Chapter 1:

Basics

SQL:

SQL is a language that is used to interact with relational database management systems

DATABASE:

This could be any collection of related information.

Example: phonebook, your to-do list, library, etc

Database can be used in different ways, you can have this information stored on paper, mind, computers, etc.

DBMS:

A database management system is a software program that helps users to create and maintain a database.

Applications:

- Makes it easy to manage a large amount of information.
- Handles security
- Backups
- Importing/Exporting data
- Concurrency
- Interact with software application

DATABASE TYPES:

Relational Database SQL	Non-Relational Database NO-SQL
Organize data into one or more tables	Organize data into anything but a traditional table
- Each table has column and rows - An unique key identifies each row - Column represents an attribute - Rows represent a complete entry -	- Key-values - Documents(JSON, XML, etc) - Graphs - Flexible tables

- More popular - Tables are predefined - spreadsheet	- General category

DATABASE QUERIES:

Queries are requests made to the database management system for specific information.

Example: Google search is quite similar in a way.

Notes:

Database is any collection of related information.
Computers are great for storing database.
DBMS makes it easy to create, maintain and secure a database.
DBMS allows you to perform C.R.U.D operations and other administrative tasks.
Two types of databases Relational and non-relational
Relational DB use SQL and store data into tables with rows and columns
Non-relational database store data using other data structures

Chapter 2:

Tables and keys

COLUMN:

This defines a single attribute.

We always want to have one special column called **“primary-key”** (which uniquely defines a single entry)

ROW:

This defines an individual entry in the given table.

Example:

Student

student_id	name	major
1	Jagat	Medical
2	Koyal	Arts
3	Chetan	English
4	Jagat	Medical

Surrogate Key:

The key which has no mapping to anything in the real world. It is a type of primary key.

Natural Key:

We can have Adhar Number as key instead of student_id because Adhar number has a purpose in the real world, not just in the database

adhar_id	name	major
11201-1212-121-212	Jagat	Medical
2212-121-14534-213	Jagat	Arts

Chapter 3:

MYSQL AND POPSQL

INSTALL MYSQL ON FEDORA:

After running the required commands enable MySQL with

```
systemctl enable mariadb.service
```

MySQL init commands

activate	**sudo systemctl enable mysqld --now**
status	systemctl status mysqld
stop	sudo systemctl stop mysqld
start	sudo systemctl start mysqld
disable	**sudo systemctl disable mysqld**
enable	**sudo systemctl enable mysqld**
restart	**sudo systemctl restart mysqld**

MySQL Prompt Commands:

login	**mysql -u root -p**
create database	**create database cosmos;**

CHAPTER 4

CREATING TABLES

Data Types:

- ### Basic

#	Type	Description
1	**INT**	- Accepts whole numbers. - Example: -120, 0, 1203, etc.
2	**DECIMAL(M, N)**	- M: Total numbers of digits we want to store - N: number of digits after decimal in total M numbers of digits. - Example: DECIMAL(5,2) => xxx. xx
3	**VARCHAR(I)**	- Variable character. - L specifies the length of the string.
4	**BLOB**	- Binary large object. - This is basically a structure that can store a large amount of binary data.
5	**DATE**	- Date with format 'YYYY-MM-DD'
6	**TIMESTAMP**	- Format 'YYYY-MM-DD HH:MM: SS'

