

LESSON : 9

WEEK : 8

TOPIC 1 : Introduction to Databases with Microsoft Access

OBJECTIVE: To introduce the concept of the database and to acquaint the student with the basic components of Microsoft Access. To know what a Database Management System is, basic database terminology and database objects used in Access.

LEARNING OUTCOMES:

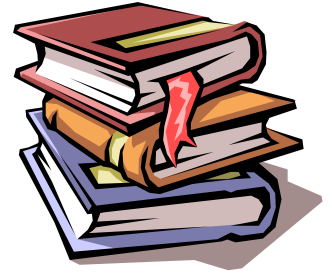
After completing this chapter you should be able to:

1. Appreciate the advantages of databases
2. Understand how databases are organized
3. Explain the difference between data and information
4. Become familiar with database terminology
5. Know what a Database Management System (DBMS) is and what it is used for
6. Know what are the database objects in Access
 - a. Table
 - b. Query
 - c. Form
 - d. Report
7. Know the purpose of each Access database object
8. Understand, in general, how to build a database

TOPIC OUTLINE:

- 9.1 What is a database?
- 9.2 Examples of manual databases
- 9.3 Problems of manual databases
- 9.4 Examples of electronic databases
- 9.5 Advantages of electronic databases
- 9.6 Database concepts
- 9.7 Components of a database
- 9.8 Relational Database
- 9.9 Normalisation
- 9.10 DBMS
 - a. Table Structure Creator
 - b. Datasheet view
 - c. Query
 - d. Form
 - e. Report

DCA105 DATABASE, SPREADSHEET & DTP (DATABASE COMPONENT)



9.1 WHAT IS A DATABASE?

A database is a *collection* of related data.

9.2 EXAMPLES OF MANUAL DATABASES

- phone book
- address book
- filing cabinet
- 555 Book
- Business card folder
- Doctor patient cards

9.3 PROBLEMS WITH MANUAL DATABASES

1. Useful and convenient only if the number of data stored is small
2. Difficult to sort (e.g., to list alphabetically) if the number is huge
3. Slow to access data needed
4. Data may be duplicated in various places
5. Lack of data accuracy

9.4 EXAMPLES OF ELECTRONIC DATABASES

- MyCard / JPJ database
- Payroll database

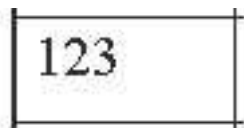
9.5 ADVANTAGES OF ELECTRONIC DATABASES

1. Reduced redundant (duplicated) data
2. Data is accurate
3. Fast retrieval, storage, sorting and processing
4. Data is linked

9.6 DATABASE CONCEPTS

WHAT IS A DATA?

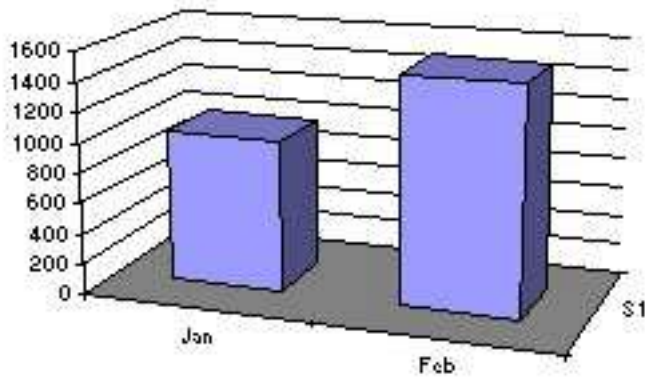
Data is a value, number, letters or symbol, which has a specific purpose. The term *data item* can also be used in the place of data.



E.g., Sales in January was RM1,000; Sales in February was RM1,500. 123 is an Order Number.

WHAT IS INFORMATION?

Information is data that has been processed into a meaningful form. Processed means the assembly, analysis of summarizing of data into a meaningful form.



E.g., Sales has increased by 50% since last month.

When a lot of data is to be created and analysed, a database can be used to ease the task.

9.7 COMPONENTS OF A DATABASE:

Field, Record, Table

WHAT IS A FIELD?

A field is a category or a type of data. E.g., OrderNumber field has a data item 123

Order#
123

WHAT IS A RECORD?

A record is a collection or a set of related fields.

Order#	Ord_date	Cust#
123	11/12/97	101

WHAT IS A TABLE?

A collection of related data stored in rows and columns.

