Database

Database management systems:

Hierarchical:

Network:

Relational:

Object oriented:

Sequel and non sequential data

Sequel is relational databases

No sequel databases include both sequential and no sql data

Data are facts or observation about basically everything

Physical view is actual format and location

Logical view focuses on the meaning and content of the data

Database: collection of data organized in a manner that allows access retrieval and use of that data

Data: Collection of unprocessed items (data can be either structured or unstructured)

Information: Processed data organized meaningful useful

Field: a group of related characters ( represents an attribute)

record : collection of related fields. A record represents a collection of attributes that describes an entity basically values

File is a collection of related records

Character: is the most basic logical data element (single letter number etc)

Database is an integrated collection of logical records

Key field : it is a unique identifier (like ID number) unique information so that each record can be distinguished from others.

Batch processing :data is collected over several hours or days or even weeks. It is then processed all at once as a batch.

Real time processing also known as online processing occurs when the data is processed at the same time the transaction occurs

Advantages of database

Less data redundancy: with several departments having access to one file there are fewer files

Data integrity

Older filing systems many times did not have integrity a change made in the file in one department might not be made in the file in another department

DBMS structures

The arrangement of logically structured data is allied data model

Database management systems:

Hierarchical: in hierarchical databases, fields or records are structured in nodes. Nodes are points connected like the branches of an upside down tree. Each entry has one parent node, although the parent node may have several child nodes. (one to many relationships )

Network: it also has a hierarchical arrangement of nodes. Each child node may have more than one parent node. This is many to many relationship

The interconnected design allows for access via multiple pathways i.e more flexible

Relational: a more flexible type of organization is the relational database. There are no access points paths down a hierarchy rather the data elements are stored in different tables each of which consists of rows and columns

A table is called a relation, within the table a row resembles a record, a column resembles a field. All related tables must have a key field

It is very simple

Object oriented: works with unstructured data (photos graphics audio etc)

Objects contain both data and instructions

Individual database: collection of integrated files used by one person

Shared database

SQL Environment

Catalog: A set of schema (many databases) that constitute the description of a database

Schema: structure that contains descriptions of objects created by a user

Data Definition Language (DDL) Commands that define a database creating altering and dropping tables and establishing constraints

Data Manipulation Language (DML) Commands that maintain a query and a database

Data Control Language

Commands that control a database

Steps in table creation

Identify data types for attributes

Identify columns that can and cannot be null

Identity columns that must be unique (unique key)

Identify primary key -

Determine default values

Identify constraints on columns

Create the table and associates indexes’

Basic input syntax eg:

CREATE TABLE people(

id INTEGER PRIMARY KEY,

full\_name STRING,

age INTEGER,

other string

);

INSERT INTO people VALUES (

1001, "Numair", 20, "hi"

);

Order

Select (then number or \* for all)

From (tells which table)

Where (the filter eg WHERE STUDENT id =1)

GROUP BY (indicate categorisation of results)

Having (indicates a group condition)

Order by (Sorts the results according to specified criteria)

SQL stands for structured query language

It is domain specific language and not a general programming language

Its specialized to handle structured data

It is a language that has its specifications

It is very very structural, if you were to insert data into the table it has to be done so according to the order and data type of the table fields

CREATE TABLE library(

ISBN\_NO INTEGER PRIMARY KEY,

book\_name varchar(255),

number\_of\_pages INTEGER

);

INSERT INTO library VALUES(

9123210122, 'Harry potter and the sorcerers stone', 500

);

INSERT INTO library VALUES(

98454452110, 'good book name', 450

);

ALTER TABLE library

RENAME COLUMN number\_of\_pages to no\_of\_pg;

ALTER TABLE library

ADD COLUMN ultimate\_genre\_of\_book;

ALTER TABLE library

ADD COLUMN ultimate\_genre\_of\_book;

SELECT \* FROM library