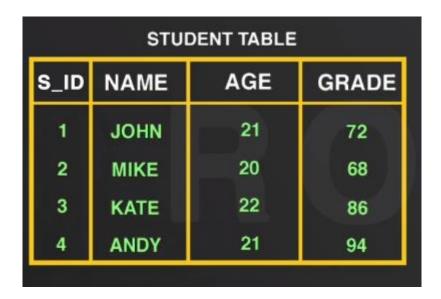# Structured Query Language

SQL - Day 7

- Creating Database, table and manipulating data.
- Different ways of creating PRIMARY KEY.
- ALTER, ADD, DROP, MODIFY Command.

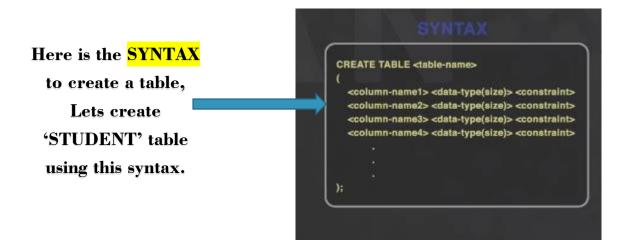# How to create a Database, table and manipulate data.

Let's create 'ROOMAN' database and create 'STUDENT' table and try to insert values/data inside it as shown below.

STUDENT TABLE

S_ID	NAME	AGE	GRADE
1	JOHN	21	72
2	MIKE	20	68
3	KATE	22	86
4	ANDY	21	94

First Lets Create 'ROOMAN' database.

Using this command, we have created 'ROOMAN' database

```
mysql> CREATE DATABASE rooman;
Query OK, 1 row affected (0.01 sec)
```

Now we have created 'ROOMAN' database, inside database how can we create 'STUDENT' table.

Here is the SYNTAX to create a table, Lets create 'STUDENT' table using this syntax.

SYNTAX

```
CREATE TABLE <table-name>
(
    <column-name1> <data-type(size)> <constraint>
    <column-name2> <data-type(size)> <constraint>
    <column-name3> <data-type(size)> <constraint>
    <column-name4> <data-type(size)> <constraint>
        .
        .
        .
);
```
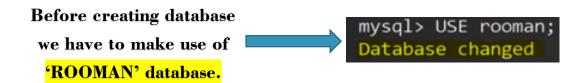
Before creating database we have to make use of 'ROOMAN' database.

```
mysql> USE rooman;
Database changed
```

Creating 'STUDENT' database.

```
mysql> CREATE TABLE student(
    -> s_id tinyint PRIMARY KEY,
    -> name varchar(10) NOT NULL,
    -> age tinyint CHECK(age>18),
    -> grade decimal(2,2) DEFAULT 0.0
    -> );
Query OK, 0 rows affected (0.05 sec)
```

HOW to get the description of 'STUDENT' TABLE.

```
mysql> DESCRIBE student;
+--------+--------------+------+-----+---------+-------+
| Field  | Type         | Null | Key | Default | Extra |
+--------+--------------+------+-----+---------+-------+
| s_id   | tinyint      | NO   | PRI | NULL    |       |
| name   | varchar(10)  | NO   |     | NULL    |       |
| age    | tinyint      | YES  |     | NULL    |       |
| grade  | decimal(2,2) | YES  |     | 0.00    |       |
+--------+--------------+------+-----+---------+-------+
4 rows in set (0.01 sec)
```

Note:

In this table description,

- In s_id/ Student ID field, type is mentioned as tinyint, Because ID is a numeric value, and Null column is mentioned as NO because s_id should not be Null/ s_id column should not be empty. s_id is made as PRIMARY KEY hence s_id always remains unique. Default values as NULL.

- In name field, type is mentioned as varchar(10), because name is a string value, and Null column is mentioned as NO because name should not be Null/ name column should not be empty. Default values as NULL

- In age field, type is mentioned as tinyint, Because age is a numeric value, and Null column is mentioned as YES which means in age field Null column can be empty. Default values as NULL.

- In grade field, type is mentioned as decimal(2,2), which means grade value can have 2 digits before the decimal and 2 digits after the decimal, and Null column is mentioned as YES which means in age field Null column can be empty. Default values as 0.0.

