Structured Query Language

SQL - Day 8

Agenda

- INSERT, MODIFY.
- AUTO_INCREMENT
- Types of Primary Key
- Case studies for CONSTRAINTS Violation.

We have understood how to create table and alter the table.

Now, Let's understand how to INSERT values into the TABLE.

Syntax : to Insert values into the table.

```
INSERT INTO table-name VALUES (value1,value2,value3,value4);
```

WRITE A QUERY TO INSERT THE BELOW DATA INTO STUDENT TABLE.

s_id : 1,

name : JHON

age : 21

grade : 72.

Query to insert data into table.

```
mysql> INSERT INTO student VALUES (1,'JOHN',21,72);
Query OK, 1 row affected (0.00 sec)
```

WRITE A QUERY TO GET PERTICULAR COLUMN DATA PRESENT IN STUDENT TABLE.

Syntax:

```
SELECT <column1><column2><column3><column4> FROM <table-name>;
```

Query to get s_id, name, age, and grade data from student.

```
mysql> SELECT s_id,name,age,grade FROM student;
+------+------+------+-------+
| s_id | name | age  | grade |
+------+------+------+-------+
|    1 | JOHN |   21 | 72.00 |
+------+------+------+-------+
1 row in set (0.00 sec)
```

WRITE A QUERY TO GET ALL COLUMN DATA PRESENT IN STUDENT TABLE.

Syntax:

```
SELECT * FROM <table-name>;
```

Query to get all column data from table:

```
mysql> SELECT * FROM student;
+------+------+------+-------+
| s_id | name | age  | grade |
+------+------+------+-------+
|    1 | JOHN |   21 | 72.00 |
+------+------+------+-------+
1 row in set (0.00 sec)
```

Note: There is another way to insert data inside the table as shown below:

Instead of directly specifying the values, we can first specify the column name and then specify the values.

```
mysql> INSERT INTO student (s_id,name,age,grade) VALUES (2,'MIKE',20,68);
Query OK, 1 row affected (0.00 sec)
```

But column name should be in the same order in which the columns are created in table or you will get an 'ERROR' as shown below:

```
mysql> INSERT INTO student VALUES ('KATE',3,22,86);
ERROR 1366 (HY000): Incorrect integer value: 'KATE' for column 's_id'
mysql> INSERT INTO student (name,s_id,age,grade) VALUES ('KATE',3,22,
```

Now, Let's try to enter new row into the table.

```
mysql> INSERT INTO student VALUES (4,'ANDY',21,94);
Query OK, 1 row affected (0.00 sec)
```

Successfully we have entered new row, but if we try to enter the same value into the table we will get ERROR.

```
mysql> INSERT INTO student VALUES (4,'ANDY',21,94);
ERROR 1062 (23000): Duplicate entry '4' for key 'student.PRIMARY'
```

Note: In STUDENT table, CONSTRATINT of s_id column is PRIMARY KEY. So whenever the constraints of any field in a table is mentioned as PRIMARY KEY, then duplicate entries will not be allowed and that column can't be empty. PRIMARY KEY is a combination of UNIQUE and NOT NULL.

Now let's enter the proper value into the column, and see all the rows and column present in STUDENT table.

```
mysql> INSERT INTO student VALUES (6,'ANDY',21,94);
Query OK, 1 row affected (0.01 sec)
```

```
mysql> SELECT * FROM student;
+------+------+------+-------+
| s_id | name | age  | grade |
+------+------+------+-------+
|    1 | JOHN |   21 | 72.00 |
|    2 | MIKE |   20 | 68.00 |
|    3 | KATE |   22 | 86.00 |
|    4 | ANDY |   21 | 94.00 |
|    6 | ANDY |   21 | 94.00 |
+------+------+------+-------+
5 rows in set (0.00 sec)
```

Let's now violet few CONSTRAINTS and check how exactly the Query works.

NOT NULL CONSTRAINT VIOLATION:

Inside the STUDENT table we have given CONTRAINT of NAME filed as NOT NULL, Now Let's try to create new row without entering anything in NAME field.

```
mysql> INSERT INTO student (s_id,age,grade) VALUES (5,21,88.2);
ERROR 1364 (HY000): Field 'name' doesn't have a default value
```

Note: We got ERROR message because, when a column CONSTRAINT is mentioned as NOT NULL in the table, then that column should be specified with some values, it cannot be empty.

