PROGRAM 5. AIRLINE FLIGHT DATABASE

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.

✔ MySQL returned an empty result set (i.e. zero rows). (Query took 0.0000 seconds.)

```
use Airline_flight
```

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

✔ MySQL returned an empty result set (i.e. zero rows). (Query took 0.2090 seconds.)

```
create table flights(flno int primary key , from_ varchar(30) , to_ varchar(30) , distance int , departs datetime, arrives datetime ,
price int)
```

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

✔ MySQL returned an empty result set (i.e. zero rows). (Query took 0.2330 seconds.)

```
create table aircraft(aid int primary key , aname varchar(30) , cruisingrange int)
```

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

✔ MySQL returned an empty result set (i.e. zero rows). (Query took 0.1820 seconds.)

```
create table employee(eid int primary key , ename varchar(30) , salary int)
```

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

✔ MySQL returned an empty result set (i.e. zero rows). (Query took 0.2670 seconds.)

```
create table certified(eid int, aid int , primary key(eid , aid) , foreign key(eid) references employee(eid)on UPDATE CASCADE on DELETE
CASCADE , foreign key(aid) references aircraft(aid)on UPDATE CASCADE on DELETE CASCADE)
```

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

Table	Action							Rows	Type	Collation	Size	Overhead
class	⭐	📋 Browse	🔧 Structure	🔍 Search	➕ Insert	🗑 Empty	⊘ Drop	8	InnoDB	utf8mb4_general_ci	32.0 KiB	-
enrolled	⭐	📋 Browse	🔧 Structure	🔍 Search	➕ Insert	🗑 Empty	⊘ Drop	10	InnoDB	utf8mb4_general_ci	48.0 KiB	-
faculty	⭐	📋 Browse	🔧 Structure	🔍 Search	➕ Insert	🗑 Empty	⊘ Drop	5	InnoDB	utf8mb4_general_ci	16.0 KiB	-
student	⭐	📋 Browse	🔧 Structure	🔍 Search	➕ Insert	🗑 Empty	⊘ Drop	6	InnoDB	utf8mb4_general_ci	16.0 KiB	-
4 tables	Sum							29	InnoDB	utf8mb4_general_ci	112.0 KiB	0 B

✔ 1 row inserted. (Query took 0.0580 seconds.)

```
insert into flights values(101,'Bangalore','Mumbai',2500,'2021-05-13 07:15:31','2021-05-13 17:15:31',5000)
```

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

✔ 1 row inserted. (Query took 0.1370 seconds.)

```
insert into flights values(102,'Bangalore','Lucknow',3000,'2021-05-13 07:15:31','2021-05-13 11:15:31',6000)
```

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

✔ 1 row inserted. (Query took 0.0560 seconds.)

```
insert into flights values(103,'Lucknow','Mumbai',500,'2021-05-13 12:15:31', '2021-05-13 17:15:31',3000)
```

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

✔ 1 row inserted. (Query took 0.0420 seconds.)

```
insert into flights values(107,'Bangalore','Frankfurt',8000,'2021-05-13 07:15:31', '2021-05-13 22:15:31',60000)
```

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

✔ 1 row inserted. (Query took 0.1690 seconds.)

```
insert into flights values(104,'Bangalore','Frankfurt',8500,'2021-05-13 07:15:31','2021-05-13 23:15:31',75000)
```

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

✔ 1 row inserted. (Query took 0.0520 seconds.)

```
insert into flights values(105,'Kolkata','Mumbai',3400,'2021-05-13 07:15:31','2021-05-13 09:15:31',7000)
```

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

✔ Showing rows 0 - 5 (6 total, Query took 0.0020 seconds.)

```sql
SELECT * FROM `flights`
```

☐ Profiling [Edit inline] [Edit] [Explain SQL] [Create PHP code] [Refresh]

☐ Show all | Number of rows: 25 ▾ Filter rows: [Search this table] Sort by key: None ▾

+ Options

				flno	from_	to_	distance	departs	arrives	price
☐	✏ Edit	📋 Copy	⊘ Delete	101	Bangalore	Mumbai	2500	2021-05-13 07:15:31	2021-05-13 17:15:31	5000
☐	✏ Edit	📋 Copy	⊘ Delete	102	Bangalore	Lucknow	3000	2021-05-13 07:15:31	2021-05-13 11:15:31	6000
☐	✏ Edit	📋 Copy	⊘ Delete	103	Lucknow	Mumbai	500	2021-05-13 12:15:31	2021-05-13 17:15:31	3000
☐	✏ Edit	📋 Copy	⊘ Delete	104	Bangalore	Frankfurt	8500	2021-05-13 07:15:31	2021-05-13 23:15:31	75000
☐	✏ Edit	📋 Copy	⊘ Delete	105	Kolkata	Mumbai	3400	2021-05-13 07:15:31	2021-05-13 09:15:31	7000
☐	✏ Edit	📋 Copy	⊘ Delete	107	Bangalore	Frankfurt	8000	2021-05-13 07:15:31	2021-05-13 22:15:31	60000