	Field1	Field2	Field3	Field4	Field5
	Order ID	Product	Unit Price	Quantity	Discount
Record1	10248	Queso Cabrales	\$14.00	12	0%
Record2	10248	Singaporean Hukkiern Fried Mee	\$9.80	10	0%
Record3	10248	Mozzarella di Giovanni	\$34.80	5	0%
Record4	10249	Tofu	\$18.60	9	0%

WHAT IS A KEY FIELD?

A field that uniquely identifies a record. E.g., student id, or IC Number. In a table, only one field can be a key field.

9.8 RELATIONAL DATABASE

A relational database is a *collection* of related data and tables. Data is organized in a table format consisting of related rows and columns. **Note: Bold field = Key Field**

Order Table

II. C	Ord_date	Cust#
123	11/12/97	101
126	11/12/97	102
127	12/12/97	101

Customer Table

I. C	Cust_Name
101	Smith
102	HI-FI Ltd.
103	Smith

Order Detail Table

Order	Item#	Item_Qty
123	12	19
123	14	2
123	15	5
126	11	2
126	14	3
127	13	1
127	14	2

Item Table

Item#	Item_Price
11	67.89
12	23.78
13	99.99
14	145.99
15	200.00

9.9 WHAT IS NORMALISATION?

Normalisation is a process of producing tables that are manageable and that permit simple retrieval and storage of data.

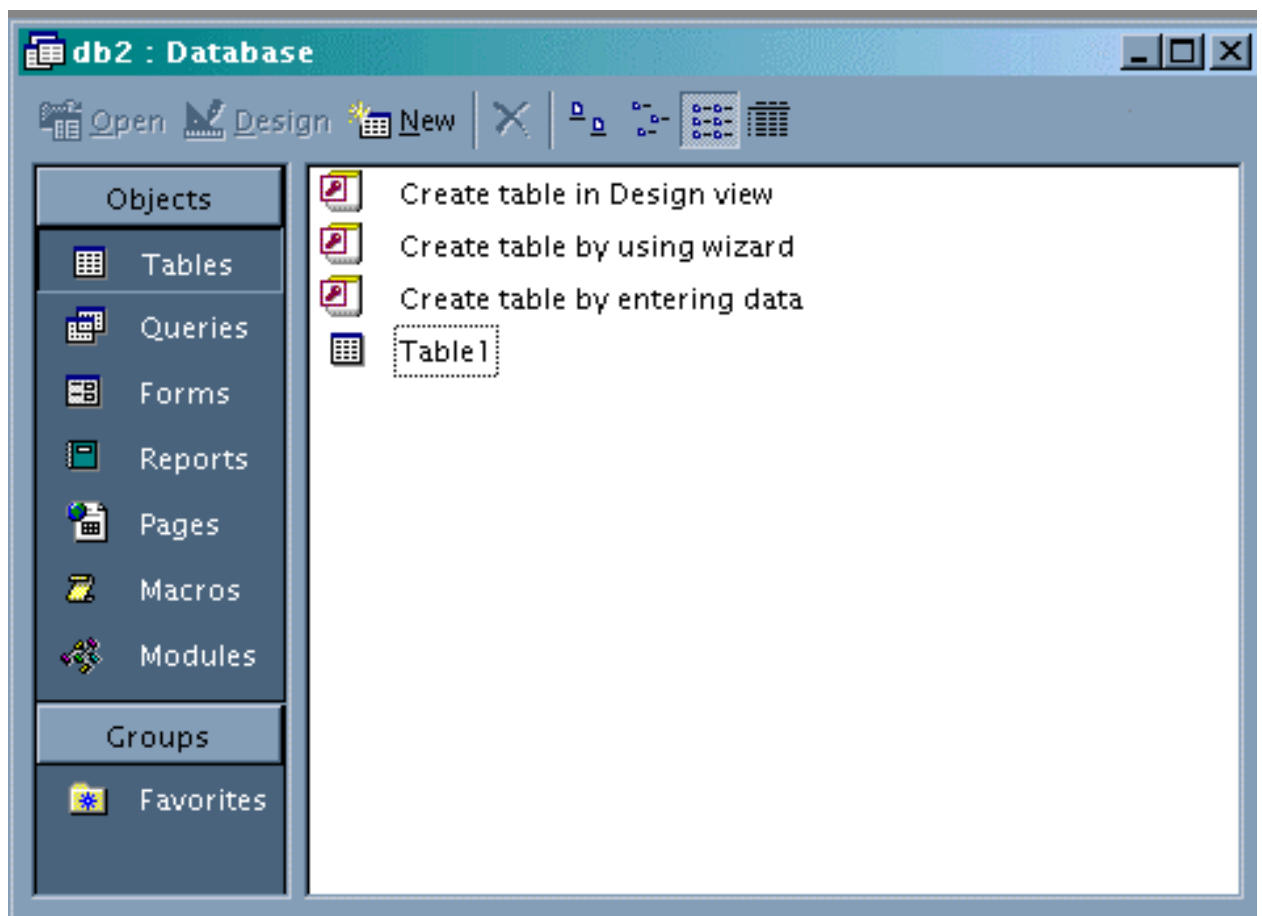
Normalised tables follow certain rules to keep the data optimized (e.g., there are no repeating groups in each table).