Create Tables:

```
#USE cosmos
```

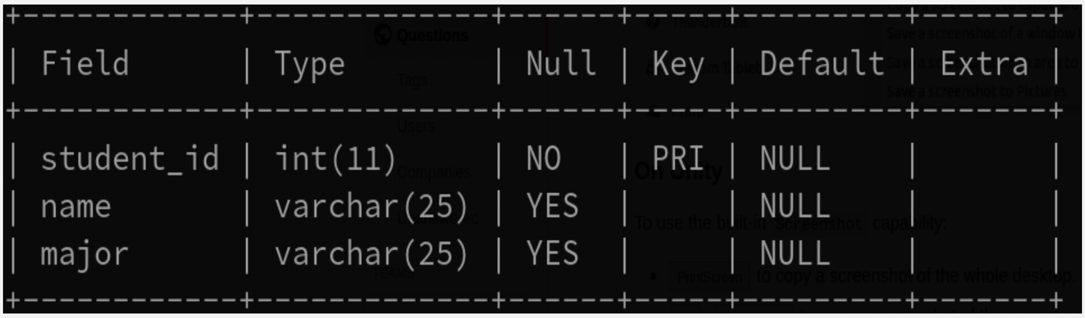
- ### Create Table Command

  - Create Student table
  - CREATE TABLE' is an SQL reserved work and is not case sensitive

```
CREATE TABLE student (
student_id INT,
name VARCHAR(30),
major VARCHAR(30),
PRIMARY KEY (student_id)
);
```

- **Describe Table Command:**

```
mysql> DESCRIBE student;
```



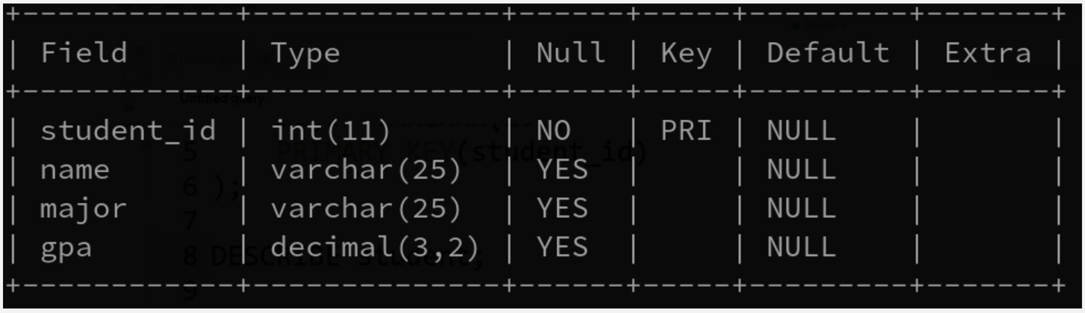
```
+-------------+-------------+------+-----+---------+-------+
| Field       | Type        | Null | Key | Default | Extra |
+-------------+-------------+------+-----+---------+-------+
| student_id  | int(11)     | NO   | PRI | NULL    |       |
| name        | varchar(25) | YES  |     | NULL    |       |
| major       | varchar(25) | YES  |     | NULL    |       |
+-------------+-------------+------+-----+---------+-------+
```

- **Delete Table**

```
mysql> DROP TABLE student;
```

- **Modify Table**
- **Add another Column ‘gpa’**

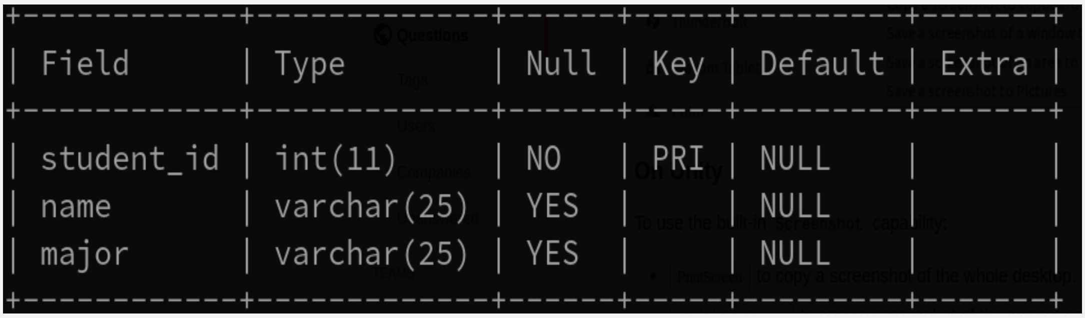
```
mysql> ALTER TABLE student ADD gpa DECIMAL(3,2);

mysql> DESCRIBE student;
```



```
+------------+--------------+------+-----+---------+-------+
| Field      | Type         | Null | Key | Default | Extra |
+------------+--------------+------+-----+---------+-------+
| student_id | int(11)      | NO   | PRI | NULL    |       |
| name       | varchar(25)  | YES  |     | NULL    |       |
| major      | varchar(25)  | YES  |     | NULL    |       |
| gpa        | decimal(3,2) | YES  |     | NULL    |       |
+------------+--------------+------+-----+---------+-------+
```

