Submitted to

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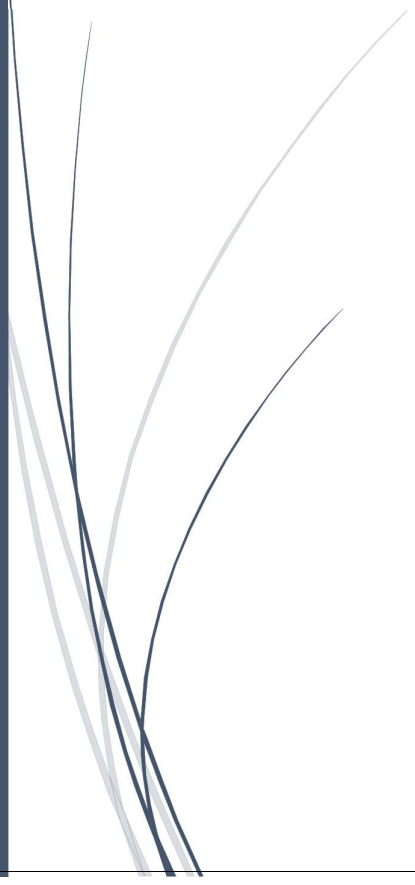
SQL Case Studies

Adv. Database Management Systems



CASE STUDY-1

1. Write a query to retrieve the details of all employees working in the Company.

```
Select *
From employee;
```

```
+----------+-------+---------+-----------+-----------+--------------------------+-
-----+----------+------------+-----+
| Fname    | Minit | Lname   | Ssn       | Bdate      | Address                  |
Sex  | Salary   | Super_ssn  | Dno |
+----------+-------+---------+-----------+-----------+--------------------------+-
-----+----------+------------+-----+
| John     | B     | Smith   | 123456789 | 1955-01-09 | 731 Fondren, Houston, TX |
M    | 30000.00 | 987654321  |   5 |
| Franklin | T     | Wong    | 333445555 | 1945-12-08 | 638 Voss, Houston, TX    |
M    | 40000.00 | 888665555  |   5 |
| Joyce    | A     | English | 453453453 | 1962-12-31 | 5631 Rice, Houston, TX   |
F    | 25000.00 | 333445555  |   5 |
| Ramesh   | K     | Narayan | 666884444 | 1952-09-15 | Fire Oak, Humble, TX     |
M    | 38000.00 | 333445555  |   5 |
| James    | E     | Borg    | 888665555 | 1927-11-10 | Stone, Houston, TX       |
M    | 55000.00 | NULL       |   1 |
| Jennifer | S     | Wallace | 987654321 | 1931-06-20 | Berry, Bellaire, TX      |
F    | 43000.00 | 888665555  |   4 |
| Ahmad    | V     | Jabbar  | 987987987 | 1959-03-29 | Dallas, Houston, TX      |
M    | 25000.00 | 98765432-1 |   4 |
| Alicia   | J     | Zelaya  | 999887777 | 1958-06-19 | Castle, SPring, TX       |
F    | 25000.00 | 987654321  |   4 |
+----------+-------+---------+-----------+-----------+--------------------------+-
-----+----------+------------+-----+
```

2. Write a query to retrieve the names and salaries of all employees.

```
Select Fname, Lname
from employee;
```

```
+----------+---------+
| Fname    | Lname   |
+----------+---------+
| John     | Smith   |
| Franklin | Wong    |
| Joyce    | English |
| Ramesh   | Narayan |
| James    | Borg    |
| Jennifer | Wallace |
| Ahmad    | Jabbar  |
| Alicia   | Zelaya  |
+----------+---------+
```

3. Write a query to retrieve distinct salary values.

```
Select distinct salary
from employee;
```

```
+----------+
| salary   |
+----------+
| 30000.00 |
```

```
| 40000.00 |
| 25000.00 |
| 38000.00 |
| 55000.00 |
| 43000.00 |
+----------+
```

