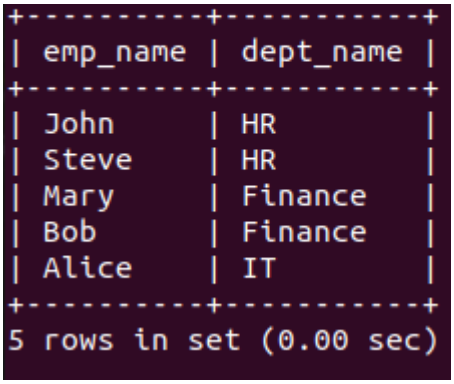
DATABASE INITIALIZATION

```
-- DROP DATABASE employee_db;

CREATE DATABASE employee_db;
USE employee_db;

-- Create Departments table
CREATE TABLE Departments (
    dept_id INT PRIMARY KEY,
    dept_name VARCHAR(255) NOT NULL
);

-- Insert data into Departments table
INSERT INTO Departments (dept_id, dept_name) VALUES
(101, 'HR'),
(102, 'Finance'),
(103, 'IT');


-- Create Employee table
CREATE TABLE Employee (
    emp_id INT PRIMARY KEY AUTO_INCREMENT,
    emp_name VARCHAR(255) NOT NULL,
    dept_id INT,
    FOREIGN KEY (dept_id) REFERENCES Departments(dept_id)
);

-- Insert data into Employee table
INSERT INTO Employee (emp_name, dept_id) VALUES
('John', 101),
('Mary', 102),
('Steve', 101),
('Alice', 103),
('Bob', 102);


-- Create Projects table
CREATE TABLE Projects (
    project_id INT PRIMARY KEY,
    project_name VARCHAR(255) NOT NULL,
    dept_id INT,
    FOREIGN KEY (dept_id) REFERENCES Departments(dept_id)
);

-- Insert data into Projects table
INSERT INTO Projects (project_id, project_name, dept_id) VALUES
(201, 'Website', 101),
(202, 'Mobile App', 101),
(203, 'Accounting', 102),
(204, 'Networking', 103);
```

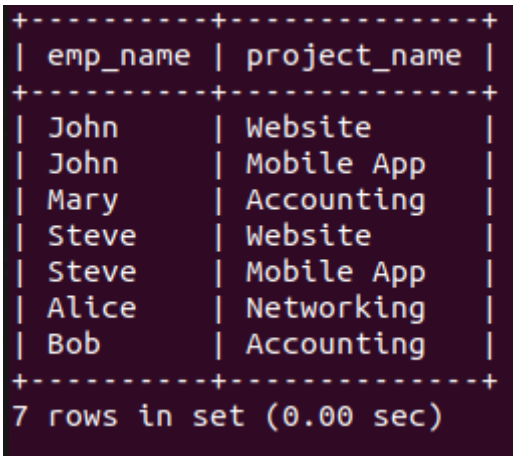
SOLUTIONS

1.
SELECT empTable.emp_name, deptTable.dept_name
FROM Employee empTable
INNER JOIN Departments deptTable ON empTable.dept_id = deptTable.dept_id;



```
+----------+-----------+
| emp_name | dept_name |
+----------+-----------+
| John     | HR        |
| Steve    | HR        |
| Mary     | Finance   |
| Bob      | Finance   |
| Alice    | IT        |
+----------+-----------+
5 rows in set (0.00 sec)
```

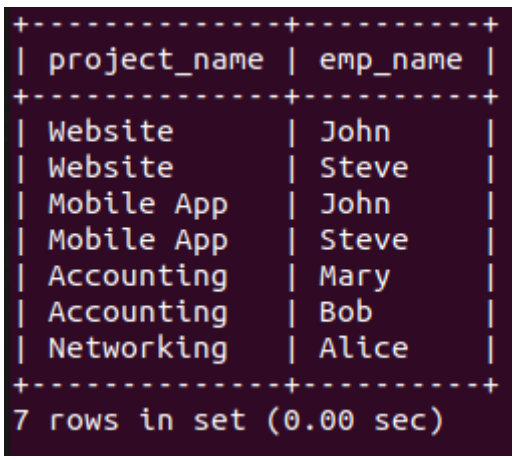
2.
SELECT empTable.emp_name, proj.project_name
FROM Employee empTable
LEFT JOIN Projects proj ON empTable.dept_id = proj.dept_id;



```
+----------+--------------+
| emp_name | project_name |
+----------+--------------+
| John     | Website      |
| John     | Mobile App   |
| Mary     | Accounting   |
| Steve    | Website      |
| Steve    | Mobile App   |
| Alice    | Networking   |
| Bob      | Accounting   |
+----------+--------------+
7 rows in set (0.00 sec)
```

3.
SELECT proj.project_name, empTable.emp_name
FROM Projects proj
LEFT JOIN Employee empTable ON proj.dept_id = empTable.dept_id;

4.