PRIMARY KEY CONSTRAINT VIOLATION:

Now, let's try to create new row without giving s_id .

```
mysql> INSERT INTO student (name,age,grade) VALUES ('TOM',23,89.2);
ERROR 1364 (HY000): Field 's_id' doesn't have a default value
```

Note: We got ERROR message because, when a column CONSTRAINT is mentioned as PRIMARY KEY, if the column CONSTRAINT is mentioned as PRIMARY KEY then the COLUMN cannot be left empty or duplicate values will not be allowed.

AGE CONSTRAINTS VIOLATION:

```
mysql> INSERT INTO student VALUES (7,'TOM',16,76.4);
ERROR 3819 (HY000): Check constraint 'student_chk_1' is violated.
```

Note: Here, we got ERROR because, while creating the AGE column we given the CONSTRAINT as greater than 18. So when we tried to enter value less than 18 i.e. 16, it generated error.

Let's now try to insert new row without specifying any value into grade column.

```
mysql> INSERT INTO student (s_id,name,age) VALUES (7,'BOB',22);
Query OK, 1 row affected (0.01 sec)
```

Note: Here we have not got any ERROR, because we have set any CONSTRAINT or for grade column DEFAULT value is given as 0.0.

For s_id, name and age column DEFAULT value was not mentioned or certain CONSTRAINT was given, so we got ERROR.

AFTER ALL THESE CHANGES LET'S SEE HOW STUDENT TABLE LOOK LIKE.

```
mysql> SELECT * FROM student;
+------+------+------+-------+
| s_id | name | age  | grade |
+------+------+------+-------+
|    1 | JOHN |   21 | 72.00 |
|    2 | MIKE |   20 | 68.00 |
|    3 | KATE |   22 | 86.00 |
|    4 | ANDY |   21 | 94.00 |
|    5 | TOM  |   21 | 76.40 |
|    6 | ANDY |   21 | 94.00 |
|    7 | BOB  |   22 |  0.00 |
+------+------+------+-------+
7 rows in set (0.00 sec)
```

Note: while inserting last row, we have not given any value but default value to grade column have been added as 0.0. Because while creating grade column we have given the default value as 0.0.

Note: If we try to insert a row without specifying the any value to age column then by default NULL will be inserted to age column, because while creating age column we have not given any PRIMARY key or NOT NULL constraint.

```
mysql> SELECT * FROM student;
+------+------+------+-------+
| s_id | name | age  | grade |
+------+------+------+-------+
|    1 | JOHN |   21 | 72.00 |
|    2 | MIKE |   20 | 68.00 |
|    3 | KATE |   22 | 86.00 |
|    4 | ANDY |   21 | 94.00 |
|    5 | TOM  |   21 | 76.40 |
|    6 | ANDY |   21 | 94.00 |
|    7 | BOB  |   22 |  0.00 |
|    8 | ALEX | NULL | 98.90 |
+------+------+------+-------+
8 rows in set (0.00 sec)
```

Note: If you notice, in STUDENT table data is ordered in ascending order, that is because of PRIMARY KEY CONSTRAINT. If we mention PRIMARY KEY CONSTRAINTS to any column then automatically physical ordering of data will be done in ascending order.

```
mysql> SELECT * FROM student;
+------+------+------+-------+
| s_id | name | age  | grade |
+------+------+------+-------+
|    1 | JOHN |   21 | 72.00 |
|    2 | MIKE |   20 | 68.00 |
|    3 | KATE |   22 | 86.00 |
|    4 | ANDY |   21 | 94.00 |
|    5 | TOM  |   21 | 76.40 |
|    6 | ANDY |   21 | 94.00 |
|    7 | BOB  |   22 |  0.00 |
|    8 | ALEX | NULL | 98.90 |
+------+------+------+-------+
8 rows in set (0.00 sec)
```

AUTO-INCREMENT CONSTRAINT.

Auto-increment allows a unique number to be generated automatically when a new record is inserted into a table.

Often this is the primary key field that we would like to be created automatically every time a new record is inserted.

Let's modify or alter STUDENT table s_id constraints to AUTO_INCREMENT.

```
mysql> ALTER TABLE student MODIFY s_id tinyint AUTO_INCREMENT;
Query OK, 8 rows affected (0.12 sec)
Records: 8  Duplicates: 0  Warnings: 0
```

Note 1: Already we have set Constraint for s_id as PRIMARY_KEY, again we modified the CONSTRATINTS to AUTO_INCREMENT, but still PRIMARY KEY constraint will not be changed or in other word AUTO_INCREMENT is set as EXTRA CONSTRAINT.

