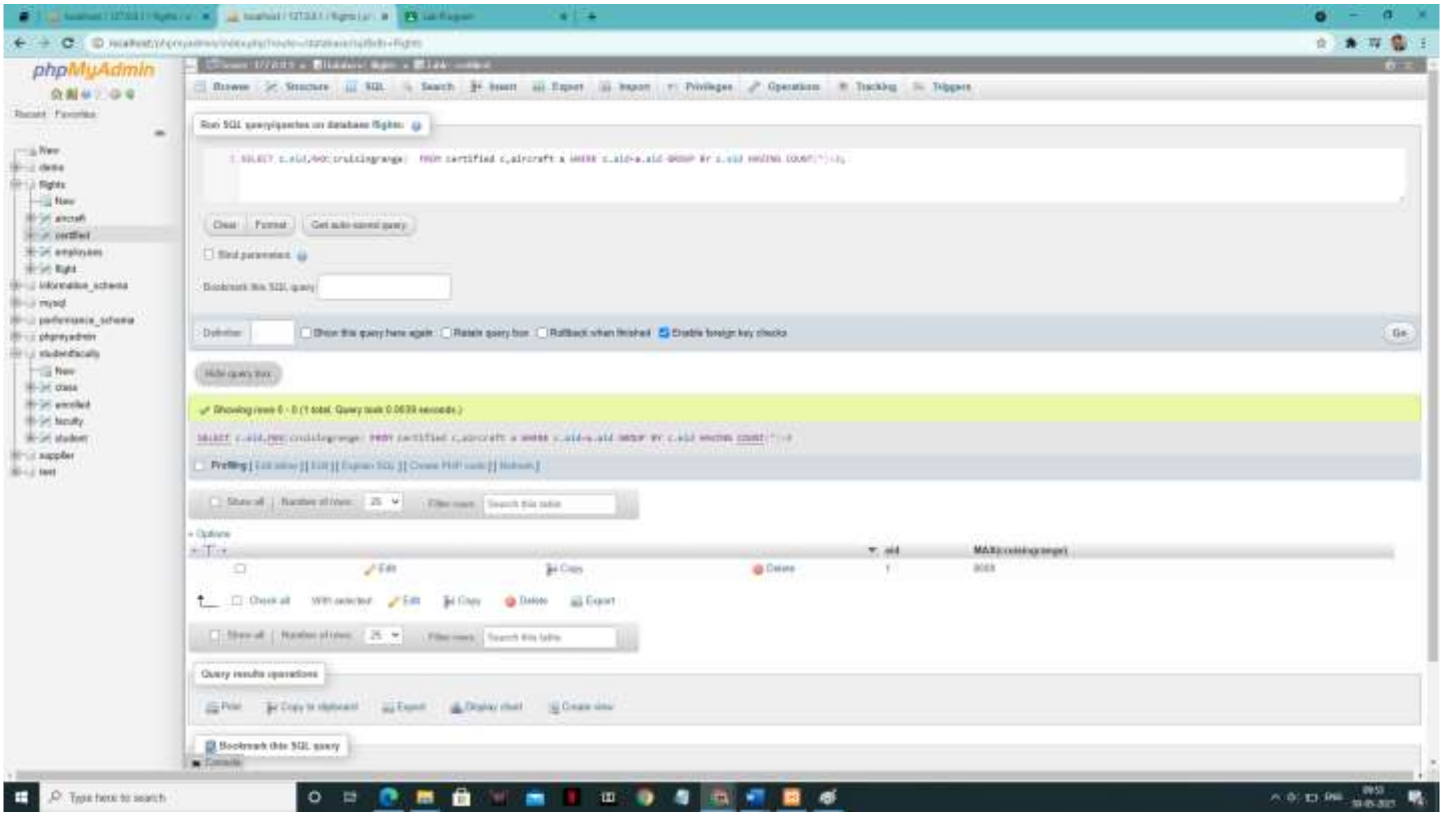
Run SQL query/queries on database flights:

```
SELECT DISTINCT a.aname FROM aircraft a,certified c,employees e WHERE a.aid=c.aid  AND c.eid=e.eid AND NOT EXISTS (SELECT * FROM employees e1 WHERE e1.eid=e.eid  AND e1.salary<80000);
```