9.10 WHAT IS A DATABASE MANAGEMENT SYSTEM?

A database management system (DBMS) is software that helps you organize data in a way that allows fast and easy access to the data. A DBMS stores, retrieves and analyzes data. This is important when there are thousands of records.

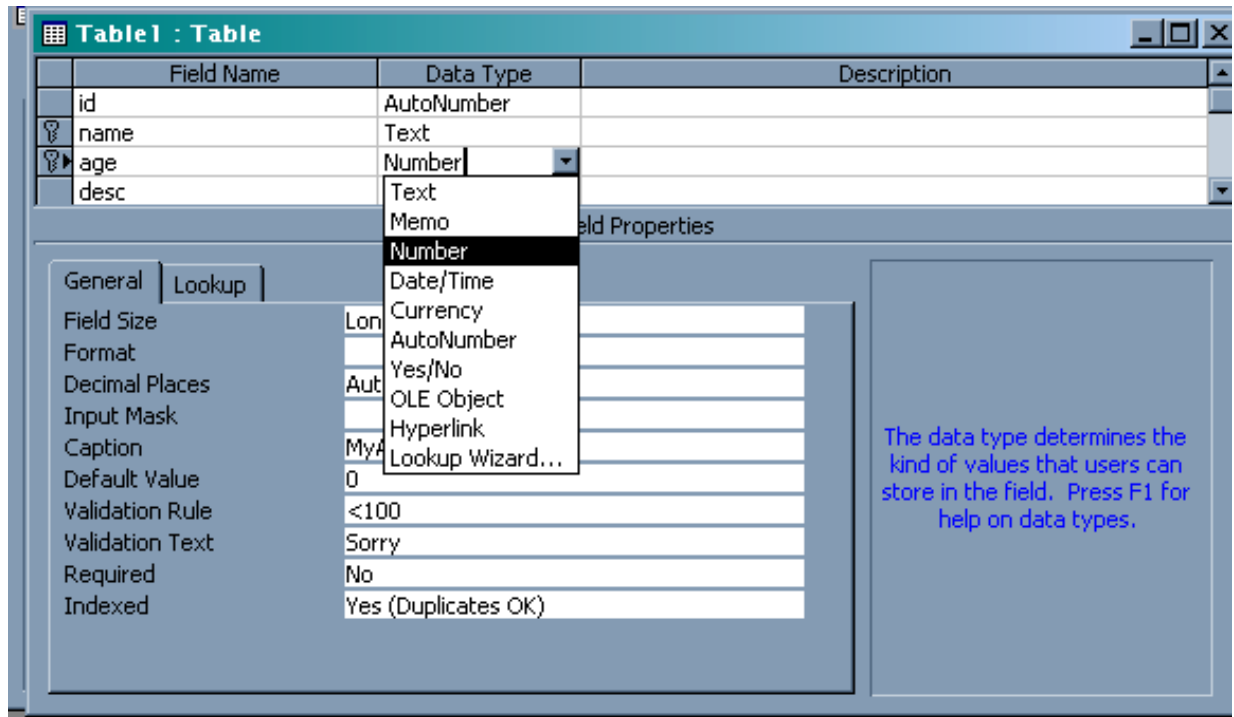
It is a collection of objects called table structure creator, datasheet view for entering data, tables, queries, forms and reports that interact with the data.

In Access, a Database Window is the main interface that allows the user to create, modify or delete the database objects.



WHAT IS A TABLE STRUCTURE CREATOR?

It is a feature that allows the user to design a table's fields.
In Access, it is called the *Design View*.



