

Lab 5 : Dipesh Singh – 190905520

DDL:

```
create table employee(  
    fname varchar(20),  
    minit varchar(1),  
    lname varchar(20),  
    bdate varchar(20),  
    address varchar(50),  
    ssn number(20),  
    sex char(1),  
    supervisor number(20),  
    salary number(10),  
    dept_no number(20),  
    primary key(ssn)  
);
```

```
--  
insert into employee  
values(  
    'Dipesh',  
    'S',  
    'Chauhan',  
    '14-01-2002',  
    'Winterfell',  
    190905520,  
    'M',  
    190900000,  
    100000,  
    11111111  
);
```

```
insert into employee  
values(  
    'Hemangi',  
    'J',  
    'Jain',  
    '28-06-2001',  
    'Winterfell',  
    190905486,  
    'F',  
    190905520,  
    40000,  
    11111111  
);
```

```
insert into employee  
values(  
    'Shreya',  
    'F',  
    'Srikrishna',  
    '14-01-2002',  
    'Winterfell',  
    190905520,  
    'F',  
    190900000,  
    100000,  
    11111111  
);
```

```
        '29-06-2000',
        'King''s Landing',
        180905154,
        'F',
        190905520,
        25000,
        11111111
    );
insert into employee
values(
    'Ayush',
    'F',
    'Goyal',
    '01-01-2000',
    'King''s Landing',
    190905522,
    'M',
    180905154,
    10000,
    11111111
);
insert into employee
values(
    'Ina',
    'G',
    'Goel',
    '17-06-2000',
    'Dorne',
    190911224,
    'F',
    190900000,
    200000,
    22222222
);
insert into employee
values(
    'Kaushikee',
    'D',
    'Agnihotri',
    '02-09-2000',
    'Dorne',
    190907160,
    'F',
    190911224,
    30000,
    22222222
);
insert into employee
```

```
values(
    'Parikalp',
    'A',
    'Singh',
    '01-01-2000',
    'Arryn',
    190905356,
    'M',
    190907160,
    6000,
    22222222
);
insert into employee
values(
    'Naman',
    'I',
    'Goel',
    '01-01-2001',
    'Arryn',
    190905521,
    'M',
    190911224,
    20000,
    22222222
);
insert into employee
values(
    'Abheesht',
    'R',
    'Roy',
    '11-10-2000',
    'Winterfell',
    190911066,
    'M',
    190900000,
    400000,
    33333333
);
insert into employee
values(
    'Vedant',
    'R',
    'Das',
    '01-01-1999',
    'Winterfell',
    190905160,
    'M',
    190911066,
```

```

        20000,
        33333333
    );
insert into employee
values(
    'Nishika',
    'N',
    'Agarwal',
    '01-01-2002',
    'Arryn',
    190905523,
    'F',
    190911066,
    30000,
    33333333
);
insert into employee
values(
    'Pritima',
    'C',
    'Singh',
    '28-03-1976',
    'Winterfell',
    190900000,
    'F',
    190900000,
    900000,
    11111111
);
--
alter table employee
add foreign key (supervisor) references employee(ssn);
--
create table department(
    name varchar(20),
    dept_no number(20),
    emp_count number(10),
    manager number(20),
    start_date varchar(20),
    primary key(dept_no),
    foreign key(manager) references employee(ssn)
);
--
insert into department
values(
    'Web Development',
    11111111,
    5,

```

```

        190905520,
        '02-06-2021'
    );
insert into department
values(
    'CyberSecurity',
    22222222,
    4,
    190911224,
    '02-04-2021'
);
insert into department
values(
    'Machine Learning',
    33333333,
    3,
    190911066,
    '24-03-2021'
);
--
alter table employee
add foreign key (dept_no) references department(dept_no);
--
create table locations(
    dept_no number(20),
    area varchar(20),
    primary key (dept_no, area),
    foreign key (dept_no) references department(dept_no)
);
--
insert into locations
values(11111111, 'Winterfell');
insert into locations
values(11111111, 'King''s Landing');
insert into locations
values(22222222, 'Dorne');
insert into locations
values(22222222, 'Arryn');
insert into locations
values(33333333, 'Wintefell');
insert into locations
values(33333333, 'Arryn');
--
create table dependents(
    ssn number(20),
    name varchar(20),
    sex char(1),
    bdate varchar(20),

```

```

        relationship varchar(20),
        primary key (ssn, name),
        foreign key (ssn) references employee(ssn)
    );
--
insert into dependents
values(
    190905520,
    'Pritima',
    'F',
    '28-03-1976',
    'Mother'
);
insert into dependents
values(
    190905520,
    'Harshita',
    'F',
    '18-09-2002',
    'Sister'
);
--
create table projects(
    dept_no number(20),
    location varchar(20),
    name varchar(20),
    project_code number(20),
    primary key(project_code),
    foreign key(dept_no) references department(dept_no)
);
--
insert into projects
values(11111111, 'Winterfell', 'Web Scraper', 123456);
insert into projects
values(11111111, 'King's Landing', 'Forms', 1234567);
insert into projects
values(22222222, 'Winterfell', 'Password Hashing', 123);
insert into projects
values(33333333, 'Winterfell', 'DCGANS', 1234);
--
create table works(
    ssn number(20),
    project_code number(20),
    hours number(10),
    primary key(ssn, project_code),
    foreign key(ssn) references employee(ssn),
    foreign key(project_code) references projects(project_code)
);

