Database- Day -1: MySQL

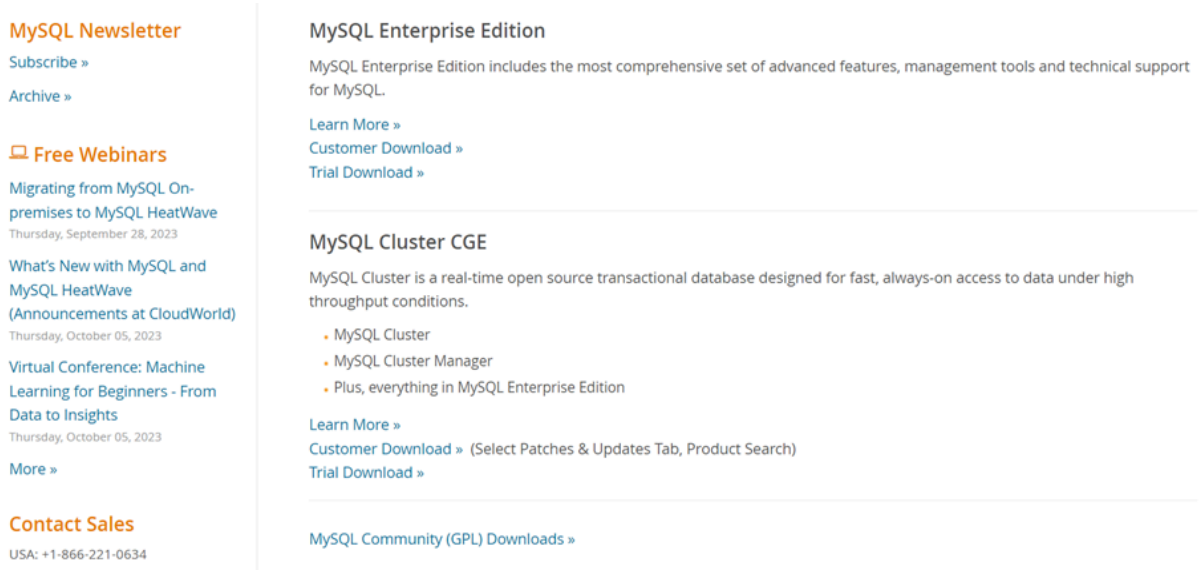
Contents:

Installing MySql:

Video Ref:**https://youtu.be/k5tlCunelSU?si=Wft5eTgCvKO9lrWJ**

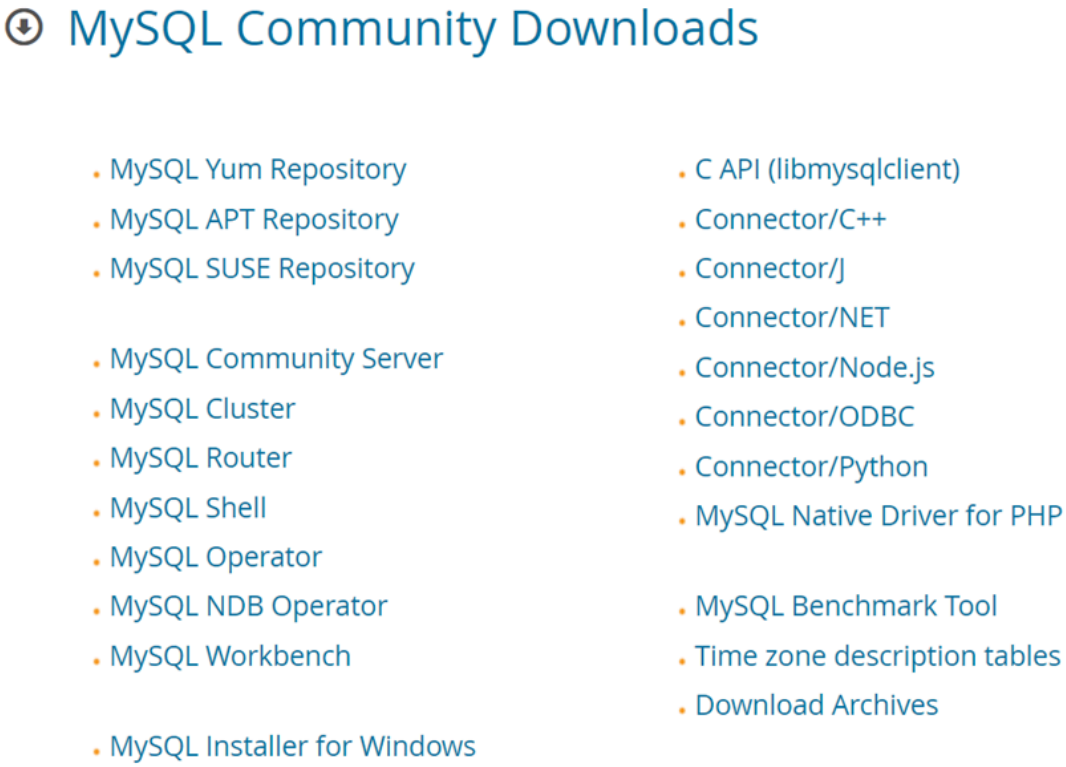
https://www.mysql.com/downloads/

Step-1:



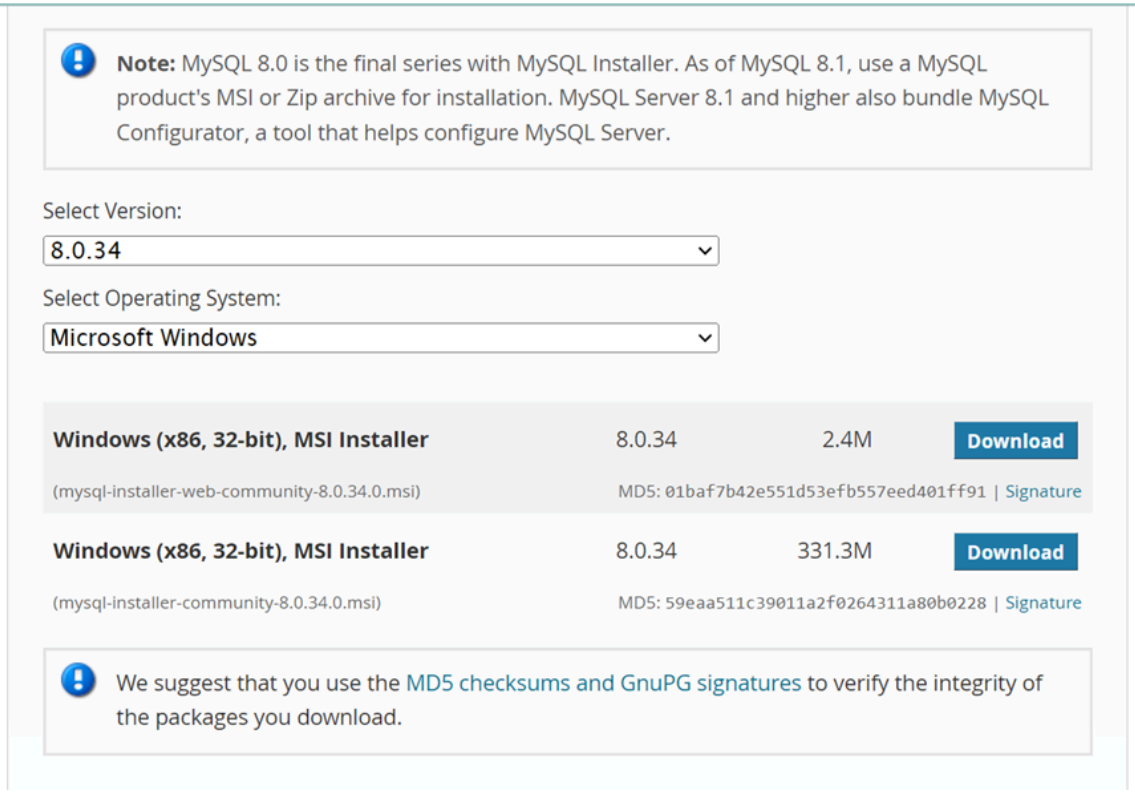
Click-> last line -> MySql Community (GPL) Downloads.