Showing rows 0 - 4 (5 total, Query took 0.0118 seconds.)

aname
Airbus
Boeing
Jet01
Airbus380
Aircraft02

2:-



Run SQL query/queries on database flights:

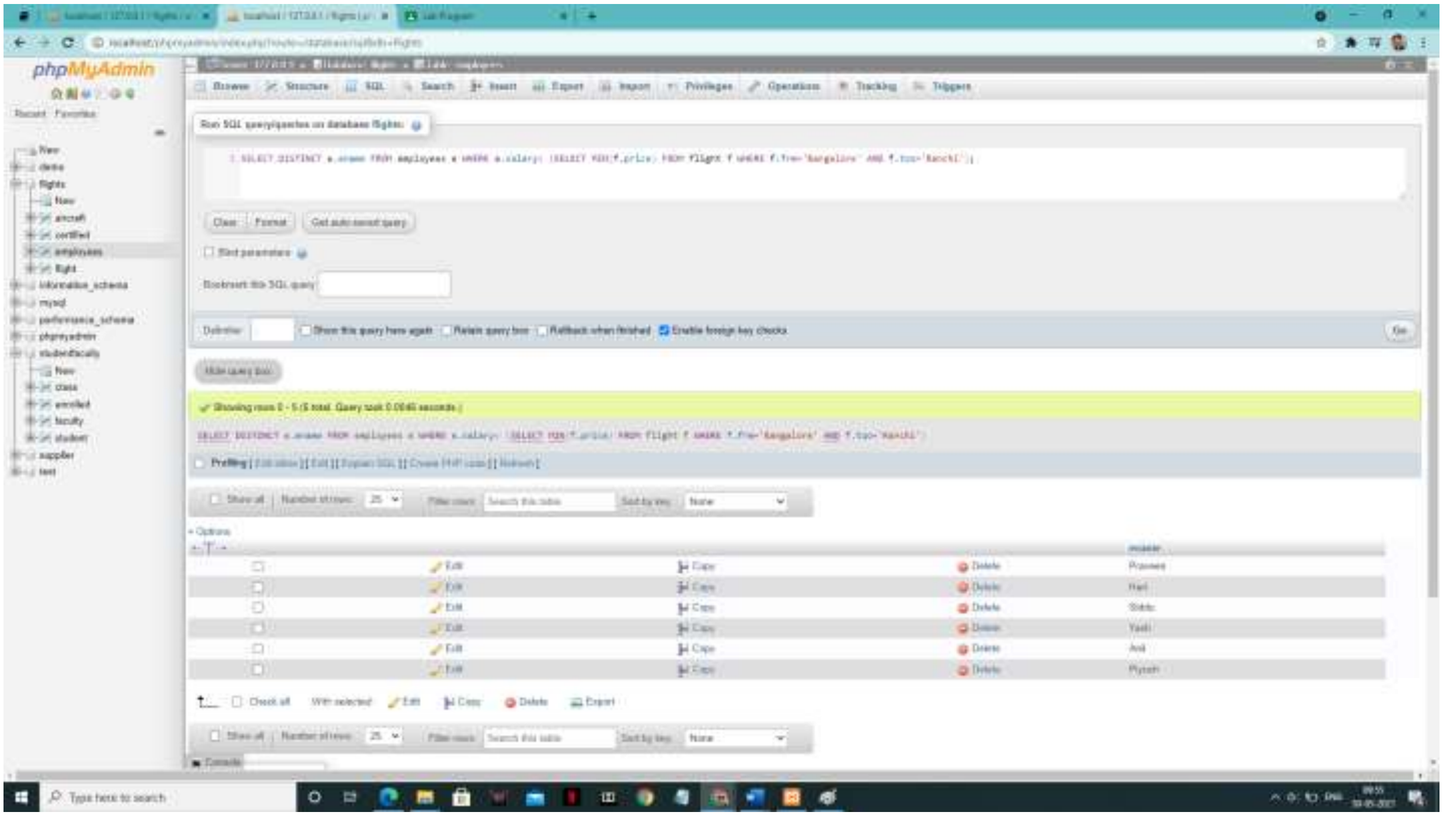
```
SELECT c.aid,MAX(cruisingrange) FROM certified c,aircraft a WHERE c.aid=a.aid GROUP BY c.aid HAVING COUNT(*)>3;
```

