

Schema

Loci		
Locus	5' Flank	3' Flank
ss24269141	aacctccctg...	tatatacg...
ss67247651	tattcaagg	tttcagt...

Table

Genotypes	
Genotype	Strand
A	+
C	+
A/C	+
T	-
C	+
C	+
C/T	+
G	-

Relation

Column

Samples	
Sample	Disease State
mouse1	healthy
mouse2	diseased
mouse3	healthy
mouse4	healthy

Field

Row, tuple, or record

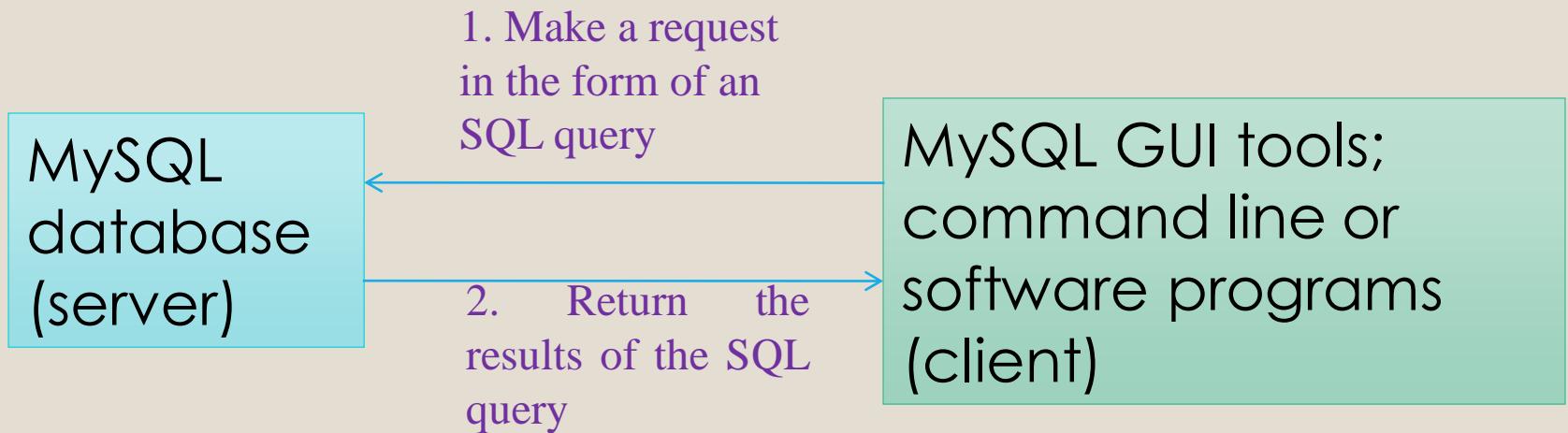
# SQL Server and Workbench

Lab 1  
Tania Malik

# MySQL – the DBMS we will be using in the lab

- MySQL is a Relational Database Management System (RDBMS).
- MySQL is the most popular Open Source database implementation
- MySQL Database Server is very fast, reliable, and easy to use.
- The MySQL Database Software is a client/server system.

# MySQL – Client / Server



- ▶ Client program can be a MySQL command line client, GUI (Graphical User Interface) client, or a program written in any language such as C, Perl, PHP, Java that has an interface to the MySQL server.

# MySQL

- Download from: <http://dev.mysql.com/downloads/>
- MySQL can be installed as a service which starts automatically when your machine starts up.
  - Can add icons on the desktop for starting and stopping the server.
- Alternatively it can be started from a terminal window.
- Default administrator user name and password is:

User name: root

Password:

# Installing MySQL on Laptop

## Install MySQL step-by-step

**Windows:**

<https://medium.com/@gayankurukulasooriya/how-to-install-mysql-8-0-33-server-on-windows-11-e5ddb2e9cc6e>

**Mac:**

<https://www.geeksforgeeks.org/how-to-install-mysql-on-macos/>

## Download MySQL

<https://dev.mysql.com/downloads/mysql/>

## YouTube Videos

MySQL Workbench Tutorials

[https://www.youtube.com/watch?v=X\\_umYKqKaF0](https://www.youtube.com/watch?v=X_umYKqKaF0)

<https://www.youtube.com/watch?v=pZKrznZymMg>

Loads more on youtube...

# Installing MySQL on Laptop

## Note:

### Documentation on Mysql:

<https://dev.mysql.com/doc/refman/8.0/en/windows-installation.html>

MySQL 8.0 Server requires the Microsoft Visual C++ 2019 Redistributable Package to run on Windows platforms. Users should make sure the package has been installed on the system before installing the server. The package is available at the [Microsoft Download Center](#). Additionally, MySQL debug binaries require Visual Studio 2015 to be installed.

# Starting MySQL(in Lab)

To start the MySQL server, select start-> program files-> mysql -> mysql server ->mysql command line client.