4. Write a query to show resulting salaries if every employee working in department 5 is given a 10 percent raise.

```
Select fname, lname, 1.1*salary as Salary
from employee;
```

```
+----------+---------+-----------+
| fname    | lname   | Salary    |
+----------+---------+-----------+
| John     | Smith   | 33000.000 |
| Franklin | Wong    | 44000.000 |
| Joyce    | English | 27500.000 |
| Ramesh   | Narayan | 41800.000 |
| James    | Borg    | 60500.000 |
| Jennifer | Wallace | 47300.000 |
| Ahmad    | Jabbar  | 27500.000 |
| Alicia   | Zelaya  | 27500.000 |
+----------+---------+-----------+
```

5. Write a query to retrieve birth date and address of the employee(s) whose name is 'John B Smith'.

```
Select Bdate, address
from employee
where fname='John' and minit='B' and lname='Smith';
```

```
+------------+--------------------------+
| Bdate      | address                  |
+------------+--------------------------+
| 1955-01-09 | 731 Fondren, Houston, TX |
+------------+--------------------------+
```

6. Write a query to retrieve all employees whose address is in Houston, Texas.

```
Select fname, lname, address
from employee
where address like '%Houston, TX%';
```

```
+----------+---------+--------------------------+
| fname    | lname   | address                  |
+----------+---------+--------------------------+
| John     | Smith   | 731 Fondren, Houston, TX |
| Franklin | Wong    | 638 Voss, Houston, TX    |
| Joyce    | English | 5631 Rice, Houston, TX   |
| James    | Borg    | Stone, Houston, TX       |
| Ahmad    | Jabbar  | Dallas, Houston, TX      |
+----------+---------+--------------------------+
```

7. Write a query to retrieve all employees who were born during the 1950s.

```
Select fname, lname, bdate
from employee
where bdate between '1950-01-01' and '1959-12-31';
```

```
+--------+---------+------------+
```

```
| fname  | lname   | bdate      |
+--------+---------+------------+
| John   | Smith   | 1955-01-09 |
| Ramesh | Narayan | 1952-09-15 |
| Ahmad  | Jabbar  | 1959-03-29 |
| Alicia | Zelaya  | 1958-06-19 |
+--------+---------+------------+
```

8. Write a query to retrieve all employees whose salary is between $30,000 and $40,000.

```
Select fname, minit, lname, salary
from employee
where salary between 30000 and 40000;
```

```
+----------+-------+---------+----------+
| fname    | minit | lname   | salary   |
+----------+-------+---------+----------+
| John     | B     | Smith   | 30000.00 |
| Franklin | T     | Wong    | 40000.00 |
| Ramesh   | K     | Narayan | 38000.00 |
+----------+-------+---------+----------+
```

9. Write a query to retrieve names and salaries of employees in the descending order of their salaries

```
Select fname, minit, lname, salary
from employee
order by salary desc;
```

```
+----------+-------+---------+----------+
| fname    | minit | lname   | salary   |
+----------+-------+---------+----------+
| James    | E     | Borg    | 55000.00 |
| Jennifer | S     | Wallace | 43000.00 |
| Franklin | T     | Wong    | 40000.00 |
| Ramesh   | K     | Narayan | 38000.00 |
| John     | B     | Smith   | 30000.00 |
| Joyce    | A     | English | 25000.00 |
| Ahmad    | V     | Jabbar  | 25000.00 |
| Alicia   | J     | Zelaya  | 25000.00 |
+----------+-------+---------+----------+
```

10. Write a query to retrieve the names of all employees who do not have supervisors.

```
Select fname,minit,lname
from employee
where super_ssn is null;
```

```
+-------+-------+-------+
| fname | minit | lname |
+-------+-------+-------+
| James | E     | Borg  |
+-------+-------+-------+
```

CASE STUDY-2

1. Write a query to retrieve list of employees and the projects they are working on, ordered by department and within each department, ordered alphabetically by last name, first name.

```
select fname,Minit,lname,Pname
from employee,DEPARTMENT,WORKS_ON,PROJECT
where dno=dnumber and ssn=essn and pno=Pnumber
order by Dname,fname,lname;
```

```
+----------+-------+---------+-----------------+
| fname    | Minit | lname   | Pname           |
+----------+-------+---------+-----------------+
| Ahmad    | V     | Jabbar  | Computerization |
| Ahmad    | V     | Jabbar  | Newbenefits     |
| Alicia   | J     | Zelaya  | Computerization |
| Alicia   | J     | Zelaya  | Newbenefits     |
| Jennifer | S     | Wallace | Reorganization  |
| Jennifer | S     | Wallace | Newbenefits     |
| James    | E     | Borg    | Reorganization  |
| Franklin | T     | Wong    | producty        |
| Franklin | T     | Wong    | productz        |
| Franklin | T     | Wong    | Computerization |
| Franklin | T     | Wong    | Reorganization  |
| John     | B     | Smith   | productx        |
| John     | B     | Smith   | producty        |
| Joyce    | A     | English | productx        |
| Joyce    | A     | English | producty        |
| Ramesh   | K     | Narayan | productz        |
+----------+-------+---------+-----------------+
```

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

```
select pnumber,Dnum,lname,Address,Bdate
from project,DEPARTMENT,employee
where Plocation='Stafford' and dnum=Dnumber and Mgr_ssn=ssn;
```

```
+---------+------+---------+---------------------+------------+
| pnumber | Dnum | lname   | Address             | Bdate      |
+---------+------+---------+---------------------+------------+
|      10 |    4 | Wallace | Berry, Bellaire, TX | 1931-06-20 |
|      30 |    4 | Wallace | Berry, Bellaire, TX | 1931-06-20 |
+---------+------+---------+---------------------+------------+
```

3. Without using a nested query, retrieve the names of employees who have no dependents.

```
SELECT fname,lname
FROM employee, DEPENDENT
WHERE ssn=essn and fname=Dependent_name;
```

```
Empty set
```

4. Find the sum of the salaries of all employees, the maximum salary, the minimum salary and the average salary.

```
select sum(salary) as Total_Salary,max(salary)as max_salary,min(salary) as
min_salary,avg(salary) as avg_salary
from employee;
```

```
+--------------+------------+------------+--------------+
| Total_Salary | max_salary | min_salary | avg_salary   |
+--------------+------------+------------+--------------+
|    281000.00 |   55000.00 |   25000.00 | 35125.000000 |
```

```
+-------------+-----------+-----------+-------------+
```

5. Find the sum of the salaries of all employees, the maximum salary, the minimum salary and the average salary of all employees of the 'Research' department.

```
select sum(salary) as Total_Salary,max(salary)as max_salary,min(salary) as
min_salary,avg(salary) as avg_salary
from employee,DEPARTMENT where Dno=Dnumber and Dname='research';
```

```
+-------------+-----------+-----------+-------------+
| Total_Salary | max_salary | min_salary | avg_salary   |
+-------------+-----------+-----------+-------------+
|    133000.00 |   40000.00 |   25000.00 | 33250.000000 |
+-------------+-----------+-----------+-------------+
```

6. Count the number of employees working in the 'Research' department.

```
select count(*) as count
from employee, DEPARTMENT
where dno=Dnumber and Dname='research';
```

```
+----------+
|  count   |
+----------+
|        4 |
+----------+
```

7. For each department, retrieve the department number, the number of employees in the department and their average salary.

```
select dno,count(*),avg(salary) as Avg_Salary
from employee
group by dno;
```

```
+-----+----------+-------------+
| dno | count(*) | Avg_Salary   |
+-----+----------+-------------+
|   1 |        1 | 55000.000000 |
|   4 |        3 | 31000.000000 |
|   5 |        4 | 33250.000000 |
+-----+----------+-------------+
```

8. For each project, retrieve the project number, Project name and the number of employees who work on that project.

```
select pno,pname,count(*)
from works_on,project
where pno=pnumber
group by pno,pname;
```

```
+-----+----------------+----------+
| pno | pname          | count(*) |
+-----+----------------+----------+
|  10 | Computerization |        3 |
|  30 | Newbenefits     |        3 |
|   1 | productx        |        2 |
|   2 | producty        |        3 |
|   3 | productz        |        2 |
|  20 | Reorganization  |        3 |
+-----+----------------+----------+
```

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

```
select pno,pname
from works_on,project
where pno=pnumber
group by pno,pname having count(*)>2;
```

```
+-----+-----------------+
| pno | pname           |
+-----+-----------------+
|  10 | Computerization |
|  30 | Newbenefits     |
|   2 | producty        |
|  20 | Reorganization  |
+-----+-----------------+
```