WHAT IS A DATASHEET VIEW

It is a feature that allows the user to enter data items directly into a table's fields.

	id	name	MyAge	desc	salary	birthday
	SCM3	AHMAD	26	Desc-abc	RM221.20	04-Feb-80
	SCMB	JOHN	28	Desc-nil	RM0.00	22-Jun-78
▶	SCM1	KAM	24			
*	(AutoNumber)		0		RM0.00	

WHAT IS A QUERY?

A Query is a selection of data from one or more tables.

A Query is a stored question or request to view a section of the data. A query displays and analyses specific fields.

	id	MyAge	MyAge
▶	SCM3	26	26
	SCM8	28	28
	SCM1	16	16
	SCM12	50	50
*	(AutoNumber)	0	0

A Query is also known as a user-view

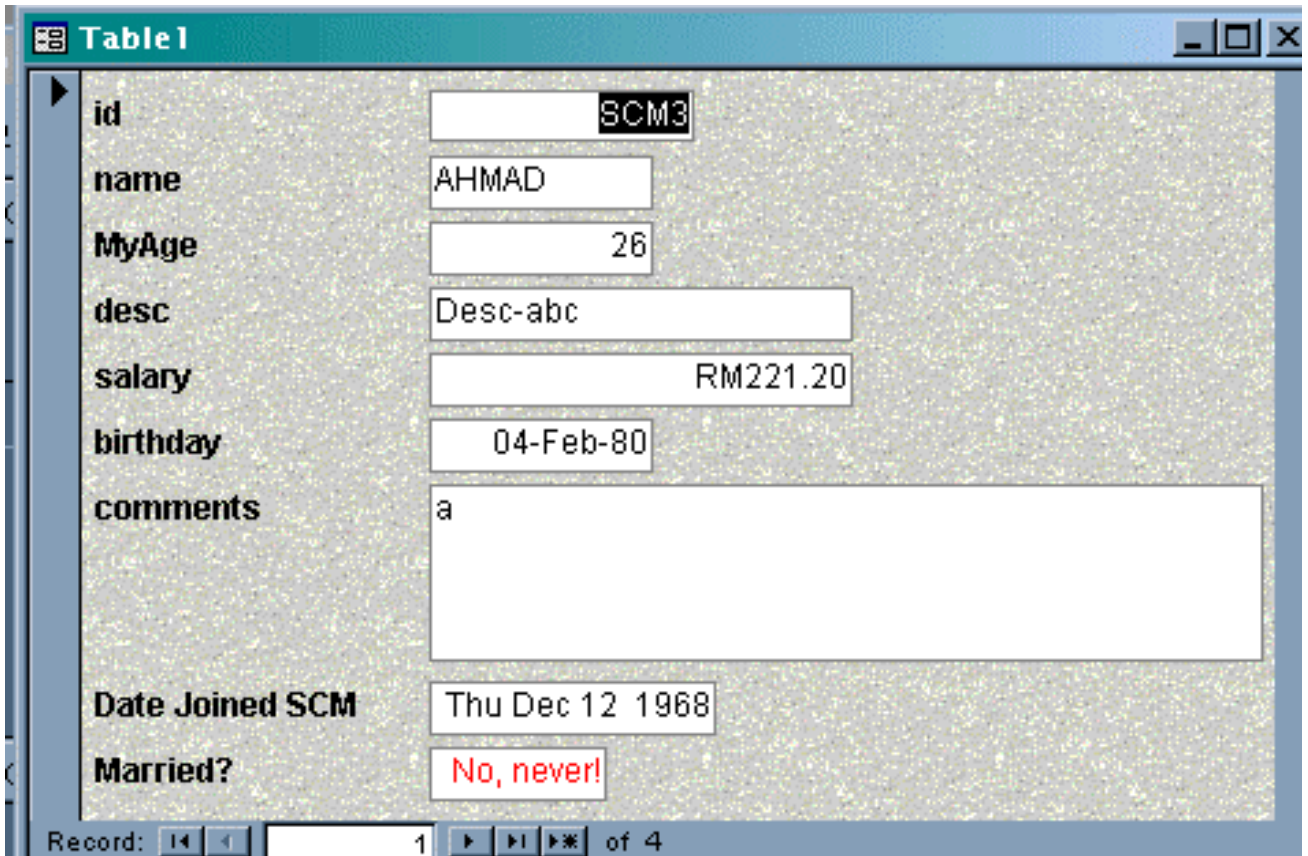
In Access, a Query is created via the Query DesignView window:

Field:	id	age	age	
Table:	Table1	Table1	Table1	
Sort:				
Show:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Criteria:				
or:				

WHAT IS A FORM?

