

Lab 5

Consider the following database that keeps track of airline flight information:

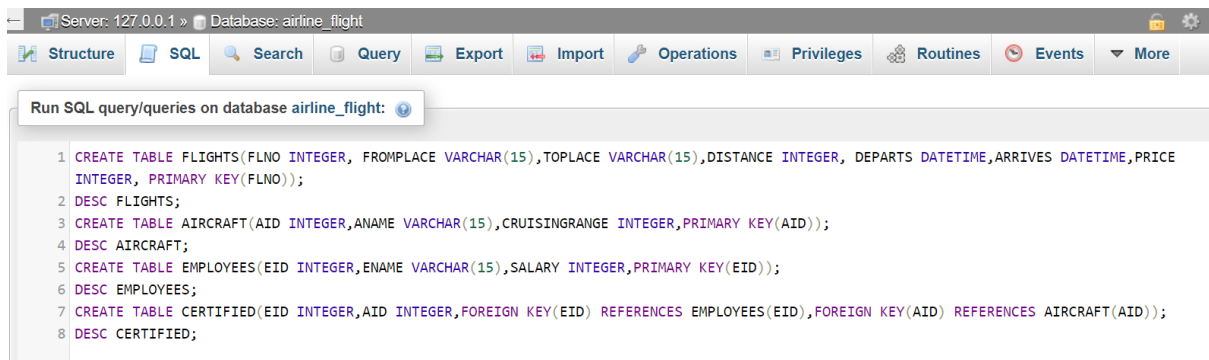
FLIGHTS (flno: integer, from: string, to: string, distance: integer, departs: time, arrives: time, price: integer)

AIRCRAFT (aid: integer, aname: string, cruisingrange: integer)

CERTIFIED (eid: integer, aid: integer)

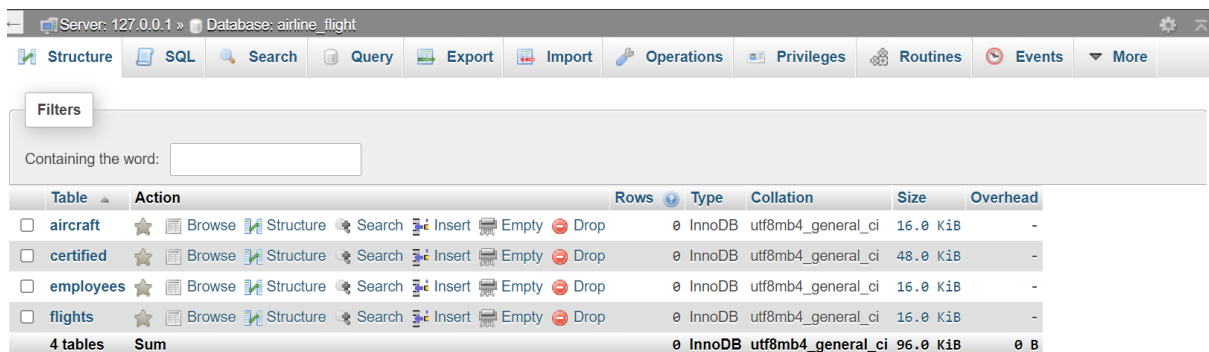
EMPLOYEE (eid: integer, ename: string, salary: integer)

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.



Run SQL query/queries on database airline_flight:

```
1 CREATE TABLE FLIGHTS(FLNO INTEGER, FROMPLACE VARCHAR(15),TOPPLACE VARCHAR(15),DISTANCE INTEGER, DEPARTS DATETIME,ARRIVES DATETIME,PRICE
  INTEGER, PRIMARY KEY(FLNO));
2 DESC FLIGHTS;
3 CREATE TABLE AIRCRAFT(AID INTEGER,ANAME VARCHAR(15),CRUISINGRANGE INTEGER,PRIMARY KEY(AID));
4 DESC AIRCRAFT;
5 CREATE TABLE EMPLOYEES(EID INTEGER,ENAME VARCHAR(15),SALARY INTEGER,PRIMARY KEY(EID));
6 DESC EMPLOYEES;
7 CREATE TABLE CERTIFIED(EID INTEGER,AID INTEGER,FOREIGN KEY(EID) REFERENCES EMPLOYEES(EID),FOREIGN KEY(AID) REFERENCES AIRCRAFT(AID));
8 DESC CERTIFIED;
```