10. For each project, retrieve the project number, Project name and the number of employees from department 5 who work on the project.

```
select pno,pname,count(*)
from works_on,project,employee
where dno=5 and pno=pnumber and ssn=essn
group by pno,pname;
```

```
+-----+-----------------+----------+
| pno | pname           | count(*) |
+-----+-----------------+----------+
|   1 | productx        |        2 |
|   2 | producty        |        3 |
|   3 | productz        |        2 |
|  10 | Computerization |        1 |
|  20 | Reorganization  |        1 |
+-----+-----------------+----------+
```

CASE STUDY-3

1. Write a query to retrieve name and address of all employee names who work for the 'RESEARCH' department.

```
select e.fname,e.address
from employee e,department d
where e.dno=d.dnumber and dname like'RESEARCH';
```

```
+----------+--------------------------+
| fname    | address                  |
+----------+--------------------------+
| John     | 731 Fondren, Houston, TX |
| Franklin | 638 Voss, Houston, TX    |
| Joyce    | 5631 Rice, Houston, TX   |
| Ramesh   | Fire Oak, Humble, TX     |
+----------+--------------------------+
```

2. Write a query to retrieve employees first and last name and first and last name of his/her immediate supervisor .

```
select e.fname,e.lname,s.fname,s.lname
```

```
from employee e,employee s
where e.ssn=s.super_ssn;
```

```
+----------+---------+----------+---------+
| fname    | lname   | fname    | lname   |
+----------+---------+----------+---------+
| Jennifer | Wallace | John     | Smith   |
| James    | Borg    | Franklin | Wong    |
| Franklin | Wong    | Joyce    | English |
| Franklin | Wong    | Ramesh   | Narayan |
| James    | Borg    | Jennifer | Wallace |
| Jennifer | Wallace | Alicia   | Zelaya  |
+----------+---------+----------+---------+
```

3. Write a query to show resulting salaries if every employee working on the product x project is given a 10% raise.

```
select e.salary+e.salary*0.01 as Bonus_with_salary
from employee e,project p
where e.dno=p.dnum and pname like'productx';
```

```
+-------------------+
| Bonus_with_salary |
+-------------------+
|        30300.0000 |
|        40400.0000 |
|        25250.0000 |
|        38380.0000 |
+-------------------+
```

4. Write a query to retrieve list of employees and the project they are working on, ordered by dept and within each dept, ordered alphabetically by last name and first name

```
select e.fname,e.minit,e.lname,d.dname,p.pname
from employee e,department d,works_on w,project p
where e.dno=d.dnumber and e.ssn=w.essn and w.pno=p.pnumber
order by d.dname,e.fname,e.lname;
```

```
+----------+-------+---------+----------------+-----------------+
| fname    | minit | lname   | dname          | pname           |
+----------+-------+---------+----------------+-----------------+
| Ahmad    | V     | Jabbar  | Administration | Computerization |
| Ahmad    | V     | Jabbar  | Administration | Newbenefits     |
| Alicia   | J     | Zelaya  | Administration | Computerization |
| Alicia   | J     | Zelaya  | Administration | Newbenefits     |
| Jennifer | S     | Wallace | Administration | Reorganization  |
| Jennifer | S     | Wallace | Administration | Newbenefits     |
| James    | E     | Borg    | Headquarters   | Reorganization  |
| Franklin | T     | Wong    | Research       | producty        |
| Franklin | T     | Wong    | Research       | productz        |
| Franklin | T     | Wong    | Research       | Computerization |
| Franklin | T     | Wong    | Research       | Reorganization  |
| John     | B     | Smith   | Research       | productx        |
| John     | B     | Smith   | Research       | producty        |
| Joyce    | A     | English | Research       | productx        |
| Joyce    | A     | English | Research       | producty        |
| Ramesh   | K     | Narayan | Research       | productz        |
+----------+-------+---------+----------------+-----------------+
```

