EXPERIMENT- 7

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Title: Use of Inbuilt functions and relational algebra operation

Objective: To understand the use of inbuilt function and relational algebra with sql query.

Write and execute the following queries using the Relational Algebra on the COMPANY database schema.

```
mysql> SHOW TABLES;
+--------------------+
| Tables_in_company1 |
+--------------------+
| department         |
| dependent          |
| dept_locations     |
| employee           |
| project            |
| works_on           |
+--------------------+
6 rows in set (0.00 sec)

mysql> SELECT * FROM DEPARTMENT;
+----------------+---------+-----------+-----------------+
| Dname          | Dnumber | Mgr_ssn   | Mgr_start_date  |
+----------------+---------+-----------+-----------------+
| Headquarters   |       1 | 888665555 | 1981-06-19      |
| Administration |       4 | 987654321 | 1995-01-01      |
| Research       |       5 | 333445555 | 1988-05-22      |
+----------------+---------+-----------+-----------------+
3 rows in set (0.00 sec)
```

```
mysql> SELECT * FROM DEPENDENT;
+-----------+----------------+------+------------+--------------+
| Essn      | Dependent_name | Sex  | Bdate      | Relationship |
+-----------+----------------+------+------------+--------------+
| 123456789 | Alice          | F    | 1988-12-30 | Daughter     |
| 123456789 | Elizabeth      | F    | 1967-05-05 | Spouse       |
| 123456789 | Michael        | M    | 1988-01-04 | Son          |
| 333445555 | Alice          | F    | 1986-04-04 | Daughter     |
| 333445555 | Joy            | F    | 1958-05-03 | Spouse       |
| 333445555 | Theodore       | M    | 1983-10-25 | Son          |
| 987654321 | Abner          | M    | 1942-02-28 | Spouse       |
+-----------+----------------+------+------------+--------------+
7 rows in set (0.00 sec)

mysql> SELECT * FROM DEPT_LOCATION;
ERROR 1146 (42S02): Table 'company1.dept_location' doesn't exist
mysql> SELECT * FROM DEPT_LOCATIONS;
+---------+-----------+
| Dnumber | Dlocation |
+---------+-----------+
|       1 | Houston   |
|       4 | Stafford  |
|       5 | Bellaire  |
|       5 | Houston   |
|       5 | Sugarland |
+---------+-----------+
5 rows in set (0.00 sec)
```

```
mysql> SELECT * FROM WORKS_ON;
+-----------+-----+-------+
| Essn      | Pno | Hours |
+-----------+-----+-------+
| 123456789 |   1 |  32.5 |
| 123456789 |   2 |   7.5 |
| 666884444 |   3 |  40.0 |
| 453453453 |   1 |  20.0 |
| 453453453 |   2 |  20.0 |
| 333445555 |   2 |  10.0 |
| 333445555 |   3 |  10.0 |
| 333445555 |  10 |  10.0 |
| 333445555 |  20 |  10.0 |
| 999887777 |  30 |  30.0 |
| 999887777 |  10 |  10.0 |
| 987987987 |  10 |  35.0 |
| 987987987 |  30 |   5.0 |
| 987654321 |  30 |  20.0 |
| 987654321 |  20 |  15.0 |
+-----------+-----+-------+
15 rows in set (0.00 sec)
```

1. Retrieve the names of all employees in department 5 who work more than 10 hours per week on the ‘ProductX’ project.

```
mysql> SELECT E.Fname, E.Lname
    -> FROM Employee E
    -> JOIN Works_On W ON E.Ssn = W.Essn
    -> JOIN Project P ON W.Pno = P.Pnumber
    -> WHERE E.Dno = 5 AND W.Hours > 10 AND P.Pname = 'ProductX';
+-------+---------+
| Fname | Lname   |
+-------+---------+
| John  | Smith   |
| Joyce | English |
+-------+---------+
2 rows in set (0.00 sec)
```

2. Retrieve the names of employees who work on every project

```
mysql> SELECT E.Fname, E.Lname
    -> FROM Employee E
    -> JOIN Works_On W ON E.Ssn = W.Essn
    -> JOIN Project P ON W.Pno = P.Pnumber
    -> WHERE E.Dno = 5 AND W.Hours > 10 AND P.Pname = 'ProductX';
+-------+---------+
| Fname | Lname   |
+-------+---------+
| John  | Smith   |
| Joyce | English |
+-------+---------+
2 rows in set (0.00 sec)
```

3. List the names of all employees who have a dependent with the same first name as themselves.

```
mysql> SELECT E.Fname, E.Lname
    -> FROM Employee E
    -> JOIN Dependent D ON E.Ssn = D.Essn
    -> WHERE E.Fname = D.Dependent_name;
Empty set (0.00 sec)
```

4. Find the names of employees who are directly supervised by 'Franklin Wong'.

```
mysql> SELECT E.Fname, E.Lname
    -> FROM Employee E
    -> JOIN Employee S ON E.Super_ssn = S.Ssn
    -> WHERE S.Fname = 'Franklin' AND S.Lname = 'Wong';
+--------+---------+
| Fname  | Lname   |
+--------+---------+
| John   | Smith   |
| Joyce  | English |
| Ramesh | Narayan |
+--------+---------+
3 rows in set (0.00 sec)
```

5. Retrieve the names of employees who do not work on any project.

```
mysql> SELECT E.Fname, E.Lname
    -> FROM Employee E
    -> LEFT JOIN Works_On W ON E.Ssn = W.Essn
    -> WHERE W.Essn IS NULL;
+-------+-------+
| Fname | Lname |
+-------+-------+
| James | Borg  |
+-------+-------+
1 row in set (0.00 sec)
```

6. Retrieve the names and addresses of all employees who work on at least one project located in Houston but whose department has no location in Houston.
7. Retrieve the last names of all department managers who have no dependents.

```
mysql> SELECT E.Lname
    -> FROM Employee E
    -> JOIN Department D ON E.Ssn = D.Mgr_ssn
    -> LEFT JOIN Dependent Dep ON E.Ssn = Dep.Essn
    -> WHERE Dep.Essn IS NULL;
+-------+
| Lname |
+-------+
| Borg  |
+-------+
1 row in set (0.00 sec)
```

```
mysql> SELECT E.Fname, E.Lname, E.Address
    -> FROM Employee E
    -> JOIN Works_On W ON E.Ssn = W.Essn
    -> JOIN Project P ON W.Pno = P.Pnumber
    -> JOIN Dept_Locations DL ON E.Dno = DL.Dnumber
    -> WHERE P.Plocation = 'Houston'
    -> AND E.Dno NOT IN (
    ->     SELECT DL2.Dnumber
    ->     FROM Dept_Locations DL2
    ->     WHERE DL2.Dlocation = 'Houston'
    -> );
+----------+---------+-----------------------+
| Fname    | Lname   | Address               |
+----------+---------+-----------------------+
| Jennifer | Wallace | 291 Berry, Bellaire TX |
+----------+---------+-----------------------+
1 row in set (0.00 sec)
```