```

```
--
insert into works
values(190905520, 123456, 12);
insert into works
values(190905520, 1234567, 30);
insert into works
values(180905154, 123456, 24);
insert into works
values(190905486, 1234567, 56);
insert into works
values(190911224, 123, 105);
insert into works
values(190905521, 123, 30);
insert into works
values(190911066, 1234, 300);
insert into works
values(190905523, 1234, 41);
--
```

Question 1 : Retrieve the birth date and address of the employee(s) whose name is 'John B. Smith'. Retrieve the name and address of all employees who work for the 'Research' department.

```
select bdate,
       address
from employee
where fname = 'Dipesh'
       and minit = 'S'
       and lname = 'Chauhan';
select fname,
       minit,
       lname,
       address
from employee
     natural join department
where name = 'Web Development';
```

Question 2 : For every project located in 'Stanford', list the project number, the controlling department number, and the department manager's last name, address, and birth date.

```
select project_code,
       p.dept_no,
       lname,
       address,
       bdate
from employee e,
(
```

```

        select *
        from projects
            inner join department using(dept_no)
        where location = 'Winterfell'
    ) p
where manager = ssn;

```

Question 3 : Find all distinct salaries of employees.

```

select distinct salary
from employee;

```

Question 4 : For each employee, retrieve the employee's first and last name and the first and last name of his or her immediate supervisor.

```

select a.fname,
       a.lname,
       b.fname,
       b.lname
from employee a,
     employee b
where a.supervisor = b.ssn;

```

Question 5 : Make a list of all project numbers for projects that involve an employee whose last name is 'Smith', either as a worker or as a manager of the department that controls the project.

```

select distinct project_code
from projects
where project_code in (
    select project_code
    from works
        natural join employee
    where lname = 'Chauhan'
)
or project_code in (
    select project_code
    from projects
        inner join (
            select d.dept_no,
                   lname
            from department d,
                 employee e
            where manager = ssn
        ) using(dept_no)
    where lname = 'Chauhan'
);

```


Question 6 : Retrieve all employees who reside is in Houston, Texas.

```
select *
from employee
where address = 'Arryn';
```

Question 7 : Show the resulting salaries if every employee working on the 'ProductX' project is given a 10 percent raise.

```
select fname,
       lname,
       salary * 1.01
from employee e,
     works w,
     projects p
where e.ssn = w.ssn
     and w.project_code = p.project_code
     and p.name = 'Web Scraper';
```

Question 8 : Retrieve all employees in department 5 whosesalary is between 30,000 and 40,000.

```
select *
from employee
where dept_no = 11111111
     and salary >= 30000
     and salary <= 40000;
```

Question 9 : Retrieve a list of employees and the projects they are working on, ordered by department and, within each department, ordered alphabetically by last name, then first name.

```
select fname,
       lname,
       project_code,
       dept_no
from employee
     natural join works
order by dept_no,
       lname,
       fname;
```

Question 10 : Retrieve the names of all employees who do not have supervisors.

```
select *
from employee
where supervisor is null;
```

Question 11 : Retrieve the name of each employee who has a dependent with the same first name and is the same sex as the employee.

```
select fname,  
       lname  
from employee e  
      inner join dependents d using(ssn)  
where fname = name  
      and d.sex = e.sex;
```

Question 12 : Retrieve the names of employees who have no dependents.

```
select fname,  
       lname  
from employee  
      left outer join dependents using(ssn)  
where name is null;
```

Question 13 : List the names of managers who have at least one dependent.

```
select distinct fname,  
       lname  
from (   
      select *  
      from employee,  
           department  
      where manager = ssn  
    )  
  left outer join dependents d using(ssn)  
where d.name is not null;
```

Question 14 : Retrieve the Social Security numbers of all employees who work on project numbers 1, 2, or 3.

```
select ssn  
from works  
where project_code = 123  
      or project_code = 1234  
      or project_code = 123456;
```

Question 15 : Find the sum of the salaries of all employees, the maximum salary, the minimum salary, and the average salary.

```
select max(salary) as maximum,  
       min(salary) as minimum,  
       avg(salary) as average,  
       sum(salary) as summation  
from employee;
```

Question 16 : Find the sum of the salaries of all employees of the 'Research' department, as well as the maximum salary, the minimum salary, and the average salary in this department.

```
select max(salary),
       min(salary),
       avg(salary),
       sum(salary)
from (
    select *
    from employee
        inner join department using(dept_no)
)
group by name
having name = 'Web Development';
```

Question 17 : For each project, retrieve the project number, the project name, and the number of employees who work on that project.

```
with suum(project_code, no_of_emp) as (
    select project_code,
           count(*)
    from works
    group by project_code
)
select project_code,
       name,
       no_of_emp
from suum
    inner join projects using(project_code);
```

Question 18 : For each project on which more than two employees work, retrieve the project number, the project name, and the number of employees who work on the project.

```
with suum(project_code, no_of_emp) as (
    select project_code,
           count(*)
    from works
    group by project_code
)
select project_code,
       name,
       no_of_emp
from suum
    inner join projects using(project_code)
where no_of_emp > 2;
```

Question 19 : For each department that has more than five employees, retrieve the department number and the number of its employees who are making more than 40,000.

```
with one(dept_no, no) as (  
    select dept_no,  
           count(*)  
    from employee  
    group by dept_no  
) ,  
two(dept_no, no) as (  
    select dept_no,  
           count(*)  
    from employee  
    where salary > 40000  
    group by dept_no  
)  
select a.dept_no,  
       b.no  
from one a,  
      two b  
where a.dept_no = b.dept_no  
      and a.no > 5;
```