Showing rows 0 - 0 (1 total, Query took 0.0639 seconds.)

```
SELECT c.aid,MAX(cruisingrange) FROM certified c,aircraft a WHERE c.aid=a.aid GROUP BY c.aid HAVING COUNT(*)>3
```

aid	MAX(cruisingrange)
1	8000

3:-



Run SQL query/queries on database flights:

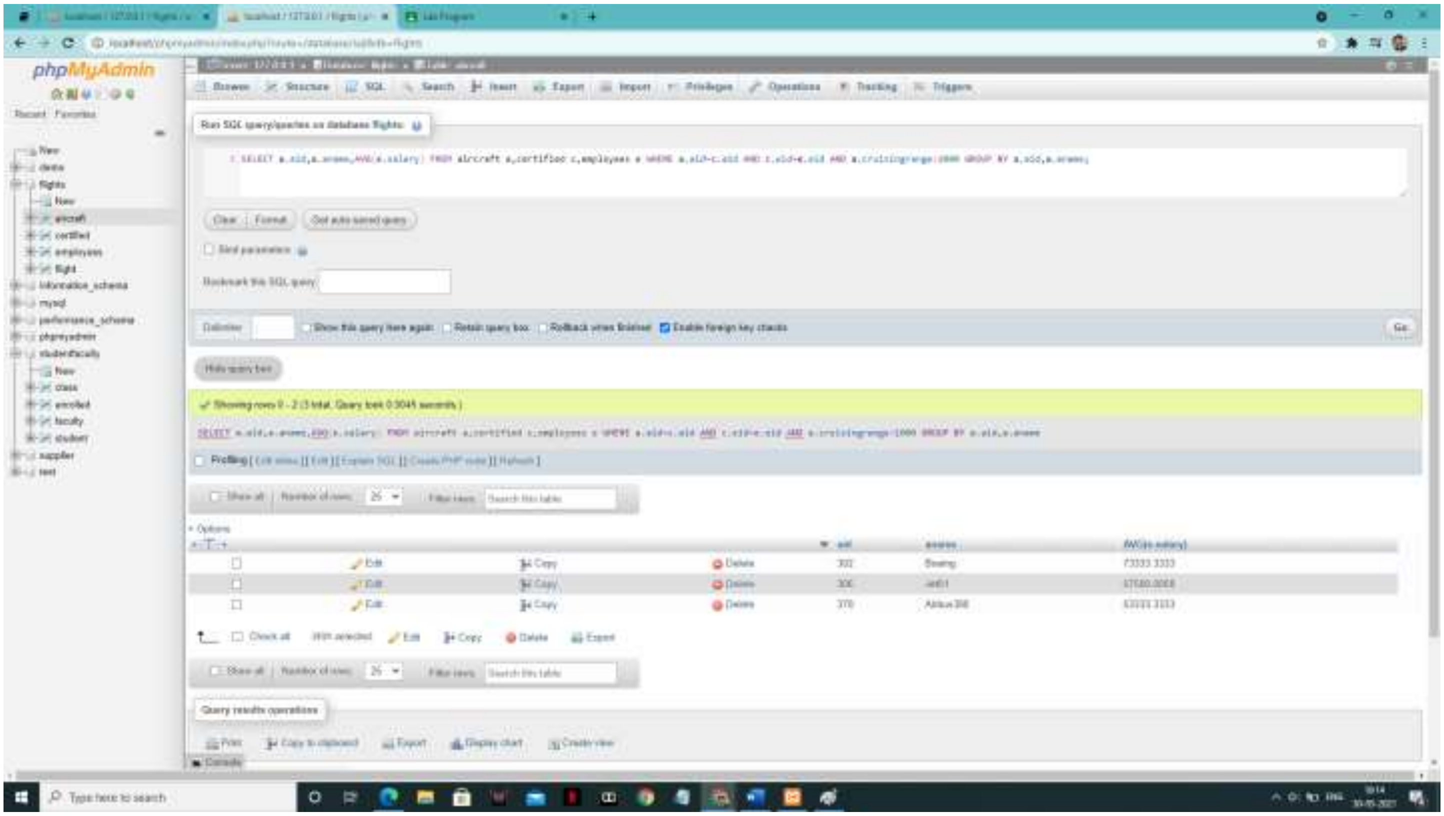
```
SELECT DISTINCT e.ename FROM employees e WHERE e.salary<(SELECT MIN(f.price) FROM flight f WHERE f.fro='Bangalore' AND f.to='Ranchi');
```