- **DROP specific Column**

```
mysql> ALTER TABLE student DROP COLUMN gpa;

mysql> DESCRIBE student;
```



```
+------------+-------------+------+-----+---------+-------+
| Field      | Type        | Null | Key | Default | Extra |
+------------+-------------+------+-----+---------+-------+
| student_id | int(11)     | NO   | PRI | NULL    |       |
| name       | varchar(25) | YES  |     | NULL    |       |
| major      | varchar(25) | YES  |     | NULL    |       |
+------------+-------------+------+-----+---------+-------+
```

Notes:

- We can create table
- We can remove table
- We can add columns
- We can remove column
- Whenever you are creating your database the first thing that you want to do is define your database schema
- In other you want to define your all other tables and then you want to start inserting data into tables.

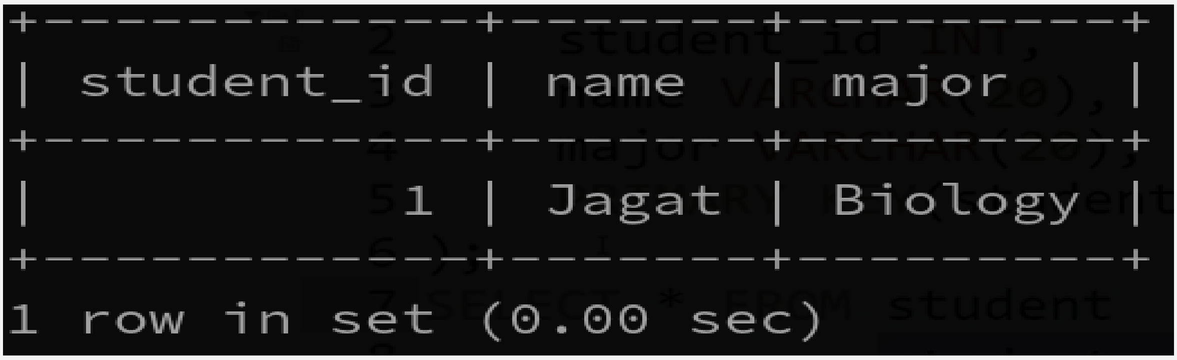
CHAPTER 5

INSERTS DATA

Insert Values:

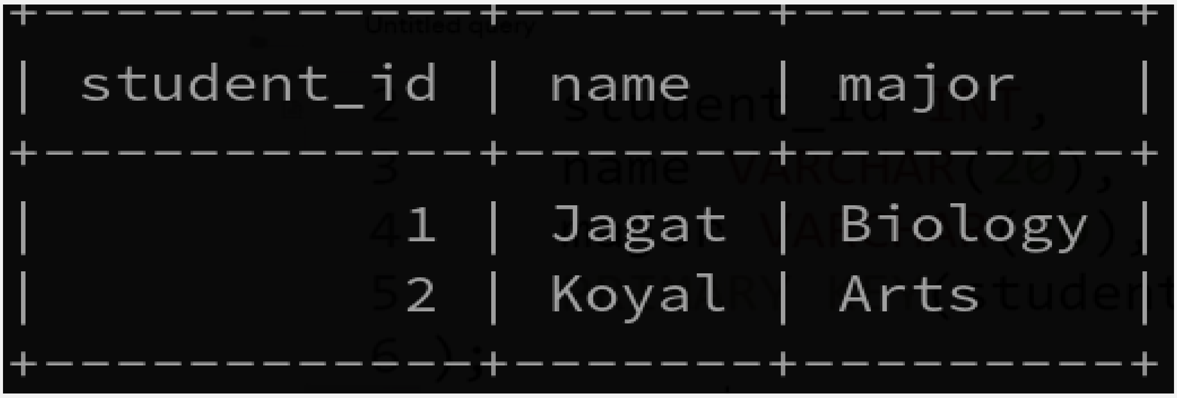
- We need to follow the order of attributes we gave during table creation

```
mysql> INSERT INTO student VALUES (1, ’Jagat’, ‘Biology’);

mysql> SELECT * FROM student;
```



```
+------------+-------+---------+
| student_id | name  | major   |
+------------+-------+---------+
|          1 | Jagat | Biology |
+------------+-------+---------+
1 row in set (0.00 sec)
```

```
mysql> INSERT INTO student VALUES (2, ’Koyal’, ‘Arts’);

mysql> SELECT * FROM student;
```