✔ 1 row inserted. (Query took 0.0610 seconds.)

```
insert into aircraft values(101 , 'Airbus' , 3000)
```

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

✔ 1 row inserted. (Query took 0.1120 seconds.)

```
insert into aircraft values(102,'Boeing',900)
```

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

✔ 1 row inserted. (Query took 0.0350 seconds.)

```
insert into aircraft values(103,'Dassault',800)
```

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

✔ 1 row inserted. (Query took 0.0410 seconds.)

```
insert into aircraft values(104,'Dreamliner',10000)
```

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

✔ 1 row inserted. (Query took 0.0400 seconds.)

```
insert into aircraft values(105,'Boeing',3500)
```

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

✔ 1 row inserted. (Query took 0.0360 seconds.)

```
insert into aircraft values(106,'Cessena',1500)
```

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

✔ 1 row inserted. (Query took 0.1120 seconds.)

```
insert into aircraft values(107,'Dream', 120000)
```

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

✔ Showing rows 0 - 6 (7 total, Query took 0.0030 seconds.)

```sql
SELECT * FROM `aircraft`
```

☐ Profiling [Edit inline] [Edit] [Explain SQL] [Create PHP code] [Refresh]

☐ Show all | Number of rows: 25 ▾   Filter rows: Search this table   Sort by key: None ▾

+ Options

←T→

					aid	aname	cruisingrange
☐	🖉 Edit	Copy	⊖ Delete		101	Airbus	3000
☐	🖉 Edit	Copy	⊖ Delete		102	Boeing	900
☐	🖉 Edit	Copy	⊖ Delete		103	Dassault	800
☐	🖉 Edit	Copy	⊖ Delete		104	Dreamliner	10000
☐	🖉 Edit	Copy	⊖ Delete		105	Boeing	3500
☐	🖉 Edit	Copy	⊖ Delete		106	Cessena	1500
☐	🖉 Edit	Copy	⊖ Delete		107	Dream	120000

↑ ☐ Check all   With selected: 🖉 Edit   Copy   ⊖ Delete   🗐 Export

✓ 1 row inserted. (Query took 0.0570 seconds.)

```
insert into employee values(701,'Arvind',50000)
```

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

✓ 1 row inserted. (Query took 0.1590 seconds.)

```
insert into employee values(702,'Bali',100000)
```

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

✓ 1 row inserted. (Query took 0.0490 seconds.)

```
insert into employee values(703,'Chutki',150000)
```

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

✓ 1 row inserted. (Query took 0.0310 seconds.)

```
insert into employee values(704,'Drake',90000)
```

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

✓ 1 row inserted. (Query took 0.0290 seconds.)

```
insert into employee values(705,'Elena',40000)
```

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

✓ 1 row inserted. (Query took 0.0310 seconds.)

```
insert into employee values(706,'Shashank',60000)
```

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

✓ 1 row inserted. (Query took 0.0290 seconds.)

```
insert into employee values(707,'Sharma',90000)
```

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

```
SELECT * FROM `employee`
```

Profiling [Edit inline] [Edit] [Explain SQL] [Create PHP code] [Refresh]

☐ Show all | Number of rows: 25 ▾ Filter rows: Search this table Sort by key: None ▾

+ Options

←T→

				eid	ename	salary
☐	🖉 Edit	⧉ Copy	⊖ Delete	701	Arvind	50000
☐	🖉 Edit	⧉ Copy	⊖ Delete	702	Bali	100000
☐	🖉 Edit	⧉ Copy	⊖ Delete	703	Chutki	150000
☐	🖉 Edit	⧉ Copy	⊖ Delete	704	Drake	90000
☐	🖉 Edit	⧉ Copy	⊖ Delete	705	Elena	40000
☐	🖉 Edit	⧉ Copy	⊖ Delete	706	Shashank	60000
☐	🖉 Edit	⧉ Copy	⊖ Delete	707	Sharma	90000

↑ ☐ Check all   With selected: 🖉 Edit   ⧉ Copy   ⊖ Delete   🖳 Export

✔ 1 row inserted. (Query took 0.0750 seconds.)

```
insert into certified values(702,101)
```

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

✔ 1 row inserted. (Query took 0.0700 seconds.)

```
insert into certified values(703,105)
```

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

✔ 1 row inserted. (Query took 0.0320 seconds.)

```
insert into certified values(704,105)
```

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

✔ 1 row inserted. (Query took 0.0530 seconds.)

```
insert into certified values(705,103)
```

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

✔ 1 row inserted. (Query took 0.0410 seconds.)

```
insert into certified values(701,102)
```

