PRACTICE QUESTIONS – DBMS

1. Create a Database with the name "university" and create all the required tables and insert data in to them.

Consider the following requirements list:

• The university has many Departments.

• The Departments offer one or more programs.

• A program is made up of one or more courses.

• A student must enroll in a program.

• A student takes the courses that are part of her program.

• A program has a name, a program identifier, department id, the total credit points required to graduate, and the year it commenced.

• A course has a name, a course identifier, program id, a credit point value, and the year it commenced. • Students have name, a surname, a student identifier, a date of birth, and the year they first enrolled. • When a student takes a course, the year and semester he attempted it are recorded. When he finishes the course, a grade (such as A or B) and a mark (such as 60 percent) are recorded. • Each course in a program is sequenced into a year (for example, year 1) and a semester (for example, semester 1).

```
mysql> CREATE DATABASE university;
Query OK, 1 row affected (0.02 sec)

mysql> USE university;
Database changed
mysql>
mysql> CREATE TABLE Departments (
    ->     department_id INT AUTO_INCREMENT PRIMARY KEY,
    ->     department_name VARCHAR(25) NOT NULL
    -> );
Query OK, 0 rows affected (0.07 sec)

mysql> DESCRIBE Departments;
+-----------------+-------------+------+-----+---------+----------------+
| Field           | Type        | Null | Key | Default | Extra          |
+-----------------+-------------+------+-----+---------+----------------+
| department_id   | int         | NO   | PRI | NULL    | auto_increment |
| department_name | varchar(25) | NO   |     | NULL    |                |
+-----------------+-------------+------+-----+---------+----------------+
2 rows in set (0.00 sec)

mysql> INSERT INTO Departments (department_name) VALUES
    ->     ('Science'),
    ->     ('Engineering'),
    ->     ('Arts');
Query OK, 3 rows affected (0.02 sec)
Records: 3  Duplicates: 0  Warnings: 0

mysql> SELECT * FROM Departments;
+---------------+-----------------+
| department_id | department_name |
+---------------+-----------------+
|             1 | Science         |
|             2 | Engineering     |
|             3 | Arts            |
+---------------+-----------------+
3 rows in set (0.00 sec)

mysql> CREATE TABLE Programs (
    ->     program_id INT AUTO_INCREMENT PRIMARY KEY,
    ->     program_name VARCHAR(30) NOT NULL,
    ->     department_id INT,
    ->     total_credit_points_required INT,
    ->     year_commenced INT,
    ->     FOREIGN KEY (department_id) REFERENCES Departments(department_id)
    -> );
Query OK, 0 rows affected (0.08 sec)
```

```
mysql> DESCRIBE PROGRAMS;
+------------------------------+-------------+------+-----+---------+----------------+
| Field                        | Type        | Null | Key | Default | Extra          |
+------------------------------+-------------+------+-----+---------+----------------+
| program_id                   | int         | NO   | PRI | NULL    | auto_increment |
| program_name                 | varchar(30) | NO   |     | NULL    |                |
| department_id                | int         | YES  | MUL | NULL    |                |
| total_credit_points_required | int         | YES  |     | NULL    |                |
| year_commenced               | int         | YES  |     | NULL    |                |
+------------------------------+-------------+------+-----+---------+----------------+
5 rows in set (0.00 sec)

mysql> INSERT INTO Programs (program_name, department_id, total_credit_points_required, year_commenced) VALUES
    ->     ('Bachelor of Science', 1, 120, 2019),
    ->     ('Bachelor of Engineering', 2, 150, 2018),
    ->     ('Bachelor of Arts', 3, 90, 2020);
Query OK, 3 rows affected (0.02 sec)
Records: 3  Duplicates: 0  Warnings: 0

mysql> SELECT * FROM Programs;
+------------+------------------------+---------------+------------------------------+----------------+
| program_id | program_name           | department_id | total_credit_points_required | year_commenced |
+------------+------------------------+---------------+------------------------------+----------------+
|          1 | Bachelor of Science    |             1 |                          120 |           2019 |
|          2 | Bachelor of Engineering |             2 |                          150 |           2018 |
|          3 | Bachelor of Arts       |             3 |                           90 |           2020 |
+------------+------------------------+---------------+------------------------------+----------------+
3 rows in set (0.00 sec)

mysql> CREATE TABLE Courses (
    ->     course_id INT AUTO_INCREMENT PRIMARY KEY,
    ->     course_name VARCHAR(30) NOT NULL,
    ->     program_id INT,
    ->     credit_point_value INT,
    ->     year_commenced INT,
    ->     FOREIGN KEY (program_id) REFERENCES Programs(program_id)
    -> );
Query OK, 0 rows affected (0.10 sec)

mysql> DESCRIBE courses;
+--------------------+-------------+------+-----+---------+----------------+
| Field              | Type        | Null | Key | Default | Extra          |
+--------------------+-------------+------+-----+---------+----------------+
| course_id          | int         | NO   | PRI | NULL    | auto_increment |
| course_name        | varchar(30) | NO   |     | NULL    |                |
| program_id         | int         | YES  | MUL | NULL    |                |
| credit_point_value | int         | YES  |     | NULL    |                |
| year_commenced     | int         | YES  |     | NULL    |                |
+--------------------+-------------+------+-----+---------+----------------+
5 rows in set (0.00 sec)
```

```
mysql> DESCRIBE courses;
+--------------------+-------------+------+-----+---------+----------
| Field              | Type        | Null | Key | Default | Extra
+--------------------+-------------+------+-----+---------+----------
| course_id          | int         | NO   | PRI | NULL    | auto_incre
| course_name        | varchar(30) | NO   |     | NULL    |
| program_id         | int         | YES  | MUL | NULL    |
| credit_point_value | int         | YES  |     | NULL    |
| year_commenced     | int         | YES  |     | NULL    |
+--------------------+-------------+------+-----+---------+----------
5 rows in set (0.00 sec)

mysql> INSERT INTO Courses (course_name, program_id, credit_point_valu
    ->     ('Mathematics', 1, 5, 2019),
    ->     ('Physics', 1, 5, 2019),
    ->     ('Computer Science', 2, 4, 2018),
    ->     ('Electrical Engineering', 2, 4, 2018),
    ->     ('History', 3, 3, 2020),
    ->     ('Literature', 3, 3, 2020);
Query OK, 6 rows affected (0.01 sec)
Records: 6  Duplicates: 0  Warnings: 0

mysql> SELECT * FROM Courses;
+-----------+-----------------------+------------+-------------------
| course_id | course_name           | program_id | credit_point_value
+-----------+-----------------------+------------+-------------------
|         1 | Mathematics           |          1 |                 5
|         2 | Physics               |          1 |                 5
|         3 | Computer Science      |          2 |                 4
|         4 | Electrical Engineering |          2 |                 4
|         5 | History               |          3 |                 3
|         6 | Literature            |          3 |                 3
+-----------+-----------------------+------------+-------------------
6 rows in set (0.00 sec)

mysql> CREATE TABLE Students (
    ->     student_id INT AUTO_INCREMENT PRIMARY KEY,
    ->     first_name VARCHAR(30) NOT NULL,
    ->     last_name VARCHAR(25) NOT NULL,
    ->     date_of_birth DATE,
    ->     year_enrolled INT
    -> );
Query OK, 0 rows affected (0.09 sec)

mysql> DESCRIBE Students;
+---------------+-------------+------+-----+---------+----------------
| Field         | Type        | Null | Key | Default | Extra
+---------------+-------------+------+-----+---------+----------------
| student_id    | int         | NO   | PRI | NULL    | auto_increment
| first_name    | varchar(30) | NO   |     | NULL    |
| last_name     | varchar(25) | NO   |     | NULL    |
| date_of_birth | date        | YES  |     | NULL    |
| year_enrolled | int         | YES  |     | NULL    |
+---------------+-------------+------+-----+---------+----------------
```

```
mysql> DESCRIBE Students;
+---------------+-------------+------+-----+---------+----------------+
| Field         | Type        | Null | Key | Default | Extra          |
+---------------+-------------+------+-----+---------+----------------+
| student_id    | int         | NO   | PRI | NULL    | auto_increment |
| first_name    | varchar(30) | NO   |     | NULL    |                |
| last_name     | varchar(25) | NO   |     | NULL    |                |
| date_of_birth | date        | YES  |     | NULL    |                |
| year_enrolled | int         | YES  |     | NULL    |                |
+---------------+-------------+------+-----+---------+----------------+
5 rows in set (0.00 sec)

mysql> INSERT INTO Students ( first_name, last_name, date_of_birth, year_enrolled)
    -> VALUES
    ->     ('Nisha', 'Elizabeth', '1992-02-15', 2018),
    ->     ('Alice', 'Koshy', '2000-03-20', 2019),
    ->     ('Emi', 'Johnson', '2001-07-10', 2020),
    -> ('Mathew', 'Luke', '2000-03-20', 2020),
    ->  ('Alice', 'Koshy', '2001-08-25', 2018),
    -> ('Anu', 'Mariam', '2000-03-20', 2018);
Query OK, 6 rows affected (0.02 sec)
Records: 6  Duplicates: 0  Warnings: 0

mysql> SELECT * FROM Students;
+------------+------------+-----------+---------------+---------------+
| student_id | first_name | last_name | date_of_birth | year_enrolled |
+------------+------------+-----------+---------------+---------------+
|          1 | Nisha      | Elizabeth | 1992-02-15    |          2018 |
|          2 | Alice      | Koshy     | 2000-03-20    |          2019 |
|          3 | Emi        | Johnson   | 2001-07-10    |          2020 |
|          4 | Mathew     | Luke      | 2000-03-20    |          2020 |
|          5 | Alice      | Koshy     | 2001-08-25    |          2018 |
|          6 | Anu        | Mariam    | 2000-03-20    |          2018 |
+------------+------------+-----------+---------------+---------------+
6 rows in set (0.00 sec)

mysql> CREATE TABLE Enrollments (
    ->     enrollment_id INT AUTO_INCREMENT PRIMARY KEY,
    ->     student_id INT,
    ->     program_id INT,
    ->     FOREIGN KEY (student_id) REFERENCES Students(student_id),
    ->     FOREIGN KEY (program_id) REFERENCES Programs(program_id)
    -> );
Query OK, 0 rows affected (0.10 sec)

mysql> DESCRIBE Enrollments;
+---------------+------+------+-----+---------+----------------+
| Field         | Type | Null | Key | Default | Extra          |
+---------------+------+------+-----+---------+----------------+
| enrollment_id | int  | NO   | PRI | NULL    | auto_increment |
| student_id    | int  | YES  | MUL | NULL    |                |
| program_id    | int  | YES  | MUL | NULL    |                |
+---------------+------+------+-----+---------+----------------+
3 rows in set (0.00 sec)
```

```
mysql> DESCRIBE Enrollments;
+---------------+------+------+-----+---------+----------------+
| Field         | Type | Null | Key | Default | Extra          |
+---------------+------+------+-----+---------+----------------+
| enrollment_id | int  | NO   | PRI | NULL    | auto_increment |
| student_id    | int  | YES  | MUL | NULL    |                |
| program_id    | int  | YES  | MUL | NULL    |                |
+---------------+------+------+-----+---------+----------------+
3 rows in set (0.00 sec)

mysql> INSERT INTO Enrollments (student_id, program_id)
    -> VALUES
    ->     (1, 1),
    ->     (2, 2),
    ->     (3, 1);
Query OK, 3 rows affected (0.02 sec)
Records: 3  Duplicates: 0  Warnings: 0

mysql> SELECT * FROM Enrollments;
+---------------+------------+------------+
| enrollment_id | student_id | program_id |
+---------------+------------+------------+
|             1 |          1 |          1 |
|             2 |          2 |          2 |
|             3 |          3 |          1 |
+---------------+------------+------------+
3 rows in set (0.00 sec)

mysql> CREATE TABLE CourseRegistrations (
    ->     registration_id INT AUTO_INCREMENT PRIMARY KEY,
    ->     student_id INT,
    ->     course_id INT,
    ->     year_attempted INT,
    ->     semester_attempted INT,
    ->     grade VARCHAR(2),
    ->     mark DECIMAL(5, 2),
    ->     FOREIGN KEY (student_id) REFERENCES Students(student_id),
    ->     FOREIGN KEY (course_id) REFERENCES Courses(course_id)
    -> );
Query OK, 0 rows affected (0.09 sec)

mysql> DESCRIBE CourseRegistrations;
+--------------------+--------------+------+-----+---------+----------------+
| Field              | Type         | Null | Key | Default | Extra          |
+--------------------+--------------+------+-----+---------+----------------+
| registration_id    | int          | NO   | PRI | NULL    | auto_increment |
| student_id         | int          | YES  | MUL | NULL    |                |
| course_id          | int          | YES  | MUL | NULL    |                |
| year_attempted     | int          | YES  |     | NULL    |                |
| semester_attempted | int          | YES  |     | NULL    |                |
| grade              | varchar(2)   | YES  |     | NULL    |                |
| mark               | decimal(5,2) | YES  |     | NULL    |                |
+--------------------+--------------+------+-----+---------+----------------+
7 rows in set (0.00 sec)
```

```
mysql> INSERT INTO CourseRegistrations (student_id, course_id, year_attempted, semester_attempted, grade, mark)
    -> VALUES
    ->     (1, 1, 2023, 1, 'A+', 90.5),
    ->     (2, 6, 2023, 2, 'B+', 78.0),
    ->     (3, 3, 2023, 1, 'A', 88.0),
    ->     (4, 5, 2023, 2, 'A+', 92.5),
    ->     (5, 4, 2023, 1, 'A', 81.5),
    ->     (6, 2, 2023, 2, 'B', 65.8);
Query OK, 6 rows affected (0.01 sec)
Records: 6  Duplicates: 0  Warnings: 0

mysql> SELECT * FROM CourseRegistrations;
+-----------------+------------+-----------+----------------+--------------------+-------+-------+
| registration_id | student_id | course_id | year_attempted | semester_attempted | grade | mark  |
+-----------------+------------+-----------+----------------+--------------------+-------+-------+
|               7 |          1 |         1 |           2023 |                  1 | A+    | 90.50 |
|               8 |          2 |         6 |           2023 |                  2 | B+    | 78.00 |
|               9 |          3 |         3 |           2023 |                  1 | A     | 88.00 |
|              10 |          4 |         5 |           2023 |                  2 | A+    | 92.50 |
|              11 |          5 |         4 |           2023 |                  1 | A     | 81.50 |
|              12 |          6 |         2 |           2023 |                  2 | B     | 65.80 |
+-----------------+------------+-----------+----------------+--------------------+-------+-------+
6 rows in set (0.00 sec)
```