5. For every project located in the 'stafford',list the project number, the controlling dept number and the dept managers last name,birthdate.

```
select pnumber,dnum,lname,address,bdate
from project,department,employee
where plocation='Stafford'and dnum=dnumber and mgr_ssn=ssn;
```

```
+---------+------+---------+---------------------+------------+
| pnumber | dnum | lname   | address             | bdate      |
+---------+------+---------+---------------------+------------+
|      10 |    4 | Wallace | Berry, Bellaire, TX | 1931-06-20 |
|      30 |    4 | Wallace | Berry, Bellaire, TX | 1931-06-20 |
+---------+------+---------+---------------------+------------+
```

6. To display the fname,minit,lname,mgr start date who is joined as manager in the first quarter of 1995.

```
select e.fname,e.lname,e.minit,e.ssn,d.mgr_start_date
from employee e,department d
where e.ssn=d.mgr_ssn and mgr_start_date between'01-jan-1995'and'31-mar-1995';
```

```
Empty set
```

7. Write a query to retrieve the details of the department which contains only one location displaying its number, name and location.

```
select d.dnumber,d.dname
from department d,dept_locations dl
where d.dnumber=dl.dnumber
group by d.dnumber,d.dname
having count(dlocation)<=1;
```

```
+---------+----------------+
| dnumber | dname          |
+---------+----------------+
|       1 | Headquarters   |
|       4 | Administration |
+---------+----------------+
```

8. Display the department number and name which do not contains ant employees using join.

```
select d.dnumber,d.dname
from employee e,department d
where e.dno=d.dnumber and ssn is null;
```

```
Empty set
```

9. Write a query to display the fname,lname,ssn rename as manager Ssn of all the employees who are controlling the dept.

```
select e.fname,e.lname,e.ssn"manager_ssn"
from employee e,department d
where e.ssn=d.mgr_ssn;
```

```
+----------+---------+-------------+
| fname    | lname   | manager_ssn |
+----------+---------+-------------+
| John     | Smith   | 123456789   |
| Franklin | Wong    | 333445555   |
| James    | Borg    | 888665555   |
| Jennifer | Wallace | 987654321   |
+----------+---------+-------------+
```

10. Write a query to retrieve the names of all employees who have two or more dependents.

```
select e.fname,count(*) no_of_dependents
from employee e,dependent d
where e.ssn=d.essn
group by e.fname
having count(*)>=2
order by e.fname;
```

```
+----------+------------------+
| fname    | no_of_dependents |
+----------+------------------+
| Franklin |                3 |
| John     |                3 |
+----------+------------------+
```

CASE STUDY-4

1. write a query to retrieve the names of all employees whose salary is greater than the maximum salary of all the employees in department 5.

```
select fname,dno,salary
from employee
where salary>(select max(salary)
      from employee
      where dno=5);
```

```
+----------+-----+----------+
| fname    | dno | salary   |
+----------+-----+----------+
| James    |   1 | 55000.00 |
| Jennifer |   4 | 43000.00 |
+----------+-----+----------+
```

2. write a query to retrieve the name of each employee who has a dependent with the same first name and same sex as the employee.

```
select e.fname,e.sex
from employee e
where ssn in(select essn
      from dependent d
      where e.fname=d.dependent_name and e.sex=d.sex);
```

```
Empty set
```

3. write a query to retrieve the name of employees who have no dependents.

```
select fname
from employee e
where not exists(select *
      from dependent d
      where e.ssn=d.essn);
```

```
+--------+
```

```
| fname  |
+--------+
| Joyce  |
| Ramesh |
| James  |
| Ahmad  |
| Alicia |
+--------+
```

4. write a query to list the names of managers who have at least one dependent.

```
select fname,ssn
from employee
where ssn in(select mgr_ssn
      from department
      where mgr_ssn=ssn);
```

```
+----------+-----------+
| fname    | ssn       |
+----------+-----------+
| John     | 123456789 |
| Franklin | 333445555 |
| James    | 888665555 |
| Jennifer | 987654321 |
+----------+-----------+
```

5. for each department that has more than or equal to 3 employees, retrieve the department number and the number of its employees who are making more than or equal to 30000.

```
select d.dnumber,count(*) as no_of_employees
from employee e,department d
where d.dnumber=e.dno and salary>=30000 and dno in(select dno
      from employee
      group by dno having count(*)>=3);
```

```
+---------+-----------------+
| dnumber | no_of_employees |
+---------+-----------------+
|       5 |               4 |
+---------+-----------------+
```