Showing rows 0 - 5 (6 total, Query took 0.0046 seconds.)

```
SELECT DISTINCT e.ename FROM employees e WHERE e.salary<(SELECT MIN(f.price) FROM flight f WHERE f.fro='Bangalore' AND f.to='Ranchi')
```

ename
Praveen
Hari
Siddu
Yash
Anil
Piyush

4:-

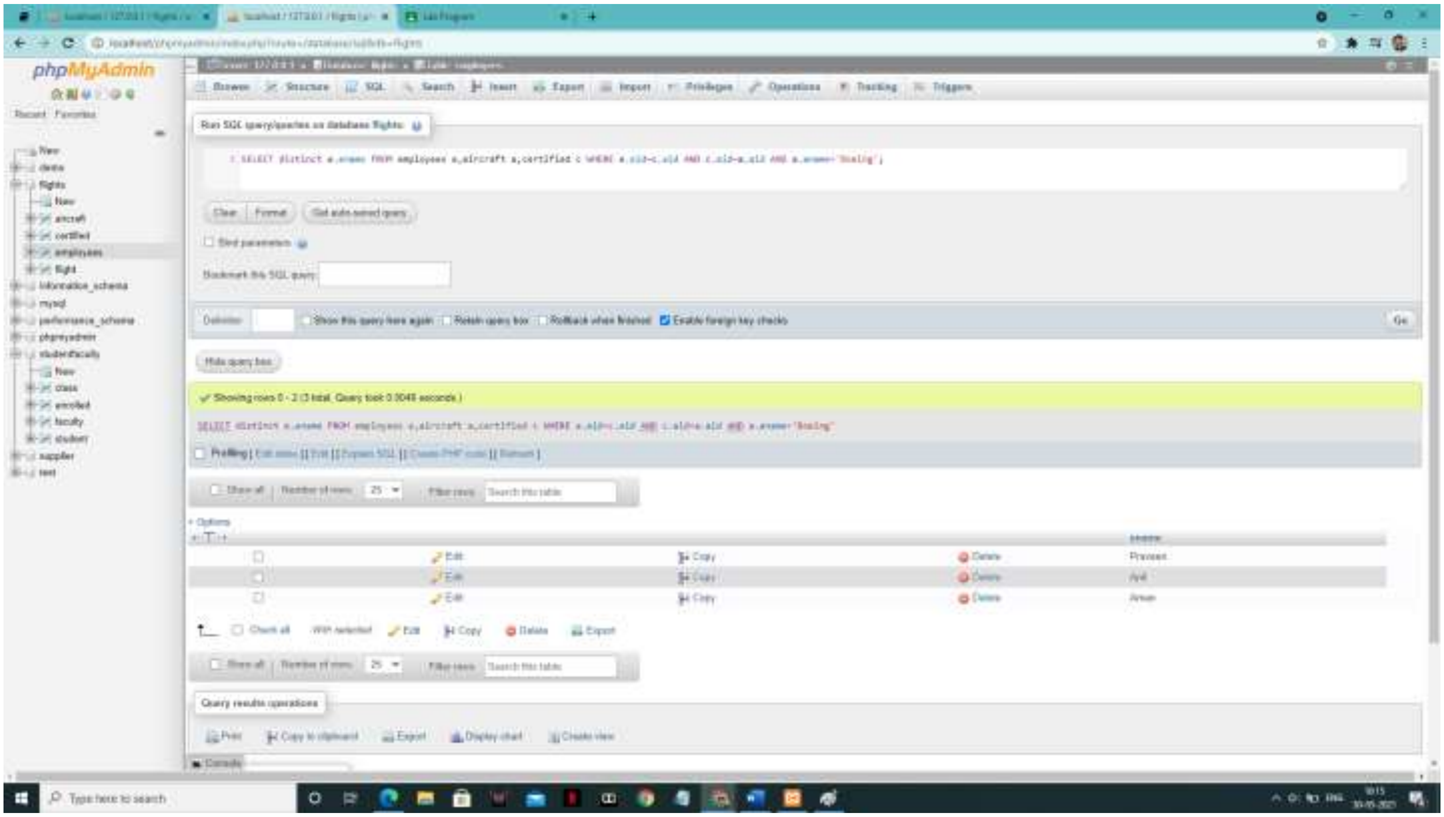


```
SELECT a.aid,a.aname,AVG(e.salary) FROM aircraft a,certified c,employees e WHERE a.aid=c.aid AND c.eid=e.eid AND a.cruisingrange>1000 GROUP BY a.aid,a.aname;
```

✓ Showing rows 0 - 2 (3 total, Query took 0.0045 seconds.)

aid	aname	AVG(e.salary)
302	Boeing	73333.3333
306	Jet01	37500.0000
378	Airbus 380	63333.3333

5:-

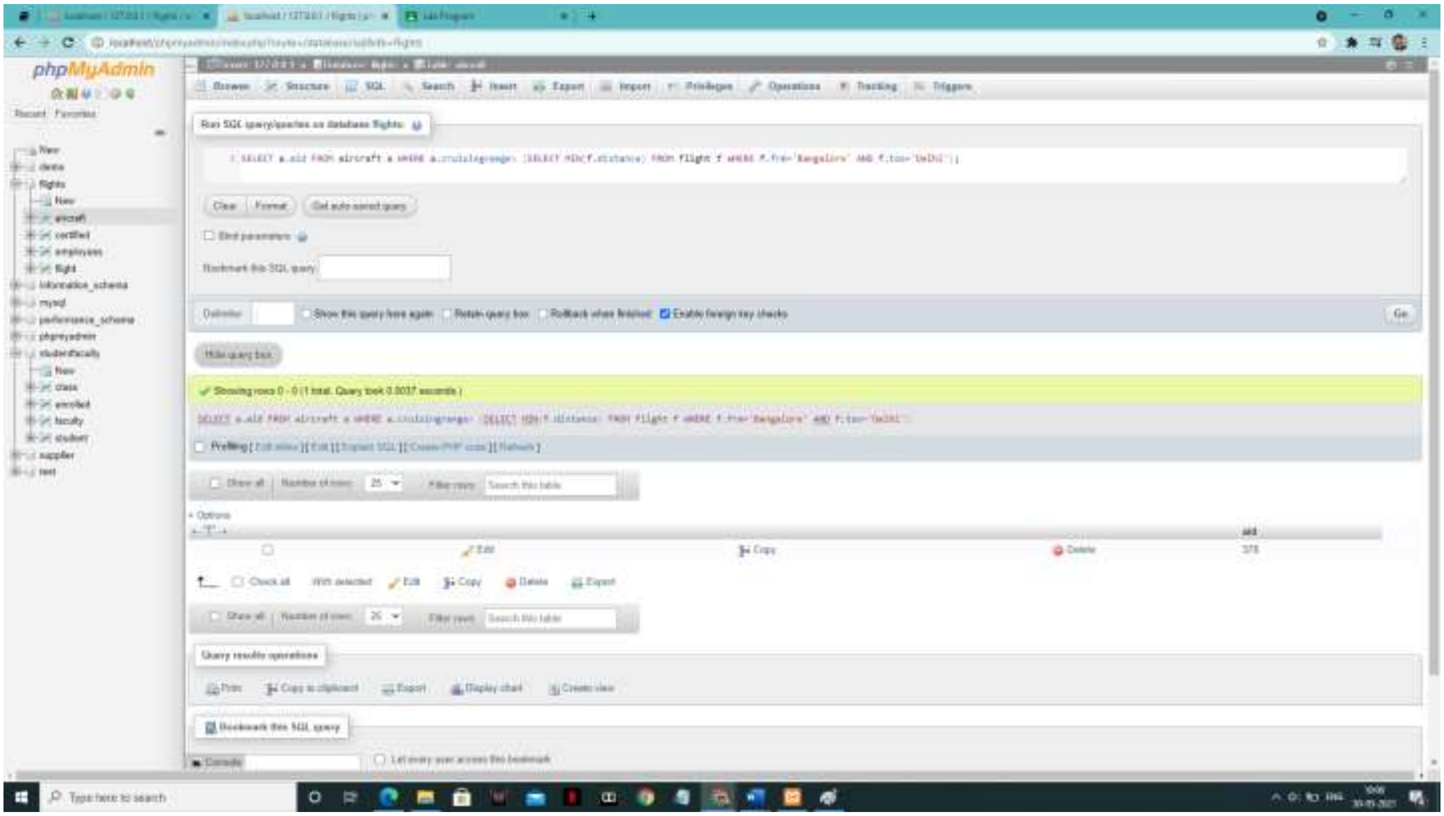


```
SELECT distinct e.ename FROM employees e,aircraft a,certified c WHERE e.eid=c.eid AND c.aid=a.aid AND a.aname='Boeing';
```