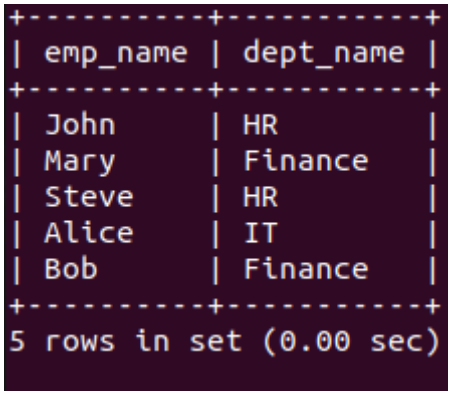


```
+--------------+----------+
| project_name | emp_name |
+--------------+----------+
| Website      | John     |
| Website      | Steve    |
| Mobile App   | John     |
| Mobile App   | Steve    |
| Accounting   | Mary     |
| Accounting   | Bob      |
| Networking   | Alice    |
+--------------+----------+
7 rows in set (0.00 sec)
```

SELECT empTable.emp_name, deptTable.dept_name
FROM Employee empTable
FULL OUTER JOIN Departments deptTable ON empTable.dept_id = deptTable.dept_id;

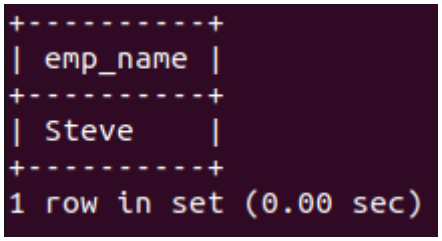
OR

SELECT empTable.emp_name, deptTable.dept_name
FROM Employee empTable
LEFT JOIN Departments deptTable ON empTable.dept_id = deptTable.dept_id
UNION
SELECT empTable.emp_name, deptTable.dept_name
FROM Employee empTable
RIGHT JOIN Departments deptTable ON empTable.dept_id = deptTable.dept_id;



```
+----------+-----------+
| emp_name | dept_name |
+----------+-----------+
| John     | HR        |
| Mary     | Finance   |
| Steve    | HR        |
| Alice    | IT        |
| Bob      | Finance   |
+----------+-----------+
5 rows in set (0.00 sec)
```

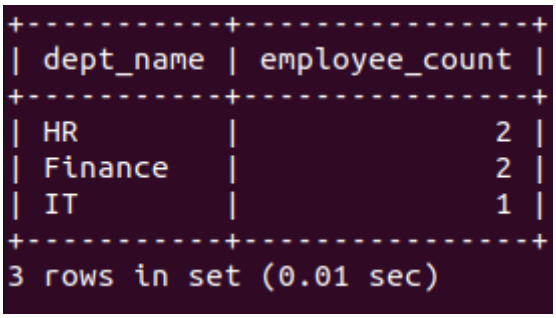
5.
SELECT emp2Table.emp_name
FROM Employee emp1Table
JOIN Employee emp2Table ON emp1Table.dept_id = emp2Table.dept_id
WHERE emp1Table.emp_name = 'John' AND emp2Table.emp_name != 'John';



```
+----------+
| emp_name |
+----------+
| Steve    |
+----------+
1 row in set (0.00 sec)
```

6.
SELECT deptTable.dept_name, COUNT(empTable.emp_id) as employee_count
FROM Departments deptTable
LEFT JOIN Employee empTable ON deptTable.dept_id = empTable.dept_id
GROUP BY deptTable.dept_name;

7.



```
+-----------+----------------+
| dept_name | employee_count |
+-----------+----------------+
| HR        |              2 |
| Finance   |              2 |
| IT        |              1 |
+-----------+----------------+
3 rows in set (0.01 sec)
```

```
SELECT deptTable.dept_name, COUNT(empTable.emp_id) as emp_count
FROM Employee empTable
RIGHT JOIN Departments deptTable ON empTable.dept_id = deptTable.dept_id
GROUP BY deptTable.dept_name;
```

```
+-----------+-----------+
| dept_name | emp_count |
+-----------+-----------+
| HR        |         2 |
| Finance   |         2 |
| IT        |         1 |
+-----------+-----------+
3 rows in set (0.00 sec)
```

8.

```
SELECT DISTINCT empTable.emp_name
FROM Employee empTable
JOIN Departments deptTable ON empTable.dept_id = deptTable.dept_id
JOIN Projects proj ON deptTable.dept_id = proj.dept_id
WHERE deptTable.dept_name = 'HR';
```

```
+----------+
| emp_name |
+----------+
| John     |
| Steve    |
+----------+
2 rows in set (0.00 sec)
```

9.

```
SELECT empTable.emp_name, deptTable.dept_name
FROM Employee empTable
JOIN Departments deptTable ON empTable.dept_id = deptTable.dept_id
WHERE empTable.emp_name LIKE 'S%';
```

```
+----------+-----------+
| emp_name | dept_name |
+----------+-----------+
| Steve    | HR        |
+----------+-----------+
1 row in set (0.00 sec)
```

10.