A Form is an object that allows the user to enter data into a table, one record at a time.

Forms make viewing, entering and modifying your data easier. It is a software version of a paper form that is filled in by an applicant.



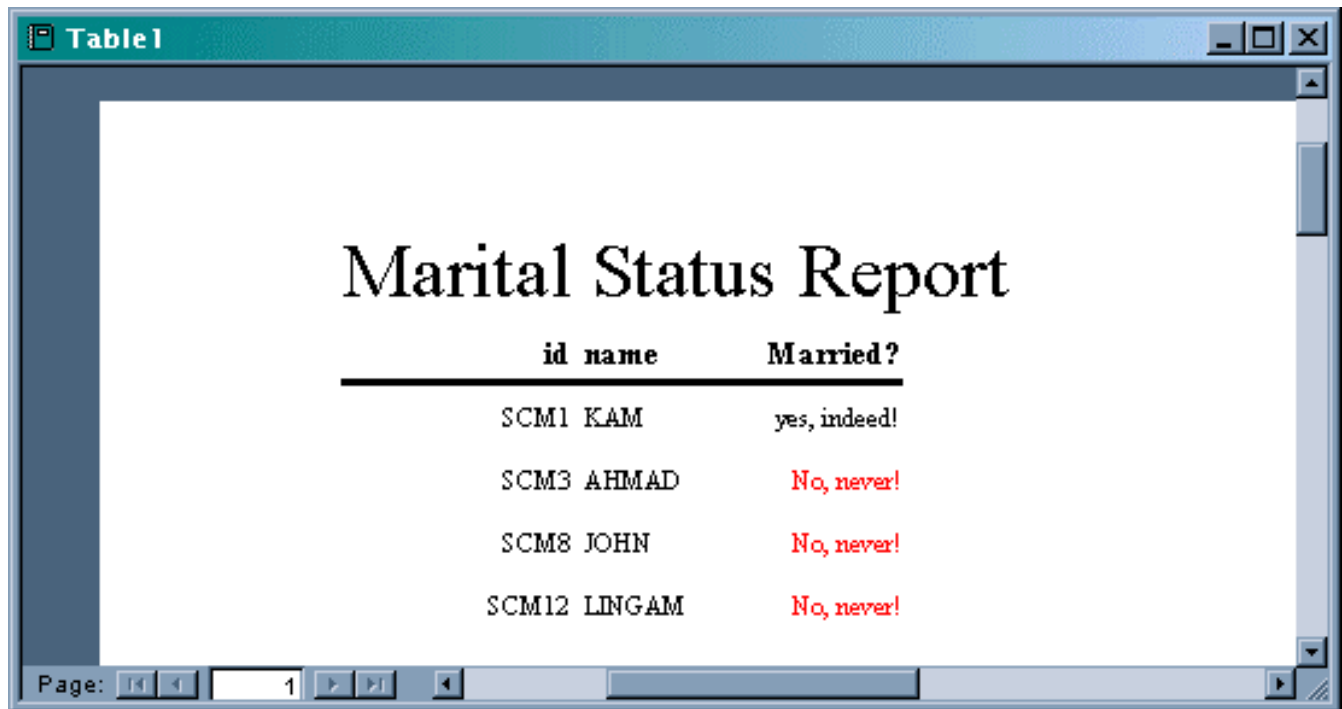
The image shows a screenshot of a database application window titled "Table 1". The window contains a form with the following fields and values:

Field Name	Value
id	SCM3
name	AHMAD
MyAge	26
desc	Desc-abc
salary	RM221.20
birthday	04-Feb-80
comments	a
Date Joined SCM	Thu Dec 12 1968
Married?	No, never!

At the bottom of the window, there is a record navigation bar showing "Record: 1 of 4" with navigation buttons for first, previous, next, and last records.

WHAT IS A REPORT?

A Report is a displayed or printed copy of your data presented in a particular format.



The screenshot shows a window titled "Table 1" with a teal header bar. The main content area displays a report titled "Marital Status Report" in a large, black, serif font. Below the title is a table with two columns: "id name" and "Married?". The table has a horizontal line under the column headers. The data rows are as follows:

id name	Married?
SCM1 KAM	yes, indeed!
SCM3 AHMAD	No, never!
SCM8 JOHN	No, never!
SCM12 LINGAM	No, never!

At the bottom of the window, there is a page navigation bar. It starts with the text "Page:" followed by a set of navigation icons (back, forward, search, etc.) and a text input field containing the number "1".