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

Note 2: AUTO_INCREMENT CONSTRAINT can be set only for the field for which PRIMARY KEY CONSTRAINTS as set.

Here, we are trying to set AUTO_INCREMENT CONSTRAINT to age column,

```
mysql> ALTER TABLE student MODIFY age tinyint AUTO_INCREMENT;
ERROR 1075 (42000): Incorrect table definition; there can be only one auto column and it must be defi
d as a key
```

Note 3: In the previous STUDENT table we have inserted 8 rows, now if we try to insert row without specifying the s_id , then automatically the value will be set to 9 as shown below.

```
mysql> INSERT INTO student (name,age,grade) VALUES ('RAM',19,88);
Query OK, 1 row affected (0.00 sec)
```

```
mysql> SELECT * FROM student;
+------+------+------+-------+
| s_id | name | age  | grade |
+------+------+------+-------+
|    1 | JOHN |   21 | 72.00 |
|    2 | MIKE |   20 | 68.00 |
|    3 | KATE |   22 | 86.00 |
|    4 | ANDY |   21 | 94.00 |
|    5 | TOM  |   21 | 76.40 |
|    6 | ANDY |   21 | 94.00 |
|    7 | BOB  |   22 |  0.00 |
|    8 | ALEX | NULL | 98.90 |
|    9 | RAM  |   19 | 88.00 |
+------+------+------+-------+
9 rows in set (0.00 sec)
```

Here, we have not specified the s_id value but still it has been incremented and given the value as 9, same way if we try to insert one more row then AUTO_INCREMNET will give the value as 10.

Note 4: AUTO_INCREMENT can be stareted with any sequence of letters,

If we start with certain sequence then the next column will be automatically set the value based on the previous value

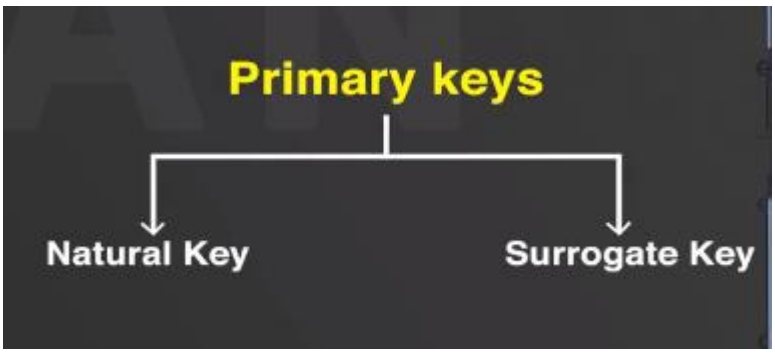
```
mysql> INSERT INTO student VALUES (101,'MERCY',19,79.2);
Query OK, 1 row affected (0.01 sec)
```

Here, we have inserted the row which is having the s_id as 101. If we try to insert on more row then automatically that row s_id will set as 102, as shown below.

```
mysql> INSERT INTO student (name,age,grade) VALUES ('ADAM',21,83.2);
```

```
+------+-------+------+-------+
| s_id | name  | age  | grade |
+------+-------+------+-------+
|    1 | JOHN  |   21 | 72.00 |
|    2 | MIKE  |   20 | 68.00 |
|    3 | KATE  |   22 | 86.00 |
|    4 | ANDY  |   21 | 94.00 |
|    5 | TOM   |   21 | 76.40 |
|    6 | ANDY  |   21 | 94.00 |
|    7 | BOB   |   22 |  0.00 |
|    8 | ALEX  | NULL | 98.90 |
|    9 | RAM   |   19 | 88.00 |
|  101 | MERCY |   19 | 79.20 |
|  102 | ADAM  |   21 | 83.20 |
+------+-------+------+-------+
11 rows in set (0.00 sec)
```

PRIMARY KEYS are classified into two types, as shown below;



Natural key: Natural keys are such keys which is cannot be generated programatically or automaticcaly using AUTO_INCREMENT CONSTRAINT.

Example: Email, SSN.

Surrogate Key: Surrogate keys are such keys which is generated programatically or automaticcaly using AUTO_INCREMENT CONSTRAINT.

Example: Student Id.