✓ Showing rows 0 - 2 (3 total, Query took 0.0048 seconds.)

ename
Praveen
Anil
Arjun

6:-



Run SQL query/queries on database flights:

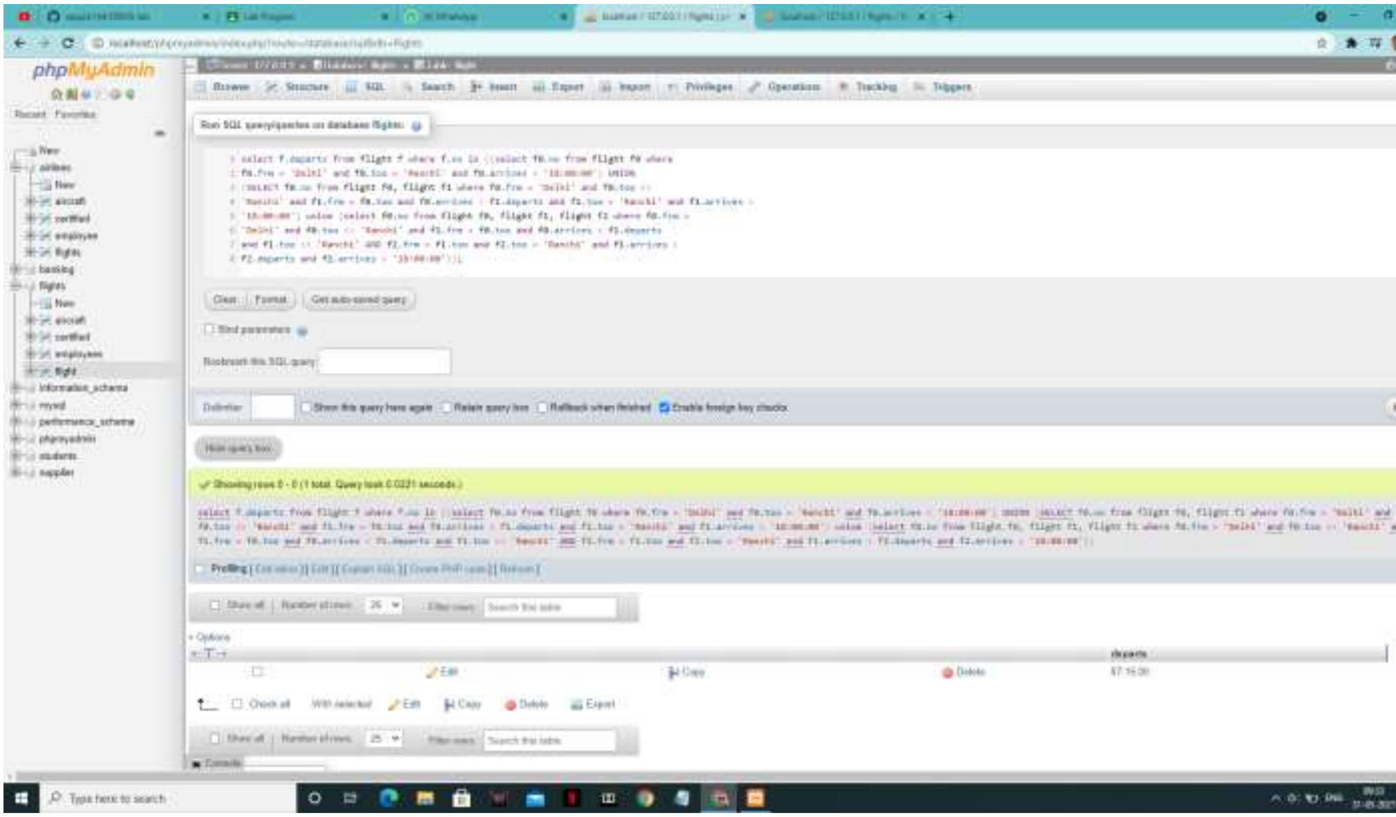
```
SELECT a.aid FROM aircraft a WHERE a.cruisingrange> (SELECT MIN(f.distance) FROM flight f WHERE f.fro='Bangalore' AND f.too='Delhi');
```