Just hit **enter** when asked for a **password** (the password is NULL on installation)

# What have you just started?

**Answer:** A MySQL database **instance**.

- The term **instance** means a complete database environment, including the RDBMS software, table structures and other objects.
- Each **database instance** can store multiple **databases** (also called **schemas**).
- Each **database** will contain multiple **tables**.

# Database instance

## A MySQL Database **Instance**

RDBMS software

Sales **database** (also called a **schema**)

Customer **table** holding details of all customers

Sales order **table** holding details of all sales

Promotions **table** showing details of all current promotions

and other tables . . . .

Payroll **database** (also called a **schema**)

Employee **table** holding details of all employees

Tax\_bands **table** holding details of current tax bands and rates

and other tables . . . .

# Working with MySQL

Once the server is started, you can interact with it using GUI clients such as:

- **MySQL Administrator**:- Server Administration to manage the database objects and users.
- **MySQL Query Browser**:- for running SQL queries.
- **MySQL workbench**:- incorporates both tools above and an ERD modelling tool

# Some initial SQL queries

- Show databases: list all the database the current user has access to
- Use *databaseName*: tells MySQL which database to run the queries against, e.g. Use consult
- Describe *tablename* gives the column names and definitions of a table in the database, e.g. Describe client
- Select \* from *tablename* lists all the data in the specified table, e.g. Select \* from client

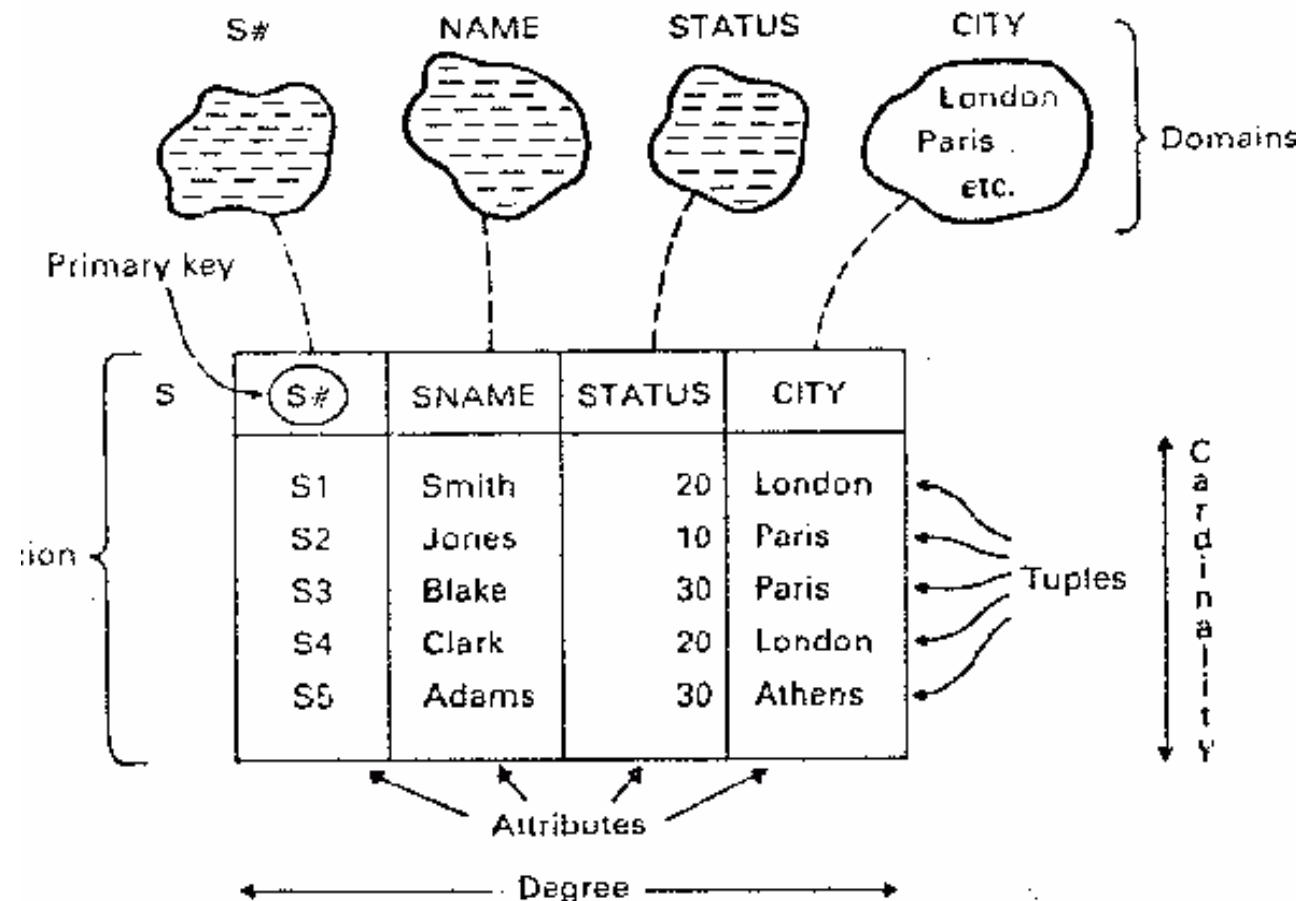
# More on terminology – a database system

