SQL

What is SQL?

- 1. What is data?
  - data = information (*ex: name, age, height*)
- 2. Database - place where you have some data

    - is a systematic collection of data

- Since the Data in a database is organized – it makes Data management easy

What is a database management system?

- DBMS – Database Management System
- Database Management System – is a collection of programs which enables its users to access database
- It helps control access to the database by various users

- Example of DBMS
- Facebook – it needs to store, manipulate and present data related to members, their friends, member activities, messages and lot more

What is SQL?

- SQL – Structured Query Language

- SQL is the language that you use to communicate with the databases through DBMS

- DBMS – is a software through which we execute SQL queries

    -- is an interface between us and databases

- The most popular Database Management Systems: Oracle, MySQL, Microsoft SQL Server

What is MySQL

- MySQL is a Database Management System

- Developed in 1994 by some Swedish company

- It's an open source DBMS and can be used for free
  - Runs on various platforms,
  - easy to use
  - keeps your data safe and secure
  - offers great performance results

What is a table?

- A table is a database object that is composed of rows and columns and contains related data

- We create tables in SQL using commands

- A table is created in SQL using the "create table" command

- You always have to give some name to your tables in SQL

Example of a table

Product ID	Color	Price (euro)
1	Red	10
2	Yellow	5
3	Green	11
4	Blue	12

What is a Field?

- A field is a column in a table that is supposed to provide specific information about all the records in the table

- In the table in the previous slide, Product id, Color and Price are Fields

What is a record?

- A record is a row in a table
- The table seen earlier has four records or four rows
- It is also known as horizontal entity of a table

What is a column?

- A column is a vertical entity in a table that contains information associated with a specific field

Color
Red
Yellow
Green
Blue

- SQL can be effectively used to insert, search, update and delete database records

What is a Null Value?

- Null Value is NO VALUE

- It is not a space or zero, it is NOTHING

- While inserting data in a table if you do not provide value for a cell, the cell is said to contain null value

Data types in SQL

- A data type is a property that specifies the type of data you can put in your table
- Each field has a data type and all values for a field have the same data type
- If Product ID is a field and if we put only product IDs, product id = numbers.
- Each field has a data type
- Color = character value, string values (red, green, blue)
- Number = integer, number (1,2,3,4)
- Date, date time, time = data types

Sno.	Name	Age	Email
1	Spiderman	30	spiderman@gmail.com
2	Batman	32	batman@gmail.com
3	Ironman	29	ironman@gmail.com
4	Superman	64	superman_returns@hotmail.com
5	Hulk	172	incredible_hulk@yahoomail.com

For numeric fields

- Bigint (really big values) - (-9,223,372,036,854,775,808) to (9,223,372,036,854,775,807)

- Int (big values) - (-2,147,483,648) to (2,147,483,647)

- Smallint (-32.768 to 32.767)

- Tinyint (0-255)

- Decimal (m,d)

- Numeric (m,d)
    * Display length (m)
    * Number of decimals (d)

Date and time data types

- Datetime (yyyy-mm-dd hh:mm:ss)
- Date (yyyy-mm-dd)
- Time (hh-mm-ss)
- Year (yyyy)

Character Data types

- Char

- Specify the upper limit for the field

– If you mention 60 you cannot capture more than 60

– The memory you use to store will be same even if you capture 2 characters or 60

- Varchar

– If you capture just 2 characters you use memory just for 2 characters

- Text – to store large amounts of text

Constrains in SQL

- Not null
- Default
- Unique
- Primary key

- Not null
  - If you want to make sure that a field gets some value for every row in the table apply not null constraint to it
- Default
  - If while populating a table you miss giving a column some value, the default value will be used
  - We will get an option for specifying the default value for a particular field

- Unique
  - Makes sure that all values entered for the field on which the constraint is applied are different
  - = unique value
- Primary key
  - Combination of not null and unique
  - Some value would have to be provided in each row and all the values entered must be different

Creating table statement

- Creating table statement requires you to do three things
    1. Name the table
    2. Define the columns
    3. Mention data types of columns

Create, use or drop databases

- CREATE DATABASE (+ space + name of the database);
  - example: CREATE DATABASE technology;
  - Press the combination control key + Enter
  - We will see in the output section "Create database technology" and a green check mark
- USE technology;
- DROP DATABASE technology;

Create table syntax

```
CREATE TABLE table_name (
col 1 datatype,
col 2 datatype,
col 3 datatype,
col 4 datatype,
);
```

Example:

- CREATE TABLE Products (
- ProductID integer,
- Color varchar(10),
- Price integer
-);

Product ID	Color	Price (euro)
1	Red	10
2	Yellow	5
3	Green	11
4	Blue	12

Example:

```
CREATE TABLE Persons (
PersonID int,
LastName varchar(255),
FirstName varchar(255),
Address varchar(255),
City varchar(255)
);
```

Removing tables from Database

- DROP TABLE table_name;
- SHOW TABLES;

Structure of the table

DESC table_name;

Insert data into tables syntax

INSERT INTO table_name (col 1, col 2, col 3, ..., col n)

VALUES (val 1, val 2, val 3, ... val n);

- **Example**

INSERT INTO Products (ProductID, Color, Price)

VALUES (1,'red',100);

Verify the table

SELECT * FROM table_name;