Primary Key

1. Create a Table with a Primary Key:

Create a table named Students with columns StudentID (Primary Key), Name, and Age. Insert five records into the table and verify the primary key constraint.

2. Primary Key Violation:

Attempt to insert duplicate values into the StudentID column of the Students table and observe the result.

Foreign Key

3. Define a Foreign Key:

Create two tables:

- Departments with DepartmentID (Primary Key) and DepartmentName.

- Employees with EmployeeID (Primary Key), EmployeeName, and DepartmentID (Foreign Key referencing Departments).

Insert records to demonstrate the relationship.

4. Cascade Delete:

Modify the Employees table to include a ON DELETE CASCADE clause. Delete a record from the Departments table and observe the effect on the Employees table.

Unique Constraint

5. Implement a Unique Constraint:

Create a table Courses with columns CourseID (Primary Key), CourseName (Unique), and Duration. Try to insert duplicate values in CourseName and observe the result.

Check Constraint

6. Check for Age Restriction:

Create a table Voters with columns VoterID, Name, and Age. Add a CHECK constraint to ensure Age is greater than or equal to 18. Test the constraint by inserting both valid and invalid values.

Default Constraint

7. Add a Default Value:

Create a table Orders with columns OrderID (Primary Key), CustomerName, and OrderStatus with a DEFAULT value of Pending. Insert records without specifying the OrderStatus and verify the default value.

Not Null Constraint

8. Ensure Non-Null Values:

Create a table Products with columns ProductID (Primary Key), ProductName (NOT NULL), and Price. Attempt to insert a record with a NULL value in the ProductName column.

Composite Key

9. Create a Composite Key:

Create a table Enrollment with columns StudentID, CourseID, and EnrollmentDate. Set a composite primary key using StudentID and CourseID. Insert and verify records.

Index on a Key

10. Index Creation:

Create an index on the Email column in a table Users to ensure unique and fast retrieval. Test the indexed column with query performance.

1.

mysql> create database assigment13122024;

Query OK, 1 row affected (0.01 sec)

mysql> use assigment13122024;

Database changed

mysql> create table students(studentId int primary key, name varchar(50), age int);

Query OK, 0 rows affected (0.05 sec)

mysql> insert into students(studentId, name, age)values(1,"Sona", 19),(2, "Hemant", 25), (3, "Riyan", 35), (4, "Rohan", 25), (5, "Uma", 35);

Query OK, 5 rows affected (0.01 sec)

Records: 5 Duplicates: 0 Warnings: 0

2.

mysql> insert into students(1,"Kajal", 28);

ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your MySQL server version for the right syntax to use near '1,"Kajal", 28)' at line 1

mysql> insert into students values(1,"Kajal", 28);

ERROR 1062 (23000): Duplicate entry '1' for key 'students.PRIMARY'

mysql> explain students;

+-----------+-------------+------+-----+---------+-------+

| Field | Type | Null | Key | Default | Extra |

+-----------+-------------+------+-----+---------+-------+

| studentId | int | NO | PRI | NULL | |

| name | varchar(50) | YES | | NULL | |

| age | int | YES | | NULL | |

+-----------+-------------+------+-----+---------+-------+

3 rows in set (0.01 sec)

mysql> select \* from students;

+-----------+--------+------+

| studentId | name | age |

+-----------+--------+------+

| 1 | Sona | 19 |

| 2 | Hemant | 25 |

| 3 | Riyan | 35 |

| 4 | Rohan | 25 |

| 5 | Uma | 35 |

+-----------+--------+------+

5 rows in set (0.00 sec)

3.

mysql> create table department(departmentId int primary key, departmentName varchar(50));

Query OK, 0 rows affected (0.04 sec)

mysql> create table employees(employeeId int primary key, employeeName varchar(50), departmentId int foreign key(departmentid) references department(departmentId));

ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your MySQL server version for the right syntax to use near 'foreign key(departmentid) references department(departmentId))' at line 1

mysql> create table employees(employeeId int primary key, employeeName varchar(50), departmentId int, foreign key(departmentid) references department(departmentId));

Query OK, 0 rows affected (0.05 sec)

mysql> insert into department values(101, "Exchange department");

Query OK, 1 row affected (0.01 sec)

mysql> insert into department values(102, "cash department");

Query OK, 1 row affected (0.01 sec)

mysql> insert into employees values(1, "Rohan", 101);