- The database system is the term given to all of the following together:
  - The DBMS,
  - The data
  - And the programs that access and maintain the data

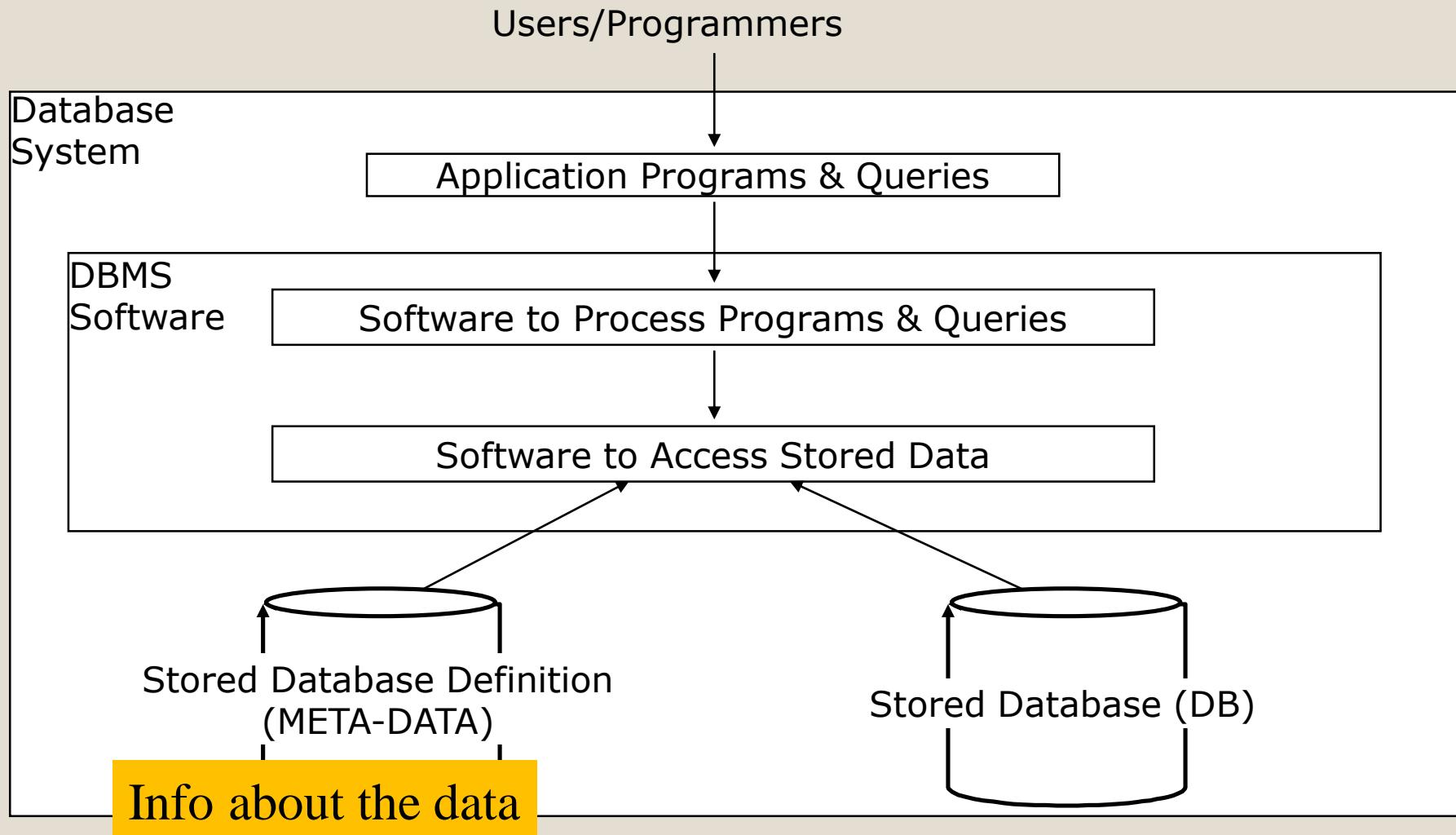
# Basic Concepts of Relational Model

- Relation <-> Table
- Tuple <-> Row or record
- Attribute <-> Column or field
- Cardinality <-> Number of rows
- Degree <-> Number of columns
- Primary key <-> Unique identifier
- Domain <-> Pool of legal values

# Concepts map of Relational Model



# A database system



# Short Video

- Video:

Intro to Databases and SQL

URL: <http://www.youtube.com/watch?v=UeJKioNqe5w>

# Exercise – Interpret the following:

