SQL

Class 1

Agenda

What is DataBase and why do we need SQL

Select statement in SQL

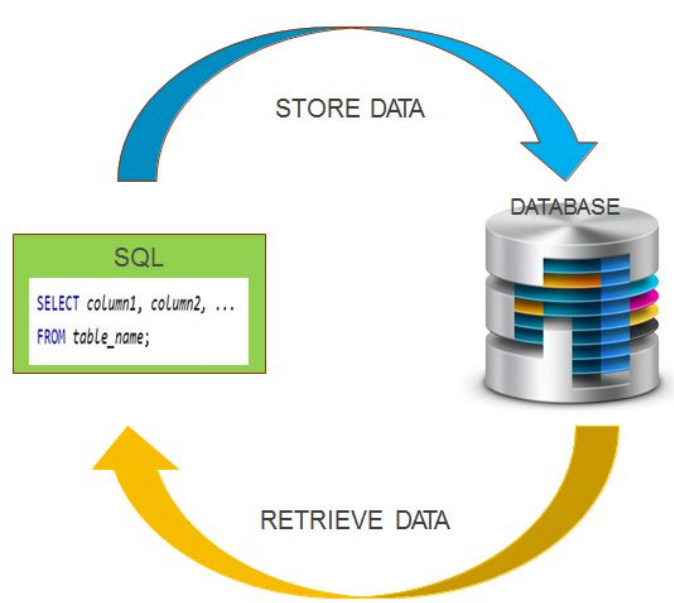
Where clause in SQL

Order By Statement in SQL

Logical Operators in SQL

What is SQL?

- Structured Query Language designed specifically for communicating with databases
- We use it to manipulate, manage and maintain databases (3 m's)
- SQL has Syntax Rules



What is Data?

- Information or Facts or Records of Information
- Is a collection of facts and figures, numbers, words, measurements, observations or even just descriptions of things
- Example:
- Car insurance: to issue you a policy which information they will be collecting from you?

What is DataBase?

- Storage/systems that allow users to keep, organize and manage Data.
- Is a complex program that design to store data. It keeps data correctly and retrieve data efficiently.

Why Am I learning SQL and Database?

Every Application or software will have a **FRONTEND** and a **BACKEND**

GUI→Graphical User Interface
GUI→ everything users can see and interact with.

BackEnd is where all the data is stored

As a testers our role is to verify Front End and Back End

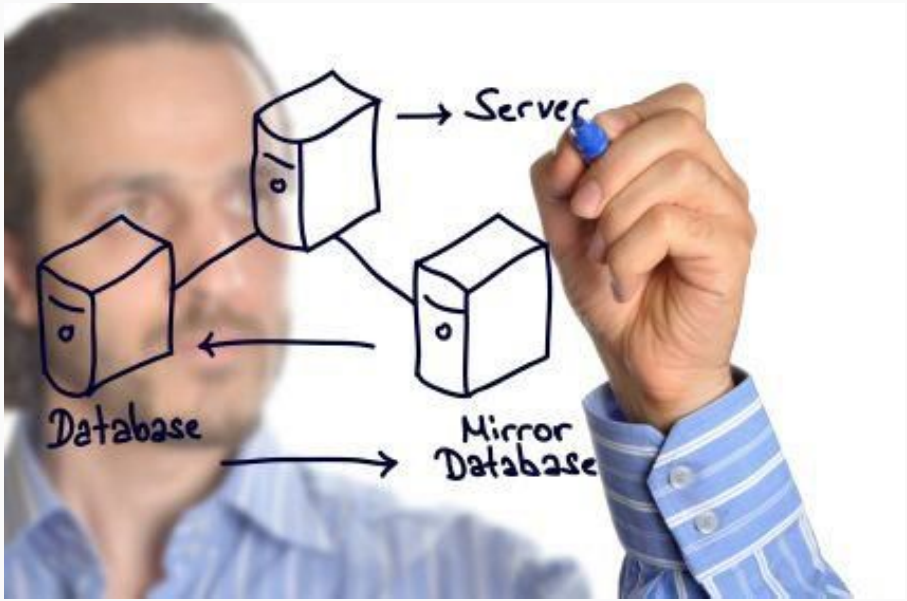
Examples of Databases

Microsoft Access – Ideal for small and mid-sized business
SQL Server – Ideal for mid sized business
Oracle – Ideal for large size business
Sybase – Ideal for large size business

In class we will be covering
Oracle DB

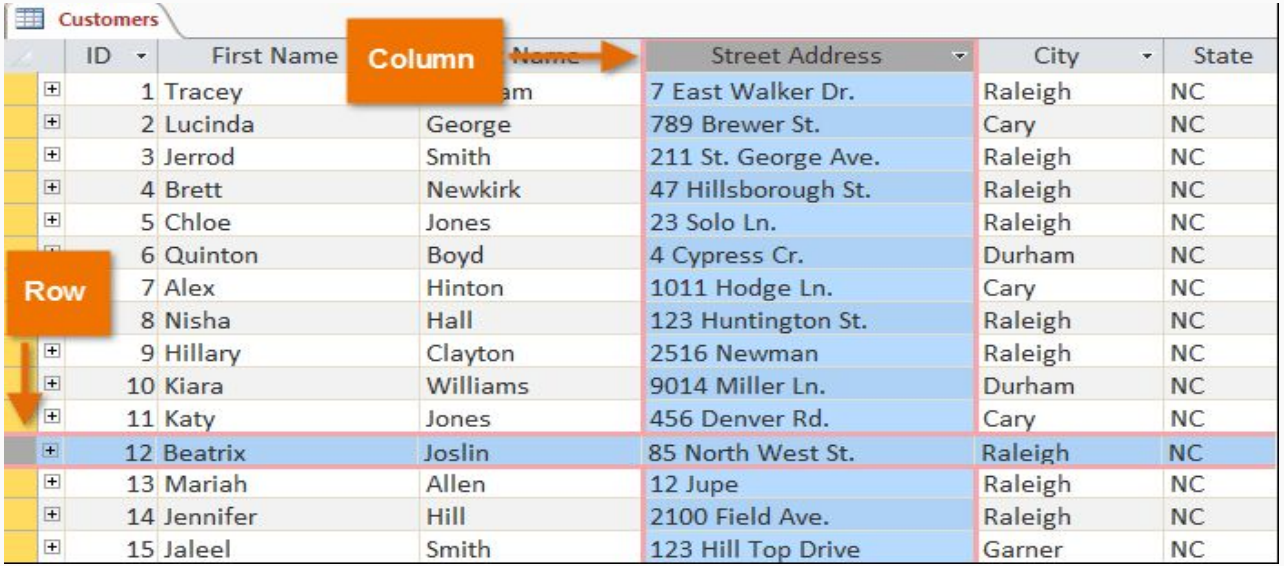
FYI

What is the title of IT professional that sets up and maintains DataBase?



DataBase Basic

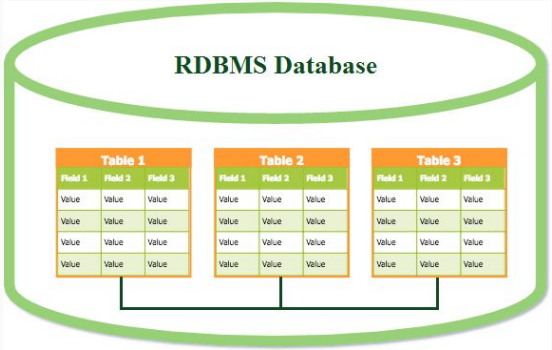
- DB is a collection of Tables
- Tables in DB consist of Rows and Columns that holds Data
- Rows in DB called Records
- Columns in DB called Fields/Attributes



ID	First Name	Last Name	Street Address	City	State
1	Tracey	am	7 East Walker Dr.	Raleigh	NC
2	Lucinda	George	789 Brewer St.	Cary	NC
3	Jerrod	Smith	211 St. George Ave.	Raleigh	NC
4	Brett	Newkirk	47 Hillsborough St.	Raleigh	NC
5	Chloe	Jones	23 Solo Ln.	Raleigh	NC
6	Quinton	Boyd	4 Cypress Cr.	Durham	NC
7	Alex	Hinton	1011 Hodge Ln.	Cary	NC
8	Nisha	Hall	123 Huntington St.	Raleigh	NC
9	Hillary	Clayton	2516 Newman	Raleigh	NC
10	Kiara	Williams	9014 Miller Ln.	Durham	NC
11	Katy	Jones	456 Denver Rd.	Cary	NC
12	Beatrix	Joslin	85 North West St.	Raleigh	NC
13	Mariah	Allen	12 Jupe	Raleigh	NC
14	Jennifer	Hill	2100 Field Ave.	Raleigh	NC
15	Jaleel	Smith	123 Hill Top Drive	Garner	NC

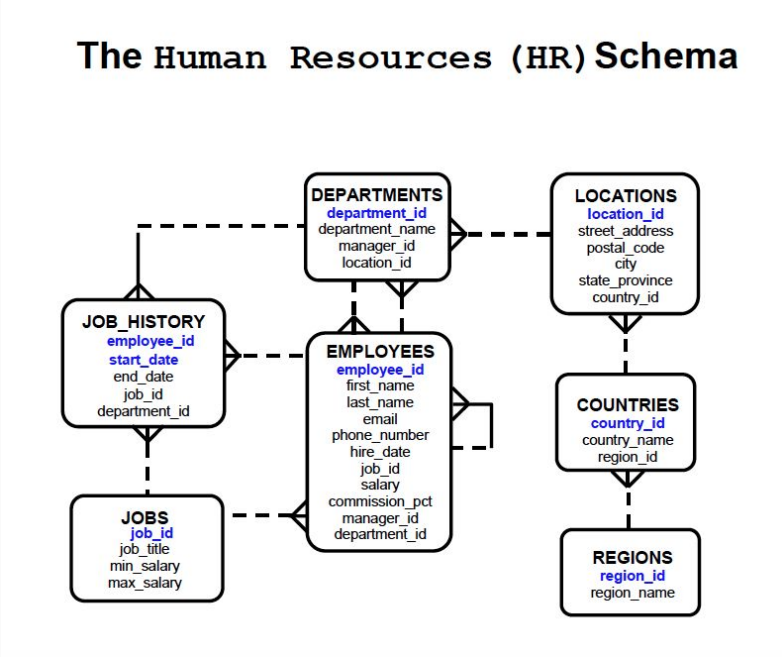
Relational Database Management System (RDBMS)

- RDBMS is a collection of tables (relations) that store particular sets of data in an organized way.
- RDBMS works on principle that each table has a key field that uniquely identifies each row and that these keys can be used to connect one table to another.



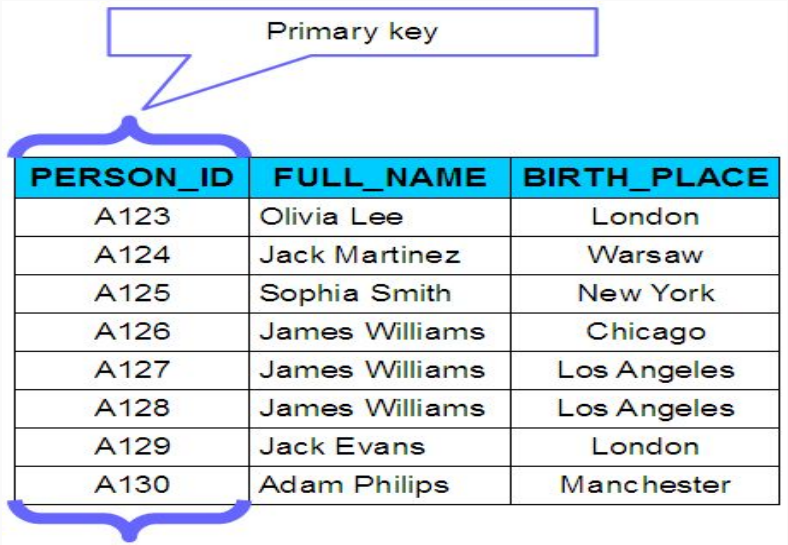
DataBase Schema

- Is the logical and definition of a database structure that defines objects in the Database
- DB Schema shows how tables interconnected/related to each other by the Primary Key and Foreign Key