SELECT empTable.emp_name, deptTable.dept_name, proj.project_name
FROM Employee empTable
JOIN Departments deptTable ON empTable.dept_id = deptTable.dept_id
JOIN Projects proj ON deptTable.dept_id = proj.dept_id;

```
+----------+-----------+--------------+
| emp_name | dept_name | project_name |
+----------+-----------+--------------+
| John     | HR        | Website      |
| Steve    | HR        | Website      |
| John     | HR        | Mobile App   |
| Steve    | HR        | Mobile App   |
| Mary     | Finance   | Accounting   |
| Bob      | Finance   | Accounting   |
| Alice    | IT        | Networking   |
+----------+-----------+--------------+
7 rows in set (0.00 sec)
```

11.
SELECT DISTINCT deptTable.dept_name
FROM Departments deptTable
JOIN Employee empTable ON deptTable.dept_id = empTable.dept_id;

```
+-----------+
| dept_name |
+-----------+
| HR        |
| Finance   |
| IT        |
+-----------+
3 rows in set (0.00 sec)
```

12.
SELECT emp2Table.emp_name
FROM Employee emp1Table
JOIN Employee emp2Table ON emp1Table.dept_id = emp2Table.dept_id
WHERE emp1Table.emp_name = 'Steve';

```
+----------+
| emp_name |
+----------+
| John     |
| Steve    |
+----------+
2 rows in set (0.00 sec)
```

13.

```
SELECT empTable.emp_name
FROM Employee empTable
LEFT JOIN Projects proj ON empTable.dept_id = proj.dept_id
WHERE proj.project_id IS NULL;
```

```
Empty set (0.00 sec)
```

14.

```
SELECT DISTINCT empTable.emp_name
FROM Employee empTable
WHERE empTable.emp_id NOT IN (
    SELECT emp2Table.emp_id
    FROM Employee emp2Table
    JOIN Departments deptTable ON emp2Table.dept_id = deptTable.dept_id
    JOIN Projects proj ON deptTable.dept_id = proj.dept_id
    WHERE deptTable.dept_name = 'HR'
);
```

```
+----------+
| emp_name |
+----------+
| Mary     |
| Alice    |
| Bob      |
+----------+
3 rows in set (0.00 sec)
```

15.

```
SELECT DISTINCT deptTable.dept_name
FROM Departments deptTable
JOIN Employee empTable ON deptTable.dept_id = empTable.dept_id;
```

```
+-----------+
| dept_name |
+-----------+
| HR        |
| Finance   |
| IT        |
+-----------+
3 rows in set (0.00 sec)
```

16.

SELECT empTable.emp_name, deptTable.dept_name
FROM Employee empTable
JOIN Departments deptTable ON empTable.dept_id = deptTable.dept_id
ORDER BY deptTable.dept_name, empTable.emp_name;

```
+----------+-----------+
| emp_name | dept_name |
+----------+-----------+
| Bob      | Finance   |
| Mary     | Finance   |
| John     | HR        |
| Steve    | HR        |
| Alice    | IT        |
+----------+-----------+
5 rows in set (0.00 sec)
```

17.
SELECT empTable.emp_name, projTable.project_name
FROM Employee empTable
CROSS JOIN Projects projTable;

```
+----------+--------------+
| emp_name | project_name |
+----------+--------------+
| John     | Networking   |
| John     | Accounting   |
| John     | Mobile App   |
| John     | Website      |
| Mary     | Networking   |
| Mary     | Accounting   |
| Mary     | Mobile App   |
| Mary     | Website      |
| Steve    | Networking   |
| Steve    | Accounting   |
| Steve    | Mobile App   |
| Steve    | Website      |
| Alice    | Networking   |
| Alice    | Accounting   |
| Alice    | Mobile App   |
| Alice    | Website      |
| Bob      | Networking   |
| Bob      | Accounting   |
| Bob      | Mobile App   |
| Bob      | Website      |
+----------+--------------+
20 rows in set (0.00 sec)
```

18.

SELECT deptTable.dept_name, COUNT(empTable.emp_id) as emp_count
FROM Departments deptTable
JOIN Employee empTable ON deptTable.dept_id = empTable.dept_id
GROUP BY deptTable.dept_name
HAVING COUNT(empTable.emp_id) > 1;

```
+-----------+-----------+
| dept_name | emp_count |
+-----------+-----------+
| HR        |         2 |
| Finance   |         2 |
+-----------+-----------+
2 rows in set (0.00 sec)
```

19.
SELECT empTable2.emp_name
FROM Employee empTable1
JOIN Employee empTable2 ON empTable1.dept_id = empTable2.dept_id
WHERE empTable1.emp_name = 'Alice' AND empTable2.emp_name != 'Alice';

```
Empty set (0.00 sec)
```

20.
SELECT empTable.emp_name, deptTable.dept_name
FROM Employee empTable
JOIN Departments deptTable ON empTable.dept_id = deptTable.dept_id
WHERE deptTable.dept_id BETWEEN 101 AND 102;

```
+----------+-----------+
| emp_name | dept_name |
+----------+-----------+
| John     | HR        |
| Steve    | HR        |
| Mary     | Finance   |
| Bob      | Finance   |
+----------+-----------+
4 rows in set (0.00 sec)
```