2. Alter the above tables with Foreign Keys as required for the scenario. And perform the following activities.

a. List all students in a specific department (e.g., Computer Science)

```
mysql> UPDATE Students
    -> SET department_id =  1
    -> ;
Query OK, 4 rows affected (0.03 sec)
Rows matched: 6  Changed: 4  Warnings: 0

mysql> SELECT * FROM Students;
+------------+------------+-----------+---------------+---------------+---------------+
| student_id | first_name | last_name | date_of_birth | year_enrolled | department_id |
+------------+------------+-----------+---------------+---------------+---------------+
|          1 | Nisha      | Elizabeth | 1992-02-15    |          2018 |             1 |
|          2 | Alice      | Koshy     | 2000-03-20    |          2019 |             1 |
|          3 | Emi        | Johnson   | 2001-07-10    |          2020 |             1 |
|          4 | Mathew     | Luke      | 2000-03-20    |          2020 |             1 |
|          5 | Alice      | Koshy     | 2001-08-25    |          2018 |             1 |
|          6 | Anu        | Mariam    | 2000-03-20    |          2018 |             1 |
+------------+------------+-----------+---------------+---------------+---------------+
6 rows in set (0.00 sec)

mysql> ALTER TABLE Students
    -> ADD CONSTRAINT FK_Students_Departments
    -> FOREIGN KEY (department_id)
    -> REFERENCES Departments(department_id);
Query OK, 6 rows affected (0.18 sec)
Records: 6  Duplicates: 0  Warnings: 0

mysql> DESCRIBE Students;
+---------------+-------------+------+-----+---------+----------------+
| Field         | Type        | Null | Key | Default | Extra          |
+---------------+-------------+------+-----+---------+----------------+
| student_id    | int         | NO   | PRI | NULL    | auto_increment |
| first_name    | varchar(30) | NO   |     | NULL    |                |
| last_name     | varchar(25) | NO   |     | NULL    |                |
| date_of_birth | date        | YES  |     | NULL    |                |
| year_enrolled | int         | YES  |     | NULL    |                |
| department_id | int         | YES  | MUL | NULL    |                |
+---------------+-------------+------+-----+---------+----------------+
6 rows in set (0.00 sec)

mysql> SELECT Students.student_id, Students.first_name, Students.last_name
    -> FROM Students
    -> INNER JOIN Departments ON Students.department_id = Departments.department_id
    -> WHERE Departments.department_name = 'Science';
+------------+------------+-----------+
| student_id | first_name | last_name |
+------------+------------+-----------+
|          1 | Nisha      | Elizabeth |
|          2 | Alice      | Koshy     |
|          3 | Emi        | Johnson   |
|          4 | Mathew     | Luke      |
|          5 | Alice      | Koshy     |
|          6 | Anu        | Mariam    |
+------------+------------+-----------+
6 rows in set (0.00 sec)
```

