What is Database?

- A collection of information organized in such a way that a computer program can quickly select desired pieces of data.

- You can think of a database as an electronic filing system

Where do we use Database?

Front End: done in PHP / .Net / JSP or any server side scripting languages

Stores data at the **Back end** database in MYSQL/SQL Server / Oracle or any other DBMS

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Database management system (DBMS)

"Simply DBMS helps you to create and manage databases-same like MSWord helps you to create or manage word documents."

Database management system (DBMS)

- DBMS is a computer software providing the interface between users and a database (or databases)

- It is a software system designed to allow the definition, creation, querying, update, and administration of databases

- Different types of DBMS are RDBMS, Object Oriented DBMS, Network DBMS, Hierarchical DBMS

- Examples : Oracle, Mysql, PostgreSQl, SQL server, Firebird etc

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What is Entity – Relationship (ER) Data Model ?

In ER model all the data will be viewed as Entities, Attributes and different relations that can be defined between entities

- Entities
  - Is an object in the real world that is distinguishable from other objects
  - Ex. Employees, Places

Attributes
  - An entity is described in the database using a set of attributes
  - Ex. Employee_Name, Employee_Age, Gender

Entity – Relationship (ER) Data Model ?

Relationships

– A relationship is an association among two or more entities

- So a relation means simply a two dimensional table
- Entities will be data within a table
- And attributes will be the columns of that table

Relational model basics

- Data is viewed as existing in two dimensional tables known as relations.
- A relation (table) consists of unique attributes (columns) and tuples (rows)

Attributes/Fields/Columns

Emp_id	Emp_name	Emp_age	Emp_email
1000	Deepak	24	dk@gmail.com
1001	Aneesh	23	an@gmail.com
1002	Naveen	25	nn@gmail.com
1003	Jacob	25	jb@gmail.com

Rows/
Records/
Tuples

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Relational model Example

Tbl_designation

Pk_int_id	Vchr_Designation
1	Area manager
2	Supervisor
3	Software Engineer
4	Clerk

Tbl_place

Pk_int_id	Vchr_place
1	Mumbai
2	Kolkata
3	Bangalore
4	Cochin

Tbl_employee

Emp_id	Emp_name	Emp_age	Emp_email	Fk_int_designation	fk_int_place_id
1000	Deepak	24	dk@gmail.com	1	1
1001	Aneesh	23	an@gmail.com	2	1
1002	Naveen	25	nn@gmail.com	1	2
1003	Jacob	25	jb@gmail.com	3	4

Keys in relational Model

- **Primary Key**
- Here there are 2 employees with name "Deepak" but each can be identified distinctly by defining a primary key

Emp_name	Emp_age	Emp_email	Fk_int_designation	Pk_int_place_id
Deepak	45	dk@gmail.com	1	1
Aneesh	23	an@gmail.com	2	1
Naveen	25	nn@gmail.com	1	2
Deepak	25	dpk@gmail.com	4	4

Keys in relational Model

- **Primary Key**
- The PRIMARY KEY constraint uniquely identifies each record in a database table.

Emp_name	Emp_age	Emp_email	Fk_int_designation	Pk_int_place_id
Deepak	45	dk@gmail.com	1	1
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Relational model Example

Foreign Key

A Foreign key in one table **points** to a **Primary Key** of another table.

Tbl_designation

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SQL SERVER

- **Microsoft SQL (Structured Query Language) Server** is a relational database management system developed by Microsoft.

- As a database server, it is a software product whose primary function is to store and retrieve data as requested by other software applications, be it those on the same computer or those running on another computer across a network (including the Internet). The SQL phrase stands for Structured Query Language

- In January 2008, Sun Microsystems bought MySQL for $1 billion

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SQL SEVER

- **Data Definition Language (DDL)**
  - are used to define the database structure or schema.
    - Create
    - Alter
    - Drop
    - Truncate

- **Data Manipulation Language (DML)**
  - are used for managing data within schema objects.
    - Insert
    - Update
    - Delete
    - SELECT

- **Data Control Language (DCL) statements**.
  - Used to create roles, permissions, and referential integrity as well it is used to control access to database by securing it.
    - Grant
    - Revoke
    - Commit
    - Rollback