Step-2:



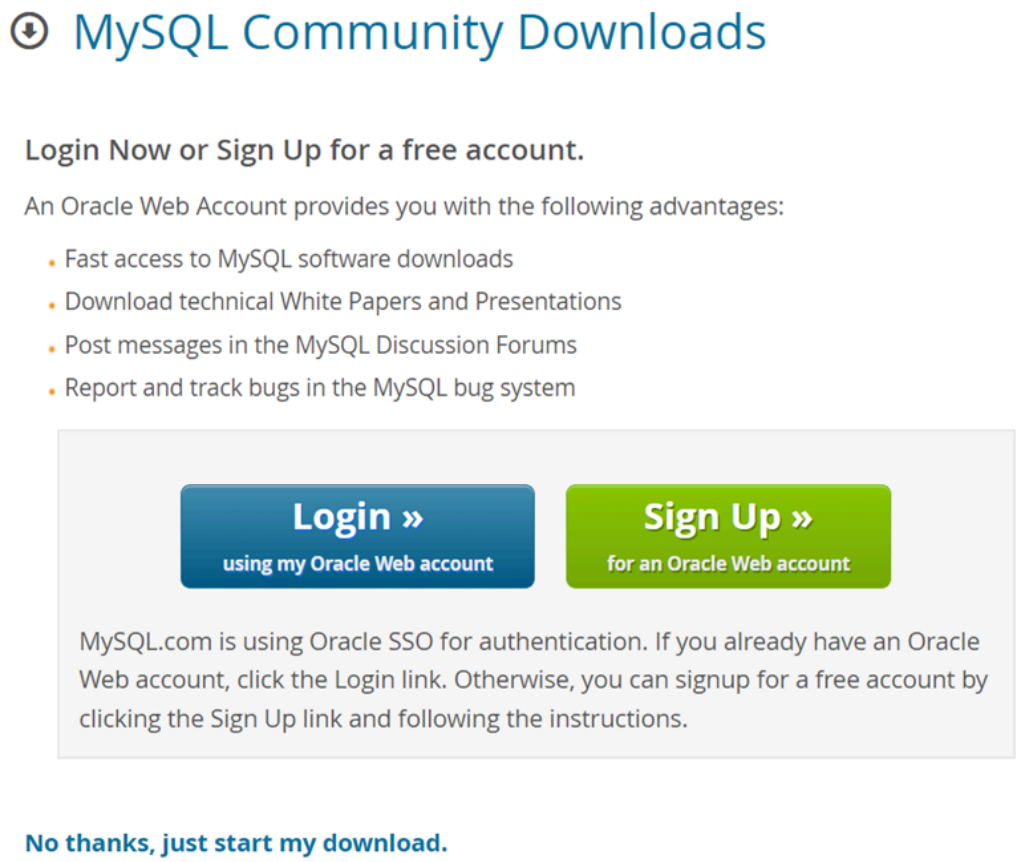
Click : MySQL installer for windows

Step-3:



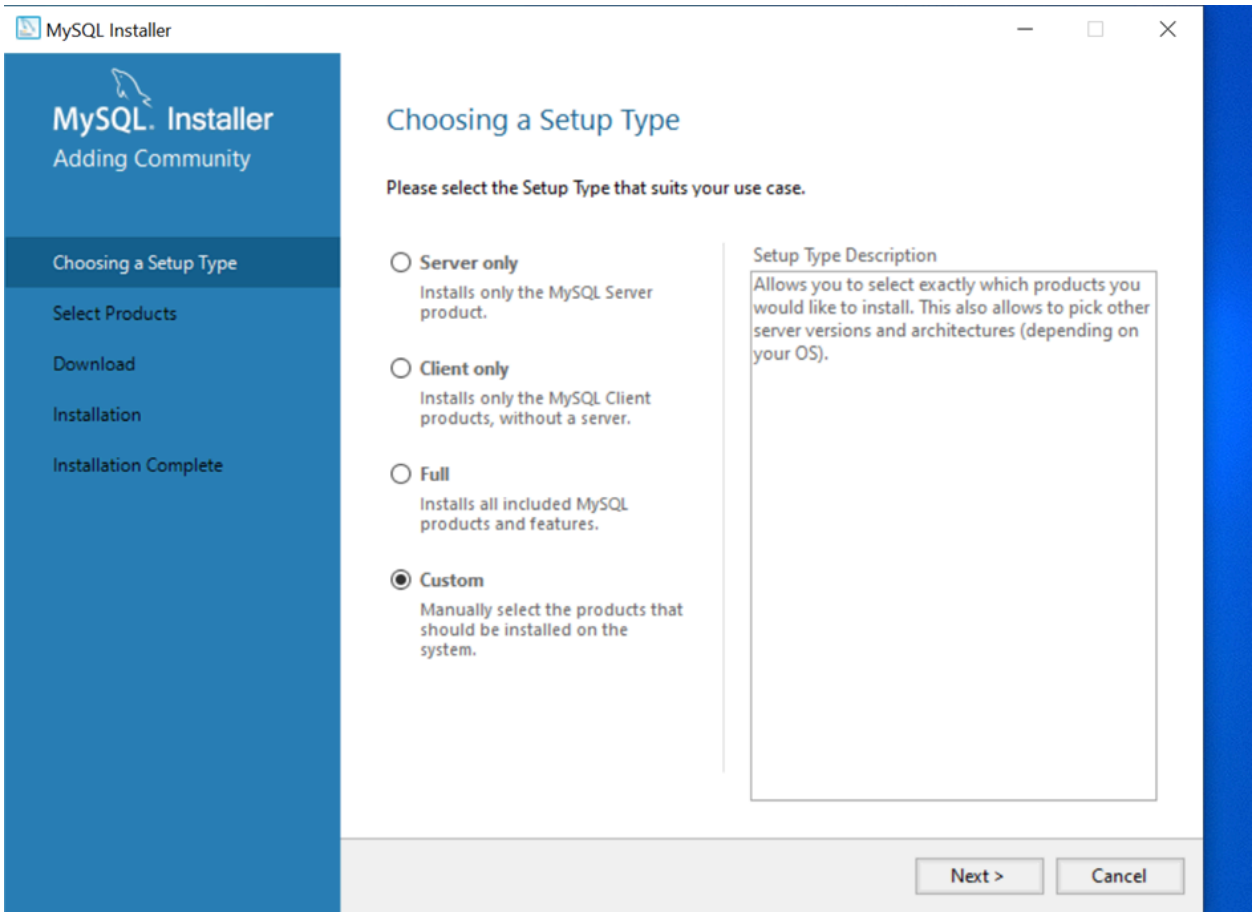
Click -> Windows(x86, 32bit), MSI installer (second one) 8.0.34 331.3m , it supports both 32 and 64 bit os.

