MySQL (Community Version)

MySQL is an open-source relational database management system. Its name is a combination of "My", the name of co-founder Michael Widenius's daughter, and "SQL", the abbreviation for Structured Query Language. A relational database organizes data into one or more data tables in which data types may be related to each other; these relations help structure the data.

https://www.w3schools.com/mysql/

Note :

1. I am putting together these notes (and adding links for those who find it difficult to open a browser tab and search, although I did the exact same thing to make these notes so if you can google you are at par with me on a lot of levels) for quick references during the lab and maintaining some order for the content taught.
2. All information here will be collected from multiple resources online and from textbooks, please remember this is just a handy set of notes when practising if you tend to forget a concept.
3. To understand a concept and learn about it please read more about them on multiple websites and textbooks.

MySQL vs Oracle sql

https://www.javatpoint.com/mysql-vs-oracle

Installation :

follow the official website : https://www.mysql.com/

Notes:

1. Make sure to add to path if you wanna use it where ever you want (ps,cmd,terminal etc)
2. Make the service manual, so you can shut or start it when you want (don't want a port open and a service running unnecessarily)
    a. windows - types services in start button, browse for
    b. linux - systemctl or systemd or /etc (according to flavour and version)

ABSTRACTION:

1. Views / external
2. Conceptual - **will be dealing with this**
3. Physical / internal

eg : university website

1. conceptual tables:
    a. students
    b. courses
    c. Faculty
2. Internal:
    a. bytes and disks etc.
3. External:
    a. University details displayed on the website which is a combination of information from the three tables

Note : Understanding dependency of tables (will be studying in detail in theory classes) for now try to understand relation between information, e.g. 1 teacher many students, 1 student many courses, 1 student many teachers, one student one grade all are unique relationships.

DATA MODEL AND DATA SCHEMA

How are entities defined and how are the relationships defined.

1. Hierarchical (oops concepts like inheritance)
2. network / graph (like in computer networks or data structures)
3. relational (most IMPORTANT for us and relatively new concept when compared to other subjects)

Relations can be understood with OOP principles to understand data. (resource to understand oop - tech with tim youtube(pythony))

One database(db) for one project and each db will container multiple tables each table will have a schema defining the data it can store (columns, data type of each column, conditions on each column

method to define the best db for now : cycle between designing schema and relations (intuition / hit and trial)

SQL (as per syllabus)

1. DDL data def
    CREATE, DROP, RENAME, TRUNCATE and ALTER.
2. DML data manipulation
    SELECT, INSERT, UPDATE and DELETE.
3. T-SQL/PL-SQL transact sql, sequential sql statements (scripts like loops and while etc)

DATA TYPES

MySQL : CHAR, VARCHAR,BLOB,CLOB, DATE, DECIMAL, FLOAT, INTEGER, SMALLINT, NUMBER etc.

Note: varchar2 wont work here only in oracle, will discuss later why

QUERY TYPES :

General Structure : SELECT, ALL / DISTINCT, *, AS, FROM, WHERE
Comparison : IN, BETWEEN, LIKE "% _"
Grouping : GROUP BY, HAVING,COUNT( ), SUM( ), AVG( ), MAX( ), MIN( )
Display Order: ORDER BY, ASC / DESC
Logical Operators :AND, OR, NOT
Output : INTOTABLE / CURSORTO FILE [ADDITIVE], TO PRINTER, TO SCREEN
Union : UNION

MYSQL useful commands

* show databases
* use <database>
* create <database>
* show tables
* mysql>system <shell cmd> : will run shell commands like cls/clear etc.

Note : other utility apps : workbench, (out of the scope of syllabus and also should not use for the course if you wanna score well, learn to use cmd line (terminal) for everything)

Constraints

https://www.w3schools.com/mysql/mysql_constraints.asp

1. NOT NULL - Ensures that a column cannot have a NULL value
2. UNIQUE - Ensures that all values in a column are different
3. PRIMARY KEY - A combination of a **NOT NULL** and **UNIQUE**. Uniquely identifies each row in a table
4. FOREIGN KEY - Prevents actions that would destroy links between tables
5. CHECK - Ensures that the values in a column satisfies a specific condition
6. DEFAULT - Sets a default value for a column if no value is specified
7. CREATE INDEX - Used to create and retrieve data from the database very quickly (will discuss separately slightly detailed concept)