Filters

Containing the word:

Table	Action	Rows	Type	Collation	Size	Overhead
<input type="checkbox"/> aircraft	Browse Structure Search Insert Empty Drop	0	InnoDB	utf8mb4_general_ci	16.0 KiB	-
<input type="checkbox"/> certified	Browse Structure Search Insert Empty Drop	0	InnoDB	utf8mb4_general_ci	48.0 KiB	-
<input type="checkbox"/> employees	Browse Structure Search Insert Empty Drop	0	InnoDB	utf8mb4_general_ci	16.0 KiB	-
<input type="checkbox"/> flights	Browse Structure Search Insert Empty Drop	0	InnoDB	utf8mb4_general_ci	16.0 KiB	-
4 tables	Sum	0	InnoDB	utf8mb4_general_ci	96.0 KiB	0 B

'FLIGHTS' TABLE:

✔ 1 row inserted. (Query took 0.2621 seconds.)

```
INSERT INTO FLIGHTS VALUES(101,'Bangalore','Kolkata',2500,'2021-01-03 08:20:31','2021-01-03 9:20:31',5000)
```

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

✔ 1 row inserted. (Query took 0.0825 seconds.)

```
INSERT INTO FLIGHTS VALUES(102,'Delhi','Bangalore',4000,'2021-01-03 16:10:15','2021-01-03 19:30:10',8000)
```

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

✔ 1 row inserted. (Query took 0.0680 seconds.)

```
INSERT INTO FLIGHTS VALUES(103,'Kolkata','Pune',1500,'2021-01-03 07:15:31','2021-01-03 7:20:31',3000)
```

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

✔ 1 row inserted. (Query took 0.0625 seconds.)

```
INSERT INTO FLIGHTS VALUES(104,'New York','Bangalore',25000,'2021-01-03 08:20:31','2021-01-04 9:20:31',50000)
```

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

✔ 1 row inserted. (Query took 0.2270 seconds.)

```
INSERT INTO FLIGHTS VALUES(105,'Bangalore','Chennai',1000,'2021-01-03 08:20:31','2021-01-03 9:20:31',2000)
```