Query OK, 1 row affected (0.01 sec)

mysql> insert into employees values(1, "sonam", 101);

ERROR 1062 (23000): Duplicate entry '1' for key 'employees.PRIMARY'

mysql> insert into employees values(2, "sonam", 101);

Query OK, 1 row affected (0.01 sec)

mysql> insert into employees values(3, "poonam", 102);

Query OK, 1 row affected (0.01 sec)

mysql> select \* from employees;

+------------+--------------+--------------+

| employeeId | employeeName | departmentId |

+------------+--------------+--------------+

| 1 | Rohan | 101 |

| 2 | sonam | 101 |

| 3 | poonam | 102 |

+------------+--------------+--------------+

3 rows in set (0.00 sec)

mysql> select \* from department;

+--------------+---------------------+

| departmentId | departmentName |

+--------------+---------------------+

| 101 | Exchange department |

| 102 | cash department |

+--------------+---------------------+

2 rows in set (0.00 sec)

5.

mysql> create table courses(courseId int primary key, coursename varchar(20) unique key, duration time);

Query OK, 0 rows affected (0.04 sec)

mysql> insert into courses values(101, "Sonam", 12:15);

ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your MySQL server version for the right syntax to use near ':15)' at line 1

mysql> insert into courses values(101, "Sonam", "12:15");

Query OK, 1 row affected (0.01 sec)

mysql> insert into courses values(101, "Reena", "12:00");

ERROR 1062 (23000): Duplicate entry '101' for key 'courses.PRIMARY'

mysql> insert into courses values(102, "Reena", "12:00");

Query OK, 1 row affected (0.01 sec)

mysql> insert into courses values(103, "seena", "12:00");

Query OK, 1 row affected (0.01 sec)

mysql> insert into courses values(104, "seena", "12:00");

ERROR 1062 (23000): Duplicate entry 'seena' for key 'courses.coursename'

6.

create table voters(voterid int primary key, name varchar(50), age int)

mysql> desc voters;

+---------+-------------+------+-----+---------+-------+

| Field | Type | Null | Key | Default | Extra |

+---------+-------------+------+-----+---------+-------+

| voterid | int | NO | PRI | NULL | |

| name | varchar(50) | YES | | NULL | |

| age | int | YES | | NULL | |

+---------+-------------+------+-----+---------+-------+

3 rows in set (0.00 sec)

mysql> alter table voters modify age int check (age>=18);

Query OK, 0 rows affected (0.07 sec)

Records: 0 Duplicates: 0 Warnings: 0

mysql> desc voters;

+---------+-------------+------+-----+---------+-------+

| Field | Type | Null | Key | Default | Extra |

+---------+-------------+------+-----+---------+-------+

| voterid | int | NO | PRI | NULL | |

| name | varchar(50) | YES | | NULL | |

| age | int | YES | | NULL | |

+---------+-------------+------+-----+---------+-------+

3 rows in set (0.01 sec)

mysql> insert into voters values(1, "Tom", 26);

Query OK, 1 row affected (0.01 sec)

mysql> insert into voters values(2, "Tom", 18);

Query OK, 1 row affected (0.01 sec)

mysql> insert into voters values(2, "Tom", 17);

ERROR 3819 (HY000): Check constraint 'voters\_chk\_1' is violated.

mysql>

7.

create table orders(orderId int primary key, cutomername varchar(50), orderstatus varchar(50) default "pending");

Query OK, 0 rows affected (0.03 sec)

mysql> desc orders;

+-------------+-------------+------+-----+---------+-------+

| Field | Type | Null | Key | Default | Extra |

+-------------+-------------+------+-----+---------+-------+

| orderId | int | NO | PRI | NULL | |

| cutomername | varchar(50) | YES | | NULL | |

| orderstatus | varchar(50) | YES | | pending | |

+-------------+-------------+------+-----+---------+-------+

3 rows in set (0.01 sec)

mysql> insert into orders values(1, "Joy", "completed");

Query OK, 1 row affected (0.01 sec)

mysql> insert into orders values(2, "soy", "process");

Query OK, 1 row affected (0.01 sec)

mysql> insert into orders values(2, "soy");

ERROR 1136 (21S01): Column count doesn't match value count at row 1

mysql> insert into orders (orderid, cutomername)values(3, "soy");

Query OK, 1 row affected (0.01 sec)

mysql> select \* from orders;

