

## BBM471 DATABASE MANAGEMENT SYSTEMS

### Homework 3

1. Consider the given schema of a sample database.

Worker(WORKER\_ID, FIRST\_NAME, LAST\_NAME, SALARY, JOINING\_DATE, DEPARTMENT)

a) Write an SQL query to fetch the count of employees working in the department 'Admin'.

```
SELECT COUNT(*) FROM worker WHERE DEPARTMENT = 'Admin';
```

b) Write an SQL query to fetch the list of employees with the same salary.

```
Select distinct W.WORKER_ID, W.FIRST_NAME, W.Salary
from Worker W, Worker W1
where W.Salary = W1.Salary
and W.WORKER_ID != W1.WORKER_ID;
```

c) Write an SQL query to show the second highest salary from a table.

```
Select max(Salary) from Worker
where Salary not in (Select max(Salary) from Worker);
```

d) Write an SQL query to fetch the departments that have less than five people in it.

```
SELECT DEPARTMENT, COUNT(WORKER_ID) as 'Number of Workers' FROM Worker GROUP
BY DEPARTMENT HAVING COUNT(WORKER_ID) < 5
```

e) Write an SQL query to fetch the names of workers who earn the highest salary.

```
SELECT FIRST_NAME, SALARY from Worker WHERE SALARY=(SELECT max(SALARY) from
Worker);
```

2. Consider the following relations containing airline flight information:

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

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 (otherwise, he or she would not qualify as a pilot), and only pilots are certified to fly. Write the following queries in relational algebra

a) Find the eids of pilots certified for some Boeing aircraft.,

$$\pi_{eid}(\sigma_{aname='Boeing'}(Aircraft \bowtie Certified))$$

b) Find the eids of employees who make the highest salary.

$$\rho(E1, Employees)$$
$$\rho(E2, Employees)$$
$$\rho(E3, \pi_{E2.eid}(E1 \bowtie_{E1.salary > E2.salary} E2))$$
$$(\pi_{eid} E1) - E3$$