

DATABASE MANAGEMENT SYSTEMS - LABORATORY

AY: 2025-26

Sem - I

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Class: TE Division: 06 Batch: N6 Roll No: 32215

Assignment No: 2

Design and Develop SQL DDL statements which demonstrate the use of SQL objects such as Table, View, Index, Sequence and Synonym

DDL Commands: CREATE, DROP, ALTER, RENAME, TRUNCATE

DML Commands: SELECT, INSERT, UPDATE, DELETE

For every command / sub question below:

Paste screenshots of the commands and the executed queries

In case of typical cases, demonstrate the errors

Ensure use of your name and roll no for the databases

Ensure your name appended with your last name for the creation of the tables

1.	Difference in Mysql workbench , Mysql line – command, sudo mysql
Answer	MySQL Workbench is a graphical interface for managing and designing MySQL databases visually, while the mysql command-line client lets you interact with the database by typing SQL commands directly in the terminal; using sudo mysql runs the command-line client with root (superuser) privileges on Linux, often allowing passwordless access to the MySQL root user for administrative tasks.

2.	<p>Show Databases</p> <p>Also try commands like Show database SHOW DaTaBaSe</p> <p>Derive Conclusions on the case sensitivity in mysql Try to create the databases by using - pseudo mysql and client server option check for the error and draw conclusion on the "database administrator and analyst"</p>
Answer	<pre>mysql> show databases; +-----+ Database +-----+ 32215db information_schema performance_schema +-----+ 3 rows in set (0.01 sec)</pre> <p><i>mysql> SHOW DaTabasEs; // case sensitive command don't affect the execution</i></p> <pre>+-----+ Database +-----+ 32215db information_schema performance_schema +-----+ 3 rows in set (0.01 sec)</pre>
3.	<p>Create Database</p> <p>Check if you can create a database when logged in using pseudo mysql ? justify the results After creation of the database, again use to command 'show databases' to see it.</p>
Answer	<pre>// inside the pseudo mysql mysql> create Database new_database; ERROR 1044 (42000): Access denied for user '32215'@'%' to database 'new_database'</pre> <p>//we are not allowed to create database since are in a restricted mode</p> <pre>// inside non restricted mode mysql> create Database new_database;</pre>

	<p>Query OK, 1 row affected (0.10 sec)</p> <pre>mysql> show databases;</pre> <pre>+-----+ Database +-----+ 1234db 32105_Arpit new_1 <u>new_database</u> performance_schema pict pictsstr prajakta prajakta_N8_32478 pune ritesh sachin_32431 sample_db stud student world +-----+</pre> <p>120 rows in set (0.02 sec)</p>
4.	Show Tables
Answer	<pre>mysql> show tables -> ;</pre> <pre>+-----+ Tables_in_32215db +-----+ College_complete College_view college course d_c_view department student +-----+</pre> <p>7 rows in set (0.00 sec)</p>
5.	<p>Create Table</p> <p>Try to assign a name to an attribute with space in between ex: Roll No , First name. check the error. Execute the command "show tables: to check to created table"</p>
Answer	<pre>mysql> CREATE TABLE Students (</pre>

	<p>-> Roll No INT, -> First name VARCHAR(50) ->);</p> <p>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 'No INT, First name VARCHAR(50))' at line 2</p> <p><i>//this is a wrong syntax to create a table</i></p> <p>mysql> CREATE TABLE Students (-> `Roll No` INT, -> `First name` VARCHAR(50) ->);</p> <p>Query OK, 0 rows affected (0.50 sec)</p> <p><i>//correct syntax</i></p> <p>mysql> show tables;</p> <pre> +-----+ Tables_in_32215db +-----+ College_complete College_view Students college course d_c_view department student +-----+ 8 rows in set (0.01 sec) </pre>
6.	<p>Describe and Desc</p> <p>Create a table named student and describe it Desc student1 Describe student1 Desc table student1 Describe table student1</p> <p>Derive conclusion on Desc table / Describe table commands. Paste the screen shots to demonstrate the outcomes in both the cases</p>

Answer	<pre>mysql> desc Students -> ; +-----+-----+-----+-----+-----+ Field Type Null Key Default Extra +-----+-----+-----+-----+-----+ Roll No int YES NULL First name varchar(50) YES NULL +-----+-----+-----+-----+-----+ 2 rows in set (0.01 sec) mysql> describe Students; +-----+-----+-----+-----+-----+ Field Type Null Key Default Extra +-----+-----+-----+-----+-----+ Roll No int YES NULL First name varchar(50) YES NULL +-----+-----+-----+-----+-----+ 2 rows in set (0.01 sec) mysql> desc table Students; +-----+-----+-----+-----+-----+-----+-----+ id select_type table partitions type possible_keys key key_len ref rows filtered Extra +-----+-----+-----+-----+-----+-----+-----+ 1 SIMPLE Students NULL ALL NULL NULL NULL NULL 1 100.00 NULL +-----+-----+-----+-----+-----+-----+-----+ 1 row in set, 1 warning (0.00 sec) mysql> describe table Students; +-----+-----+-----+-----+-----+-----+-----+ id select_type table partitions type possible_keys key key_len ref rows filtered Extra +-----+-----+-----+-----+-----+-----+-----+ 1 SIMPLE Students NULL ALL NULL NULL NULL NULL 1 100.00 NULL +-----+-----+-----+-----+-----+-----+-----+ 1 row in set, 1 warning (0.00 sec)</pre>
7.	<p>Show Create table</p> <p>Show create table student1 Compare the results of all three commands</p> <ul style="list-style-type: none"> - desc, - describe, - show create

Answer	<pre>mysql> Show create table student1 ; ERROR 1146 (42S02): Table '32215db.student1' doesn't exist mysql> Show create table student1(-> `Roll no` INT, -> `Name` varchar(10) ->); 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 '(`Roll no` INT, `Name` varchar(10))' at line 1 mysql></pre>
8.	<p>Insert commands</p> <p>Only one value at a time - in a single command Multiple values in a single command Selective values (only some of the defined attributes)</p> <p><i>(Insert your name other details and five students after your roll no)</i></p>
Answer	<pre>// inserting single entry at a time mysql> INSERT INTO Students (`Roll No`, `First name`) VALUES (1, 'Alice'); Query OK, 1 row affected (0.08 sec) mysql> INSERT INTO Students (`Roll No`, `First name`) VALUES (2, 'Bob'); Query OK, 1 row affected (0.08 sec) //insert multiple values mysql> INSERT INTO Students (`Roll No`, `First name`) VALUES -> (32,"Dhruv"), -> (35,"Meetali"); Query OK, 2 rows affected (0.08 sec) Records: 2 Duplicates: 0 Warnings: 0</pre>
9.	<p>Display Table (Select *from)</p> <p>Compare the outcomes with 'Show create table' student1</p>
Answer	<pre>mysql> INSERT INTO Students (`Roll No`, `First name`) VALUES^C mysql> select * from Students; +-----+-----+ Roll No First name +-----+-----+ 1 Alice 2 Bob 32 Dhruv 35 Meetali +-----+-----+ 4 rows in set (0.00 sec)</pre>

10.	Drop Implement an example of drop Again, use show tables to verify
Answer	<pre>mysql> DROP TABLE Students; Query OK, 0 rows affected (0.35 sec)</pre> <pre>mysql> show tables; +-----+ Tables_in_32215db +-----+ College_complete College_view college course d_c_view department student +-----+ 7 rows in set (0.01 sec)</pre>
11.	Truncate Implement an example of truncate and demonstrate the difference in drop & truncate <i>(Paste screenshots of the commands and the executed queries / errors)</i>
Answer	<pre>mysql> TRUNCATE TABLE Students; Query OK, 0 rows affected (0.65 sec)</pre> <pre>mysql> SELECT * FROM Students; Empty set (0.01 sec)</pre> <pre>mysql> DROP TABLE Students; Query OK, 0 rows affected (0.25 sec)</pre> <pre>mysql> SELECT * FROM Students; ERROR 1146 (42S02): Table '32215db.Students' doesn't exist</pre> <p><i>//Difference</i></p> <p><i>TRUNCATE deletes all data from a table but keeps the table itself for future use.</i></p> <p><i>DROP deletes the entire table and its data permanently. Truncate is faster and keeps the structure; drop removes everything.</i></p>
12.	Delete Mention an example of delete and demonstrate the difference in Delete, Drop & Truncate