✓ Showing rows 0 - 0 (1 total, Query took 0.0037 seconds.)

SELECT a.aid FROM aircraft a WHERE a.cruisingrange> (SELECT MIN(f.distance) FROM flight f WHERE f.fro='Bangalore' AND f.too='Delhi');

aid
378

7:-



Run SQL query/queries on database flights:

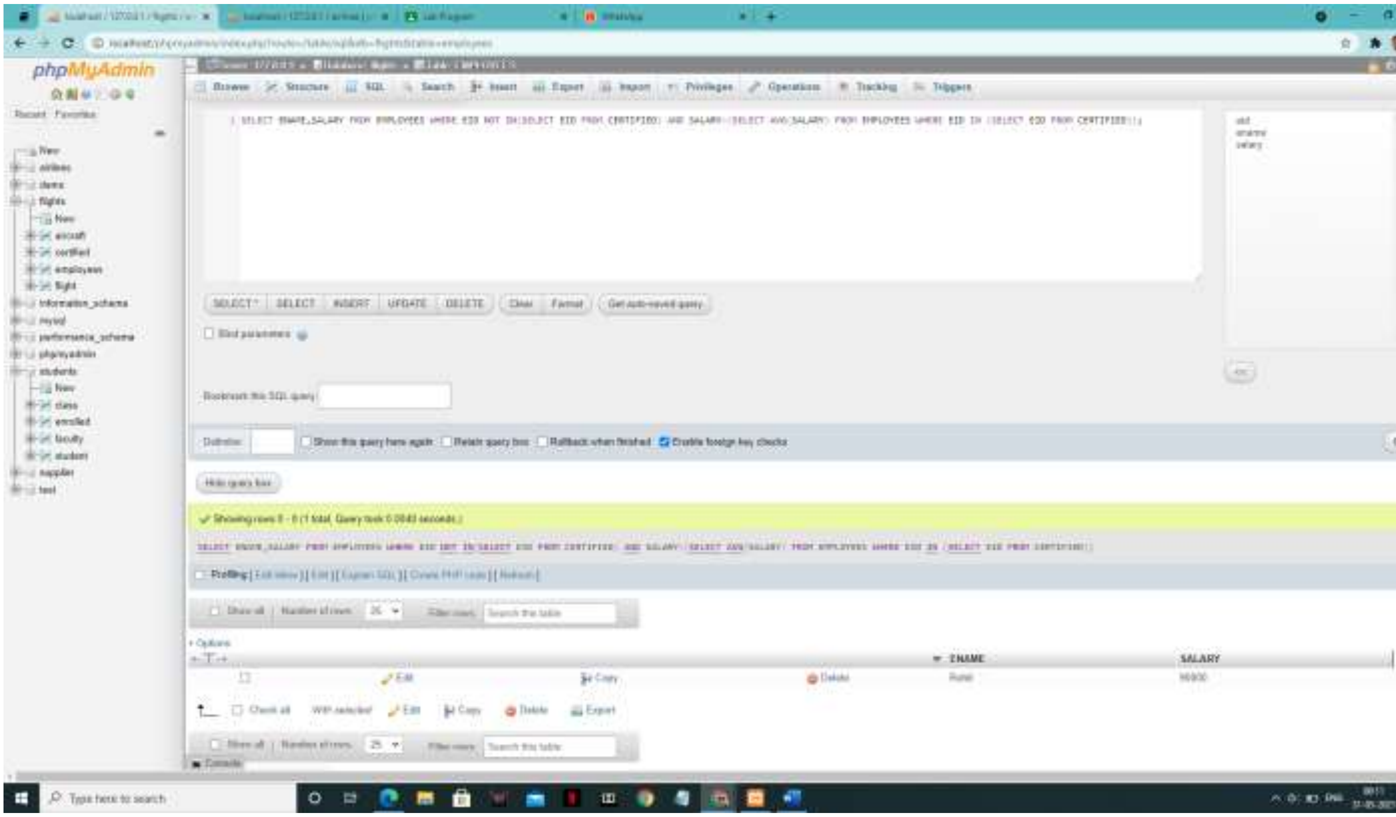
```
select f.departs from flight f where f.no in ((select f0.no from flight f0 where
f0.fro = 'Delhi' and f0.too = 'Ranchi' and f0.arrives < '18:00:00') UNION
(select f0.no from flight f0, flight f1 where f0.fro = 'Delhi' and f0.too <>
'Ranchi' and f1.fro = f0.too and f0.arrives < f1.departs and f1.too = 'Ranchi' and f1.arrives <
'18:00:00') union (select f0.no from flight f0, flight f1, flight f2 where f0.fro =
'Delhi' and f0.too <> 'Ranchi' and f1.fro = f0.too and f0.arrives < f1.departs
and f1.too <> 'Ranchi' AND f2.fro = f1.too and f2.too = 'Ranchi' and f1.arrives <
f2.departs and f2.arrives < '18:00:00'));
```