b. List all courses a specific student (e.g., with Student ID 123) is enrolled in

```
mysql> SELECT Courses.course_id, Courses.course_name
    -> FROM Courses
    -> JOIN CourseRegistrations ON Courses.course_id = CourseRegistrations.course_id
    -> WHERE CourseRegistrations.student_id = 1;
+-----------+-------------+
| course_id | course_name |
+-----------+-------------+
|         1 | Mathematics |
+-----------+-------------+
1 row in set (0.00 sec)
```

c. Retrieve the total number of students enrolled in each course

```
mysql> SELECT Courses.course_id, Courses.course_name, COUNT(CourseRegistrations.student_id) AS EnrollmentCount
    -> FROM Courses
    -> LEFT JOIN CourseRegistrations ON Courses.course_id = CourseRegistrations.course_id
    -> GROUP BY Courses.course_id, Courses.course_name;
+-----------+-----------------------+-----------------+
| course_id | course_name           | EnrollmentCount |
+-----------+-----------------------+-----------------+
|         1 | Mathematics           |               1 |
|         2 | Physics               |               1 |
|         3 | Computer Science      |               1 |
|         4 | Electrical Engineering |               1 |
|         5 | History               |               1 |
|         6 | Literature            |               1 |
+-----------+-----------------------+-----------------+
6 rows in set (0.03 sec)
```

d. Find the course with the highest enrolment

```
mysql> SELECT Courses.course_id, Courses.course_name, COUNT(CourseRegistrations.student_id) AS EnrollmentCount
    -> FROM Courses
    -> LEFT JOIN CourseRegistrations ON Courses.course_id = CourseRegistrations.course_id
    -> GROUP BY Courses.course_id, Courses.course_name
    -> ORDER BY EnrollmentCount DESC
    -> LIMIT 1;
+-----------+-------------+-----------------+
| course_id | course_name | EnrollmentCount |
+-----------+-------------+-----------------+
|         1 | Mathematics |               1 |
+-----------+-------------+-----------------+
1 row in set (0.00 sec)

mysql> SELECT Courses.course_id, Courses.course_name, COUNT(CourseRegistrations.student_id) AS EnrollmentCount
    -> FROM Courses
    -> LEFT JOIN CourseRegistrations ON Courses.course_id = CourseRegistrations.course_id
    -> GROUP BY Courses.course_id, Courses.course_name
    -> ORDER BY EnrollmentCount DESC
    -> LIMIT 2;
+-----------+-------------+-----------------+
| course_id | course_name | EnrollmentCount |
+-----------+-------------+-----------------+
|         1 | Mathematics |               1 |
|         2 | Physics     |               1 |
+-----------+-------------+-----------------+
2 rows in set (0.00 sec)
```

e. List all Programs of a particular department

```
mysql>
mysql> SELECT program_id, program_name
    -> FROM Programs
    -> WHERE department_id = (
    ->     SELECT department_id
    ->     FROM Departments
    ->     WHERE department_name = 'Science'
    -> );
+------------+---------------------+
| program_id | program_name        |
+------------+---------------------+
|          1 | Bachelor of Science |
+------------+---------------------+
1 row in set (0.02 sec)
```

f. List all courses under a specific program.

```
mysql> SELECT course_id, course_name
    -> FROM Courses
    -> WHERE program_id = (
    ->     SELECT program_id
    ->     FROM Programs
    ->     WHERE program_name = 'Bachelor of Science'
    -> );
+-----------+-------------+
| course_id | course_name |
+-----------+-------------+
|         1 | Mathematics |
|         2 | Physics     |
+-----------+-------------+
2 rows in set (0.00 sec)
```

3. The data to be recorded according to the requirements are as follows.

Staff Id, Name, Designation, staff address, staff email, staff phone No, salary, branch Id, branch Description, Branch Address, branch phone No

a. Normalize the data and form the tables accordingly.

Q. StaffId, Name, Designation, Staff Address, staff email, staff phone, salary, branch Id, branch Description, Branch Address, branch phone No.

I Staff Table :
Staff Id (Primary key)
Name
Designation
Staff Address
Staff Email
Staff Phone No
Salary
Branch Id (Foreign Key)

I Branch Table :
Branch Id (primary key)
Branch Description
Branch Address
Branch phoneNo

Effiwently organiee Data, we can separate the values for given entities into two Separate Tables :-
Staff & Branch.

Here, Each column having atomic values
No repeating groups.

Now it is 3NF form,
Staff Table with Staff related Attributes
Branch Table with branch related Attributes

b. Create the normalized tables, with required relationships.

```
mysql> CREATE TABLE Branch (
    ->     BranchId INT PRIMARY KEY,
    ->     Description VARCHAR(255),
    ->     Address VARCHAR(255),
    ->     PhoneNo VARCHAR(20)
    -> );
Query OK, 0 rows affected (0.08 sec)

mysql> CREATE TABLE Staff (
    ->     StaffId INT PRIMARY KEY,
    ->     Name VARCHAR(255),
    ->     Designation VARCHAR(255),
    ->     Address VARCHAR(255),
    ->     Email VARCHAR(255),
    ->     PhoneNo VARCHAR(20),
    ->     Salary DECIMAL(10, 2),
    ->     BranchId INT,
    ->     FOREIGN KEY (BranchId) REFERENCES Branch(BranchId)
    -> );
Query OK, 0 rows affected (0.09 sec)

mysql> DESCRIBE Branch;
+-------------+--------------+------+-----+---------+-------+
| Field       | Type         | Null | Key | Default | Extra |
+-------------+--------------+------+-----+---------+-------+
| BranchId    | int          | NO   | PRI | NULL    |       |
| Description | varchar(255) | YES  |     | NULL    |       |
| Address     | varchar(255) | YES  |     | NULL    |       |
| PhoneNo     | varchar(20)  | YES  |     | NULL    |       |
+-------------+--------------+------+-----+---------+-------+
4 rows in set (0.00 sec)

mysql> SELECT * FROM  Branch;
Empty set (0.00 sec)

mysql> DESCRIBE Staff;
+-------------+---------------+------+-----+---------+-------+
| Field       | Type          | Null | Key | Default | Extra |
+-------------+---------------+------+-----+---------+-------+
| StaffId     | int           | NO   | PRI | NULL    |       |
| Name        | varchar(255)  | YES  |     | NULL    |       |
| Designation | varchar(255)  | YES  |     | NULL    |       |
| Address     | varchar(255)  | YES  |     | NULL    |       |
| Email       | varchar(255)  | YES  |     | NULL    |       |
| PhoneNo     | varchar(20)   | YES  |     | NULL    |       |
| Salary      | decimal(10,2) | YES  |     | NULL    |       |
| BranchId    | int           | YES  | MUL | NULL    |       |
+-------------+---------------+------+-----+---------+-------+
8 rows in set (0.00 sec)
```