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

✔ Showing rows 0 - 4 (5 total, Query took 0.0049 seconds.)

```
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	FROMPLACE	TOPLACE	DISTANCE	DEPARTS	ARRIVES	PRICE
<input type="checkbox"/>	Edit Copy Delete	101	Bangalore	Kolkata	2500	2021-01-03 08:20:31	2021-01-03 09:20:31	5000
<input type="checkbox"/>	Edit Copy Delete	102	Delhi	Bangalore	4000	2021-01-03 16:10:15	2021-01-03 19:30:10	8000
<input type="checkbox"/>	Edit Copy Delete	103	Kolkata	Pune	1500	2021-01-03 07:15:31	2021-01-03 07:20:31	3000
<input type="checkbox"/>	Edit Copy Delete	104	New York	Bangalore	25000	2021-01-03 08:20:31	2021-01-04 09:20:31	50000
<input type="checkbox"/>	Edit Copy Delete	105	Bangalore	Chennai	1000	2021-01-03 08:20:31	2021-01-03 09:20:31	2000

'AIRCRAFT' TABLE:

✓ 1 row inserted. (Query took 0.1205 seconds.)

`INSERT INTO AIRCRAFT VALUES(101,'747',3000)`

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

✓ 1 row inserted. (Query took 0.0461 seconds.)

`INSERT INTO AIRCRAFT VALUES(102,'Dreamliner',1500)`

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

✓ 1 row inserted. (Query took 0.0837 seconds.)

`INSERT INTO AIRCRAFT VALUES(103,'747',500)`

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

✓ 1 row inserted. (Query took 0.0329 seconds.)

`INSERT INTO AIRCRAFT VALUES(104,'Boeing',10000)`

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

✓ 1 row inserted. (Query took 0.0732 seconds.)

`INSERT INTO AIRCRAFT VALUES(105,'Dreamliner',4000)`

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

✓ Showing rows 0 - 4 (5 total, Query took 0.0024 seconds.)

`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

				AID	ANAME	CRUISINGRANGE
<input type="checkbox"/>	 Edit	 Copy	 Delete	101	747	3000
<input type="checkbox"/>	 Edit	 Copy	 Delete	102	Dreamliner	1500
<input type="checkbox"/>	 Edit	 Copy	 Delete	103	747	500
<input type="checkbox"/>	 Edit	 Copy	 Delete	104	Boeing	10000
<input type="checkbox"/>	 Edit	 Copy	 Delete	105	Dreamliner	4000

‘EMPLOYEES’ TABLE:

✓ 1 row inserted. (Query took 0.0828 seconds.)

`INSERT INTO EMPLOYEES VALUES(601, 'A', 60000)`

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

✓ 1 row inserted. (Query took 0.0631 seconds.)

`INSERT INTO EMPLOYEES VALUES(602, 'B', 80000)`

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

✓ 1 row inserted. (Query took 0.1114 seconds.)

`INSERT INTO EMPLOYEES VALUES(603, 'C', 160000)`

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

✓ 1 row inserted. (Query took 0.0367 seconds.)

`INSERT INTO EMPLOYEES VALUES(604, 'D', 120000)`

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

✓ 1 row inserted. (Query took 0.0338 seconds.)

`INSERT INTO EMPLOYEES VALUES(605, 'E', 40000)`

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

✓ Showing rows 0 - 4 (5 total, Query took 0.0031 seconds.)

`SELECT * FROM EMPLOYEES`

☐ 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	ENAME	SALARY
<input type="checkbox"/>				601	A	60000
<input type="checkbox"/>				602	B	80000
<input type="checkbox"/>				603	C	160000
<input type="checkbox"/>				604	D	120000
<input type="checkbox"/>				605	E	40000

‘CERTIFIED’ TABLE:

✔ 1 row inserted. (Query took 0.0596 seconds.)

`INSERT INTO CERTIFIED VALUES(601,101)`

[\[Edit inline\]](#) [\[Edit \]](#) [\[Create PHP code \]](#)

✔ 1 row inserted. (Query took 0.0795 seconds.)

`INSERT INTO CERTIFIED VALUES(601,102)`

[\[Edit inline\]](#) [\[Edit \]](#) [\[Create PHP code \]](#)

✔ 1 row inserted. (Query took 0.1563 seconds.)

`INSERT INTO CERTIFIED VALUES(602,102)`

[\[Edit inline\]](#) [\[Edit \]](#) [\[Create PHP code \]](#)

✔ 1 row inserted. (Query took 0.1225 seconds.)

`INSERT INTO CERTIFIED VALUES(603,102)`

[\[Edit inline\]](#) [\[Edit \]](#) [\[Create PHP code \]](#)

✔ 1 row inserted. (Query took 0.0468 seconds.)

`INSERT INTO CERTIFIED VALUES(603,103)`

[\[Edit inline\]](#) [\[Edit \]](#) [\[Create PHP code \]](#)

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

`INSERT INTO CERTIFIED VALUES(604,104)`

[\[Edit inline\]](#) [\[Edit \]](#) [\[Create PHP code \]](#)

✔ 1 row inserted. (Query took 0.0376 seconds.)

`INSERT INTO CERTIFIED VALUES(604,105)`

[\[Edit inline\]](#) [\[Edit \]](#) [\[Create PHP code \]](#)

✔ 1 row inserted. (Query took 0.0426 seconds.)

`INSERT INTO CERTIFIED VALUES(605,105)`

[\[Edit inline\]](#) [\[Edit \]](#) [\[Create PHP code \]](#)

✔ Showing rows 0 - 7 (8 total, Query took 0.0047 seconds.)

`SELECT * FROM CERTIFIED`

☐ 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
601	101
601	102
602	102
603	102
603	103
604	104
604	105
605	105

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

Showing rows 0 - 1 (2 total, Query took 0.2238 seconds.)

