INTRODUCTION TO DATABASE

- A **database** is a collection of information that is organized so that it can easily be accessed, managed, and updated.

Examples of databases

- School registers
- National voters register
- Address book or visitors book
- Mobile phone subscribers database etc

Database management system (DBMS)

- A database management system (DBMS) is a computer software that enable users to create and maintain the database

Examples of DBMS

- Microsoft access
- Oracle
- MySQL
- Visual basic
- Borland dBase
- Corel paradox
- Microsoft Visual FoxPro

Advantages of using DBMS over file based system

- DBMS controls data redundancy i.e. duplication of the same information about the same subject
- It is easy to update a database designed in DBMS than those in the file based
- It offers the database administrator a tool to restrict access to the database by those not authorized to access it.
- It improves on accessibility since the data can be accessed via the network connections

- DBMS provides facilities for backup and recovery incases of hardware and software failures

Disadvantages of using DBMS over file based systems

- There is lack of confidentiality, privacy and security since most of the databases are centralized and shared by many users
- It is costly in maintenance since most of the database systems require regular maintenance especially application programs
- It is limited to only people with ICT knowledge
- Data can easily be lost due to hardware and soft ware failures incase there was no backup.

MICROSOFT ACCESS

- Microsoft access is an entry level database that offers a flexible environment for database developers and users to access, manage and update.

Database objects

- A database object is any defined object in a database that is used to store or reference data.

e.g. Table, Query, Form, Report, Macro and Module.

Table

- A table is a set of columns and rows. Each column is referred to as a field and each row is referred to as a record
- A field: is a column in a table that contains specific piece of information within a record
- A record: is a row in a table that contains information about a given person, event or an object.

FORMS

- These give the user the ability to choose the format and arrangement of fields.
- Forms can be used to enter, edit and display data

QUERIES

- These are used to retrieve specific data from the database and to answer questions defined by the user about the data.

e.g. A user can use a query to find the names of students in Mandela database who live in Hoima town

REPORTS

- Reports organize or summarizes data so that it can be printed or viewed on screen. Reports are often used to analyze data or present data to other people

Macros

- **Macros** - a set of one or more actions that each performs a particular operation, such as opening a form or printing a report. Macros can help you to automate common tasks. For example, you can run a macro that prints a report when a user clicks a command button.

Modules

- **Module** - a collection of Visual Basic for Applications declarations and procedures that are stored together as a unit.

CREATING TABLES

- Access provides three ways to create a table for which there are icons in the database window
- Creating tables in design view provides the tool for creating fields in a table by allowing the user to define the field name (e.g. first name, last name, sex, age), primary key and specify the data type for each field.

Primary And Foreign keys

- **Primary key** is a field that contains values that uniquely identify each record in a table. **OR**
- This is a field or set of fields that **uniquely identify** any given record(row) in a given table. It ensures no two rows have the same value

- **Foreign key** is a field in one table that uniquely identifies a row of another table. **OR**
- Is a field or set of fields (primary key) in one table that uniquely identifies a record(row) of another table.

DATA TYPE

Databases consist of tables, tables consist of fields and fields are of a certain **data type**. A field's data type determines what kind of data it can hold. Every database has data types for text, integers etc

That is a data type: Is the type of value that will be entered into the fields.

Examples include

- Text: this allows any combination of letters, symbols and numbers up to a maximum of 255 characters per field record. This is used very often for names, descriptions, titles, et cetera

- **Number:** these are numeric numbers 0 to 9 that are to be manipulated numerically or The **Number data type** in Access is a data type for different types of numbers, like Integer, Long Integer, Byte, Decimal, et cetera. The exact number type is configured using the **Field Size property**.

- Memo: this is made up of alphanumeric (both numeric and alphabetic) data. This data type is used where there is need to enter several paragraphs of text up to maximum of 64000 characters.
- Date/time: allows date, time or combination of both
- Currency: allows monetary values that can be set up automatically and these include dollar sign ($) and correct decimal and comma positions

- Auto number: AutoNumber is a data type that is used to let Access generate unique numeric values for you. The AutoNumber data type is used on primary key fields. when a new record is created, access will automatically assign a unique integer to the record in this field.
- Boolean (Yes/No): use this option for true or false, yes/no, on/off or other values that must be only one of the two. Yes/No fields appear as a checkbox in the data sheet.

- **Hyperlink:** this will link to an internet or intranet site or another location in the database
- **Lookup wizard:** used where a user defines a set of values where one is chosen from the list
- **OLE object:** OLE stands for object linking and embedding. This type is mostly used with graphical user interface applications for inserting pictures, drawings, charts, etc
- **The calculated data type :**The calculated data type lets you store the result of a calculation that includes data from other fields, like the amount of product x the product price

Description

- Allows a user to enter a brief description of what the contents of fields are and it is optional.

Field properties

- Field size: this is used to set the number of characters needed in a text or number field.

Field Property	Description
Field Size	The maximum number of characters you can enter in the field. The largest maximum you can set is 255.
Format	The display layout for the field. Select a pre-defined format or enter a custom format.
Input Mask	A pattern for all data to be entered in the field.
Caption	The label for the field when used on a form. If you don't enter a caption, the field name is used as the label.
Default Value	A value that is automatically entered in the field for new records.
Validation Rule	An expression that limits the values that can be entered in the field.
Validation Text	The error message that appears when you enter a value prohibited by the validation rule.
Required	Specify whether the field is required data entry.
Allow Zero Length	Specify whether allow zero-length strings in the field.
Indexed	An index speeds up searches and sorting on the field, but may slow updates. Selecting "Yes - No Duplicates" prohibits duplicate values in the field.