Study Material

BCH_4.3 – Computer Applications in Business

TOPIC

Managing Databases using MS ACCESS

Prepared by-Kamaldeep Kaur Sarna Assistant Professor Shri Ram College of Commerce University of Delhi

1.	MS ACCESS – OVERVIEW1
2.	MS ACCESS – RDBMS
	Data Definition3
	Data Manipulation
	Data Control
3.	MS ACCESS — OBJECTS
	<u>Table5</u>
	Query
	<u>Form</u> <u>6</u>
	<u>Report</u>
	Other MS Access Objects
4.	MS ACCESS — CREATE DATABASE8
	Create Blank Database
5.	MS ACCESS — DATA TYPES14

1. MS ACCESS: AN OVERVIEW

Microsoft Access is a Database Management System (DBMS) from Microsoft that combines the relational Microsoft Jet Database Engine with a graphical user interface and softwaredevelopment tools. It is a member of the Microsoft Office suite of applications, included in the professional and higher editions.

- Microsoft Access is just one part of Microsoft's overall data management product strategy.
- It stores data in its own format based on the Access Jet Database Engine.
- Like relational databases, Microsoft Access also allows you to link related information easily. For example, customer and order data. However, Access 2013 also complements other database products because it has several powerful connectivity features.
- It can also import or link directly to data stored in other applications and databases.
- As its name implies, Access can work directly with data from other sources, including many popular PC database programs, with many SQL (Structured Query Language) databases on the desktop, on servers, on minicomputers, or on mainframes, and with data stored on Internet or intranet web servers.
- Access can also understand and use a wide variety of other data formats, including many other database file structures.
- You can export data to and import data from word processing files, spreadsheets, or database files directly.
- Access can work with most popular databases that support the Open Database Connectivity (ODBC) standard, including SQL Server, Oracle, and DB2.
- Software developers can use Microsoft Access to develop application software.

Microsoft Access stores information which is called a database. To use MS Access, you will need to follow these four steps:

- **Database Creation** Create your Microsoft Access database and specify what kind of data you will be storing.
- **Data Input** After your database is created, the data of every business day can be entered into the Access database.
- **Query** This is a fancy term to basically describe the process of retrieving information from the database.

• **Report** (optional) - Information from the database is organized in a nice presentation that can be printed in an Access Report.

Architecture

- Access calls anything that can have a name an object. Within an Access desktop database, the main objects are tables, queries, forms, reports, macros, data macros, and modules.
- If you have worked with other database systems on desktop computers, you might have seen the term database used to refer to only those files in which you store data.
- But, in Access, a desktop database (.accdb) also includes all the major objects related to the stored data, including objects you define to automate the use of your data.

2. MS Access – RDBMS

Microsoft Access has the look and feel of other Microsoft Office products as far as its layout and navigational aspects are concerned, but MS Access is a database and, more specifically, a relational database.

- Before MS Access 2007, the file extension was *.mdb, but in MS Access 2007 the extension has been changed to *.accdb extension.
- Early versions of Access cannot read accdb extensions but MS Access 2007 and later versions can read and change earlier versions of Access.
- An Access desktop database (.accdb or .mdb) is a fully functional RDBMS.
- It provides all the data definition, data manipulation, and data control features that you need to manage large volumes of data.
- You can use an Access desktop database (.accdb or .mdb) either as a standalone RDBMS on a single workstation or in a shared client/server mode across a network.
- A desktop database can also act as the data source for data displayed on webpages on your company intranet.
- When you build an application with an Access desktop database, Access is the RDBMS.

Data Definition

Let us now understand what Data Definition is:

- In document or a spreadsheet, you generally have complete freedom to define the contents of the document or each cell in the spreadsheet.
- In a document, you can include paragraphs of text, a table, a chart, or multiple columns of data displayed with multiple fonts.
- In spreadsheet, you can have text data at the top to define a column header for printing or display, and you might have various numeric formats within the same column, depending on the function of the row.
- An RDBMS allows you to define the kind of data you have and how the data should be stored.
- You can also usually define rules that the RDBMS can use to ensure the integrity of your data.
- For example, a validation rule might ensure that the user can't accidentally store alphabetic characters in a field that should contain a number.

Data Manipulation

Working with data in RDBMS is very different from working with data in a word processing or spreadsheet program.

- In a word processing document, you can include tabular data and perform a limited set of functions on the data in the document.
- You can also search for text strings in the original document and, with ActiveX controls, include tables, charts, or pictures from other applications.
- In a spreadsheet, some cells contain functions that determine the result you want, and in other cells, you enter the data that provides the source information for the functions.

An RDBMS provides you many ways to work with your data. For example,

- You can search a single table for information or request a complex search across several related tables.
- You can update a single field or many records with a single command.
- You can write programs that use RDBMS commands to fetch data that you want to display and allow the user to update the data.

Access uses the powerful SQL database language to process data in your tables. Using SQL, you can define the set of information that you need to solve a particular problem, including data from perhaps many tables.

Data Control

Spreadsheets and word processing documents are great for solving single-user problems, but they are difficult to use when more than one person needs to share the data.