```
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 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

ANAME	
<input type="checkbox"/> Edit	Copy Delete 747
<input type="checkbox"/> Edit	Copy Delete Dreamliner

2. For each pilot who is certified for more than one aircraft, find the EID and the maximum cruising range of the aircraft for she/he is certified to fly.

Showing rows 0 - 2 (3 total, Query took 0.0413 seconds.)

```
SELECT MAX(A.CRUISEINGRANGE),C.EID FROM certified C, aircraft A WHERE C.AID=A.AID GROUP BY C.EID HAVING COUNT(C.EID)>1
```

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

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

+ Options

MAX(A.CRUISEINGRANGE)	EID
3000	601
1500	603
10000	604

3. Find the names of pilots whose salary is less than the price of the cheapest route from New York to Bangalore.

Showing rows 0 - 0 (1 total, Query took 0.0047 seconds.)

```
SELECT ENAME FROM employees WHERE SALARY < (SELECT MIN(PRICE) FROM flights WHERE FROMPLACE='New York' AND TOPPLACE='Bangalore')
```

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

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

+ Options

ENAME	
<input type="checkbox"/> Edit	Copy Delete E

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.

Showing rows 0 - 3 (4 total, Query took 0.0499 seconds.)

```
SELECT AVG(E.SALARY), C.AID FROM certified C,employees E WHERE C.AID IN(SELECT AID FROM aircraft WHERE CRUISEINGRANGE>1000) AND E.EID=C.EID GROUP BY C.AID
```

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

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

+ Options

AVG(E.SALARY)	AID
60000.0000	101
100000.0000	102
120000.0000	104
80000.0000	105

5. Find the names of the pilot for some Boeing aircraft.

Showing rows 0 - 0 (1 total, Query took 0.0113 seconds.)

```
SELECT ENAME FROM employees WHERE EID IN(SELECT EID FROM certified WHERE AID IN(SELECT AID FROM aircraft WHERE ANAME='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 D

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

Showing rows 0 - 0 (1 total, Query took 0.0030 seconds.)

```
SELECT ANAME FROM aircraft WHERE CRUISINGRANGE > ANY(SELECT DISTANCE FROM flights WHERE FROMPLACE='Delhi' AND TOPPLACE='Bangalore')
```

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

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

+ Options

← T → ANAME

☐ Edit Copy Delete Boeing

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

Showing rows 0 - 0 (1 total, Query took 0.1198 seconds.)

```
SELECT F.fno, F.departs FROM flights F WHERE F.fno IN ( ( SELECT F0.fno FROM flights F0 WHERE F0.fromplace = 'New York' AND F0.toplace = 'Bangalore' AND extract(hour from F0.arrives) < 18 ) UNION ( SELECT F0.fno FROM flights F0, flights F1 WHERE F0.fromplace = 'New York' AND F0.toplace <> 'Bangalore' AND F0.toplace = F1.fromplace AND F1.toplace = 'Bangalore' AND F1.departs > F0.arrives AND extract(hour from F1.arrives) < 18 ) UNION ( SELECT F0.fno FROM flights F0, flights F1, flights F2 WHERE F0.fromplace = 'New York' AND F0.toplace = F1.fromplace AND F1.toplace = F2.fromplace AND F2.toplace = 'Bangalore' AND F0.toplace <> 'Bangalore' AND F1.toplace <> 'Bangalore' 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

+ Options

fno	departs
104	2021-01-03 08:20:31