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

✔ 1 row inserted. (Query took 0.0310 seconds.)

```
insert into certified values(703,104)
```

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

✔ 1 row inserted. (Query took 0.1870 seconds.)

```
insert into certified values(701,101)
```

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

✔ 1 row inserted. (Query took 0.0380 seconds.)

```sql
insert into certified values(704,104)
```

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

✔ 1 row inserted. (Query took 0.0340 seconds.)

```sql
insert into certified values(702,107)
```

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

✔ 1 row inserted. (Query took 0.0330 seconds.)

```sql
insert into certified values(703,107)
```

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

✔ 1 row inserted. (Query took 0.0550 seconds.)

```sql
insert into certified values(704,107)
```

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

✔ 1 row inserted. (Query took 0.0570 seconds.)

```sql
insert into certified values(701,106)
```

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

✔ 1 row inserted. (Query took 0.0260 seconds.)

```sql
insert into certified values(701,105)
```

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

✔ 1 row inserted. (Query took 0.0300 seconds.)

```sql
insert into certified values(702,104)
```

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

✔ Showing rows 0 - 13 (14 total, Query took 0.0040 seconds.) [aid: **101...** - **107...**]

```
SELECT * FROM `certified` ORDER BY `certified`.`aid` ASC
```

☐ Profiling [Edit inline] [Edit] [Explain SQL] [Create PHP code] [Refresh]

☐ Show all | Number of rows: 25 ▼   Filter rows: Search this table   Sort by key: None ▼

+ Options

				eid	aid ▲ 1
☐	🖉 Edit	⏩ Copy	⊖ Delete	701	101
☐	🖉 Edit	⏩ Copy	⊖ Delete	702	101
☐	🖉 Edit	⏩ Copy	⊖ Delete	701	102
☐	🖉 Edit	⏩ Copy	⊖ Delete	705	103
☐	🖉 Edit	⏩ Copy	⊖ Delete	702	104
☐	🖉 Edit	⏩ Copy	⊖ Delete	703	104
☐	🖉 Edit	⏩ Copy	⊖ Delete	704	104
☐	🖉 Edit	⏩ Copy	⊖ Delete	701	105
☐	🖉 Edit	⏩ Copy	⊖ Delete	703	105
☐	🖉 Edit	⏩ Copy	⊖ Delete	704	105
☐	🖉 Edit	⏩ Copy	⊖ Delete	701	106
☐	🖉 Edit	⏩ Copy	⊖ Delete	702	107
☐	🖉 Edit	⏩ Copy	⊖ Delete	703	107
☐	🖉 Edit	⏩ Copy	⊖ Delete	704	107

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, Employee E WHERE C.eid = E.eid AND NOT EXISTS (
SELECT * FROM Employee E1 WHERE E1.eid = E.eid AND E1.salary <80000 ))
```

☐ Profiling [Edit inline] [Edit] [Explain SQL] [Create PHP code] [Refresh]

☐ Show all | Number of rows: 25 ⌄   Filter rows: Search this table   Sort by key: None ⌄

+ Options

←T→				aname
☐	✎ Edit	⧉ Copy	⊖ Delete	Airbus
☐	✎ Edit	⧉ Copy	⊖ Delete	Dreamliner
☐	✎ Edit	⧉ Copy	⊖ Delete	Boeing
☐	✎ Edit	⧉ Copy	⊖ Delete	Dream

↑ ☐ Check all   With selected: ✎ Edit ⧉ Copy ⊖ Delete 🖾 Export

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.

✔ Showing rows 0 - 0 (1 total, Query took 0.0220 seconds.)

```sql
select c.eid , max(a.cruisingrange) from certified c , aircraft a where a.aid = c.aid group by c.eid having count(*) > 3
```

☐ Profiling [Edit inline] [Edit] [Explain SQL] [Create PHP code] [Refresh]

☐ Show all | Number of rows: 25 ▾   Filter rows: Search this table

+ Options
←T→					▾	eid	max(a.cruisingrange)
☐	🖉 Edit	✂ Copy	⊖ Delete			701	3500

↑ ☐ Check all   With selected: 🖉 Edit ✂ Copy ⊖ Delete 🖳 Export

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

Showing rows 0 - 1 (2 total, Query took 0.0040 seconds.)

select ename from employee where salary < (select min(price) from flights where from_ = 'Bangalore' and to_ = 'Frankfurt')

☐ Profiling [Edit inline] [Edit] [Explain SQL] [Create PHP code] [Refresh]

☐ Show all | Number of rows: 25 ∨ Filter rows: Search this table Sort by key: None ∨

+ Options

←T→				ename
☐	🖉 Edit	⬚ Copy	⊖ Delete	Arvind
☐	🖉 Edit	⬚ Copy	⊖ Delete	Elena

↑ ☐ Check all   With selected: 🖉 Edit   ⬚ Copy   ⊖ Delete   🖶 Export

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.

