

AISHWARYA.M

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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.

- 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 cruisingrange 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 cruisingrange 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 Bangalore to Kolkata New with no more than two changes of flight. List the choice of departure times from Madison if the customer wants to arrive in Kolkata by 6 p.m.

SQL> select * from Flights;

FLNO	FFROM	TO	DISTANCE	DEPARTS	ARRIVES	PRICE
101	Bangalore	Delhi	2500	13-MAY-05 07:15:31.000000	AM13-MAY-05 07:15:31.000000	A 5000
102	Bangalore	Lucknow	3000	05/05/13 07:15:31.000000	05/05/13 11:15:31.000000	6000
103	Lucknow	Delhi	500	05/05/13 12:15:31.000000	05/05/13 17:15:31.000000	3000
107	Bangalore	Frankfurt	8000	05/05/13 07:15:31.000000	05/05/13 22:15:31.000000	60000
104	Bangalore	Frankfurt	8500	05/05/13 07:15:31.000000	05/05/13 23:15:31.000000	75000
105	Kolkata	Delhi	3400	05/05/13 07:15:31.000000	05/05/13 09:15:31.000000	7000

SQL> select * from Aircraft;

AID	ANAME	CRUISINGRANGE
101	747	3000
102	Boeing	900
103	647	800
104	Dreamliner	10000

105 Boeing	3500
106 707	1500
107 Dream	120000

7 rows selected.

SQL> select * from Certified;

EID	AID
701	101
701	102
701	106
701	105
702	104
703	104
704	104
702	107
703	107
704	107
702	101

EID	AID
703	105
704	105
705	103

14 rows selected.

SQL> select * from Employees;

EID	ENAME	SALARY
701	A	50000
702	B	100000
703	C	150000
704	D	90000
705	E	40000
706	F	60000
707	G	90000

7 rows selected.

CREATE DATABASE AIRLINE_DATABASE;

USE AIRLINE_DATABASE;

CREATE TABLE FLIGHTS

```
(  
    flno int,  
    ffrom varchar(40),  
    tto varchar(40),  
    distance int,  
    departs datetime,  
    arrives datetime,  
    price int,  
    primary key(flno)  
);
```

CREATE TABLE AIRCRAFT

```
(  
    aid int,  
    aname varchar(40),  
    cruisingrange int,  
    primary key(aid)  
);
```

CREATE TABLE EMPLOYEES

```
(  
    eid int,  
    ename varchar(40),  
    salary int,  
    primary key(eid)  
);
```

CREATE TABLE CERTIFIED

```
(  
    eid int,  
    aid int,
```

```
FOREIGN KEY(aid) REFERENCES AIRCRAFT(aid),
FOREIGN KEY(eid) REFERENCES EMPLOYEES(eid)
```

```
);
```

```
INSERT INTO FLIGHTS VALUES (101,"Bangalore","Delhi",2500,'2005-05-13:07:15:31.000000','2005-05-13:07:15:31.000000',5000),
```

```
(102,"Bangalore","Lucknow",3000,'2013-05-05:07:15:31.000000','2013-05-05:11:15:31.000000',6000),
```

```
(103,"Lucknow","Delhi",500,'2013-05-05:12:15:31.000000','2013-05-05:17:15:31.000000',3000),
```

```
(107,"Bangalore","Frankfurt",8000,'2013-05-05:07:15:31.000000','2013-05-05:22:15:31.000000',60000),
```

```
(104,"Bangalore","Frankfurt",8500,'2013-05-05:07:15:31.000000','2013-05-05:23:15:31.000000',75000),
```

```
(105,"Kolkata","Delhi",3400,'2013-05-05:07:15:31.000000','2013-05-05:09:15:31.000000',7000);
```

```
SELECT * FROM FLIGHTS;
```