c. Perform all CRUD operations on these tables.

```
mysql> INSERT INTO branch (branch_description, branch_address, branch_phone_no)
    -> VALUES ('Main Branch', 'Kochi', '944567890');
Query OK, 1 row affected (0.01 sec)

mysql> INSERT INTO branch (branch_description, branch_address, branch_phone_no)
    -> VALUES ('Sub Branch', 'Trivandrum', '995567890');
Query OK, 1 row affected (0.01 sec)

mysql> INSERT INTO branch (branch_description, branch_address, branch_phone_no)
    -> VALUES ('Sub Branch', 'Kollam', '857423108');
Query OK, 1 row affected (0.01 sec)

mysql>  INSERT INTO staff (name, designation, staff_address, staff_email, staff_phone_no, salary, branch_id)
    ->  VALUES ('Jeena', 'Manager', 'Kochi', 'jeena@email.com', '9985456700', 50000.00, 1);
Query OK, 1 row affected (0.01 sec)
```

```
mysql>  INSERT INTO staff (name, designation, staff_address, staff_email, staff_phone_no, salary, branch_id)
    ->  VALUES ('Anoop', 'Manager', 'Kollam', 'Anoop@gmail.com', '944456700',60000.00, 2);
Query OK, 1 row affected (0.02 sec)

mysql>  INSERT INTO staff (name, designation, staff_address, staff_email, staff_phone_no, salary, branch_id)
    ->  VALUES ('Arun', 'Clerk', 'Kollam', 'Aruna@gmail.com', '998456700',25000.00, 3);
Query OK, 1 row affected (0.01 sec)
```

```
mysql> select * FROM branch;
+-----------+--------------------+----------------+-----------------+
| branch_id | branch_description | branch_address | branch_phone_no |
+-----------+--------------------+----------------+-----------------+
|         1 | Main Branch        | Kochi          | 944567890       |
|         2 | Sub Branch         | Trivandrum     | 995567890       |
|         3 | Sub Branch         | Kollam         | 857423108       |
+-----------+--------------------+----------------+-----------------+
3 rows in set (0.00 sec)

mysql> select * FROM staff;
+----------+-------+-------------+---------------+-----------------+----------------+----------+-----------+
| staff_id | name  | designation | staff_address | staff_email     | staff_phone_no | salary   | branch_id |
+----------+-------+-------------+---------------+-----------------+----------------+----------+-----------+
|        2 | Jeena | Manager     | Kochi         | jeena@email.com | 9985456700     | 50000.00 |         1 |
|        3 | Anoop | Manager     | Kollam        | Anoop@gmail.com | 944456700      | 60000.00 |         2 |
|        4 | Arun  | Clerk       | Kollam        | Aruna@gmail.com | 998456700      | 25000.00 |         3 |
+----------+-------+-------------+---------------+-----------------+----------------+----------+-----------+
3 rows in set (0.00 sec)
```

```
mysql> UPDATE staff
    -> SET salary = 55000.00
    -> WHERE staff_id = 2;
Query OK, 1 row affected (0.01 sec)
Rows matched: 1  Changed: 1  Warnings: 0

mysql> select * FROM staff;
+----------+-------+-------------+---------------+-----------------+----------------+----------+-----------+
| staff_id | name  | designation | staff_address | staff_email     | staff_phone_no | salary   | branch_id |
+----------+-------+-------------+---------------+-----------------+----------------+----------+-----------+
|        2 | Jeena | Manager     | Kochi         | jeena@email.com | 9985456700     | 55000.00 |         1 |
|        3 | Anoop | Manager     | Kollam        | Anoop@gmail.com | 944456700      | 60000.00 |         2 |
|        4 | Arun  | Clerk       | Kollam        | Aruna@gmail.com | 998456700      | 25000.00 |         3 |
+----------+-------+-------------+---------------+-----------------+----------------+----------+-----------+
3 rows in set (0.00 sec)
```

```
mysql> UPDATE branch
    -> SET branch_address = 'Kochi'
    -> WHERE branch_id = 2;
Query OK, 1 row affected (0.01 sec)
Rows matched: 1  Changed: 1  Warnings: 0

mysql> UPDATE branch
    -> SET branch_address = 'Thrissur'
    -> WHERE branch_id = 3;
Query OK, 1 row affected (0.01 sec)
Rows matched: 1  Changed: 1  Warnings: 0

mysql> select * FROM branch;
+-----------+--------------------+----------------+-----------------+
| branch_id | branch_description | branch_address | branch_phone_no |
+-----------+--------------------+----------------+-----------------+
|         1 | Main Branch        | Kottayam       | 944567890       |
|         2 | Sub Branch         | Kochi          | 995567890       |
|         3 | Sub Branch         | Thrissur       | 857423108       |
+-----------+--------------------+----------------+-----------------+
3 rows in set (0.00 sec)
```

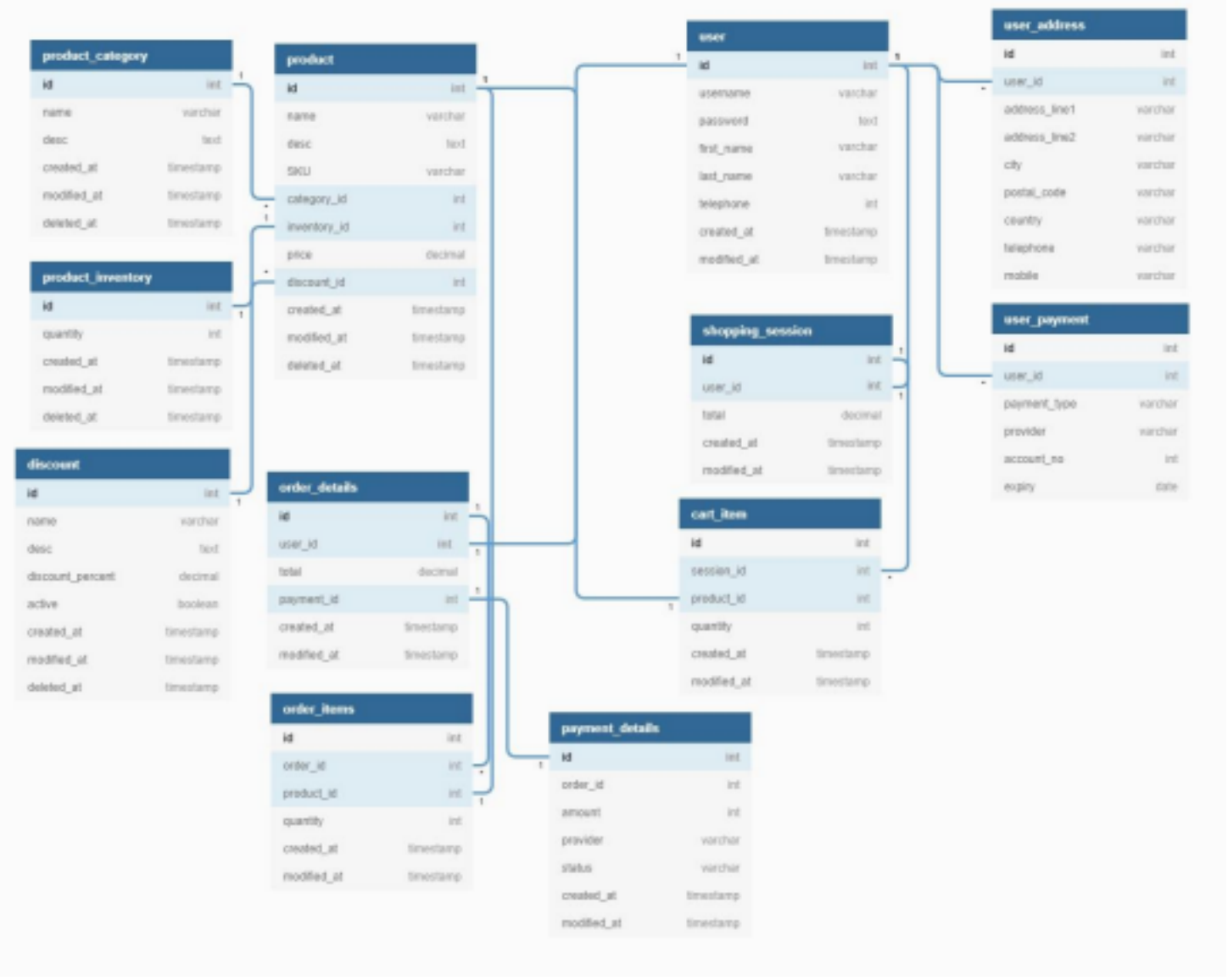
```
mysql> DELETE FROM staff
    -> WHERE staff_id = 2;
Query OK, 1 row affected (0.01 sec)

mysql> select * FROM staff;
+----------+-------+-------------+---------------+-----------------+----------------+----------+-----------+
| staff_id | name  | designation | staff_address | staff_email     | staff_phone_no | salary   | branch_id |
+----------+-------+-------------+---------------+-----------------+----------------+----------+-----------+
|        3 | Anoop | Manager     | Kollam        | Anoop@gmail.com | 944456700      | 60000.00 |         2 |
|        4 | Arun  | Clerk       | Kollam        | Aruna@gmail.com | 998456700      | 25000.00 |         3 |
+----------+-------+-------------+---------------+-----------------+----------------+----------+-----------+
2 rows in set (0.00 sec)
```

```
DELETE FROM Branch WHERE branch_id = 1' at line 1
mysql> DELETE FROM Branch WHERE branch_id = 1;
Query OK, 1 row affected (0.01 sec)

mysql> select * FROM branch;
+-----------+--------------------+----------------+-----------------+
| branch_id | branch_description | branch_address | branch_phone_no |
+-----------+--------------------+----------------+-----------------+
|         2 | Sub Branch         | Kochi          | 995567890       |
|         3 | Sub Branch         | Thrissur       | 857423108       |
+-----------+--------------------+----------------+-----------------+
2 rows in set (0.00 sec)
```

4 Create the following tables in a database “eShopping”


product_category
id int
name varchar
desc text
created_at timestamp
modified_at timestamp
deleted_at timestamp
product
id int
name varchar
desc text
SKU varchar
category_id int
inventory_id int
price decimal
discount_id int
created_at timestamp
modified_at timestamp
deleted_at timestamp
user
id int
username varchar
password text
first_name varchar
last_name varchar
telephone int
created_at timestamp
modified_at timestamp
user_address
id int
user_id int
address_line1 varchar
address_line2 varchar
city varchar
postal_code varchar
country varchar
telephone varchar
mobile varchar
product_inventory
id int
quantity int
created_at timestamp
modified_at timestamp
deleted_at timestamp
shopping_session
id int
user_id int
total decimal
created_at timestamp
modified_at timestamp
user_payment
id int
user_id int
payment_type varchar
provider varchar
account_no int
expiry date
discount
id int
name varchar
desc text
discount_percent decimal
active boolean
created_at timestamp
modified_at timestamp
deleted_at timestamp
order_details
id int
user_id int
total decimal
payment_id int
created_at timestamp
modified_at timestamp
cart_item
id int
session_id int
product_id int
quantity int
created_at timestamp
modified_at timestamp
order_items
id int
order_id int
product_id int
quantity int
created_at timestamp
modified_at timestamp
payment_details
id int
order_id int
amount int
provider varchar
status varchar
created_at timestamp
modified_at timestamp

```
mysql> show tables;
+--------------------+
| Tables_in_eshopping |
+--------------------+
| cart_items         |
| discount           |
| order_details      |
| order_items        |
| payment_details    |
| product            |
| product_category   |
| product_inventory  |
| shopping_session   |
| user               |
| user_payment       |
| useraddress        |
+--------------------+
12 rows in set (0.00 sec)

mysql> select * from cart_items;
+----+------------+------------+----------+---------------------+---------------------+
| id | session_id | product_id | quantity | created_at          | modified_at         |
+----+------------+------------+----------+---------------------+---------------------+
|  1 |          1 |          1 |        2 | 2023-11-19 15:30:00 | 2023-11-19 15:30:00 |
|  2 |          2 |          2 |        1 | 2023-11-19 15:45:00 | 2023-11-19 15:45:00 |
|  3 |          3 |          3 |        3 | 2023-11-19 16:00:00 | 2023-11-19 16:00:00 |
+----+------------+------------+----------+---------------------+---------------------+
3 rows in set (0.00 sec)

mysql> select * from discount;
+----+---------+----------------------------+------------------+--------+---------------------+---------------------+------------+
| id | name    | description                | discount_percent | active | created_at          | modified_at         | deleted_at |
+----+---------+----------------------------+------------------+--------+---------------------+---------------------+------------+
|  1 | 10% Off | Discount for electronics   |            10.00 |      1 | 2023-11-19 15:30:00 | 2023-11-19 15:30:00 | NULL       |
|  2 | 10% Off | Discount for clothing items |            20.00 |      1 | 2023-11-19 15:45:00 | 2023-11-19 15:45:00 | NULL       |
|  3 | 10% Off | Discount for kitchenware   |            15.00 |      1 | 2023-11-19 16:00:00 | 2023-11-19 16:00:00 | NULL       |
+----+---------+----------------------------+------------------+--------+---------------------+---------------------+------------+
3 rows in set (0.00 sec)

mysql> select * from order_details;
+----+---------+-------+------------+---------------------+---------------------+
| id | user_id | total | payment_id | created_at          | modified_at         |
+----+---------+-------+------------+---------------------+---------------------+
|  1 |       1 |   150 |          1 | 2023-11-19 15:30:00 | 2023-11-19 15:30:00 |
|  2 |       2 |    76 |          2 | 2023-11-19 15:45:00 | 2023-11-19 15:45:00 |
|  3 |       3 |   200 |          3 | 2023-11-19 16:00:00 | 2023-11-19 16:00:00 |
+----+---------+-------+------------+---------------------+---------------------+
3 rows in set (0.00 sec)
```

```
mysql> select * from order_items;
+----+----------+------------+----------+---------------------+---------------------+
| id | order_id | product_id | quantity | created_at          | modified_at         |
+----+----------+------------+----------+---------------------+---------------------+
|  7 |        1 |          1 |        2 | 2016-10-02 11:30:00 | 2016-10-07 12:30:00 |
|  8 |        2 |          2 |        4 | 2016-11-02 11:30:00 | 2016-11-07 12:30:00 |
|  9 |        3 |          3 |        2 | 2016-11-02 05:30:00 | 2016-11-07 12:30:00 |
+----+----------+------------+----------+---------------------+---------------------+
3 rows in set (0.00 sec)

mysql> select * from paymen_details;
ERROR 1146 (42S02): Table 'eshopping.paymen_details' doesn't exist
mysql> select * from payment_details;
+----+----------+--------+-----------+---------+---------------------+---------------------+
| id | order_id | amount | provider  | status  | created_at          | modified_at         |
+----+----------+--------+-----------+---------+---------------------+---------------------+
|  1 |   123456 |   5000 | GooglePay | Success | 2023-11-19 15:30:00 | 2023-11-19 15:30:00 |
|  2 |   789012 |   3000 | Paytm     | Pending | 2023-11-19 15:45:00 | 2023-11-19 15:45:00 |
|  3 |   345678 |   7500 | BHIM      | Success | 2023-11-19 16:00:00 | 2023-11-19 16:00:00 |
+----+----------+--------+-----------+---------+---------------------+---------------------+
3 rows in set (0.00 sec)
```

```
mysql> select * from product;
+----+-------------+--------------------------+--------+-------------+--------------+--------+-------------+---------------------+---------------------+------------+
| id | name        | description              | SKU    | category_id | inventory_id | price  | discount_id | created_at          | modified_at         | deleted_at |
+----+-------------+--------------------------+--------+-------------+--------------+--------+-------------+---------------------+---------------------+------------+
|  1 | Smartphone  | Latest smartphone model  | SKU123 |           1 |            1 | 799.99 |           1 | 2023-11-19 15:30:00 | 2023-11-19 15:30:00 | NULL       |
|  2 | T-Shirt     | Cotton T-Shirt           | SKU456 |           2 |            2 |  29.99 |           2 | 2023-11-19 15:45:00 | 2023-11-19 15:45:00 | NULL       |
|  3 | Cookware Set| Premium cookware set     | SKU789 |           3 |            3 | 149.99 |           3 | 2023-11-19 16:00:00 | 2023-11-19 16:00:00 | NULL       |
+----+-------------+--------------------------+--------+-------------+--------------+--------+-------------+---------------------+---------------------+------------+
3 rows in set (0.00 sec)

mysql> select * from product_inventory;
+----+----------+---------------------+---------------------+------------+
| id | quantity | created_at          | modified_at         | deleted_at |
+----+----------+---------------------+---------------------+------------+
|  1 |      100 | 2023-11-19 15:30:00 | 2023-11-19 15:30:00 | NULL       |
|  2 |      150 | 2023-11-19 15:45:00 | 2023-11-19 15:45:00 | NULL       |
|  3 |      200 | 2023-11-19 16:00:00 | 2023-11-19 16:00:00 | NULL       |
+----+----------+---------------------+---------------------+------------+
3 rows in set (0.00 sec)
```

```
mysql> select * from product_category;
+----+---------------+-----------------------------------------+---------------------+---------------------+---------------------+
| id | name          | description                             | created_at          | modified_at         | deleted_at          |
+----+---------------+-----------------------------------------+---------------------+---------------------+---------------------+
|  1 | Electronics   | Category for electronic products        | 2023-01-15 00:00:00 | 2023-01-15 00:00:00 | 2023-06-16 00:00:00 |
|  2 | Clothing      | Category for clothing items             | 2023-01-16 00:00:00 | 2023-01-16 00:00:00 | 2023-05-16 00:00:00 |
|  3 | Home & Kitchen| Category for home and kitchen products  | 2023-01-17 00:00:00 | 2023-01-17 00:00:00 | 2023-04-16 00:00:00 |
+----+---------------+-----------------------------------------+---------------------+---------------------+---------------------+
3 rows in set (0.00 sec)

mysql> select * from user;
+----+-----------+----------+------------+-----------+-----------+---------------------+---------------------+
| id | username  | password | first_name | last_name | telephone | created_at          | modified_at         |
+----+-----------+----------+------------+-----------+-----------+---------------------+---------------------+
|  1 | Annja     | 123      | Ann        | Jacob     |  99768512 | 2023-06-02 00:00:00 | 2023-07-01 00:00:00 |
|  2 | AswathyGB | abc      | Aswathy    | Geetha    |  99376512 | 2023-03-02 00:00:00 | 2023-09-01 00:00:00 |
|  3 | SnehaT    | 456      | Sneha      | Thomas    | 944376512 | 2023-08-02 00:00:00 | 2023-10-01 00:00:00 |
+----+-----------+----------+------------+-----------+-----------+---------------------+---------------------+
3 rows in set (0.00 sec)

mysql> select * from user_Address;
ERROR 1146 (42S02): Table 'eshopping.user_address' doesn't exist
mysql> select * from userAddress;
+----+---------+---------------+---------------+--------+-------------+-----------+------------+---------+
| id | user_id | address_line1 | address_line2 | city   | postal_code | telephone | mobile     | country |
+----+---------+---------------+---------------+--------+-------------+-----------+------------+---------+
|  1 |       1 | ABCD          | Pimpri        | PUne   | 411018      | 7452      | 7896523041 | India   |
|  2 |       2 | PQRS          | Kollam        | Kerala | 686745      | 047352    | 9446523041 | India   |
|  3 |       3 | LMNO          | Marina        | Bombay | 861745      | 12472     | 986523041  | India   |
+----+---------+---------------+---------------+--------+-------------+-----------+------------+---------+
3 rows in set (0.01 sec)
```

```
mysql> select * from shoppingsession;
ERROR 1146 (42S02): Table 'eshopping.shoppingsession' doesn't exist
mysql> select * from shopping_session;
+----+---------+--------+---------------------+---------------------+
| id | user_id | total  | created_at          | modified_at         |
+----+---------+--------+---------------------+---------------------+
|  1 |     101 | 150.25 | 2023-01-15 00:00:00 | 2023-01-15 00:00:00 |
|  2 |     102 | 200.50 | 2023-01-16 00:00:00 | 2023-01-16 00:00:00 |
|  3 |     103 | 100.75 | 2023-01-17 00:00:00 | 2023-01-17 00:00:00 |
+----+---------+--------+---------------------+---------------------+
3 rows in set (0.00 sec)

mysql> select * from user_payment;
+----+---------+--------------+------------+----------+------------+
| id | user_id | payment_type | provider   | accno    | expiry     |
+----+---------+--------------+------------+----------+------------+
|  1 |     123 | Credit Card  | Visa       | 12345678 | 2023-12-31 |
|  2 |     456 | Paytm        | Paytm      |  9876554 | 2022-11-30 |
|  3 |     789 | Debit Card   | MasterCard |  5833222 | 2024-05-31 |
+----+---------+--------------+------------+----------+------------+
3 rows in set (0.01 sec)
```