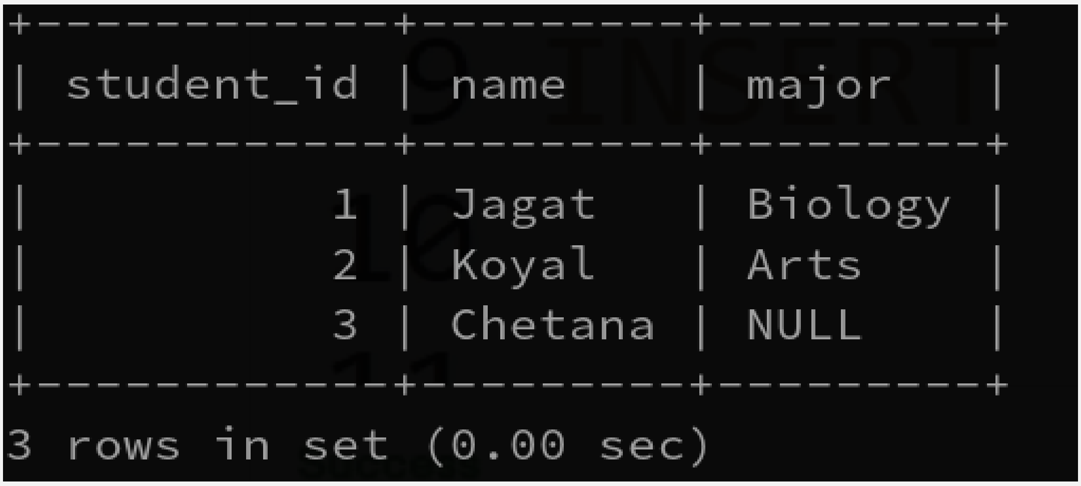


```
+------------+-------+---------+
| student_id | name  | major   |
+------------+-------+---------+
|          1 | Jagat | Biology |
|          2 | Koyal | Arts    |
+------------+-------+---------+
```

Insert Selective Attributes:

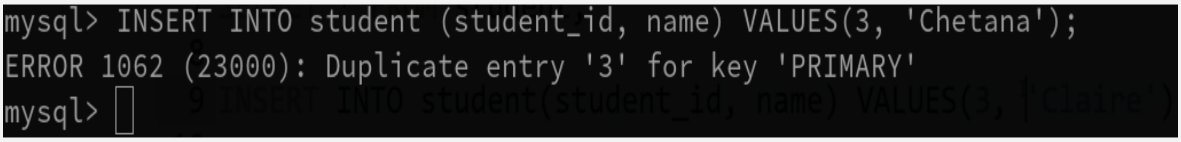
- What happens if let’s say a student doesn’t have a major
- In this case while inserting values we can also provide the list of values we are inserting as shown in the table below

```
mysql> INSERT INTO student (student_id,  name)
VALUES(3, ‘Chetana’);

mysql> SELECT * FROM student;
```



```
+------------+---------+---------+
| student_id | name    | major   |
+------------+---------+---------+
|          1 | Jagat   | Biology |
|          2 | Koyal   | Arts    |
|          3 | Chetana | NULL    |
+------------+---------+---------+
3 rows in set (0.00 sec)
```

Please note that you can not insert duplicate entry within the table as there can be unique values to the primary key.



```
mysql> INSERT INTO student (student_id, name) VALUES(3, 'Chetana');
ERROR 1062 (23000): Duplicate entry '3' for key 'PRIMARY'
mysql> 
```