Create - Database

- To create a Database
  - Syntax   : CREATE DATABASE *dbname*;
  - Example   : CREATE DATABASE my_db;

- To Use a database
  - Syntax   : Use *dbname*;
  - Example   : Use *my_db*;

Creating a table

- **Syntax**

  CREATE
  TABLE *table_name*
  (
    column_name1
  data_type(*size*),
    column_name2
  data_type(*size*),
    column_name3
  data_type(*size*),
    PRIMARY
  KEY(column_name1));

- **Example**

  CREATE TABLE Persons
  (
    PersonID int
  identity(1,1),
    FirstName varchar(255),
    Address varchar(255),
    City varchar(255),
    Primary key(PersonalID)
  );

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DDL - Altering a table

- ALTER TABLE Persons ADD email VARCHAR(60);
- ALTER TABLE Persons DROP COLUMN city;
- ALTER TABLE Persons CHANGE FirstName FullName VARCHAR(20);

DDL - Deleting a Table

- DROP TABLE table_name ;

DML STATEMENTS

DML - Insert Data into a table

- **Syntax :**
  - INSERT INTO *table_name* VALUES (*value1,value2,value3,...*);

- **Example:**
  - INSERT INTO Customers (CustomerName, City, Country) VALUES (baabtra', 'Calicut', 'India');

- *Note : String and date values are specified as quoted string. Also with insert you can insert NULL directly to represent a missing value.*

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DML -Retrieving information from a table

The **SELECT** statement is used to pull data from a table"

Syntax:

– SELECT *what_to_select* FROM *table_name* *Where*
  conditions_to_satisfy ;

What_to_select indicates what you want to see. This can be a list of columns or * to indicate "all columns".

The Where clause is optional. If it is present, conditions_to_satisfy specifies one or more conditions that rows must satisfy to qualify for retrieval.

DML - Example

- Select * from person;
- Select id,firstname from person;
- Select * from person where city='banglore'

DML - Update Query

- Syntax:
  - UPDATE *table_name*
    SET *column1=value1,column2=value2,...*
    WHERE *some_column=some_value*;

- Example:
  - UPDATE Customers
    SET ContactName='Alex', City='calicut'
    WHERE CustomerName='baabtra';

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Delete Query

- Syntax:
  - DELETE FROM *table_name*
    WHERE *some_column=some_value*;

- Example :
  - DELETE FROM Customers
    WHERE CustomerName='baabtra' AND
    ContactName='Maria';

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DCL – Setting Privilege

- Example:

GRANT ALL ON baabtra.user TO 'someuser'@'somehost';

What previlages to be given
    All -> will set all the privileges
    SELECT-> will set only to select privilage
	table name	Username

REVOKE ALL ON baabtra.user FROM 'jeffrey'@'localhost';

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Self Check !!

- Attribute of an entity is represented as

  - Row
  - Column
  - table

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Self Check !!

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  - Relations/tables
  - Attributes
  - Schemas
  - Objects

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- Example for DML is

  - Deleting all table data
  - Creating a column
  - Changing column data type

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Self Check !!

- ## Write a query to create below table

Tbl_place	
Pk_int_id	**Vchr_place**
1	Mumbai
2	Kolkata
3	Bangalore
4	Cochin

- ░░░░░░ tbl_place
  (
            ░░░░░░░░░░░░░░░░ _increment,
       ░░░░░░░ varchar(20)
  );

Self Check !!

- ## Write a query to create below table

Tbl_place	
Pk_int_id	**Vchr_place**
1	Mumbai
2	Kolkata
3	Bangalore
4	Cochin

- create table tbl_place
  (
  pk_int_id int primary key auto_increment,
  vchr_place varchar(20)
  );

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Self Check !!

- Write a query to add one more column named "int_pin"

Tbl_place	
Pk_int_id	Vchr_place
1	Mumbai
2	Kolkata
3	Bangalore
4	Cochin

Ans⬚⬚⬚⬚⬚⬚⬚⬚⬚⬚⬚⬚⬚⬚⬚⬚⬚⬚⬚ int;

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Self Check !!

- Write a query to add one more column named "int_pin"

Tbl_place	
Pk_int_id	**Vchr_place**
1	Mumbai
2	Kolkata
3	Bangalore
4	Cochin

Ans: Alter table add column int_pin int;

End