a. Insert data in all the tables.

```
mysql> create database eShopping;
Query OK, 1 row affected (0.02 sec)

mysql> use eShopping;
Database changed
mysql> create table user (
    -> id int primary key not null,
    -> username varchar(50),
    -> password text(50),
    -> first_name varchar(50),
    -> last_name varchar(50),
    -> telephone int,
    -> created_at timestamp,
    -> modified_at timestamp);
Query OK, 0 rows affected (0.06 sec)

mysql> CREATE TABLE userAddress (
    ->     id INT PRIMARY KEY,
    ->     user_id INT,
    ->     address_line1 VARCHAR(255),
    ->     address_line2 VARCHAR(255),
    ->     city VARCHAR(255),
    ->     postal_code VARCHAR(10),
    ->     telephone VARCHAR(20),
    ->     mobile VARCHAR(20)
    -> );
Query OK, 0 rows affected (0.07 sec)

mysql> describe user;
+-------------+-------------+------+-----+---------+-------+
| Field       | Type        | Null | Key | Default | Extra |
+-------------+-------------+------+-----+---------+-------+
| id          | int         | NO   | PRI | NULL    |       |
| username    | varchar(50) | YES  |     | NULL    |       |
| password    | tinytext    | YES  |     | NULL    |       |
| first_name  | varchar(50) | YES  |     | NULL    |       |
| last_name   | varchar(50) | YES  |     | NULL    |       |
| telephone   | int         | YES  |     | NULL    |       |
| created_at  | timestamp   | YES  |     | NULL    |       |
| modified_at | timestamp   | YES  |     | NULL    |       |
+-------------+-------------+------+-----+---------+-------+
8 rows in set (0.00 sec)

mysql> describe userAddress;
+---------------+--------------+------+-----+---------+-------+
| Field         | Type         | Null | Key | Default | Extra |
+---------------+--------------+------+-----+---------+-------+
| id            | int          | NO   | PRI | NULL    |       |
| user_id       | int          | YES  |     | NULL    |       |
| address_line1 | varchar(255) | YES  |     | NULL    |       |
| address_line2 | varchar(255) | YES  |     | NULL    |       |
| city          | varchar(255) | YES  |     | NULL    |       |
| postal_code   | varchar(10)  | YES  |     | NULL    |       |
| telephone     | varchar(20)  | YES  |     | NULL    |       |
| mobile        | varchar(20)  | YES  |     | NULL    |       |
+---------------+--------------+------+-----+---------+-------+
```

```
mysql> insert into user (id,username,password,first_name,last_name,telephone,created_at,modified_at)values(1,'Annja',123
,'Ann','Jacob','99768512','2023-06-02','2023-07-01');
Query OK, 1 row affected (0.02 sec)

mysql> insert into user (id,username,password,first_name,last_name,telephone,created_at,modified_at)values(2,'AswathyGB'
,abc,'Aswathy','Geetha','99376512','2023-03-02','2023-09-01');
ERROR 1054 (42S22): Unknown column 'abc' in 'field list'
mysql> insert into user (id,username,password,first_name,last_name,telephone,created_at,modified_at)values(2,'AswathyGB'
,'abc','Aswathy','Geetha','99376512','2023-03-02','2023-09-01');
Query OK, 1 row affected (0.02 sec)

mysql> insert into user (id,username,password,first_name,last_name,telephone,created_at,modified_at)values(3,'SnehaT',ab
c123,'Sneha','Thomas','944376512','2023-08-02','2023-10-01')
    -> ;
ERROR 1054 (42S22): Unknown column 'abc123' in 'field list'
mysql> insert into user (id,username,password,first_name,last_name,telephone,created_at,modified_at)values(3,'SnehaT',45
6,'Sneha','Thomas','944376512','2023-08-02','2023-10-01');
Query OK, 1 row affected (0.01 sec)
```

```
mysql> ALTER TABLE userAddress
    -> ADD COLUMN country VARCHAR(255);
Query OK, 0 rows affected (0.07 sec)
Records: 0  Duplicates: 0  Warnings: 0

mysql> describe userAddress;
+---------------+--------------+------+-----+---------+-------+
| Field         | Type         | Null | Key | Default | Extra |
+---------------+--------------+------+-----+---------+-------+
| id            | int          | NO   | PRI | NULL    |       |
| user_id       | int          | YES  |     | NULL    |       |
| address_line1 | varchar(255) | YES  |     | NULL    |       |
| address_line2 | varchar(255) | YES  |     | NULL    |       |
| city          | varchar(255) | YES  |     | NULL    |       |
| postal_code   | varchar(10)  | YES  |     | NULL    |       |
| telephone     | varchar(20)  | YES  |     | NULL    |       |
| mobile        | varchar(20)  | YES  |     | NULL    |       |
| country       | varchar(255) | YES  |     | NULL    |       |
+---------------+--------------+------+-----+---------+-------+
9 rows in set (0.00 sec)

mysql> insert into userAddress values(1,1,'ABCD','Pimpri','PUne','411018','7452','7896523041','India');
Query OK, 1 row affected (0.01 sec)

mysql>  insert into userAddress values(2,2,'PQRS','Kollam','Kerala','686745','047352','9446523041','India');
Query OK, 1 row affected (0.01 sec)

mysql>  insert into userAddress values(3,3,'LMNO','Marina','Bombay','861745','12472','986523041','India');
Query OK, 1 row affected (0.01 sec)
```

```
mysql> describe user_payment;
+--------------+--------------+------+-----+---------+-------+
| Field        | Type         | Null | Key | Default | Extra |
+--------------+--------------+------+-----+---------+-------+
| id           | int          | NO   | PRI | NULL    |       |
| user_id      | int          | YES  |     | NULL    |       |
| payment_type | varchar(255) | YES  |     | NULL    |       |
| provider     | varchar(255) | YES  |     | NULL    |       |
| accno        | int          | YES  |     | NULL    |       |
| expiry       | date         | YES  |     | NULL    |       |
+--------------+--------------+------+-----+---------+-------+
6 rows in set (0.00 sec)

mysql> INSERT INTO user_payment (id, user_id, payment_type, provider, accno, expiry)
    -> VALUES
    -> ;
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that correspon
mysql> INSERT INTO user_payment (id, user_id, payment_type, provider, accno, expiry)
    -> VALUES(1, 123, 'Credit Card', 'Visa', 12345678, '2023-12-31');
Query OK, 1 row affected (0.02 sec)

mysql>  INSERT INTO user_payment (id, user_id, payment_type, provider, accno, expiry)
    -> VALUES (2, 456, 'Paytm', 'Paytm', 9876554, '2022-11-30');
Query OK, 1 row affected (0.03 sec)

mysql>  INSERT INTO user_payment (id, user_id, payment_type, provider, accno, expiry)
    -> VALUES  (3, 789, 'Debit Card', 'MasterCard', 5833222, '2024-05-31');
Query OK, 1 row affected (0.01 sec)
```

```
mysql> CREATE TABLE shopping_session (
    ->     id INT PRIMARY KEY,
    ->     user_id INT,
    ->     total DECIMAL(10, 2),
    ->     created_at TIMESTAMP,
    ->     modified_at TIMESTAMP);
Query OK, 0 rows affected (0.08 sec)

mysql> INSERT INTO shopping_session (id, user_id, total, created_at, modified_at) VALUES
    ->     (1, 101, 150.25, '2023-01-15 ', '2023-01-15 '),
    ->     (2, 102, 200.50, '2023-01-16 ', '2023-01-16 '),
    ->     (3, 103, 100.75, '2023-01-17 ', '2023-01-17 ');
Query OK, 3 rows affected, 6 warnings (0.02 sec)
Records: 3  Duplicates: 0  Warnings: 6

mysql> describe shopping_session;
+-------------+--------------+------+-----+---------+-------+
| Field       | Type         | Null | Key | Default | Extra |
+-------------+--------------+------+-----+---------+-------+
| id          | int          | NO   | PRI | NULL    |       |
| user_id     | int          | YES  |     | NULL    |       |
| total       | decimal(10,2) | YES  |     | NULL    |       |
| created_at  | timestamp    | YES  |     | NULL    |       |
| modified_at | timestamp    | YES  |     | NULL    |       |
+-------------+--------------+------+-----+---------+-------+
5 rows in set (0.00 sec)
```

```
mysql>  CREATE TABLE product_category (
    ->          id INT PRIMARY KEY,
    ->          name VARCHAR(255),
    ->          description TEXT,
    ->         created_at TIMESTAMP,
    ->        modified_at TIMESTAMP,
    ->         deleted_at TIMESTAMP
    ->      );
Query OK, 0 rows affected (0.07 sec)

mysql> INSERT INTO product_category (id, name, description, created_at, modified_at, deleted_at)
    -> VALUES
    ->     (1, 'Electronics', 'Category for electronic products', '2023-01-15', '2023-01-15', '2023-06-16'),
    ->     (2, 'Clothing', 'Category for clothing items', '2023-01-16', '2023-01-16', '2023-05-16'),
    ->     (3, 'Home & Kitchen', 'Category for home and kitchen products', '2023-01-17', '2023-01-17', '2023-04-16');
Query OK, 3 rows affected (0.02 sec)
Records: 3  Duplicates: 0  Warnings: 0

mysql> describe product_category;
+-------------+--------------+------+-----+---------+-------+
| Field       | Type         | Null | Key | Default | Extra |
+-------------+--------------+------+-----+---------+-------+
| id          | int          | NO   | PRI | NULL    |       |
| name        | varchar(255) | YES  |     | NULL    |       |
| description | text         | YES  |     | NULL    |       |
| created_at  | timestamp    | YES  |     | NULL    |       |
| modified_at | timestamp    | YES  |     | NULL    |       |
| deleted_at  | timestamp    | YES  |     | NULL    |       |
+-------------+--------------+------+-----+---------+-------+
6 rows in set (0.00 sec)
```

```
mysql> describe product_inventory;
+-------------+-----------+------+-----+---------+-------+
| Field       | Type      | Null | Key | Default | Extra |
+-------------+-----------+------+-----+---------+-------+
| id          | int       | NO   | PRI | NULL    |       |
| quantity    | int       | YES  |     | NULL    |       |
| created_at  | timestamp | YES  |     | NULL    |       |
| modified_at | timestamp | YES  |     | NULL    |       |
| deleted_at  | timestamp | YES  |     | NULL    |       |
+-------------+-----------+------+-----+---------+-------+
5 rows in set (0.01 sec)
```

```
mysql> INSERT INTO product_inventory (id, quantity, created_at, modified_at)
    -> VALUES
    ->   (1, 100, '2023-11-19 15:30:00', '2023-11-19 15:30:00'),
    ->   (2, 150, '2023-11-19 15:45:00', '2023-11-19 15:45:00'),
    ->   (3, 200, '2023-11-19 16:00:00', '2023-11-19 16:00:00');
Query OK, 3 rows affected (0.02 sec)
Records: 3  Duplicates: 0  Warnings: 0
```

```
mysql> INSERT INTO discount (id, name, description, discount_percent, active, created_at, modified_at, deleted_at)
    -> VALUES
    ->   (1, '10% Off', 'Discount for electronics', 10.00, 1, '2023-11-19 15:30:00', '2023-11-19 15:30:00', NULL),
    ->   (2, '10% Off', 'Discount for clothing items', 20.00, 1, '2023-11-19 15:45:00', '2023-11-19 15:45:00', NULL),
    ->   (3, '10% Off', 'Discount for kitchenware', 15.00, 1, '2023-11-19 16:00:00', '2023-11-19 16:00:00', NULL);
Query OK, 3 rows affected (0.02 sec)
Records: 3  Duplicates: 0  Warnings: 0
```

```
mysql> INSERT INTO product (id, name, description, SKU, category_id, inventory_id, price, discount_id, created_at, modif
ied_at, deleted_at)
    -> VALUES
    ->   (1, 'Smartphone', 'Latest smartphone model', 'SKU123', 1, 1, 799.99, 1, '2023-11-19 15:30:00', '2023-11-19 15:3
0:00', NULL),
    ->   (2, 'T-Shirt', 'Cotton T-Shirt', 'SKU456', 2, 2, 29.99, 2, '2023-11-19 15:45:00', '2023-11-19 15:45:00', NULL),

    ->   (3, 'Cookware Set', 'Premium cookware set', 'SKU789', 3, 3, 149.99, 3, '2023-11-19 16:00:00', '2023-11-19 16:00
:00', NULL);
Query OK, 3 rows affected (0.02 sec)
Records: 3  Duplicates: 0  Warnings: 0
```

```
mysql> INSERT INTO cart_items (id, session_id, product_id, quantity, created_at, modified_at)
    -> VALUES
    ->   (1, 1, 1, 2, '2023-11-19 15:30:00', '2023-11-19 15:30:00'),
    ->   (2, 2, 2, 1, '2023-11-19 15:45:00', '2023-11-19 15:45:00'),
    ->   (3,3, 3, 3, '2023-11-19 16:00:00', '2023-11-19 16:00:00');
Query OK, 3 rows affected (0.01 sec)
Records: 3  Duplicates: 0  Warnings: 0
```

```
mysql> INSERT INTO payment_details (id, order_id, amount, provider, status, created_at, modified_at)
    -> VALUES
    ->   (1, 123456, 5000, 'GooglePay', 'Success', '2023-11-19 15:30:00', '2023-11-19 15:30:00'),
    ->   (2, 789012, 3000, 'Paytm', 'Pending', '2023-11-19 15:45:00', '2023-11-19 15:45:00'),
    ->   (3, 345678, 7500, 'BHIM', 'Success', '2023-11-19 16:00:00', '2023-11-19 16:00:00');
Query OK, 3 rows affected (0.01 sec)
Records: 3  Duplicates: 0  Warnings: 0
```

```
mysql> INSERT INTO order_details (id, user_id, total, payment_id, created_at, modified_at)
    -> VALUES
    ->   (1, 1, 150.00, 1, '2023-11-19 15:30:00', '2023-11-19 15:30:00'),
    ->   (2, 2, 75.50, 2, '2023-11-19 15:45:00', '2023-11-19 15:45:00'),
    ->   (3, 3, 200.00, 3, '2023-11-19 16:00:00', '2023-11-19 16:00:00');
Query OK, 3 rows affected, 1 warning (0.01 sec)
Records: 3  Duplicates: 0  Warnings: 1
```

```
mysql> insert into order_items(order_id, product_id, quantity, created_at, modified_at)
    -> values(1,1,2,'2016-10-02 11:30:00','2016-10-07 12:30:00'),(2,2,4,'2016-11-02 11:30:00','2016-11-07
    '> 12:30:00'),(3,3,2,'2016-11-02 05:30:00','2016-11-07 12:30:00')
    -> ;
Query OK, 3 rows affected, 1 warning (0.02 sec)
Records: 3  Duplicates: 0  Warnings: 1
```