Step:4



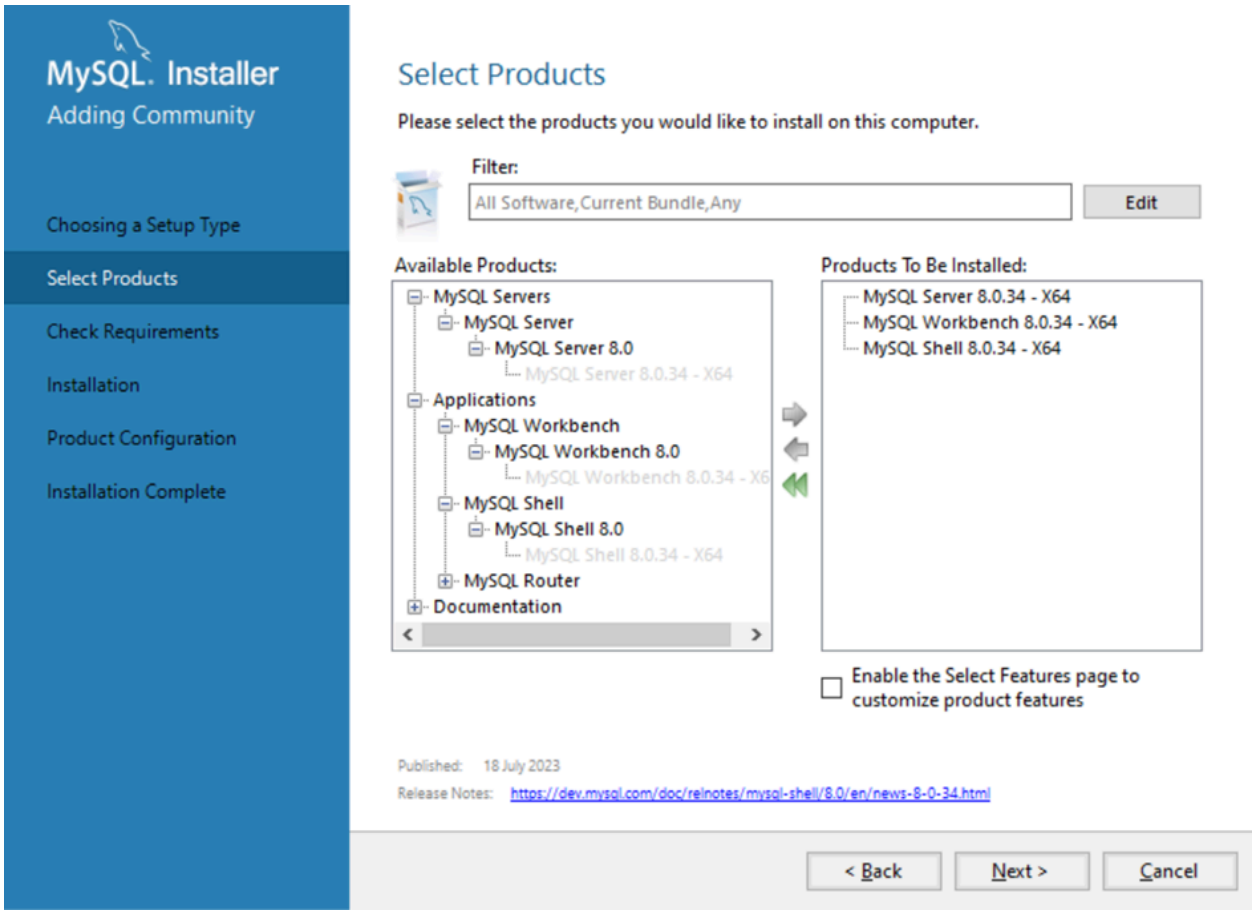
Click -> No thanks

Step-5



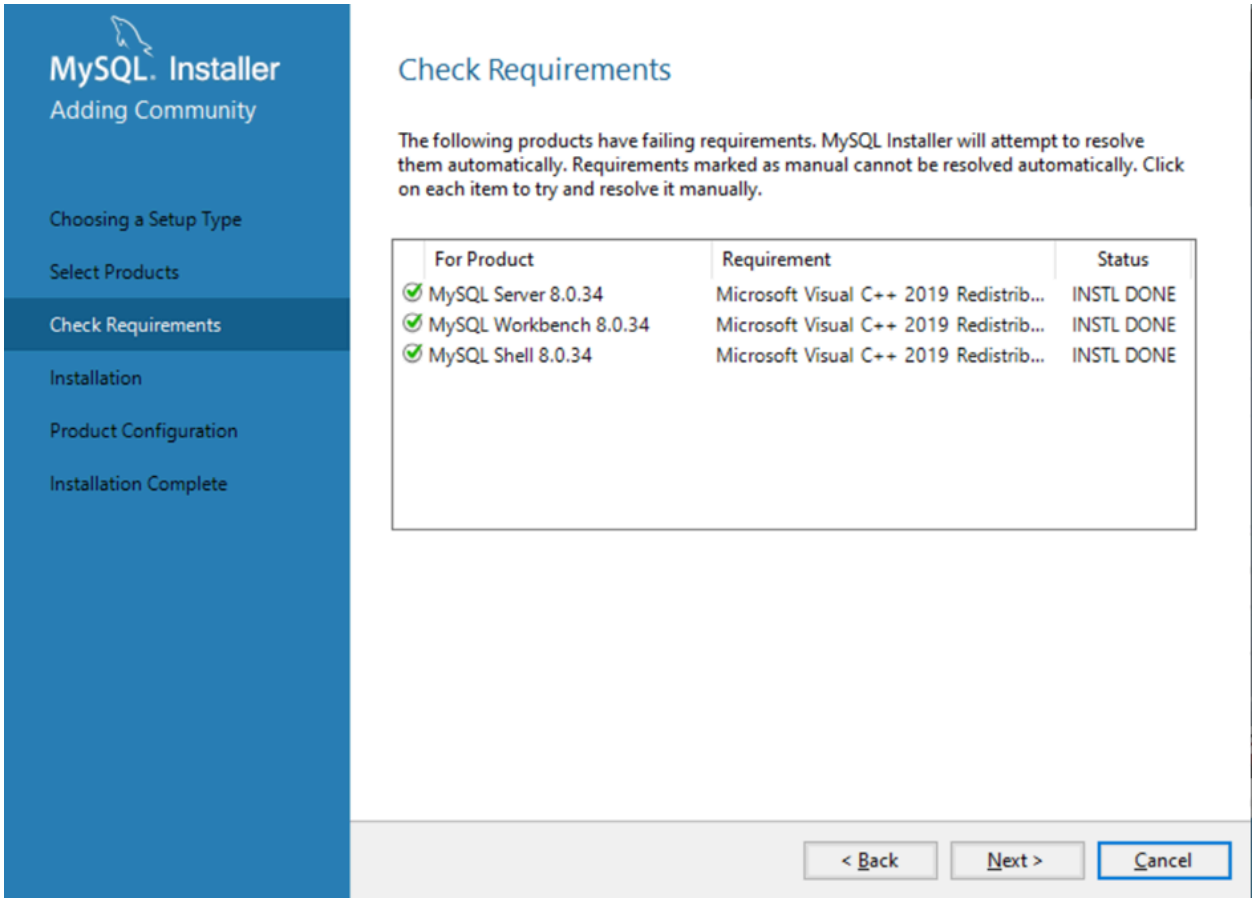
Click -> Custom