	<i>(Paste screenshots of the commands and the executed queries / errors)</i>
Answer	<p>mysql> DELETE FROM Students WHERE `Roll No` = 2; Query OK, 1 row affected (0.14 sec)</p> <p>mysql> TRUNCATE TABLE Students; Query OK, 0 rows affected (1.00 sec)</p> <p>mysql> DROP TABLE Students; Query OK, 0 rows affected (0.43 sec)</p> <p>// Differnce</p> <p>DELETE: Removes specific rows based on a condition; table structure stays.</p> <p>TRUNCATE: Quickly removes all rows; table structure stays.</p> <p>DROP: Removes the entire table and its data; table no longer exists.</p>
13. ALTER	<p>Create Faculty table Faculty {E_no, F_name, L_name, Gender, Date of Joining, Course_Id} Write a query on above table by using ALTER with</p> <ul style="list-style-type: none"> - ADD, - MODIFY, - DROP - RENAME <p><i>(Paste screenshots of the commands and the executed queries / errors)</i></p> <p>Alter – Add: - Add a column to a table (Check where the column is added by default) Alter – Add: First After column_name - specify the position of the new column in the table. (Add the column before / after the existing column) Alter - Add: Add multiple columns in a single command Alter – Modify: Specify datatype and length – ex: varchar (25) Alter – Modify – specify datatype and not length datatype –int -small int, Alter – Modify – Null to not-null, not null is null etc (if a few attributes are already null and then if you are trying to modify it to null, mark the error that you get) Alter – Modify - Decimal (6,2): write the significance of the command decimal (6,2) Alter – Drop Alter – Change / Rename</p>
Answer	<p>mysql> CREATE TABLE Faculty (-> E_no INT, -> F_name VARCHAR(50), -> L_name VARCHAR(50), -> Gender VARCHAR(10), -> `Date of Joining` DATE,</p>


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-> Course_Id INT
-> );
Query OK, 0 rows affected (0.50 sec)

mysql> INSERT INTO Faculty (E_no, F_name, L_name, Gender, `Date of Joining`, Course_Id)
VALUES
-> (1, 'John', 'Doe', 'Male', '2020-01-15', 101),
-> (2, 'Jane', 'Smith', 'Female', '2019-03-10', 102),
-> (3, 'Emily', 'Davis', 'Female', '2021-07-22', 103);
Query OK, 3 rows affected (0.15 sec)
Records: 3 Duplicates: 0 Warnings: 0

mysql> SELECT * FROM Faculty;
+-----+-----+-----+-----+-----+-----+
| E_no | F_name | L_name | Gender | Date of Joining | Course_Id |
+-----+-----+-----+-----+-----+-----+
| 1 | John | Doe | Male | 2020-01-15 | 101 |
| 2 | Jane | Smith | Female | 2019-03-10 | 102 |
| 3 | Emily | Davis | Female | 2021-07-22 | 103 |
+-----+-----+-----+-----+-----+-----+
3 rows in set (0.00 sec)

mysql> ALTER TABLE Faculty ADD Email VARCHAR(100);
Query OK, 0 rows affected (0.25 sec)
Records: 0 Duplicates: 0 Warnings: 0

mysql> SELECT * FROM Faculty;
+-----+-----+-----+-----+-----+-----+-----+
| E_no | F_name | L_name | Gender | Date of Joining | Course_Id | Email |
+-----+-----+-----+-----+-----+-----+-----+
| 1 | John | Doe | Male | 2020-01-15 | 101 | NULL |
| 2 | Jane | Smith | Female | 2019-03-10 | 102 | NULL |
| 3 | Emily | Davis | Female | 2021-07-22 | 103 | NULL |
+-----+-----+-----+-----+-----+-----+-----+
3 rows in set (0.00 sec)

mysql> ALTER TABLE Faculty ADD Phone VARCHAR(15) FIRST;
Query OK, 0 rows affected (0.26 sec)
Records: 0 Duplicates: 0 Warnings: 0

mysql> SELECT * FROM Faculty;
+-----+-----+-----+-----+-----+-----+-----+-----+
| Phone | E_no | F_name | L_name | Gender | Date of Joining | Course_Id | Email |
+-----+-----+-----+-----+-----+-----+-----+-----+
| NULL | 1 | John | Doe | Male | 2020-01-15 | 101 | NULL |
| NULL | 2 | Jane | Smith | Female | 2019-03-10 | 102 | NULL |
| NULL | 3 | Emily | Davis | Female | 2021-07-22 | 103 | NULL |
+-----+-----+-----+-----+-----+-----+-----+-----+
3 rows in set (0.00 sec)

mysql> ALTER TABLE Faculty ADD (Salary DECIMAL(10,2), Experience INT);
Query OK, 0 rows affected (0.30 sec)
Records: 0 Duplicates: 0 Warnings: 0

mysql> SELECT * FROM Faculty;
+-----+-----+-----+-----+-----+-----+-----+-----+

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| Phone | E_no | F_name | L_name | Gender | Date of Joining | Course_Id | Email | Salary | Experience |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| NULL | 1 | John | Doe | Male | 2020-01-15 | 101 | NULL | NULL | NULL |
| NULL | 2 | Jane | Smith | Female | 2019-03-10 | 102 | NULL | NULL | NULL |
| NULL | 3 | Emily | Davis | Female | 2021-07-22 | 103 | NULL | NULL | NULL |
+-----+-----+-----+-----+-----+-----+-----+
3 rows in set (0.00 sec)
```

```
mysql> ALTER TABLE Faculty MODIFY F_name VARCHAR(25);
Query OK, 3 rows affected (1.81 sec)
Records: 3 Duplicates: 0 Warnings: 0
```

```
mysql> SELECT * FROM Faculty;
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| Phone | E_no | F_name | L_name | Gender | Date of Joining | Course_Id | Email | Salary | Experience |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| NULL | 1 | John | Doe | Male | 2020-01-15 | 101 | NULL | NULL | NULL |
| NULL | 2 | Jane | Smith | Female | 2019-03-10 | 102 | NULL | NULL | NULL |
| NULL | 3 | Emily | Davis | Female | 2021-07-22 | 103 | NULL | NULL | NULL |
+-----+-----+-----+-----+-----+-----+-----+
3 rows in set (0.00 sec)
```

```
mysql> ALTER TABLE Faculty MODIFY E_no SMALLINT;
Query OK, 3 rows affected (2.06 sec)
Records: 3 Duplicates: 0 Warnings: 0
```

```
mysql> SELECT * FROM Faculty;
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| Phone | E_no | F_name | L_name | Gender | Date of Joining | Course_Id | Email | Salary | Experience |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| NULL | 1 | John | Doe | Male | 2020-01-15 | 101 | NULL | NULL | NULL |
| NULL | 2 | Jane | Smith | Female | 2019-03-10 | 102 | NULL | NULL | NULL |
| NULL | 3 | Emily | Davis | Female | 2021-07-22 | 103 | NULL | NULL | NULL |
+-----+-----+-----+-----+-----+-----+-----+
3 rows in set (0.00 sec)
```

```
mysql> UPDATE Faculty SET Email = 'unknown@example.com' WHERE Email IS NULL;
Query OK, 3 rows affected (0.06 sec)
Rows matched: 3 Changed: 3 Warnings: 0
```