b. Display the details of a Product, including the following data

a. Product Id, Name, desc, Category name, quantity, discount percentage (simple join)

```
mysql> SELECT
    ->     p.id AS 'Product Id',
    ->     p.name AS 'Product Name',
    ->     p.description AS 'Product Description',
    ->     pc.name AS 'Category Name',
    ->     pi.quantity AS 'Quantity',
    ->     d.discount_percent AS 'Discount Percentage'
    -> FROM
    ->     product p
    -> JOIN
    ->     product_category pc ON p.category_id = pc.id
    -> JOIN
    ->     product_inventory pi ON p.inventory_id = pi.id
    -> JOIN
    ->     discount d ON p.discount_id = d.id;
+------------+--------------+--------------------------+----------------+----------+--------------------
| Product Id | Product Name | Product Description      | Category Name  | Quantity | Discount Percentag
+------------+--------------+--------------------------+----------------+----------+--------------------
|          1 | Smartphone   | Latest smartphone model | Electronics    |      100 |               10.0
|          2 | T-Shirt      | Cotton T-Shirt           | Clothing       |      150 |               20.0
|          3 | Cookware Set | Premium cookware set     | Home & Kitchen |      200 |               15.0
+------------+--------------+--------------------------+----------------+----------+--------------------
3 rows in set (0.00 sec)
```

c. Display the details about an order to include the following data

a. order ID, first name, product name, quantity. (inner join)

```
mysql> SELECT
    ->     od.id AS 'Order ID',
    ->     u.first_name AS 'First Name',
    ->     p.name AS 'Product Name',
    ->     oi.quantity AS 'Quantity'
    -> FROM
    ->     order_details od
    -> JOIN
    ->     user u ON od.user_id = u.id
    -> JOIN
    ->     order_items oi ON od.id = oi.order_id
    -> JOIN
    ->     product p ON oi.product_id = p.id;
+----------+------------+--------------+----------+
| Order ID | First Name | Product Name | Quantity |
+----------+------------+--------------+----------+
|        1 | Ann        | Smartphone   |        2 |
|        2 | Aswathy    | T-Shirt      |        4 |
|        3 | Sneha      | Cookware Set |        2 |
+----------+------------+--------------+----------+
3 rows in set (0.00 sec)
```

d. Display the following details

a. First Name, product name(use left join)

```
mysql> SELECT
    ->     u.first_name AS 'First Name',
    ->     p.name AS 'Product Name'
    -> FROM
    ->     user u
    -> LEFT JOIN
    ->     order_details od ON u.id = od.user_id
    -> LEFT JOIN
    ->     order_items oi ON od.id = oi.order_id
    -> LEFT JOIN
    ->     product p ON oi.product_id = p.id;
+------------+--------------+
| First Name | Product Name |
+------------+--------------+
| Ann        | Smartphone   |
| Aswathy    | T-Shirt      |
| Sneha      | Cookware Set |
+------------+--------------+
3 rows in set (0.00 sec)
```

e. Display the following data

a. First name, product name (use right join)

```
mysql> SELECT
    ->     u.first_name AS 'First Name',
    ->     p.name AS 'Product Name'
    -> FROM
    ->     user u
    -> RIGHT JOIN
    ->     order_details od ON u.id = od.user_id
    -> RIGHT JOIN
    ->     order_items oi ON od.id = oi.order_id
    -> LEFT JOIN
    ->     product p ON oi.product_id = p.id;
+------------+--------------+
| First Name | Product Name |
+------------+--------------+
| Ann        | Smartphone   |
| Aswathy    | T-Shirt      |
| Sneha      | Cookware Set |
+------------+--------------+
3 rows in set (0.00 sec)
```

f. Display the following data

a. First name, product name (use full outer join)

```
mysql> SELECT
    ->     u.first_name AS 'First Name',
    ->     p.name AS 'Product Name'
    -> FROM
    ->     user u
    -> LEFT JOIN
    ->     order_details od ON u.id = od.user_id
    -> LEFT JOIN
    ->     order_items oi ON od.id = oi.order_id
    -> LEFT JOIN
    ->     product p ON oi.product_id = p.id
    ->
    -> UNION
    ->
    -> SELECT
    ->     u.first_name AS 'First Name',
    ->     p.name AS 'Product Name'
    -> FROM
    ->     order_items oi
    -> RIGHT JOIN
    ->     order_details od ON oi.order_id = od.id
    -> RIGHT JOIN
    ->     user u ON od.user_id = u.id
    -> LEFT JOIN
    ->     product p ON oi.product_id = p.id;
+------------+--------------+
| First Name | Product Name |
+------------+--------------+
| Ann        | Smartphone   |
| Aswathy    | T-Shirt      |
| Sneha      | Cookware Set |
+------------+--------------+
3 rows in set (0.01 sec)
```