While creating 'STUDENT' table or any table PRIMARY KEY can be created in two different ways as shown below:
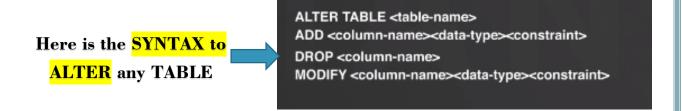
Method 1:

```
mysql> CREATE TABLE student(
    -> s_id tinyint PRIMARY KEY,
    -> name varchar(10) NOT NULL,
    -> age tinyint CHECK(age>18),
    -> grade decimal(2,2) DEFAULT 0.0
    -> );
Query OK, 0 rows affected (0.05 sec)
```

Method 2:

```
mysql> CREATE TABLE student(
    -> s_id tinyint,
    -> name varchar(10) NOT NULL,
    -> age tinyint CHECK(age>18),
    -> grade decimal(2,2) DEFAULT 0.0,
    -> PRIMARY KEY(s_id)
    -> );
```

WE have seen how to create TABLE, now let's understand how to alter the table / modify the existing table.

Here is the SYNTAX to ALTER any TABLE

```
ALTER TABLE <table-name>
ADD <column-name><data-type><constraint>
DROP <column-name>
MODIFY <column-name><data-type><constraint>
```

Note:

- To add a column to the existing table
  SYNTAX:

  ALTER TABLE <table-name>ADD<column-name><data-type><constraint>

- To delete the column in the existing table
  SYNTAX:

  ALTER TABLE <table-name>DROP<column-name>

- To modify the column in the existing table
  SYNTAX:

  ALTER TABLE <table-name>MODIFY<column-name>< data-type><constraint>

Now, Lets try to add new Column to the Student table as shown below.For that lets start writtig a query to ALTER 'STUDENT' table.

S_ID	NAME	AGE	GRADE	CONTACT_NUM
1	JOHN	21	72	
2	MIKE	20	68	
3	KATE	22	86	
4	ANDY	21	94	

STUDENT TABLE

WRITE A QUERY TO ADD CONTACT_NUM COLUMN TO STUDENT TABLE.

Query:

```
mysql> ALTER TABLE student ADD contact_num INT NOT NULL;
Query OK, 0 rows affected (0.03 sec)
Records: 0  Duplicates: 0  Warnings: 0
```

Description after adding CONTACT_NUM column:

```
mysql> DESCRIBE student;
+-------------+-------------+------+-----+---------+-------
| Field       | Type        | Null | Key | Default | Extra
+-------------+-------------+------+-----+---------+-------
| s_id        | tinyint     | NO   | PRI | NULL    |
| name        | varchar(10) | NO   |     | NULL    |
| age         | tinyint     | YES  |     | NULL    |
| grade       | decimal(2,2)| YES  |     | 0.00    |
| contact_num | int         | NO   |     | NULL    |
+-------------+-------------+------+-----+---------+-------
```

Output:

STUDENT TABLE

S_ID	NAME	AGE	GRADE	CONTACT_NUM
1	JOHN	21	72	
2	MIKE	20	68	
3	KATE	22	86	
4	ANDY	21	94	

WRITE A QUERY TO <mark>DELETE OR DROP CONTACT_NUM COULMN</mark> FROM STUDENT TABLE.

Query:

```
mysql> ALTER TABLE student DROP contact_num;
Query OK, 0 rows affected (0.07 sec)
Records: 0  Duplicates: 0  Warnings: 0
```

Description after DELETING CONTACT_NUM column:

```
mysql> DESCRIBE student;
+--------+--------------+------+-----+---------+-------+
| Field  | Type         | Null | Key | Default | Extra |
+--------+--------------+------+-----+---------+-------+
| s_id   | tinyint      | NO   | PRI | NULL    |       |
| name   | varchar(10)  | NO   |     | NULL    |       |
| age    | tinyint      | YES  |     | NULL    |       |
| grade  | decimal(2,2) | YES  |     | 0.00    |       |
+--------+--------------+------+-----+---------+-------+
```

Output:

STUDENT TABLE			
S_ID	NAME	AGE	GRADE
1	JOHN	21	72
2	MIKE	20	68
3	KATE	22	86
4	ANDY	21	94

WRITE A QUERY TO <mark>MODIFY</mark> TYPE OF <mark>AGE FIELD IN THE 'STUDENT' TABLE TO SMALLINT AND THE CONSTRAINTS AS NOT NULL.</mark>

Query:

```
mysql> ALTER TABLE student MODIFY age smallint NOT NULL;
Query OK, 0 rows affected (0.07 sec)
Records: 0  Duplicates: 0  Warnings: 0
```

Description after modifying the table :

```
mysql> DESCRIBE student;
+--------+--------------+------+-----+---------+-------+
| Field  | Type         | Null | Key | Default | Extra |
+--------+--------------+------+-----+---------+-------+
| s_id   | tinyint      | NO   | PRI | NULL    |       |
| name   | varchar(10)  | NO   |     | NULL    |       |
| age    | smallint     | NO   |     | NULL    |       |
| grade  | decimal(2,2) | YES  |     | 0.00    |       |
+--------+--------------+------+-----+---------+-------+
```