Introduction to MySQL

- MySQL is a widely used open-source relational database management system (RDBMS).
- It stores data in tables, with rows representing individual records and columns representing data attributes.
- MySQL uses Structured Query Language (SQL) for managing and manipulating data.
- It is known for its reliability, performance, and ease of use, making it suitable for both small and large-scale applications.
- MySQL is cross-platform, meaning it works on different operating systems such as Windows, Linux, and macOS.

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Key Concepts

- A table in MySQL is a collection of data organized in rows and columns. It is similar to a spreadsheet where each row is a record, and each column holds data attributes of that record.
- A row (also called a record or tuple) represents a single, data entry in a table. Each row in a table has a unique identifier, often the primary key.
- A column is a vertical structure in a table that holds a specific type of data. Each column has a data type, such as integers, strings, or dates, and each column represents an attribute of the data stored in the table (e.g., "name", "age", "email").
- Each row in a table contains values for each of the columns, which together make up the full record.
- Tables in MySQL are defined by a schema that specifies the names and types of columns, along with any constraints like primary keys or unique values.
- Primary Key is a special column or combination of columns that uniquely identifies each row in a table.
- Foreign Key is a column that creates a relationship between two tables, linking the row in one table to a row in another table.

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Installing MySQL

- Download the MySQL installer from the official MySQL website (https://dev.mysql.com/downloads/).
- Choose the appropriate version for your operating system (Windows, macOS, or Linux).
- Run the installer and follow the on-screen instructions to install MySQL on your system.
- During installation, choose the "Developer Default" setup type to install essential tools like MySQL Server, Workbench, and command-line utilities.
- Set a root password during the installation process. This password will be used to access the MySQL root account.
- Install MySQL Workbench from https://dev.mysql.com/downloads/workbench/
- Open MySQL Workbench or use the command line interface (CLI) to connect to the MySQL server:
  - Use the command mysql -u root -p to login using the root account and enter the password you set during installation.

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Installing MySQL

```
CREATE DATABASE database_name;
DROP DATABASE database_name;
CREATE TABLE table_name (
  id INT AUTO_INCREMENT PRIMARY KEY,
  username VARCHAR(100) NOT NULL,
  email VARCHAR(100) NOT NULL UNIQUE
);

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

SELECT * FROM table_name;

SELECT column1, column2 FROM table_name WHERE condition;

UPDATE table_name SET column1 = value1, column2 = value2 WHERE condition;

DELETE FROM table_name WHERE condition;
```

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Using MySQL with Node.js

- To connect to MySQL from a Node.js application, use the mysql2 or mysql package, which provides a simple and efficient way to interact with MySQL databases.
- For other SQL based databases, you can search online.
- First, install the mysql2 package by running:
    - npm install mysql2

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Using MySQL with Node.js

- When you run a query with connection.execute(), the result is returned as an array, where:

- The first element (rows) contains the actual result set from the query (in your case, the rows returned from the SELECT query).
- The second element (fields) contains metadata about the columns, such as their names and types.

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