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CSE-4A

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.

```
create database airlinesdb;
use airlinesdb;

create table Flights(
        flno int not null,
        from_loc varchar(20) not null,
```

```
        to_loc varchar(20) not null,
        distance int not null,
        departs time not null,
        arrives time not null,
        price int not null,
        primary key(flno)
);

create table Aircraft(
        aid int not null,
        aname varchar(20) not null,
        cruisingrange int not null,
        primary key(aid)
);

create table Employees(
        eid int not null,
        ename varchar(20) not null,
        salary int not null,
        primary key(eid)
);

create table Certified(
        eid int not null,
        aid int not null,
        primary key(eid,aid),
        foreign key(eid) references Employees(eid),
        foreign key(aid) references Aircraft(aid)
);

insert into Flights(flno,from_loc,to_loc,distance,departs,arrives,price)
        values (101,"Bangalore","Delhi",2500,"07:15:31","12:15:31",5000),
                (102,"Bangalore","Lucknow",3000,"07:15:31","11:15:31",6000),
                (103,"Lucknow","Delhi",500,"12:15:31","17:15:31",3000),
                (107,"Bangalore","Frankfurt",8000,"07:15:31","22:15:31",60000),
                (104,"Bangalore","Frankfurt",8500,"07:15:31","23:15:31",75000),
                (105,"Kolkata","Delhi",3400,"07:15:31","09:15:31",7000);

insert into Flights(flno,from_loc,to_loc,distance,departs,arrives,price)
        values (106,"Delhi","Kolkata",3400,"12:15:35","14:20:00",7000);

insert into Aircraft(aid,aname,cruisingrange)
        values (101,"747",3000),
                        (102,"Boeing",900),
```

```
                (103,"647",800),
                (104,"Dreamliner",10000),
        (105,"Boeing",3500),
        (106,"707",1500),
        (107,"Dream",12000);

insert into Employees(eid,ename,salary)
        values (701,'A',50000),
                (702,'B',100000),
        (703,'C',150000),
        (704,'D',90000),
        (705,'E',40000),
        (706,'F',60000),
        (707,'G',90000);

insert into Certified(eid,aid)
        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);
```

-- 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
747
Dreamliner
Dream
Boeing

-- 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

-- 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 from_loc = "Bangalore" and to_loc = "Frankfurt");

	ename
▶	A
	E

-- 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 ;

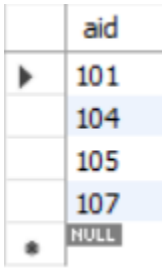
	aname	cruisingrange	avg(e.salary)
▶	747	3000	75000.0000
	Dreamliner	10000	113333.3333
	707	1500	50000.0000
	Dream	12000	113333.3333

-- 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

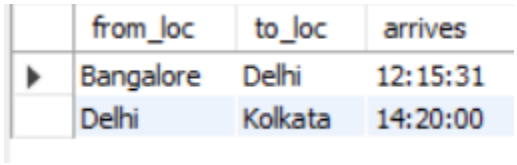
-- Find the aids of all aircraft that can be used on routes from Bengaluru to New Delhi.

```
select a.aid from aircraft a where a.cruisingrange >= (select distance from Flights where
from_loc = "Bangalore" and to_loc = "Delhi");
```



aid
101
104
105
107
NULL

```
-- A customer wants to travel from bangalore to kolkata with no more than two changes of flight
-- List the choice of departure times customer wants to arrive by 6 p.m.
select f.from_loc,f.to_loc,f.arrives from Flights f
where (f.from_loc = "Bangalore" and f.to_loc = (select from_loc from Flights where to_loc =
"Kolkata")) or f.to_loc = "Kolkata";
```



from_loc	to_loc	arrives
Bangalore	Delhi	12:15:31
Delhi	Kolkata	14:20:00