	fno	ffrom	tto	distance	departs	arrives	price
▶	101	Bangalore	Delhi	2500	2005-05-13 07:15:31	2005-05-13 07:15:31	5000
	102	Bangalore	Lucknow	3000	2013-05-05 07:15:31	2013-05-05 11:15:31	6000
	103	Lucknow	Delhi	500	2013-05-05 12:15:31	2013-05-05 17:15:31	3000
	104	Bangalore	Frankfurt	8500	2013-05-05 07:15:31	2013-05-05 23:15:31	75000
	105	Kolkata	Delhi	3400	2013-05-05 07:15:31	2013-05-05 09:15:31	7000
	107	Bangalore	Frankfurt	8000	2013-05-05 07:15:31	2013-05-05 22:15:31	60000
*	NULL	NULL	NULL	NULL	NULL	NULL	NULL

```
INSERT INTO AIRCRAFT
```

```
VALUES (101,747,3000),(102,"Boeing",900),(103,647,800),(104,"Dreamliner",10000),
```

```
(105,"Boeing",3500),(106,707,1500),(107,"Dream",120000);
```

```
SELECT * FROM AIRCRAFT;
```

	aid	aname	cruisingrange
▶	101	747	3000
	102	Boeing	900
	103	647	800
	104	Dreamliner	10000
	105	Boeing	3500
	106	707	1500
	107	Dream	120000
*	NULL	NULL	NULL

INSERT INTO EMPLOYEES VALUES

(701,"A",50000),(702,"B",100000),(703,"C",150000),(704,"D",90000),(705,"E",40000),(706,"F",60000),
(707,"G",90000);

SELECT * FROM EMPLOYEES;

	eid	ename	salary
▶	701	A	50000
	702	B	100000
	703	C	150000
	704	D	90000
	705	E	40000
	706	F	60000
	707	G	90000
*	NULL	NULL	NULL

INSERT INTO CERTIFIED

VALUES (701,101),(701,102),(701,106),(701,105),(702,104),(703,104),(704,104),(702,107),
(703,107),(704,107),(702,101),(703,105),(704,105),(705,103);

SELECT * FROM CERTIFIED;

	eid	aid
▶	701	101
	701	102
	701	106
	701	105
	702	104
	703	104
	704	104
	702	107
	703	107
	704	107
	702	101
	703	105
	704	105
	705	103

/*a.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,EMPLOYEES e,CERTIFIED c

WHERE a.aid=c.aid and e.eid=c.eid and e.salary>80000;

	aname
▶	Dreamliner
	Dream
	747
	Boeing

/*b.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 e.eid,e.ename,max(a. cruisingrange)
FROM EMPLOYEES e,CERTIFIED c,AIRCRAFT a
WHERE e.eid=c.eid and a.aid=c.aid
group by e.ename
having count(c.aid)>3;
```

	eid	ename	max(a. cruisingrange)
▶	701	A	3500

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

```
SELECT e.ename
FROM EMPLOYEES e
WHERE salary < (select min(price) from FLIGHTS where ffrom="Bangalore" and tto="Frankfurt");
```

	ename
▶	A
	E

/*d.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.cruisingrange,avg(e.salary)
FROM AIRCRAFT a,EMPLOYEES e,CERTIFIED c
WHERE c.eid=e.eid and c.aid=a.aid
```

group by a.aname

having a.cruisingrange > 1000;

	aname	cruisingrange	avg(e.salary)
▶	747	3000	75000.0000
	Dreamliner	10000	113333.3333
	707	1500	50000.0000
	Dream	120000	113333.3333

/*e.Find the names of pilots certified for some Boeing aircraft.*/

SELECT distinct e.ename

FROM EMPLOYEES e,CERTIFIED c,AIRCRAFT a

WHERE e.eid=c.eid and a.aid=c.aid and aname like "Boeing";

	ename
▶	A
	C
	D

/*f.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. cruisingrange >= (select distance from FLIGHTS where ffrom="Bangalore" and tto="Delhi");

	aid
▶	101
	104
	105
	107
•	HULL

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

SELECT f.ffrom,f.tto,f.arrives

FROM FLIGHTS f

WHERE (f.ffrom="Bangalore" and f.tto=(select ffrom from FLIGHTS where tto="Kolkata")) or
f.tto="Kolkata";

	ffrom	tto	arrives
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