```sql
select a.aname , avg(e.salary) from aircraft a , employee e , certified c where a.aid = c.aid and e.eid = c.eid and a.cruisingrange > 1000
group by a.aname
```

☐ Profiling [Edit inline] [Edit] [Explain SQL] [Create PHP code] [Refresh]

☐ Show all | Number of rows: 25 ▾   Filter rows: Search this table

+ Options

				aname	avg(e.salary)
☐	🖉 Edit	📋 Copy	⊖ Delete	Airbus	75000.0000
☐	🖉 Edit	📋 Copy	⊖ Delete	Boeing	96666.6667
☐	🖉 Edit	📋 Copy	⊖ Delete	Cessena	50000.0000
☐	🖉 Edit	📋 Copy	⊖ Delete	Dream	113333.3333
☐	🖉 Edit	📋 Copy	⊖ Delete	Dreamliner	113333.3333

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

```
select distinct e.ename from employee e , aircraft a , certified c where a.aid = c.aid and e.eid = c.eid and a.aname like 'Boeing%'
```

☐ Profiling [Edit inline] [Edit] [Explain SQL] [Create PHP code] [Refresh]

☐ Show all | Number of rows: 25 ▾   Filter rows: Search this table

+ Options

←T→				ename
☐	✎ Edit	⧉ Copy	⊖ Delete	Arvind
☐	✎ Edit	⧉ Copy	⊖ Delete	Chutki
☐	✎ Edit	⧉ Copy	⊖ Delete	Drake

↑ ☐ Check all   With selected: ✎ Edit ⧉ Copy ⊖ Delete ⤓ Export

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

✔ Showing rows 0 - 1 (2 total, Query took 0.0060 seconds.)

select a.aid from aircraft a where a.cruisingrange >= (select min(distance) from flights where from_ = 'Bangalore' and to_ = 'Frankfurt')

☐ Profiling [Edit inline] [Edit] [Explain SQL] [Create PHP code] [Refresh]

☐ Show all | Number of rows: 25 ▾   Filter rows: Search this table   Sort by key: None ▾

+ Options

←T→				aid
☐	✎ Edit	⊰ Copy	⊝ Delete	104
☐	✎ Edit	⊰ Copy	⊝ Delete	107

↑ ☐ Check all   With selected: ✎ Edit ⊰ Copy ⊝ Delete 🖺 Export

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. (Bengaluru-Mumbai used as city)

Show query box

✔ Showing rows 0 - 1 (2 total, Query took 0.0270 seconds.)

```
select F.flno, F.departs from Flights F where F.flno IN ( ( select F0.flno from Flights F0 where F0.from_ = 'Bangalore' and F0.to_ =
'Mumbai' and extract(hour from F0.arrives) < 18 ) union ( select F0.flno from Flights F0, Flights F1 where F0.from_ = 'Bangalore' AND
F0.to_ <> 'Mumbai' and F0.to_ = F1.from_ AND F1.to_ = 'Mumbai' and F1.departs > F0.arrives and extract(hour from F1.arrives) < 18) union
( select F0.flno from Flights F0, Flights F1, Flights F2 where F0.from_ = 'Bangalore' and F0.to_ = F1.from_ and F1.to_ = F2.from_ and
F2.to_ = 'Mumbai' and F0.to_ <> 'Mumbai' and F1.to_ <> 'Mumbai' and F1.departs > F0.arrives and F2.departs > F1.arrives and extract(hour
from F2.arrives) < 18))
```

☐ Profiling [Edit inline] [Edit] [Explain SQL] [Create PHP code] [Refresh]

☐ Show all | Number of rows: 25 ▾   Filter rows: Search this table   Sort by key: None ▾

+ Options

←T→   ▾   flno   departs
☐   ✏ Edit   ⧉ Copy   ⊖ Delete   101   2021-05-13 07:15:31
☐   ✏ Edit   ⧉ Copy   ⊖ Delete   102   2021-05-13 07:15:31

↑ ☐ Check all   With selected: ✏ Edit   ⧉ Copy   ⊖ Delete   🖫 Export

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

Show query box

✔ Showing rows 0 - 0 (1 total, Query took 0.0770 seconds.)

```
select e.ename , e.salary from employee e where e.salary > (select avg(distinct e1.salary) from employee e1 , certified c where e1.eid =
c.eid) and e.eid not in (select distinct eid from certified)
```

☐ Profiling [Edit inline] [Edit] [Explain SQL] [Create PHP code] [Refresh]

☐ Show all | Number of rows: 25 ▾   Filter rows: Search this table

⊢ Options

←T→   ename   salary
☐   ✏ Edi▾   ⫶ Copy   ⊖ Delete   Sharma   90000