```
mysql> SELECT * FROM Faculty;
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| Phone | E_no | F_name | L_name | Gender | Date of Joining | Course_Id | Email | Salary | Experience |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| NULL | 1 | John | Doe | Male | 2020-01-15 | 101 | unknown@example.com | NULL | NULL |
| NULL | 2 | Jane | Smith | Female | 2019-03-10 | 102 | unknown@example.com | NULL | NULL |
| NULL | 3 | Emily | Davis | Female | 2021-07-22 | 103 | unknown@example.com | NULL | NULL |
+-----+-----+-----+-----+-----+-----+-----+
3 rows in set (0.00 sec)
```

```
mysql> ALTER TABLE Faculty MODIFY Email VARCHAR(100) NOT NULL;
Query OK, 0 rows affected (1.53 sec)
Records: 0 Duplicates: 0 Warnings: 0
```

```
mysql> SELECT * FROM Faculty;
```

```

+-----+-----+-----+-----+-----+-----+-----+-----+
| Phone | E_no | F_name | L_name | Gender | Date of Joining | Course_Id | Email | Salary |
+-----+-----+-----+-----+-----+-----+-----+-----+
| NULL  | 1    | John   | Doe    | Male   | 2020-01-15      | 101      | unknown@example.com | NULL |
| NULL  | 2    | Jane   | Smith  | Female | 2019-03-10      | 102      | unknown@example.com | NULL |
| NULL  | 3    | Emily  | Davis  | Female | 2021-07-22      | 103      | unknown@example.com | NULL |
+-----+-----+-----+-----+-----+-----+-----+-----+
3 rows in set (0.00 sec)

mysql> ALTER TABLE Faculty MODIFY Salary DECIMAL(6,2);
Query OK, 3 rows affected (1.74 sec)
Records: 3 Duplicates: 0 Warnings: 0

mysql> SELECT * FROM Faculty;
+-----+-----+-----+-----+-----+-----+-----+-----+
| Phone | E_no | F_name | L_name | Gender | Date of Joining | Course_Id | Email | Salary |
+-----+-----+-----+-----+-----+-----+-----+-----+
| NULL  | 1    | John   | Doe    | Male   | 2020-01-15      | 101      | unknown@example.com | NULL |
| NULL  | 2    | Jane   | Smith  | Female | 2019-03-10      | 102      | unknown@example.com | NULL |
| NULL  | 3    | Emily  | Davis  | Female | 2021-07-22      | 103      | unknown@example.com | NULL |
+-----+-----+-----+-----+-----+-----+-----+-----+
3 rows in set (0.00 sec)

mysql> ALTER TABLE Faculty DROP COLUMN Experience;
Query OK, 0 rows affected (0.82 sec)
Records: 0 Duplicates: 0 Warnings: 0

mysql> SELECT * FROM Faculty;
+-----+-----+-----+-----+-----+-----+-----+-----+
| Phone | E_no | F_name | L_name | Gender | Date of Joining | Course_Id | Email | Salary |
+-----+-----+-----+-----+-----+-----+-----+-----+
| NULL  | 1    | John   | Doe    | Male   | 2020-01-15      | 101      | unknown@example.com | NULL |
| NULL  | 2    | Jane   | Smith  | Female | 2019-03-10      | 102      | unknown@example.com | NULL |
| NULL  | 3    | Emily  | Davis  | Female | 2021-07-22      | 103      | unknown@example.com | NULL |
+-----+-----+-----+-----+-----+-----+-----+-----+
3 rows in set (0.00 sec)

mysql> ALTER TABLE Faculty CHANGE Course_Id CourseCode VARCHAR(20);
Query OK, 3 rows affected (2.72 sec)
Records: 3 Duplicates: 0 Warnings: 0

mysql> SELECT * FROM Faculty;
+-----+-----+-----+-----+-----+-----+-----+-----+
| Phone | E_no | F_name | L_name | Gender | Date of Joining | CourseCode | Email | Salary |
+-----+-----+-----+-----+-----+-----+-----+-----+
| NULL  | 1    | John   | Doe    | Male   | 2020-01-15      | 101      | unknown@example.com | NULL |
| NULL  | 2    | Jane   | Smith  | Female | 2019-03-10      | 102      | unknown@example.com | NULL |
| NULL  | 3    | Emily  | Davis  | Female | 2021-07-22      | 103      | unknown@example.com | NULL |
+-----+-----+-----+-----+-----+-----+-----+-----+
3 rows in set (0.00 sec)

```

14.	<div>NULL Constraints</div> <div><ul style="list-style-type: none">• Create a Table without any NULL Constraints.• Describe the table• Alter the table to include Null Constraints<ul style="list-style-type: none">• - Make Roll_no Not Null• - Make Name field Not null• Describe the table to verify it• Use ALTER Command• "Alter table student1 modify roll_no int not null"• Define an attribute permitted to be Null and then after leaving some un-inserted values try to now apply Null Constraint. Is it permitted?• Draw conclusions after inserting a few values in the tables:<div><div>changing Null</div><div>Not Null</div><div>—————></div></div><div><div>changing Not Null</div><div>Null</div><div>—————></div></div></div>
Answer	<div>mysql> CREATE TABLE student1 (-> roll_no INT, -> name VARCHAR(50), -> age INT ->); Query OK, 0 rows affected (1.17 sec)</div> <div>mysql> mysql> SELECT * FROM student1; Empty set (0.00 sec)</div> <div>mysql> INSERT INTO student1 VALUES (1, 'Dhruv', 21); Query OK, 1 row affected (0.20 sec)</div> <div>mysql> INSERT INTO student1 VALUES (2, 'Meetali', NULL); Query OK, 1 row affected (0.14 sec)</div> <div>mysql> INSERT INTO student1 VALUES (3, 'Aryan', 22); Query OK, 1 row affected (0.09 sec)</div> <div>mysql> mysql> SELECT * FROM student1; +-----+-----+-----+ roll_no name age +-----+-----+-----+ 1 Dhruv 21 2 Meetali NULL 3 Aryan 22 +-----+-----+-----+ 3 rows in set (0.00 sec)</div> <div>mysql> ALTER TABLE student1 MODIFY roll_no INT NOT NULL; Query OK, 0 rows affected (1.85 sec) Records: 0 Duplicates: 0 Warnings: 0</div>

```
mysql> ALTER TABLE student1 MODIFY name VARCHAR(50) NOT NULL;
Query OK, 0 rows affected (1.36 sec)
Records: 0 Duplicates: 0 Warnings: 0

mysql>
mysql> DESC student1;
+-----+-----+-----+-----+-----+
| Field | Type      | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+
| roll_no | int       | NO   |     | NULL    |      |
| name    | varchar(50) | NO   |     | NULL    |      |
| age     | int       | YES  |     | NULL    |      |
+-----+-----+-----+-----+-----+
3 rows in set (0.00 sec)

mysql> INSERT INTO student1 VALUES (NULL, 'Someone', 20);
ERROR 1048 (23000): Column 'roll_no' cannot be null
mysql> INSERT INTO student1 VALUES (4, NULL, 23);
ERROR 1048 (23000): Column 'name' cannot be null
mysql> INSERT INTO student1 VALUES (4, 'Rohit', NULL);
Query OK, 1 row affected (0.06 sec)

mysql>
mysql> SELECT * FROM student1;
+-----+-----+-----+
| roll_no | name   | age |
+-----+-----+-----+
| 1 | Dhruv | 21 |
| 2 | Meetali | NULL |
| 3 | Aryan | 22 |
| 4 | Rohit | NULL |
+-----+-----+-----+
4 rows in set (0.00 sec)

mysql> ALTER TABLE student1 MODIFY age INT NOT NULL;
ERROR 1138 (22004): Invalid use of NULL value
mysql> UPDATE student1 SET age = 0 WHERE age IS NULL;
Query OK, 2 rows affected (0.05 sec)
Rows matched: 2 Changed: 2 Warnings: 0

mysql>
mysql> SELECT * FROM student1;
+-----+-----+-----+
| roll_no | name   | age |
+-----+-----+-----+
| 1 | Dhruv | 21 |
| 2 | Meetali | 0 |
| 3 | Aryan | 22 |
| 4 | Rohit | 0 |
+-----+-----+-----+
4 rows in set (0.01 sec)
```

