EXPERIMENT 5

```
CREATE TABLE DEPARTMENT (
   Dnumber INT PRIMARY KEY,
   Dname VARCHAR(50)
);
CREATE TABLE EMPLOYEE (
   Ssn INT PRIMARY KEY,
   Fname VARCHAR(50),
   Lname VARCHAR(50),
   Salary DECIMAL(10,2),
   Dno INT,
   FOREIGN KEY (Dno) REFERENCES DEPARTMENT(Dnumber)
);
CREATE TABLE PROJECT (
   Pnumber INT PRIMARY KEY,
   Pname VARCHAR(50)
);
CREATE TABLE WORKS_ON (
   Essn INT,
   Pno INT,
   FOREIGN KEY (Essn) REFERENCES EMPLOYEE(Ssn),
   FOREIGN KEY (Pno) REFERENCES PROJECT(Pnumber)
);
```

Here's the step-by-step code for each of the SQL queries you provided:

1. For each department, retrieve the department number and the number of employees in the department.

```
SELECT Dno, COUNT(*)
FROM EMPLOYEE
GROUP BY Dno;
```

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

```
SELECT Dname, COUNT(Ssn), AVG(Salary)
FROM EMPLOYEE
JOIN DEPARTMENT ON Dno = Dnumber
GROUP BY Dname;
```

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

```
SELECT Pnumber, Pname, COUNT(Essn)
FROM PROJECT
JOIN WORKS_ON ON Pnumber = Pno
GROUP BY Pnumber, Pname;
```

4. 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.

```
SELECT Pnumber, Pname, COUNT(Essn)
FROM PROJECT
JOIN WORKS_ON ON Pnumber = Pno
GROUP BY Pnumber, Pname
HAVING COUNT(Essn) > 2;
```

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

```
SELECT Pnumber, Pname, COUNT(Essn)
FROM PROJECT
JOIN WORKS_ON ON Pnumber = Pno
WHERE Dnum = 5
GROUP BY Pnumber, Pname;
```

6. For each department that has more than two employees, retrieve the department number and the number of its employees who are making more than $40,000.

```
SELECT Dno, COUNT(Ssn)
FROM EMPLOYEE
WHERE Salary > 40000
GROUP BY Dno
HAVING COUNT(Ssn) > 2;
```

7. For each department that has more than two employees, retrieve the department number, department name, and the number of its employees who are making more than $40,000.

```
SELECT Dno, Dname, COUNT(Ssn)
FROM EMPLOYEE
JOIN DEPARTMENT ON Dno = Dnumber
WHERE Salary > 40000
GROUP BY Dno, Dname
HAVING COUNT(Ssn) > 2;
```

8. List the total salary paid to employees in each department, but only for departments with a total salary greater than $100,000.

```
SELECT Dname, SUM(Salary) AS total_salary
FROM DEPARTMENT
JOIN EMPLOYEE ON Dnumber = Dno
GROUP BY Dname
HAVING total_salary > 100000;
```

9. List all employees' names and salaries in the Research department, ordered by their last name.

```
SELECT Lname, Dname, Salary
FROM EMPLOYEE
JOIN DEPARTMENT ON Dno = Dnumber
WHERE Dname = 'Research'
ORDER BY Lname;
```

10. Select all staff members SSN, Fname, DepartmentName, Salary in ascending order by their Department, then by their salary in descending order.

```
SELECT Ssn, Fname, Dname, Salary
FROM EMPLOYEE
JOIN DEPARTMENT ON Dno = Dnumber
ORDER BY Dname ASC, Salary DESC;
```

11. What is the name of the department with the highest department number?

```
SELECT Dname
FROM DEPARTMENT
ORDER BY Dnumber DESC
LIMIT 1;
```

12. 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 D.Dname, E.Lname, E.Fname, P.Pname
FROM DEPARTMENT D
JOIN EMPLOYEE E ON D.Dnumber = E.Dno
JOIN WORKS_ON W ON E.Ssn = W.Essn
JOIN PROJECT P ON W.Pno = P.Pnumber
ORDER BY D.Dname, E.Lname, E.Fname;
```

```
-- Insert random data into the DEPARTMENT table
INSERT INTO DEPARTMENT (Dnumber, Dname) VALUES
(1, 'HR'),
(2, 'Finance'),
(3, 'Marketing'),
(4, 'Research'),
(5, 'Development');
INSERT INTO EMPLOYEE (Ssn, Fname, Lname, Salary, Dno) VALUES
(1001, 'John', 'Doe', 50000.00, 1),
(1002, 'Jane', 'Smith', 60000.00, 1),
(1003, 'Michael', 'Johnson', 55000.00, 2),
(1004, 'Emily', 'Brown', 65000.00, 2),
(1005, 'David', 'Davis', 70000.00, 3),
(1006, 'Sarah', 'Miller', 75000.00, 3),
(1007, 'James', 'Wilson', 60000.00, 4),
(1008, 'Jennifer', 'Anderson', 65000.00, 4),
(1009, 'Robert', 'Taylor', 55000.00, 5),
(1010, 'Mary', 'Thomas', 60000.00, 5);
INSERT INTO PROJECT (Pnumber, Pname) VALUES
(1, 'Project A'),
(2, 'Project B'),
(3, 'Project C'),
(4, 'Project D'),
(5, 'Project E');
INSERT INTO WORKS_ON (Essn, Pno) VALUES
(1001, 1),
```

(1002, 1),
(1003, 2),
(1004, 2),
(1005, 3),
(1006, 3),
(1007, 4),
(1008, 4),
(1009, 5),
(1010, 5);