+---------+-------------+-------------+

| orderId | cutomername | orderstatus |

+---------+-------------+-------------+

| 1 | Joy | completed |

| 2 | soy | process |

| 3 | soy | pending |

+---------+-------------+-------------+

3 rows in set (0.00 sec)

mysql> insert into orders (orderid, cutomername)values(4, "reena");

Query OK, 1 row affected (0.01 sec)

mysql> select \* from orders;

+---------+-------------+-------------+

| orderId | cutomername | orderstatus |

+---------+-------------+-------------+

| 1 | Joy | completed |

| 2 | soy | process |

| 3 | soy | pending |

| 4 | reena | pending |

+---------+-------------+-------------+

4 rows in set (0.00 sec)

mysql>

8.

mysql> create table product(productid int primary key, productname varchar(50) not null, price int);

Query OK, 0 rows affected (0.07 sec)

mysql> insert into product(productid, productname, price)values(101, NULL, 1200);

ERROR 1048 (23000): Column 'productname' cannot be null

mysql> desc product;

+-------------+-------------+------+-----+---------+-------+

| Field | Type | Null | Key | Default | Extra |

+-------------+-------------+------+-----+---------+-------+

| productid | int | NO | PRI | NULL | |

| productname | varchar(50) | NO | | NULL | |

| price | int | YES | | NULL | |

+-------------+-------------+------+-----+---------+-------+

3 rows in set (0.00 sec)

9.

mysql> create table enrollment(studentid int, coursesid int, enrollnment\_date date, primary key(studentid, coursesid));

Query OK, 0 rows affected (0.03 sec)

mysql> desc enrollment;

+------------------+------+------+-----+---------+-------+

| Field | Type | Null | Key | Default | Extra |

+------------------+------+------+-----+---------+-------+

| studentid | int | NO | PRI | NULL | |

| coursesid | int | NO | PRI | NULL | |

| enrollnment\_date | date | YES | | NULL | |

+------------------+------+------+-----+---------+-------+

3 rows in set (0.01 sec)

mysql> insert into enrollment(studentid, coursesid, enrollnment\_date)values(1,101, "2024-12-13"),(2,102,"2024-12-13");

Query OK, 2 rows affected (0.01 sec)

Records: 2 Duplicates: 0 Warnings: 0

mysql> insert into enrollment(studentid, coursesid, enrollnment\_date)values(1,101, "2024-12-13"),(2,102,"2024-12-13");

ERROR 1062 (23000): Duplicate entry '1-101' for key 'enrollment.PRIMARY'

mysql> insert into enrollment(studentid, coursesid, enrollnment\_date)values(1,101, "2024-12-13");

ERROR 1062 (23000): Duplicate entry '1-101' for key 'enrollment.PRIMARY'

10.

mysql> create table user1(userId int primary key, email varchar(50) unique, index idx\_email(email));

Query OK, 0 rows affected (0.04 sec)

mysql> desc user1;

+--------+-------------+------+-----+---------+-------+

| Field | Type | Null | Key | Default | Extra |

+--------+-------------+------+-----+---------+-------+

| userId | int | NO | PRI | NULL | |

| email | varchar(50) | YES | UNI | NULL | |

+--------+-------------+------+-----+---------+-------+

2 rows in set (0.00 sec)

mysql> alter table user1 add column name varchar(50);

Query OK, 0 rows affected (0.04 sec)

Records: 0 Duplicates: 0 Warnings: 0

mysql> desc user1;

+--------+-------------+------+-----+---------+-------+

| Field | Type | Null | Key | Default | Extra |

+--------+-------------+------+-----+---------+-------+

| userId | int | NO | PRI | NULL | |

| email | varchar(50) | YES | UNI | NULL | |

| name | varchar(50) | YES | | NULL | |

+--------+-------------+------+-----+---------+-------+

3 rows in set (0.00 sec)

mysql> insert into user1(userid, email, name)values(1, "re@gmail.com","sonma"), (2, "So@gmail.com", "Sonam"), (3, "Um23@gmail.com","uma"),(4, "P

oja@gmail.com", "Pooja"), (5, "Ajay@gmail.com", "Ajay");

Query OK, 5 rows affected (0.01 sec)

Records: 5 Duplicates: 0 Warnings: 0

mysql> select \* from user1 where email="ajay@gmail.com";

+--------+----------------+------+

| userId | email | name |

+--------+----------------+------+

| 5 | Ajay@gmail.com | Ajay |

+--------+----------------+------+

1 row in set (0.00 sec)