✓ Showing rows 0 - 0 (1 total, Query took 0.0221 seconds.)

select f.departs from flight f where f.no in ((select f0.no from flight f0 where f0.fro = 'Delhi' and f0.too = 'Ranchi' and f0.arrives < '18:00:00') UNION (select f0.no from flight f0, flight f1 where f0.fro = 'Delhi' and f0.too <> 'Ranchi' and f1.fro = f0.too and f0.arrives < f1.departs and f1.too = 'Ranchi' and f1.arrives < '18:00:00') union (select f0.no from flight f0, flight f1, flight f2 where f0.fro = 'Delhi' and f0.too <> 'Ranchi' and f1.fro = f0.too and f0.arrives < f1.departs and f1.too <> 'Ranchi' AND f2.fro = f1.too and f2.too = 'Ranchi' and f1.arrives < f2.departs and f2.arrives < '18:00:00'));

departs
07:15:00

8:-



```
SELECT ENAME,SALARY FROM EMPLOYEES WHERE EID NOT IN(SELECT EID FROM CERTIFIED) AND SALARY>(SELECT AVG(SALARY) FROM EMPLOYEES WHERE EID IN (SELECT EID FROM CERTIFIED));
```

✓ Showing rows 0 - 0 (1 total, Query took 0.0040 seconds.)

ENAME	SALARY
Rahul	90000