

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)

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.

```
create database airline;
```

```
use airline;
```

```
create table aircraft (aid int ,aname varchar(15),cruisingrange int,constraint primary key (aid));
```

```
create table employees(eid int ,ename varchar(30),salary int,constraint e_eid primary key(eid));
```

```
create table certified(eid int ,aid int,constraint c_eid foreign key (eid) references employees(eid) on delete cascade on update cascade,constraint c_aid foreign key (aid) references aircraft (aid) on delete cascade on update cascade);
```

```
create table flights(flno int,pfrom varchar(30),pto varchar(30),distance int ,departs
time,arrives time,price int,constraint f_air primary key(flno),constraint ff_air foreign key
(flno) references aircraft(aid) on delete cascade on update cascade );
```

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 where
c.eid in (select e.eid from employees e where e.salary>80000));
```

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.

```
select c.eid,a.cruisingrange from certified c,aircraft a where c.aid =a.aid and (select
count(ca.aid) from certified ca where ca.eid=c.eid)>3 order by a.cruisingrange desc limit
1;
```

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

```
select em.ename from employees em where em.eid in( select e.eid from employees e
where e.salary<(select min(f.price) from flights f where f.pfrom='Bangalore' and
f.pto='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.

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

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

```
select distinct(e.ename) from employees e where e.eid in (select c.eid from certified c
where c.eid=e.eid and c.aid in (select a.aid from aircraft a where a.aname='Boeing'));
```

vi. 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 f.distance from flights f
where pfrom='Bangalore' and f.pto='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.

```
select f1.departs from flights f1, flights f2 where f1.pfrom='Madison' and f2.pto='New York' and f2.arrives<'18:00':
```