Step: 6



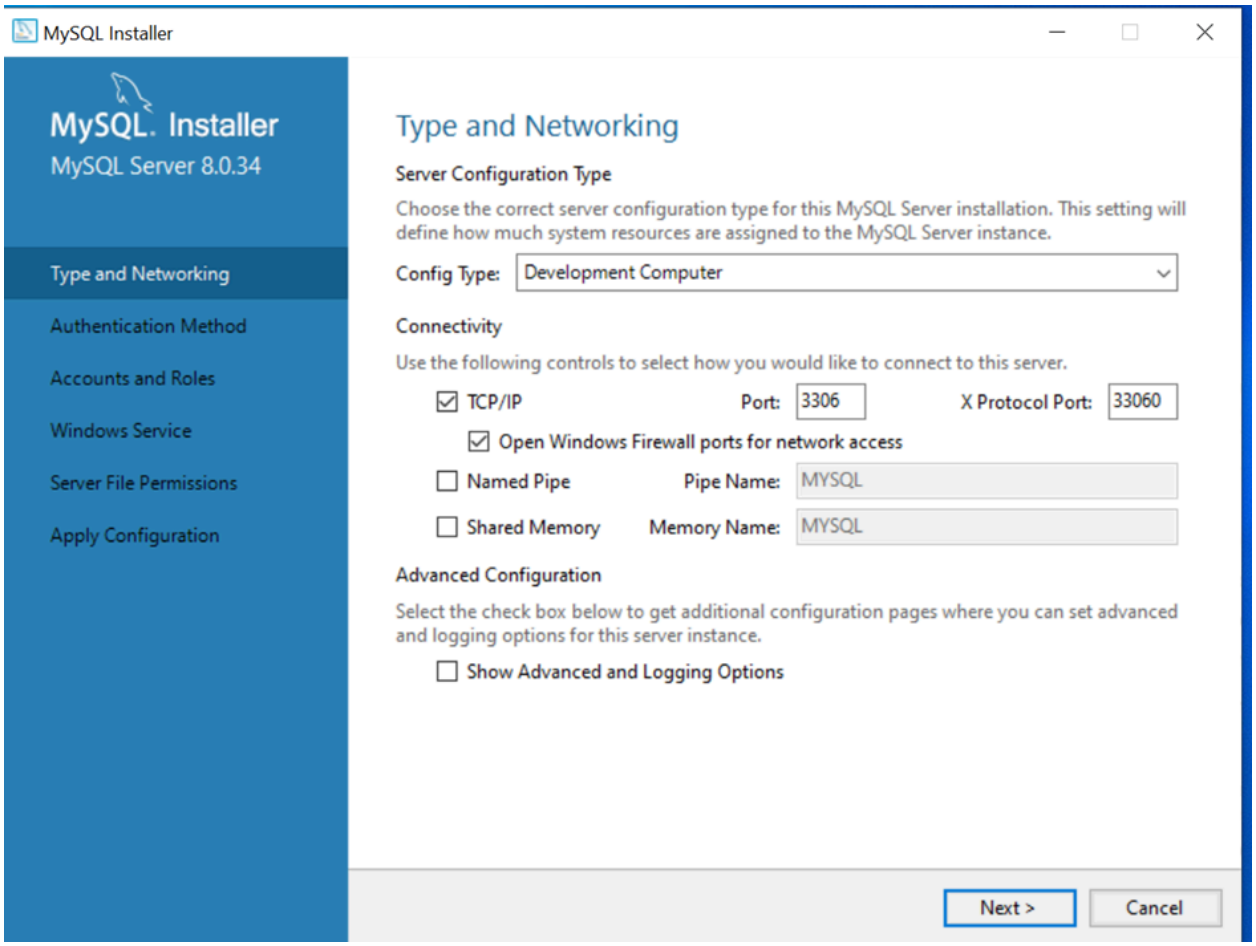
Click: mysqlsqkserver, mysqlworkbench, mysql shell -> push to right side.