6. Display employee fname,lname,salary who earns a salary greater than the average salary of their departments.

```
select fname,lname,salary
from employee e
where salary=(select avg(salary)
      from employee e1
      where e.dno=e1.dno);
```

```
+-------+-------+----------+
| fname | lname | salary   |
+-------+-------+----------+
| James | Borg  | 55000.00 |
+-------+-------+----------+
```

7(a). Write a query to display the details of top three earners.

```
select fname,ssn,salary,dno
from employee e
where 3>(select count(*)
```

```
from employee e1
where e.salary<e1.salary);
```

```
+----------+-----------+----------+-----+
| fname    | ssn       | salary   | dno |
+----------+-----------+----------+-----+
| Franklin | 333445555 | 40000.00 |   5 |
| James    | 888665555 | 55000.00 |   1 |
| Jennifer | 987654321 | 43000.00 |   4 |
+----------+-----------+----------+-----+
```

7(b).Write a query to display the least three earners.

```
select fname,ssn,salary,dno
from employee e
      where 3<(select count(*)
      from employee e1 where e.salary<e1.salary);
```

```
+--------+-----------+----------+-----+
| fname  | ssn       | salary   | dno |
+--------+-----------+----------+-----+
| John   | 123456789 | 30000.00 |   5 |
| Joyce  | 453453453 | 25000.00 |   5 |
| Ahmad  | 987987987 | 25000.00 |   4 |
| Alicia | 999887777 | 25000.00 |   4 |
+--------+-----------+----------+-----+
```

8. find all employees first name, department name and department number whose department name is not in department table.

```
select fname,lname,dname,dno
from employee e,department d
where e.dno=d.dnumber and d.dnumber not in(select d.dnumber
                                from department);
```

```
Empty set
```

9. find the first names of all employees who earn lowest salary in each department.

```
select fname,salary,dno
from employee e
where salary=(select min(salary)
      from employee e1
      where e.dno=e1.dno);
```

```
+--------+----------+-----+
| fname  | salary   | dno |
+--------+----------+-----+
| Joyce  | 25000.00 |   5 |
| James  | 55000.00 |   1 |
| Ahmad  | 25000.00 |   4 |
| Alicia | 25000.00 |   4 |
+--------+----------+-----+
```

10. display all departments which have the average salary more than average salary of department.

```
select dno,avg(salary)
from employee
group by dno
having avg(salary)=(select max(avg(salary))
      from employee
      group by dno);
```

11. List all departments where there are no employees.

```
select dnumber,dname
from department
where dnumber not in(select
      distinct dnumber
      from employee);
```

```
Empty set
```

12. Display the ssn,fname,and salary who earns the lowest salary in their corresponding departments.

```
select ssn,fname,salary,dno
from employee
where salary in(select
      min(salary)
      from employee
      group by dno);
```

```
+-----------+--------+----------+-----+
| ssn       | fname  | salary   | dno |
+-----------+--------+----------+-----+
| 453453453 | Joyce  | 25000.00 |   5 |
| 888665555 | James  | 55000.00 |   1 |
| 987987987 | Ahmad  | 25000.00 |   4 |
| 999887777 | Alicia | 25000.00 |   4 |
+-----------+--------+----------+-----+
```

13. Display the list of all employees who are not supervisors(use not exists).

```
select fname
from employee e
where not exists(select super_ssn
      from employee e1
      where e.ssn=e1.super_ssn);
```

```
+--------+
| fname  |
+--------+
| John   |
| Joyce  |
| Ramesh |
| Ahmad  |
| Alicia |
+--------+
```

14. Display the list of all employees who have at least one person reporting to them(use exists)

```
select fname,ssn
from employee e
where exists(select ssn
      from employee e1
      where e.ssn=e1.super_ssn);
```

```
+----------+-----------+
| fname    | ssn       |
+----------+-----------+
| Franklin | 333445555 |
| James    | 888665555 |
| Jennifer | 987654321 |
```

```
+----------+-----------+
```

15. Display the project no and number of employees working on that project having highest number of employees.

```
select pno,count(*)
from works_on
group by pno
having count(*)=(select
      max(count(*))
      from works_on
      group by pno);
```