Primary Key

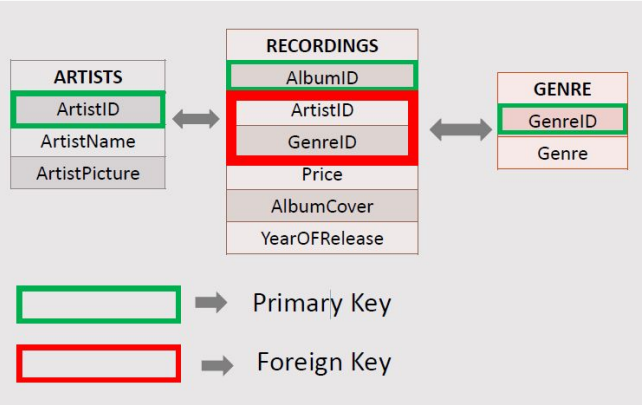
- Every table in database will have a Primary Key (UID unique identifier)
- PK is a column in the Table that uniquely identifies each record and the value is never duplicated in the same table
- PK cannot contain NULL Values
- Each table has only one Primary Key



PERSON_ID	FULL_NAME	BIRTH_PLACE
A123	Olivia Lee	London
A124	Jack Martinez	Warsaw
A125	Sophia Smith	New York
A126	James Williams	Chicago
A127	James Williams	Los Angeles
A128	James Williams	Los Angeles
A129	Jack Evans	London
A130	Adam Philips	Manchester

Foreign Key

- Is existence of PK in another table
- Is a key used to link two tables together
- It can accept Null Values
- We can have more than one Foreign Key in a table.



The **Primary Key** and **Foreign Key** creates **relationship between 2 tables in Database**

SQL Query

- SQL is Case insensitive
- SQL statements Start with Keywords: Select, Insert, Create etc...
- SQL statements End with Semicolon(;)
- Semicolon is standard way to separate SQL statements

As a tester we mostly use statement / commands like the Select statement to extract/select specific data from the database

SELECT Statement

Retrieves Information from database table

Syntax:

```
Select column name
From table name;
```

How to SELECT multiple Columns

Use Commas to separate columns

Syntax:

```
Select column name, column name
From table name;
```

How to SELECT All Columns

Use regular expression OR regex expression *(Everything)

Task

- How can you display all the data in Departments table?
- How can you display department id from Employees table?
- How can you display all the phone numbers from Employees?
- How can you display last name and hire date for all Employees?
- Please display department id and department name

Data Types

There are a lot of Data Types. Common data types used are:

- Numbers – 1234
- VarChar2 - String, letters, characters (Variable Length)
- Char - String, letters, characters (Fixed Length)
- Date - 02/13/201

Column in a database table can accept only **ONE Data Type**.
It is very strict rule.

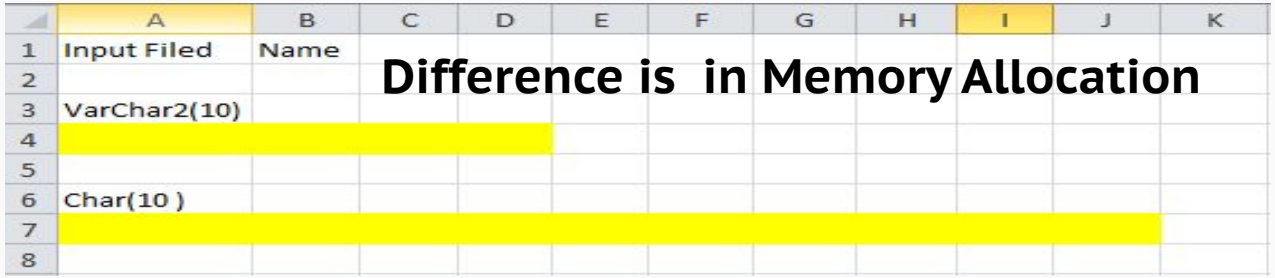
Difference between Char() and varChar2()

Use char when the sizes of the column data entries are consistent.

- char(10)--> takes 10 spaces in memory regardless of how much is used. Example: John (Column) --> still take 10 spaces

Use varchar when the sizes of the column data entries varies.

- varChar2(10) --> may take up to 10 spaces in memory. Example: John (Column) --> It will only take 4 spaces from memory and rest will be left to be used for something else



DISTINCT

Eliminates all duplicate records in the result
Used right after the Select Statement

Syntax

```
SELECT DISTINCT Column Name
FROM Table Name;
```