```
mysql> ALTER TABLE student1 MODIFY age INT NOT NULL;
Query OK, 0 rows affected (1.41 sec)
Records: 0 Duplicates: 0 Warnings: 0
```

```
mysql>
mysql> DESC student1;
+-----+-----+-----+-----+-----+
| Field | Type   | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+
| roll_no | int    | NO   |     | NULL    |       |
| name   | varchar(50) | NO   |     | NULL    |       |
| age    | int    | NO   |     | NULL    |       |
+-----+-----+-----+-----+-----+
3 rows in set (0.01 sec)
```

```
mysql> ALTER TABLE student1 MODIFY name VARCHAR(50) NULL;
Query OK, 0 rows affected (1.41 sec)
Records: 0 Duplicates: 0 Warnings: 0
```

```
mysql>
mysql> DESC student1;
+-----+-----+-----+-----+-----+
| Field | Type   | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+
| roll_no | int    | NO   |     | NULL    |       |
| name   | varchar(50) | YES  |     | NULL    |       |
| age    | int    | NO   |     | NULL    |       |
+-----+-----+-----+-----+-----+
3 rows in set (0.01 sec)
```

```
mysql> SELECT * FROM student1;
+-----+-----+-----+
| roll_no | name   | age |
+-----+-----+-----+
| 1 | Dhruv | 21 |
| 2 | Meetal | 0 |
| 3 | Aryan | 22 |
| 4 | Rohit | 0 |
+-----+-----+-----+
4 rows in set (0.00 sec)
```

15. Unique Constraints

- Already a table has been created and now alter it to add constraint
- Initialize unique constraint while creating table
- Make one of the fields-say – Roll_no as a unique key
- Try to insert duplicate values
- Describe the table to verify the application of unique constraint on an attribute
- Drop the defined unique constraints

	<ul style="list-style-type: none"> • Use alter to again define it. <p>Try multiple cases / combinations in the defined unique constraints:</p> <p><u>Case 1:</u> Only one attribute – Roll_no is defined as an unique constraint</p> <p><u>Case 2:</u> Roll_no was already defined as a unique constraint earlier. But now a combination of one more field is used along with roll_no: Roll_no + f_name</p> <p><u>Case 3:</u> Roll_no was already defined as a unique constraint earlier. But now a combination of two more fields is used along with roll_no : Roll_no + age + l_name</p> <p><u>Case 4:</u> Earlier 'Roll_no' was 'unique' key and was used in the combination. Now the combination of two fields does not include the unique key. The combination is of 'age and F-name'. The desc command describes the key age as multivalued.</p> <p><u>Case 5:</u> Earlier 'Roll_no' was 'unique' key and was used in the combination. Now the combination of three fields does not include the unique key. The combination is of 'l_name, age, F-name'. The desc command, describes the keys: L-name and age as multivalued.</p> <p>After each case, use describe command to check the attribute which is defined as multivalued – MUL</p> <p><i>(Paste screenshots of the commands and the executed queries / errors)</i></p>
Answer	<pre>mysql> mysql> CREATE TABLE student1 (-> roll_no INT, -> f_name VARCHAR(50), -> l_name VARCHAR(50), -> age INT ->); Query OK, 0 rows affected (0.52 sec) mysql> mysql> SELECT * FROM student1; Empty set (0.00 sec) mysql> ALTER TABLE student1 ADD UNIQUE (roll_no); Query OK, 0 rows affected (0.28 sec) Records: 0 Duplicates: 0 Warnings: 0 mysql> INSERT INTO student1 VALUES (1, 'Dhruv', 'Sharma', 21); Query OK, 1 row affected (0.06 sec) mysql> INSERT INTO student1 VALUES (2, 'Meetali', 'Patel', 22); Query OK, 1 row affected (0.16 sec) mysql> INSERT INTO student1 VALUES (1, 'Aryan', 'Kumar', 23);</pre>

```

ERROR 1062 (23000): Duplicate entry '1' for key 'student1.roll_no'
mysql> DESC student1;
+-----+-----+-----+-----+-----+-----+
| Field | Type   | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| roll_no | int    | YES  | UNI | NULL    |      |
| f_name  | varchar(50) | YES  |     | NULL    |      |
| l_name  | varchar(50) | YES  |     | NULL    |      |
| age    | int    | YES  |     | NULL    |      |
+-----+-----+-----+-----+-----+-----+
4 rows in set (0.00 sec)

mysql> ALTER TABLE student1 DROP INDEX roll_no;
Query OK, 0 rows affected (0.37 sec)
Records: 0 Duplicates: 0 Warnings: 0

mysql> ALTER TABLE student1 ADD UNIQUE uniq_roll_fname (roll_no, f_name);
Query OK, 0 rows affected (0.35 sec)
Records: 0 Duplicates: 0 Warnings: 0

mysql> INSERT INTO student1 VALUES (1, 'Dhruv', 'Sharma', 21);
ERROR 1062 (23000): Duplicate entry '1-Dhruv' for key 'student1.uniq_roll_fname'
mysql> INSERT INTO student1 VALUES (1, 'Meetal', 'Patel', 22); -- Allowed: roll_no
same, f_name different
Query OK, 1 row affected (0.06 sec)

mysql> INSERT INTO student1 VALUES (1, 'Dhruv', 'Kumar', 23); -- Error: duplicate
(roll_no, f_name)
ERROR 1062 (23000): Duplicate entry '1-Dhruv' for key 'student1.uniq_roll_fname'
mysql> DESC student1;
+-----+-----+-----+-----+-----+-----+
| Field | Type   | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| roll_no | int    | YES  | MUL | NULL    |      |
| f_name  | varchar(50) | YES  |     | NULL    |      |
| l_name  | varchar(50) | YES  |     | NULL    |      |
| age    | int    | YES  |     | NULL    |      |
+-----+-----+-----+-----+-----+-----+
4 rows in set (0.00 sec)

mysql> ALTER TABLE student1 DROP INDEX uniq_roll_fname;
Query OK, 0 rows affected (0.18 sec)
Records: 0 Duplicates: 0 Warnings: 0

mysql> ALTER TABLE student1 ADD UNIQUE uniq_roll_age_lname (roll_no, age,
l_name);
Query OK, 0 rows affected (0.48 sec)
Records: 0 Duplicates: 0 Warnings: 0

mysql> INSERT INTO student1 VALUES (1, 'Dhruv', 'Sharma', 21);
ERROR 1062 (23000): Duplicate entry '1-21-Sharma' for key

```



```

'student1.uniq_roll_age_lname'
mysql> INSERT INTO student1 VALUES (1, 'Meetali', 'Sharma', 22);
Query OK, 1 row affected (0.08 sec)

mysql> INSERT INTO student1 VALUES (1, 'Aryan', 'Sharma', 21); -- Allowed, age
different
ERROR 1062 (23000): Duplicate entry '1-21-Sharma' for key
'student1.uniq_roll_age_lname'
mysql> INSERT INTO student1 VALUES (1, 'Rohit', 'Sharma', 21); -- Error: duplicate
(roll_no, age, l_name)
ERROR 1062 (23000): Duplicate entry '1-21-Sharma' for key
'student1.uniq_roll_age_lname'
mysql> DESC student1;
+-----+-----+-----+-----+-----+
| Field | Type   | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+
| roll_no | int    | YES  | MUL | NULL    |      |
| f_name  | varchar(50) | YES  |      | NULL    |      |
| l_name  | varchar(50) | YES  |      | NULL    |      |
| age     | int    | YES  |      | NULL    |      |
+-----+-----+-----+-----+-----+
4 rows in set (0.01 sec)

mysql> ALTER TABLE student1 DROP INDEX uniq_roll_age_lname;
Query OK, 0 rows affected (0.16 sec)
Records: 0 Duplicates: 0 Warnings: 0

mysql> ALTER TABLE student1 ADD UNIQUE uniq_age_fname (age, f_name);
ERROR 1062 (23000): Duplicate entry '22-Meetali' for key
'student1.uniq_age_fname'
mysql> INSERT INTO student1 VALUES (1, 'Dhruv', 'Sharma', 21);
Query OK, 1 row affected (0.06 sec)

mysql> INSERT INTO student1 VALUES (2, 'Dhruv', 'Patel', 22);
Query OK, 1 row affected (0.10 sec)

mysql> INSERT INTO student1 VALUES (3, 'Meetali', 'Kumar', 21);
Query OK, 1 row affected (0.09 sec)

mysql> INSERT INTO student1 VALUES (4, 'Meetali', 'Sharma', 21); -- Error: duplicate
(age=21, f_name='Meetali')
Query OK, 1 row affected (0.10 sec)

mysql> DESC student1;
+-----+-----+-----+-----+-----+
| Field | Type   | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+
| roll_no | int    | YES  |      | NULL    |      |
| f_name  | varchar(50) | YES  |      | NULL    |      |
| l_name  | varchar(50) | YES  |      | NULL    |      |
| age     | int    | YES  |      | NULL    |      |

```

	<pre> +-----+-----+-----+-----+ 4 rows in set (0.00 sec) mysql> ALTER TABLE student1 DROP INDEX uniq_age_fname; ERROR 1091 (42000): Can't DROP 'uniq_age_fname'; check that column/key exists mysql> ALTER TABLE student1 ADD UNIQUE uniq_lname_age_fname (l_name, age, f_name); ERROR 1062 (23000): Duplicate entry 'Patel-22-Meetali' for key 'student1.uniq_lname_age_fname' mysql> INSERT INTO student1 VALUES (1, 'Dhruv', 'Sharma', 21); Query OK, 1 row affected (0.06 sec) mysql> INSERT INTO student1 VALUES (2, 'Meetali', 'Sharma', 21); Query OK, 1 row affected (0.09 sec) mysql> INSERT INTO student1 VALUES (3, 'Aryan', 'Patel', 22); Query OK, 1 row affected (0.18 sec) mysql> INSERT INTO student1 VALUES (4, 'Rohit', 'Sharma', 21); -- Error: duplicate (l_name='Sharma', age=21, f_name='Rohit') if exists Query OK, 1 row affected (0.17 sec) mysql> DESC student1; +-----+-----+-----+-----+ Field Type Null Key Default Extra +-----+-----+-----+-----+ roll_no int YES NULL f_name varchar(50) YES NULL l_name varchar(50) YES NULL age int YES NULL +-----+-----+-----+-----+ 4 rows in set (0.01 sec) mysql> INSERT INTO student1 VALUES (1, 'Aryan', 'Kumar', 23);INSERT INTO student1 VALUES (1, 'Aryan', 'Kumar', 23); </pre>
16.	<p>Primary Constraint</p> <ul style="list-style-type: none"> • Already a table has been created and now alter it to add primary constraint • Initialize unique constraint while creating table • Make one of the fields-say – Roll_no as a primary key • Describe the table to verify the application of primary constraint on an attribute • Use a combination of attributes and define them as primary constraint. • Describe command – verify the defined primary constraints – single and multiple • Drop the defined primary constraints • Replace the already defined primary constraints • Use alter to again define it.
Answer	<pre> mysql> CREATE TABLE student2 (-> roll_no INT, </pre>

```

-> f_name VARCHAR(50),
-> l_name VARCHAR(50),
-> age INT
-> );
Query OK, 0 rows affected (0.46 sec)

mysql> DESC student2;
+-----+-----+-----+-----+-----+
| Field | Type   | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+
| roll_no | int    | YES  |     | NULL    |       |
| f_name  | varchar(50) | YES  |     | NULL    |       |
| l_name  | varchar(50) | YES  |     | NULL    |       |
| age     | int     | YES  |     | NULL    |       |
+-----+-----+-----+-----+-----+
4 rows in set (0.01 sec)

mysql> INSERT INTO student2 VALUES (1, 'Dhruv', 'Sharma', 21);
Query OK, 1 row affected (0.14 sec)

mysql> INSERT INTO student2 VALUES (2, 'Meetali', 'Patel', 22);
Query OK, 1 row affected (0.18 sec)

mysql> INSERT INTO student2 VALUES (3, 'Aryan', 'Kumar', 23);
Query OK, 1 row affected (0.08 sec)

mysql> SELECT * FROM student2;
+-----+-----+-----+-----+
| roll_no | f_name | l_name | age |
+-----+-----+-----+-----+
| 1 | Dhruv | Sharma | 21 |
| 2 | Meetali | Patel | 22 |
| 3 | Aryan | Kumar | 23 |
+-----+-----+-----+-----+
3 rows in set (0.00 sec)

mysql> ALTER TABLE student2 ADD PRIMARY KEY (roll_no);
Query OK, 0 rows affected (0.82 sec)
Records: 0 Duplicates: 0 Warnings: 0

mysql> DESC student2;
+-----+-----+-----+-----+-----+
| Field | Type   | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+
| roll_no | int    | NO   | PRI | NULL    |       |
| f_name  | varchar(50) | YES  |     | NULL    |       |
| l_name  | varchar(50) | YES  |     | NULL    |       |
| age     | int     | YES  |     | NULL    |       |
+-----+-----+-----+-----+-----+
4 rows in set (0.00 sec)

```

```
mysql> INSERT INTO student2 VALUES (1, 'Rohit', 'Sharma', 24);
ERROR 1062 (23000): Duplicate entry '1' for key 'student2.PRIMARY'
mysql> ALTER TABLE student2 DROP PRIMARY KEY;
Query OK, 3 rows affected (1.46 sec)
Records: 3 Duplicates: 0 Warnings: 0

mysql> ALTER TABLE student2 ADD PRIMARY KEY (roll_no, f_name);
Query OK, 0 rows affected (1.87 sec)
Records: 0 Duplicates: 0 Warnings: 0

mysql> DESC student2;
+-----+-----+-----+-----+-----+-----+
| Field | Type   | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| roll_no | int    | NO   | PRI | NULL    |      |
| f_name  | varchar(50) | NO   | PRI | NULL    |      |
| l_name  | varchar(50) | YES  |     | NULL    |      |
| age     | int     | YES  |     | NULL    |      |
+-----+-----+-----+-----+-----+-----+
4 rows in set (0.00 sec)

mysql> INSERT INTO student2 VALUES (1, 'Dhruv', 'Sharma', 21);
ERROR 1062 (23000): Duplicate entry '1-Dhruv' for key 'student2.PRIMARY'
mysql> INSERT INTO student2 VALUES (1, 'Rohit', 'Sharma', 24);
Query OK, 1 row affected (0.06 sec)

mysql> SELECT * FROM student2;
+-----+-----+-----+-----+
| roll_no | f_name | l_name | age |
+-----+-----+-----+-----+
| 1 | Dhruv | Sharma | 21 |
| 1 | Rohit | Sharma | 24 |
| 2 | Meetal | Patel | 22 |
| 3 | Aryan | Kumar | 23 |
+-----+-----+-----+-----+
4 rows in set (0.00 sec)

mysql> ALTER TABLE student2 DROP PRIMARY KEY;
Query OK, 4 rows affected (1.48 sec)
Records: 4 Duplicates: 0 Warnings: 0

mysql> ALTER TABLE student2 ADD PRIMARY KEY (f_name);
Query OK, 0 rows affected (0.96 sec)
Records: 0 Duplicates: 0 Warnings: 0

mysql> DESC student2;
+-----+-----+-----+-----+-----+-----+
| Field | Type   | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| roll_no | int    | NO   |     | NULL    |      |
| f_name  | varchar(50) | NO   | PRI | NULL    |      |

```

	<pre> l_name varchar(50) YES NULL age int YES NULL +-----+-----+-----+-----+ 4 rows in set (0.00 sec) mysql> INSERT INTO student2 VALUES (4, 'Dhruv', 'Gupta', 25); ERROR 1062 (23000): Duplicate entry 'Dhruv' for key 'student2.PRIMARY' mysql> INSERT INTO student2 VALUES (4, 'Dhruv', 'Gupta', 25);</pre>
17.	<p>Primary Key and Auto Increment</p> <ul style="list-style-type: none"> You have created a table where say, the 'roll_no' is the primary key and it is autoincrement Now, if you try to delete a primary key (which is auto increment), you will get an error. Alter Table – define autoincrement attribute as simple int and then drop primary key <p>Derive the conclusions about primary key and autoincrement</p>
Answer	<pre>mysql> CREATE TABLE student3 (-> roll_no INT AUTO_INCREMENT PRIMARY KEY, -> f_name VARCHAR(50), -> l_name VARCHAR(50), -> age INT ->); Query OK, 0 rows affected (0.57 sec) mysql> INSERT INTO student3 (f_name, l_name, age) VALUES ('Dhruv', 'Sharma', 21); Query OK, 1 row affected (0.07 sec) mysql> INSERT INTO student3 (f_name, l_name, age) VALUES ('Meetali', 'Patel', 22); Query OK, 1 row affected (0.10 sec) mysql> INSERT INTO student3 (f_name, l_name, age) VALUES ('Aryan', 'Kumar', 23); Query OK, 1 row affected (0.12 sec) mysql> SELECT * FROM student3; +-----+-----+-----+-----+ roll_no f_name l_name age +-----+-----+-----+-----+ 1 Dhruv Sharma 21 2 Meetali Patel 22 3 Aryan Kumar 23 +-----+-----+-----+-----+ 3 rows in set (0.00 sec) mysql> ALTER TABLE student3 DROP PRIMARY KEY;</pre>

	<p>ERROR 1075 (42000): Incorrect table definition; there can be only one auto column and it must be defined as a key</p> <pre>mysql> ALTER TABLE student3 MODIFY roll_no INT; Query OK, 3 rows affected (1.63 sec) Records: 3 Duplicates: 0 Warnings: 0</pre> <p>mysql> ALTER TABLE student3 DROP PRIMARY KEY; Query OK, 3 rows affected (1.61 sec) Records: 3 Duplicates: 0 Warnings: 0</p> <pre>mysql> DESC student3; +-----+-----+-----+-----+-----+-----+ Field Type Null Key Default Extra +-----+-----+-----+-----+-----+-----+ roll_no int NO NULL f_name varchar(50) YES NULL l_name varchar(50) YES NULL age int YES NULL +-----+-----+-----+-----+-----+-----+ 4 rows in set (0.00 sec)</pre> <pre>mysql> INSERT INTO student3 (f_name, l_name, age) VALUES ('Rohit', 'Singh', 24); ERROR 1364 (HY000): Field 'roll_no' doesn't have a default value mysql> SELECT * FROM student3; +-----+-----+-----+-----+ roll_no f_name l_name age +-----+-----+-----+-----+ 1 Dhruv Sharma 21 2 Meetal Patel 22 3 Aryan Kumar 23 +-----+-----+-----+-----+ 3 rows in set (0.01 sec)</pre> <p>mysql></p>
18.	<p>Foreign Key</p> <p>Create Parent Table Create Student Table Try to insert the values which are not present in the parent table – error (Referential integrity) Include examples of the following (with errors initially and then without error)</p> <ul style="list-style-type: none"> – on-delete cascade and on-update cascade - on-delete set null and on-update cascade
Answer	<pre>mysql> CREATE TABLE departments (-> dept_id INT PRIMARY KEY, -> dept_name VARCHAR(50)</pre>

```

-> );
Query OK, 0 rows affected (0.41 sec)

mysql> insert into departments values(
-> (1,"CE"^C
mysql> INSERT INTO departments VALUES (1, 'CE');
Query OK, 1 row affected (0.06 sec)

mysql> INSERT INTO departments VALUES (2, 'EnTC');
Query OK, 1 row affected (0.08 sec)

mysql> INSERT INTO departments VALUES (3, 'IT');
Query OK, 1 row affected (0.05 sec)

mysql> CREATE TABLE students (
-> student_id INT PRIMARY KEY,
-> name VARCHAR(50),
-> dept_id INT,
-> FOREIGN KEY (dept_id) REFERENCES departments(dept_id)
-> );

Query OK, 0 rows affected (0.52 sec)

mysql>
mysql> INSERT INTO students VALUES (101, 'Dhruv', 5);
ERROR 1452 (23000): Cannot add or update a child row: a foreign key
constraint fails (`32215db`.`students`, CONSTRAINT `students_ibfk_1`
FOREIGN KEY (`dept_id`) REFERENCES `departments` (`dept_id`))
mysql> INSERT INTO students VALUES (102, 'Meetali', 1);
Query OK, 1 row affected (0.11 sec)

mysql> INSERT INTO students VALUES (103, 'Aryan', 2);
Query OK, 1 row affected (0.09 sec)

mysql> ALTER TABLE students DROP FOREIGN KEY students_ibfk_1;
Query OK, 0 rows affected (0.13 sec)
Records: 0 Duplicates: 0 Warnings: 0

mysql> ALTER TABLE students
-> ADD CONSTRAINT fk_dept
-> FOREIGN KEY (dept_id) REFERENCES departments(dept_id)
-> ON DELETE CASCADE
-> ON UPDATE CASCADE;
Query OK, 2 rows affected (2.18 sec)
Records: 2 Duplicates: 0 Warnings: 0

mysql> SELECT * FROM departments;
+-----+-----+
| dept_id | dept_name |
+-----+-----+
| 1 | CE |

```

```
| 2 | EnTC |  
| 3 | IT   |
```

```
+-----+-----+  
3 rows in set (0.00 sec)
```

```
mysql> SELECT * FROM students;DELETE FROM departments WHERE  
dept_id = 1;
```

```
+-----+-----+-----+  
| student_id | name   | dept_id |  
+-----+-----+-----+  
| 102 | Meetal | 1 |  
| 103 | Aryan  | 2 |  
+-----+-----+-----+  
2 rows in set (0.00 sec)
```

Query OK, 1 row affected (0.14 sec)

```
mysql>  
mysql> SELECT * FROM students;
```

```
+-----+-----+-----+  
| student_id | name   | dept_id |  
+-----+-----+-----+  
| 103 | Aryan  | 2 |  
+-----+-----+-----+  
1 row in set (0.00 sec)
```

```
mysql> UPDATE departments SET dept_id = 4 WHERE dept_id = 2;  
Query OK, 1 row affected (0.09 sec)  
Rows matched: 1 Changed: 1 Warnings: 0
```

```
mysql>  
mysql> SELECT * FROM departments;
```

```
+-----+-----+  
| dept_id | dept_name |  
+-----+-----+  
| 3 | IT   |  
| 4 | EnTC |  
+-----+-----+  
2 rows in set (0.00 sec)
```

```
mysql> SELECT * FROM students;
```

```
+-----+-----+-----+  
| student_id | name   | dept_id |  
+-----+-----+-----+  
| 103 | Aryan  | 4 |  
+-----+-----+-----+  
1 row in set (0.00 sec)
```

```
mysql> ALTER TABLE students DROP FOREIGN KEY fk_dept;  
Query OK, 0 rows affected (0.12 sec)  
Records: 0 Duplicates: 0 Warnings: 0
```



```

mysql> ALTER TABLE students
-> ADD CONSTRAINT fk_dept_setnull
-> FOREIGN KEY (dept_id) REFERENCES departments(dept_id)
-> ON DELETE SET NULL
-> ON UPDATE CASCADE;
Query OK, 1 row affected (1.76 sec)
Records: 1 Duplicates: 0 Warnings: 0

mysql> DELETE FROM departments WHERE dept_id = 4;
Query OK, 1 row affected (0.06 sec)

mysql>
mysql> SELECT * FROM students;
+-----+-----+-----+
| student_id | name | dept_id |
+-----+-----+-----+
| 103 | Aryan | NULL |
+-----+-----+-----+
1 row in set (0.00 sec)

mysql> INSERT INTO departments VALUES (5, 'Electrical');
Query OK, 1 row affected (0.07 sec)

mysql>
mysql> UPDATE students SET dept_id = 5 WHERE student_id = 103;
Query OK, 1 row affected (0.09 sec)
Rows matched: 1 Changed: 1 Warnings: 0

mysql>
mysql> UPDATE departments SET dept_id = 6 WHERE dept_id = 5;
Query OK, 1 row affected (0.07 sec)
Rows matched: 1 Changed: 1 Warnings: 0

mysql>
mysql> SELECT * FROM students;
+-----+-----+-----+
| student_id | name | dept_id |
+-----+-----+-----+
| 103 | Aryan | 6 |
+-----+-----+-----+
1 row in set (0.00 sec)

mysql>

```

19. Check Constraint

Single condition
 Multiple condition
 Alter

	Delete
Answer	<pre>mysql> CREATE TABLE subjects (-> subject_id INT PRIMARY KEY, -> subject_name VARCHAR(50), -> credits INT, -> CONSTRAINT chk_credits_positive CHECK (credits > 0) ->); Query OK, 0 rows affected (0.98 sec) mysql> INSERT INTO subjects VALUES (1, 'Mathematics', 4); Query OK, 1 row affected (0.07 sec) mysql> INSERT INTO subjects VALUES (2, 'Physics', 0); ERROR 3819 (HY000): Check constraint 'chk_credits_positive' is violated. mysql> SELECT * FROM subjects; +-----+-----+-----+ subject_id subject_name credits +-----+-----+-----+ 1 Mathematics 4 +-----+-----+-----+ 1 row in set (0.00 sec) mysql> CREATE TABLE subjects_v2 (-> subject_id INT PRIMARY KEY, -> subject_name VARCHAR(50), -> credits INT, -> CONSTRAINT chk_subject CHECK (credits BETWEEN 1 AND 5 AND CHAR_LENGTH(subject_name) > 2) ->); Query OK, 0 rows affected (0.44 sec) mysql> INSERT INTO subjects_v2 VALUES (1, 'Math', 3); Query OK, 1 row affected (0.21 sec) mysql> NSERT INTO subjects_v2 VALUES (2, 'CS', 4) -> INSERT INTO subjects_v2 VALUES (2, 'CS', 4) -> ; 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 'NSERT INTO subjects_v2 VALUES (2, 'CS', 4) INSERT INTO subjects_v2 VALUES (2, 'C' at line 1 mysql> INSERT INTO subjects_v2 VALUES (3, 'History', 6); ERROR 3819 (HY000): Check constraint 'chk_subject' is violated. mysql> SELECT * FROM subjects_v2; +-----+-----+-----+ subject_id subject_name credits +-----+-----+-----+ 1 Math 3 +-----+-----+-----+</pre>

	<p>1 row in set (0.00 sec)</p> <pre>mysql> ALTER TABLE subjects -> ADD CONSTRAINT chk_name_not_empty CHECK (subject_name <> ''); Query OK, 1 row affected (2.23 sec) Records: 1 Duplicates: 0 Warnings: 0</pre> <pre>mysql> INSERT INTO subjects VALUES (3, '', 3); ERROR 3819 (HY000): Check constraint 'chk_name_not_empty' is violated. mysql> ALTER TABLE subjects DROP CHECK chk_name_not_empty; Query OK, 0 rows affected (0.08 sec) Records: 0 Duplicates: 0 Warnings: 0</pre> <pre>mysql> INSERT INTO subjects VALUES (3, '', 3); Query OK, 1 row affected (0.05 sec)</pre> <pre>mysql> SELECT * FROM subjects; +-----+-----+-----+ subject_id subject_name credits +-----+-----+-----+ 1 Mathematics 4 3 3 +-----+-----+-----+ 2 rows in set (0.00 sec)</pre>
20.	<p>Sort / Order By</p> <p>Descending Ascending If nothing – Desc / Asc is mentioned, explore the default trend Mix- Sort by multiple columns Ex: Order by Asc, Salary desc Sort Alphabetically</p>
Answer	<pre>mysql> CREATE TABLE teachers (-> id INT PRIMARY KEY, -> name VARCHAR(50), -> age INT, -> salary DECIMAL(10,2), -> subject VARCHAR(50) ->); Query OK, 0 rows affected (0.62 sec)</pre> <pre>mysql> INSERT INTO teachers (id, name, age, salary, subject) VALUES -> (1, 'Alice', 30, 50000.00, 'Math'), -> (2, 'Bob', 45, 70000.00, 'Physics'), -> (3, 'Charlie', 35, 60000.00, 'Chemistry'), -> (4, 'Diana', 30, 52000.00, 'Biology'), -> (5, 'Ethan', 40, 70000.00, 'Math'); Query OK, 5 rows affected (0.07 sec) Records: 5 Duplicates: 0 Warnings: 0</pre>

```
mysql> SELECT * FROM teachers
-> ORDER BY salary DESC;
+-----+-----+-----+-----+
| id | name  | age | salary | subject |
+-----+-----+-----+-----+
| 2 | Bob   | 45 | 70000.00 | Physics |
| 5 | Ethan | 40 | 70000.00 | Math    |
| 3 | Charlie | 35 | 60000.00 | Chemistry |
| 4 | Diana | 30 | 52000.00 | Biology |
| 1 | Alice | 30 | 50000.00 | Math    |
+-----+-----+-----+-----+
5 rows in set (0.00 sec)
```

```
mysql> SELECT * FROM teachers
-> ORDER BY age ASC;
+-----+-----+-----+-----+
| id | name  | age | salary | subject |
+-----+-----+-----+-----+
| 1 | Alice | 30 | 50000.00 | Math    |
| 4 | Diana | 30 | 52000.00 | Biology |
| 3 | Charlie | 35 | 60000.00 | Chemistry |
| 5 | Ethan | 40 | 70000.00 | Math    |
| 2 | Bob   | 45 | 70000.00 | Physics |
+-----+-----+-----+-----+
5 rows in set (0.01 sec)
```

```
mysql> SELECT * FROM teachers;
+-----+-----+-----+-----+
| id | name  | age | salary | subject |
+-----+-----+-----+-----+
| 1 | Alice | 30 | 50000.00 | Math    |
| 2 | Bob   | 45 | 70000.00 | Physics |
| 3 | Charlie | 35 | 60000.00 | Chemistry |
| 4 | Diana | 30 | 52000.00 | Biology |
| 5 | Ethan | 40 | 70000.00 | Math    |
+-----+-----+-----+-----+
5 rows in set (0.01 sec)
```

```
mysql> SELECT * FROM teachers
-> ORDER BY age ASC, salary DESC;
+-----+-----+-----+-----+
| id | name  | age | salary | subject |
+-----+-----+-----+-----+
| 4 | Diana | 30 | 52000.00 | Biology |
| 1 | Alice | 30 | 50000.00 | Math    |
| 3 | Charlie | 35 | 60000.00 | Chemistry |
| 5 | Ethan | 40 | 70000.00 | Math    |
| 2 | Bob   | 45 | 70000.00 | Physics |
+-----+-----+-----+-----+
5 rows in set (0.00 sec)
```

	<pre>mysql> SELECT * FROM teachers -> ORDER BY name ASC; +-----+-----+-----+-----+ id name age salary subject +-----+-----+-----+-----+ 1 Alice 30 50000.00 Math 2 Bob 45 70000.00 Physics 3 Charlie 35 60000.00 Chemistry 4 Diana 30 52000.00 Biology 5 Ethan 40 70000.00 Math +-----+-----+-----+-----+ 5 rows in set (0.00 sec) mysql> DROP TABLE IF EXISTS teachers; Query OK, 0 rows affected (0.27 sec) mysql></pre>
21.	<p>Select Distinct</p> <p>Say you have a table – Student with roll_no, Name and Department</p> <p>Only one distinct attribute: Ex: Select Distinct Departments From Student</p> <p>Couple of distinct attributes: Ex: Select Distinct Departments, Name From Student</p> <p>Count of distinct attribute Ex: Select Count Distinct departments from student</p> <p>Ordered Distinct Attribute: Select Distinct Departments from student order by departments Desc</p>
Answer	<pre>mysql> CREATE TABLE Student (-> roll_no INT PRIMARY KEY, -> Name VARCHAR(50), -> Department VARCHAR(50) ->); Query OK, 0 rows affected (0.33 sec) mysql> mysql> INSERT INTO Student (roll_no, Name, Department) VALUES -> (1, 'Alice', 'Math'), -> (2, 'Bob', 'Physics'), -> (3, 'Charlie', 'Math'), -> (4, 'Diana', 'Biology'), -> (5, 'Ethan', 'Physics'); Query OK, 5 rows affected (0.07 sec) Records: 5 Duplicates: 0 Warnings: 0 mysql> mysql> – Only one distinct attribute</pre>

```
mysql> SELECT DISTINCT Department FROM Student;
```

Department
Math
Physics
Biology

3 rows in set (0.00 sec)

```
mysql>
```

```
mysql> – Couple of distinct attributes
```

```
mysql> SELECT DISTINCT Department, Name FROM Student;
```

Department	Name
Math	Alice
Physics	Bob
Math	Charlie
Biology	Diana
Physics	Ethan

5 rows in set (0.00 sec)

```
mysql>
```

```
mysql> – Count of distinct attribute
```

```
mysql> SELECT COUNT(DISTINCT Department) FROM Student;
```

COUNT(DISTINCT Department)
3

1 row in set (0.00 sec)

```
mysql>
```

```
mysql> – Ordered distinct attribute
```

```
mysql> SELECT DISTINCT Department FROM Student ORDER BY Department  
DESC;
```

Department
Physics
Math
Biology

3 rows in set (0.00 sec)

```
mysql>
```

22.	<p>Index</p> <p>Search the f_name (first tuple) from student table and use explain syntax</p> <p>Search the S_ID (Last tuple) from student table and use explain syntax</p> <p>Comment on above (clustered index and non-clustered index)</p> <p>Create index on f_name</p> <p>Search the f_name from student table and use explain syntax</p> <p>Comment on above</p> <p>Show clustered and non-clustered index</p>
Answer	<pre>mysql> CREATE TABLE student (-> S_ID INT PRIMARY KEY, -> f_name VARCHAR(50), -> l_name VARCHAR(50), -> age INT ->); Query OK, 0 rows affected (1.37 sec)</pre> <pre>mysql> mysql> INSERT INTO student (S_ID, f_name, l_name, age) VALUES -> (1, 'John', 'Doe', 20), -> (2, 'Jane', 'Smith', 21), -> (3, 'John', 'Adams', 22), -> (1000, 'Alice', 'Brown', 23); Query OK, 4 rows affected (0.11 sec) Records: 4 Duplicates: 0 Warnings: 0</pre> <pre>mysql> mysql> EXPLAIN SELECT * FROM student WHERE f_name = 'John'; +-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+ + id select_type table partitions type possible_keys key key_len ref rows filtered Extra +-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+ + 1 SIMPLE student NULL ALL NULL NULL NULL NULL 4 25.00 Using where +-----+-----+-----+-----+-----+-----+-----+-----+-----+ + 1 row in set, 1 warning (0.00 sec)</pre> <pre>mysql> mysql> EXPLAIN SELECT * FROM student WHERE S_ID = 1000; +-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+ + id select_type table partitions type possible_keys key key_len ref rows filtered Extra +-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+ + 1 SIMPLE student NULL const PRIMARY PRIMARY 4 const 1 100.00 NULL +-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+ </pre>

	<pre> + 1 row in set, 1 warning (0.00 sec) mysql> mysql> CREATE INDEX idx_fname ON student(f_name); Query OK, 0 rows affected (0.59 sec) Records: 0 Duplicates: 0 Warnings: 0 mysql> mysql> EXPLAIN SELECT * FROM student WHERE f_name = 'John'; +-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+ id select_type table partitions type possible_keys key key_len ref rows +-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+ 1 SIMPLE student NULL ref idx_fname idx_fname 203 const 2 +-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+ 1 row in set, 1 warning (0.00 sec) mysql> </pre>
23.	<p>Create View Table:</p> <p>Create view using only one base table and without a where clause Create view using only one base table and with a where clause Create view using multiple base-tables without matching where clause (Analyze the correct but unexpected result – cartesian product) Update view (created using a single base table) and show the sudation in the corresponding base table (updatable View concept) Update the base table and see the corresponding updation in the created - view – table (updatable View concept) Update the view created using multiple base tables – check if you get an error use the command show tables Draw conclusions on the tables seen (are virtual tables included?)</p>
Answer	<pre> mysql> CREATE TABLE students (-> student_id INT PRIMARY KEY, -> name VARCHAR(50), -> dept_id INT ->); Query OK, 0 rows affected (1.17 sec) mysql> mysql> CREATE TABLE departments (-> dept_id INT PRIMARY KEY, -> dept_name VARCHAR(50) ->); Query OK, 0 rows affected (0.62 sec) </pre>


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mysql>
mysql> INSERT INTO students (student_id, name, dept_id) VALUES
-> (1, 'Dhruv', 1),
-> (2, 'Meetali', 2),
-> (3, 'Aryan', 1);
Query OK, 3 rows affected (0.09 sec)
Records: 3 Duplicates: 0 Warnings: 0

mysql>
mysql> INSERT INTO departments (dept_id, dept_name) VALUES
-> (1, 'Math'),
-> (2, 'Physics');
Query OK, 2 rows affected (0.08 sec)
Records: 2 Duplicates: 0 Warnings: 0

mysql>
mysql> CREATE OR REPLACE VIEW v_students_all AS
-> SELECT * FROM students;
Query OK, 0 rows affected (0.13 sec)

mysql>
mysql> CREATE OR REPLACE VIEW v_students_math AS
-> SELECT * FROM students WHERE dept_id = 1;
Query OK, 0 rows affected (0.19 sec)

mysql>
mysql> CREATE OR REPLACE VIEW v_cartesian AS
-> SELECT s.name, d.dept_name
-> FROM students s, departments d;
Query OK, 0 rows affected (0.09 sec)

mysql>
mysql> UPDATE v_students_all SET name = 'Dhruv_updated' WHERE student_id
= 1;
Query OK, 1 row affected (0.13 sec)
Rows matched: 1 Changed: 1 Warnings: 0

mysql>
mysql> UPDATE students SET name = 'Meetali_updated' WHERE student_id = 2;
Query OK, 1 row affected (0.11 sec)
Rows matched: 1 Changed: 1 Warnings: 0

mysql>
mysql> SHOW TABLES;
+-----+
| Tables_in_32215db |
+-----+
| College_complete |
| College_view      |
| Faculty           |

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| Student      |
| college      |
| course       |
| d_c_view     |
| department   |
| departments  |
| student     |
| student1    |
| student2    |
| student3    |
| students     |
| subjects     |
| subjects_v2  |
| v_cartesian  |
| v_students_all |
| v_students_math |
+-----+
19 rows in set (0.00 sec)

mysql>
```