Step:7



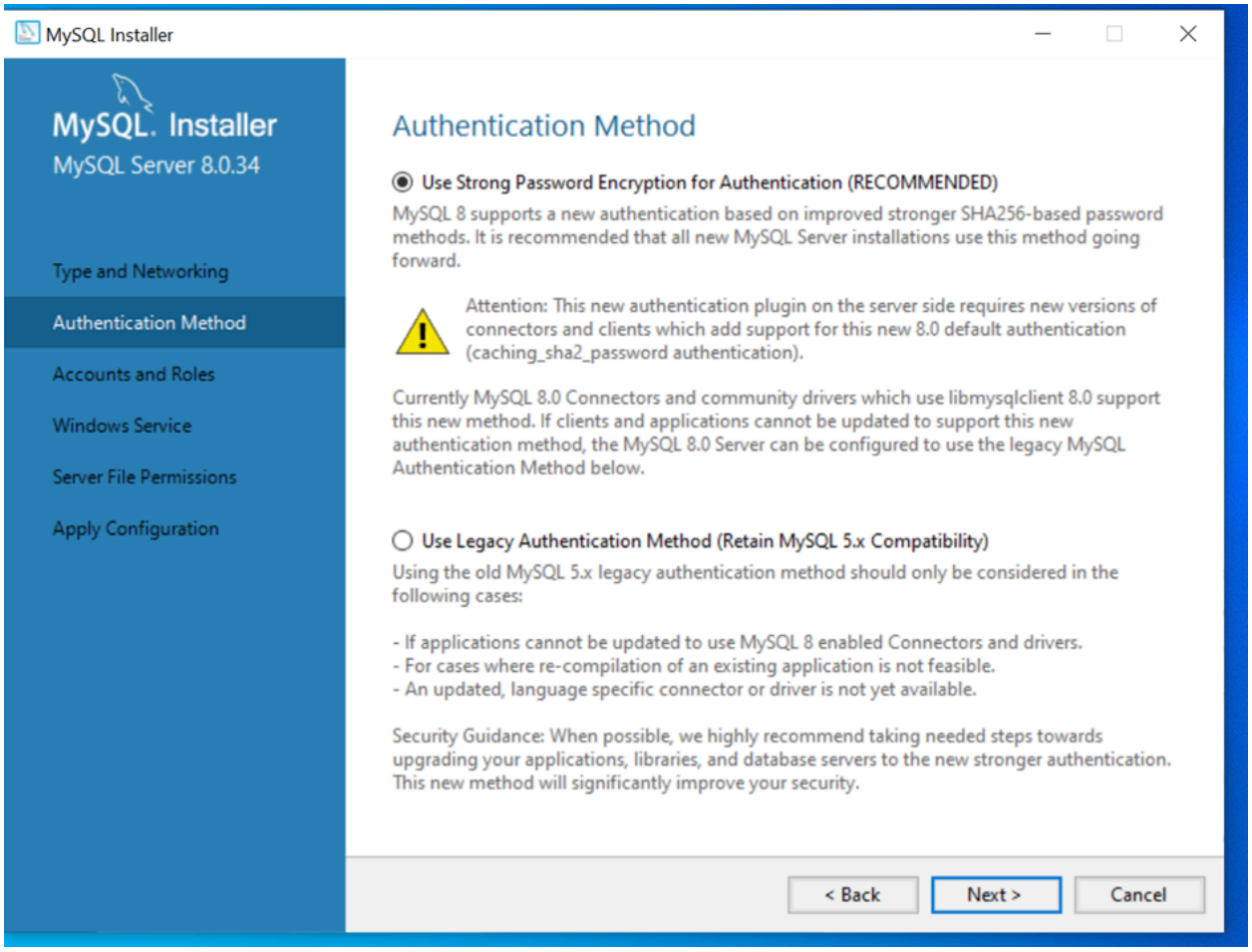
Click -> execute & next

Step:8



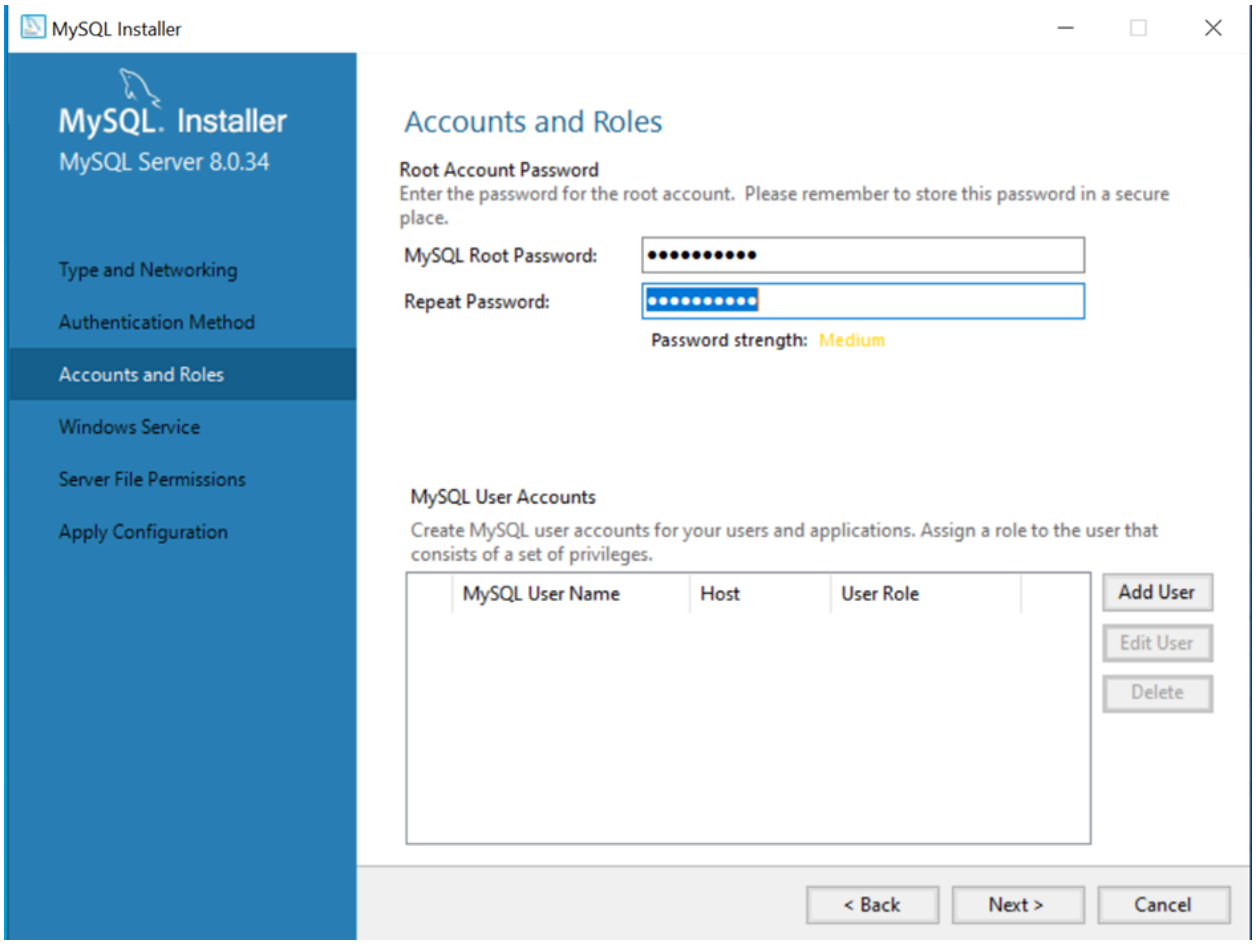
Click -> check port 3306 - > and click next

Step:9



Click-> next

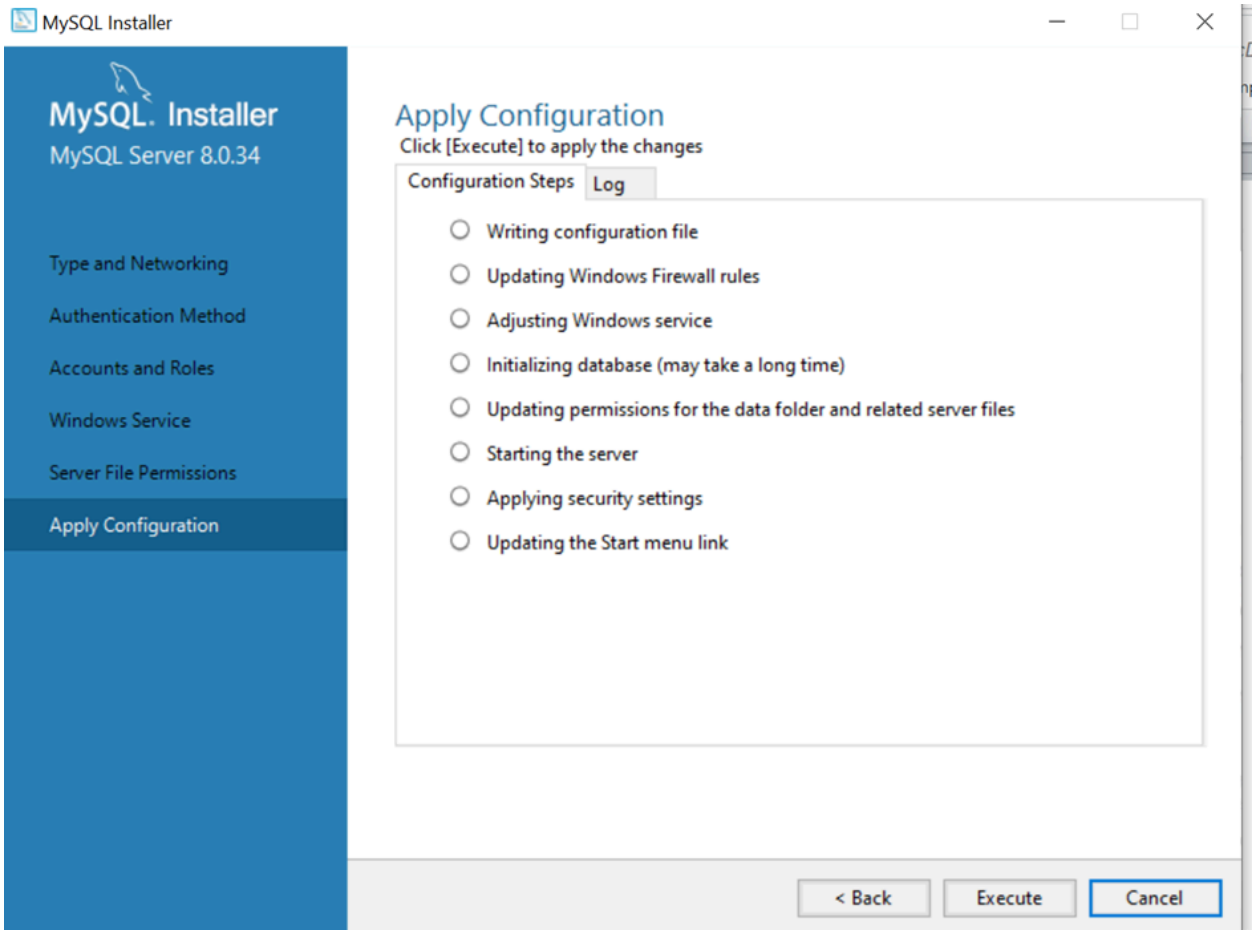
Step-10



Give your mysql root password & repeat password: **remember always**

Continuous other step click next
finally

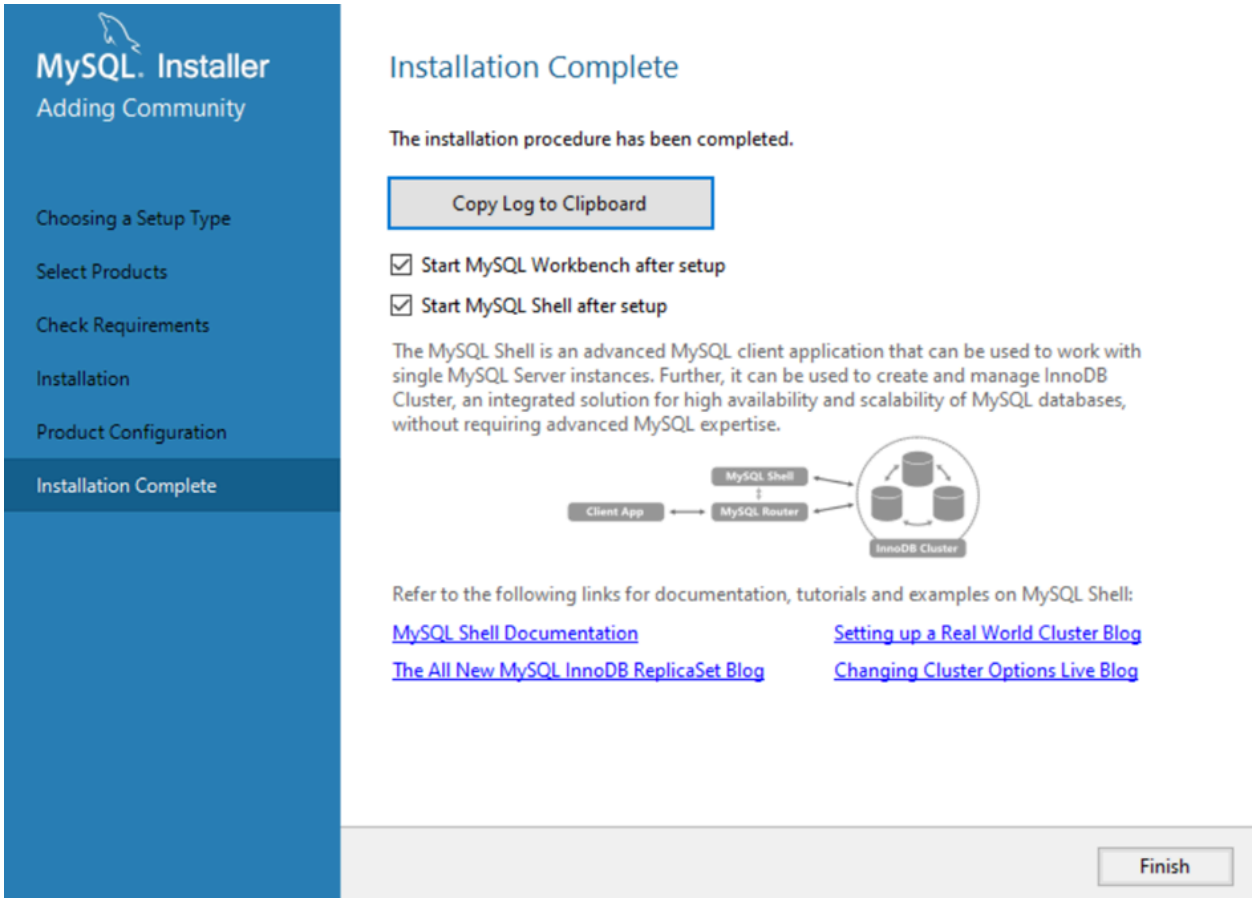
Step:11



Click -> execute

& two step click next & finally

Step:12



Click-> finish

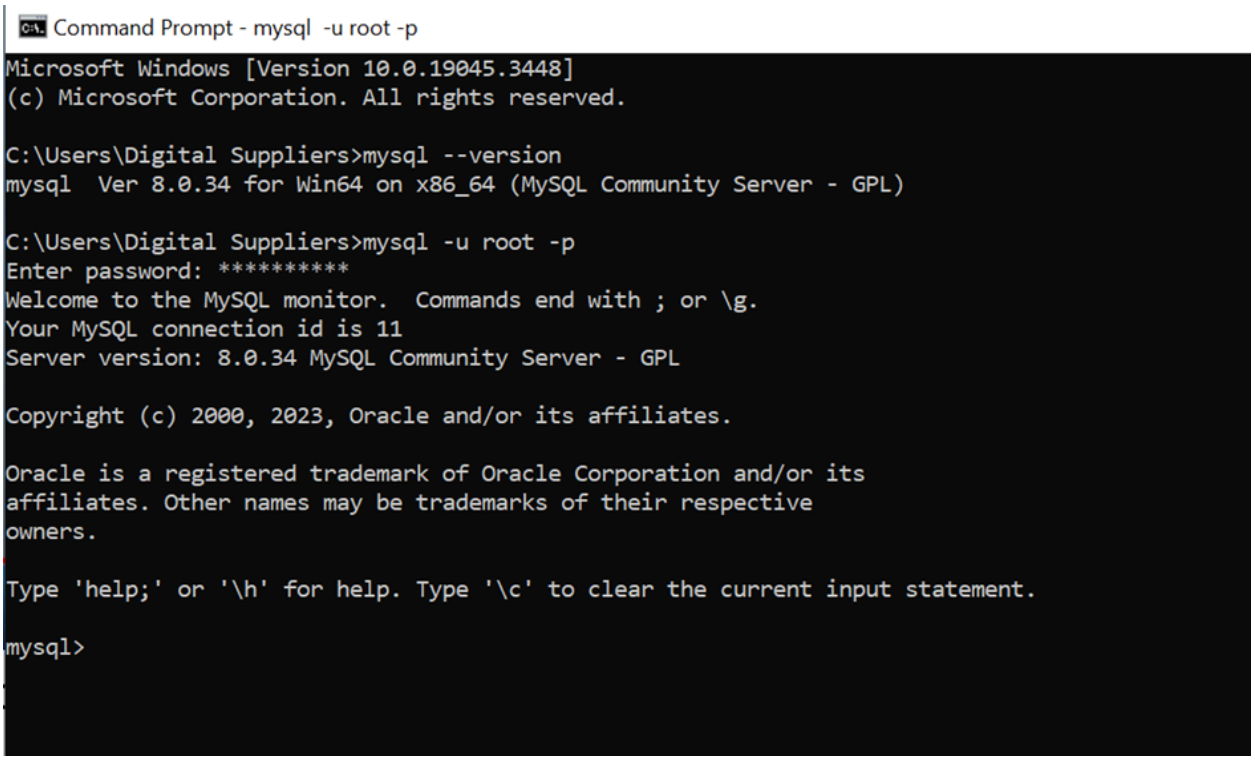
Step:13

Set Environment variable -> path -> new -> paste this path

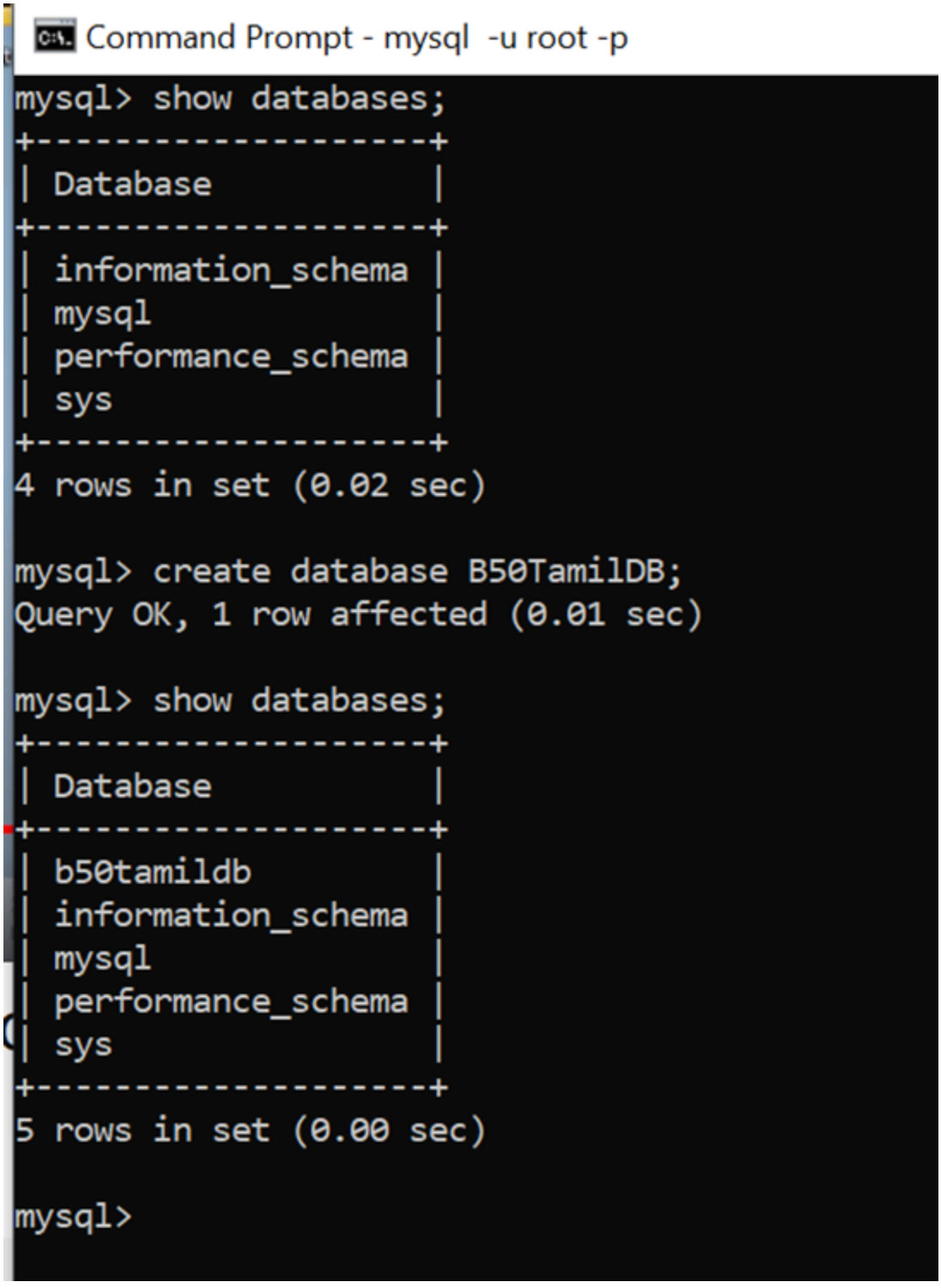
Path: C:\Program Files\MySQL\MySQL Server 8.0\bin

Step:14

Open command prompt and type this command



Show databases & create database commands:


Command Prompt - mysql -u root -p
mysql> show databases;
+--------------------+
| Database |
+--------------------+
| information_schema |
| mysql |
| performance_schema |
| sys |
+--------------------+
4 rows in set (0.02 sec)
mysql> create database B50TamilDB;
Query OK, 1 row affected (0.01 sec)
mysql> show databases;
+--------------------+
| Database |
+--------------------+
| b50tamildb |
| information_schema |
| mysql |
| performance_schema |
| sys |
+--------------------+
5 rows in set (0.00 sec)
mysql>

Introduction to database :

A database is a **structured collection of data** that is organized and **stored in a way that allows efficient access, retrieval, and manipulation of that data**. Databases play a crucial role in computing and information systems, and they are fundamental to the **storage and management of data** in various applications and industries.

Key Features:

- Data Management
- Tables
- DBMS (Database Management System) – mysql, sql, postgresql, mariadb, mongoDB
- SQL (Structured Query Language)
- Relational Databases
- NoSQL Databases
- **Indexes -> performance optimization**
- **Transactions -> sequence of operation**
- **Normalization -> distinct ,avoiding duplication**
- **Data Security -> authentic**
- **Scalability -> load balance (sharding,replicaset, dis db)**
- Backup and Recovery

what is MySQL? :

MySQL is an open-source **relational database management system** (RDBMS) that is widely used for managing and manipulating structured data. It falls under the category of relational databases, which means it stores data in **tables with predefined schemas,** and it supports SQL (Structured Query Language) for querying and managing the data.

SQL Databases:

Structured Data: SQL databases are relational databases that store **structured data in tables with predefined schemas**. **Data is organized into rows and columns.**

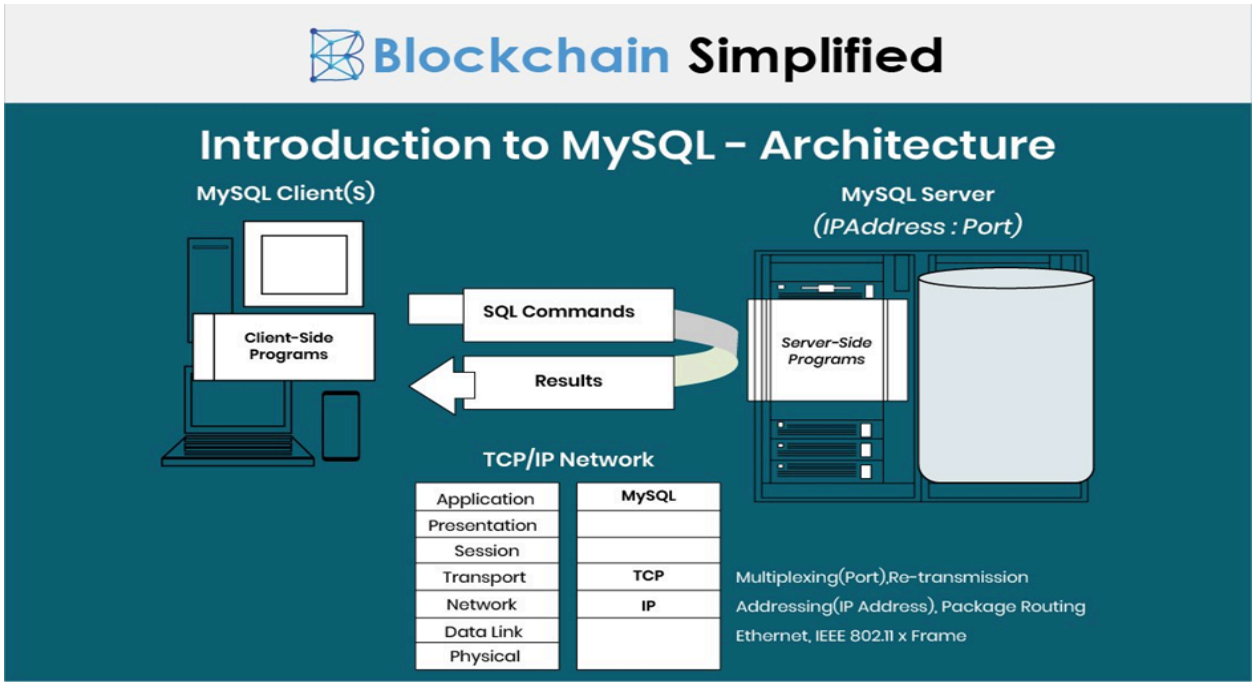
Unstructured or Semi-Structured Data:

NoSQL databases are designed to handle unstructured, semi-structured, or highly variable data. **They can store documents, key-value pairs**, graphs, and more. (like JS -> objects). Json (mongoDB)

intro to MySQL engines :

a database engine (also referred to as a storage engine) is a crucial component that determines how data is stored, retrieved, and manipulated within a MySQL database.

MySQL supports multiple **storage engines**, each with its own features, performance characteristics, and capabilities. Choosing the right storage engine for your specific use case is essential, as it can significantly impact the behavior and performance of your MySQL database.



Basic queries - create db, table insert, update, alter

PDF reference for mysql queries:

https://people.eecs.ku.edu/~hossein/746/MySQL/Docs/mysql_by_examples.pdf

Create Table Syntax & Examples:

Syntax:

CREATE TABLE table_name (column1 datatype constraints, column2 datatype constraints, ... columnN datatype constraints);

Eg:

mysql> create database empDB;

Query OK, 1 row affected (0.01 sec)

```
mysql> use empDB;
Database changed

mysql> create table employees(
    -> empid INT PRIMARY key,
    -> first_name VARCHAR(50),
    -> last_name varchar(50),
    -> designantion varchar(50)
    -> );
Query OK, 0 rows affected (0.04 sec)
```

Insert Table Syntax & Examples:

Syntax:

```
INSERT INTO table_name (column1, column2, ..., columnN)
VALUES (value1, value2, ..., valueN);
```

Eg:

```
mysql> insert into
employees(empid,first_name,last_name,designantion)
values(1,'suresh','vikram','FSD');
Query OK, 1 row affected (0.02 sec)
```

Multiple values

mysql> insert into
employees(empid,first_name,last_name,designantion) values

(2,'sathvik','suresh','FSD'),

(3,'rithu','suresh','FSD');

Query OK, 2 rows affected (0.00 sec)

Primary key error , you have to show

insert into employee(empid,first_name,last_name,designation)

values (4,'baskar','rajesh','fsd');

ERROR 1062 (23000): Duplicate entry '4' for key 'employee.PRIMARY'

mysql> select * from employees;

Update Table Syntax & Examples:

Syntax:

UPDATE table_name SET column1 = value1, column2 = value2, ..

WHERE condition;

Eg:

mysql> update employees set designantion = "python Developer"
where empid=2;

Query OK, 1 row affected (0.02 sec)

Delete Table Syntax & Examples:

Syntax:

` DELETE FROM table_name WHERE condition;

Eg:

mysql> delete from employees where empid=3;

Query OK, 1 row affected (0.01 sec)

Alter Command Syntax & Examples: change the structure

Syntax:

` ALTER TABLE table_name ADD column_name datatype

Eg:

ALTER TABLE employee MODIFY COLUMN designation VARCHAR(255);

ALTER TABLE employees CHANGE COLUMN f_name first_name VARCHAR(100);

ALTER TABLE employee CHANGE COLUMN l_name last_name VARCHAR(100);

ALTER TABLE employees ADD email VARCHAR(255);

mysql> UPDATE employee set email='rirhik@gmail.com' where empid=2;

select - where clause, distinct, group by, order by, offset, limit

select :

select * from employees;

where clause: (Filter)

mysql> select * from employees where empid=1;

mysql> select * from employees where first_name='suresh';

mysql> select empid,designantion from employees where first_name='rithu';

distinct: (Normalization, avoid duplication)

mysql> select distinct designantion from employees;

group by: (group rows that have the same values)

mysql> select designantion, count(*) from employees group by designantion;

mysql> select designantion, count(*) as emp_count from employees group by designantion;

COUNT(*): This is an aggregate default function that counts the number of rows in each group

order by: (sorting)

mysql> select * from employees order by empid ; (default asc)

mysql> select * from employees order by empid **asc**;

select * from employees order by empid **desc**;

mysql> select * from employee order by first_name desc;

offset, limit:(Pagination)

mysql> select * from employees limit 2;

mysql> select * from employees limit 2 offset 1;

mysql> select * from employees limit 2 offset 2;

Foriegn key example:

```
CREATE TABLE department (
   id INT AUTO_INCREMENT PRIMARY KEY,
   name VARCHAR(255) NOT NULL
);

CREATE TABLE employee (
   id INT AUTO_INCREMENT PRIMARY KEY,
   name VARCHAR(255) NOT NULL,
   department_id INT,
   FOREIGN KEY (department_id) REFERENCES department(id)
);

INSERT INTO department (name) VALUES ('HR'), ('Finance'), ('Engineering');

INSERT INTO employee (name, department_id) VALUES ('Suresh', 1), (‘Rithik', 2), ('Sathvik', 3);
```