- When you need to share your information with others, RDBMS gives you the flexibility to allow multiple users to read or update your data.
- An RDBMS that is designed to allow data sharing also provides features to ensure that no two people can change the same data at the same time.
- The best systems also allow you to group changes (which is also known as transaction) so that either all the changes or none of the changes appear in your data.
- You might also want to be sure that no one else can view any part of the order until you have entered all of it.
- Because you can share your Access data with other users, you might need to set some restrictions on what various users are allowed to see or update.

3. MS Access — Objects

MS Access uses "objects" to help the user list and organize information, as well as prepare specially designed reports. When you create a database, Access offers you Tables, Queries, Forms, Reports, Macros, and Modules. Databases in Access are composed of many objects but the following are the major objects:

- Tables
- Queries
- Forms
- Reports

Together, these objects allow you to enter, store, analyze, and compile your data. Here is a summary of the major objects in an Access database;

Table

Table is an object that is used to define and store data. When you create a new table, Access asks you to define fields which is also known as column headings

- Each field must have a unique name, and data type.
- Tables contain fields or columns that store different kinds of data, such as a name or an address, and records or rows that collect all the information about a particular instance of the subject, such as all the information about a customer or employee etc.
- You can define a primary key, one or more fields that have a unique value for each record, and one or more indexes on each table to help retrieve your data more quickly.

Query

An object that provides a custom view of data from one or more tables. Queries are a way of searching for and compiling data from one or more tables.

- Running a query is like asking a detailed question of your database.
- When you build a query in Access, you are defining specific search conditions to find exactly the data you want.
- In Access, you can use the graphical query by example facility or you can write Structured Query Language (SQL) statements to create your queries.
- You can define queries to Select, Update, Insert, or Delete data.

• You can also define queries that create new tables from data in one or more existing tables.

Form

Form is an object in a desktop database designed primarily for data input or display or for control of application execution. You use forms to customize the presentation of data that your application extracts from queries or tables.

- Forms are used for entering, modifying, and viewing records.
- The reason forms are used so often is that they are an easy way to guide people toward entering data correctly.
- When you enter information into a form in Access, the data goes exactly where the database designer wants it to go in one or more related tables.

Report

Report is an object in desktop databases designed for formatting, calculating, printing, and summarizing selected data.

- You can view a report on your screen before you print it.
- If forms are for input purposes, then reports are for output.
- Anything you plan to print deserves a report, whether it is a list of names and addresses, a financial summary for a period, or a set of mailing labels.
- Reports are useful because they allow you to present components of your database in an easy-to-read format.
- You can even customize a report's appearance to make it visually appealing.
- Access offers you the ability to create a report from any table or query.

Other MS Access Objects

Let us now take a look at other MS Access objects.

Macro

This object is a structured definition of one or more actions that you want Access to perform in response to a defined event. An Access Macro is a script for doing some job. For example, to create a button which opens a report, you could use a macro which will fire OpenReport action.

• You can include simple conditions in macros to specify when one or more actions in the macro should be performed or skipped.

- You can use macros to open and execute queries, to open tables, or to print or view reports.
- You can also run other macros or Visual Basic procedures from within a macro.
- Data macros can be attached directly to table events such as inserting new records, editing existing records, or deleting records.
- Data macros in web apps can also be stand-alone objects that can be called from other data macros or macro objects.

Module

Module is an object in desktop databases containing custom procedures that you code using Visual Basic. Modules provide a more discrete flow of actions and allow you to trap errors.

- Everything that can be done in a macro can also be done in a module, but you don't get the macro interface that prompts you what is needed for each action.
- Modules are far more powerful, and are essential if you plan to write code for a multi-user environment, because macros cannot include error handling.
- Modules can be standalone objects containing functions that can be called from anywhere in your application, or they can be directly associated with a form or a report to respond to events on the associated form or report.

4. MS Access — Create Database

In this chapter, we will be covering the basic process of starting Access and creating a database. This chapter will also explain how to create a desktop database by using a template and how to build a database from scratch.

To create a database from a template, we first need to open MS Access and you will see the following screen in which different Access database templates are displayed.



To view the all the possible databases, you can scroll down or you can also use the search box.

Let us enter project in the search box and press Enter. You will see the database templates related to project management.



Select the first template. You will see more information related to this template.

æ	AccessDatabase : Database- C:\Users\Muhammad.Waqas\	Documents\AccessDatabase.accdb (Access 2007 - 2016 file format) - /		uhammad Wagas
III Info N _{New}	New			
O _{Open}	I Home project	Q	×	
S _{save} A _{save} As P _{Print} C _{close} D _{Account} T _{Options}	Project management	Down Project Tasks and Tasks by Assigned To. Iget Download size: 569 KB Should I create an Access app or an Access desktop File Name	erprojects, pudgets, es, and h as	124 103 81 65 55 45 39 36
K reedback		Database1.accdb	IV Charts Orientation Reports	35 31 29 28 27 27 27 24 23
	Time and billing Task management (Shar	ePoint Updated: Task management	Personal	

After selecting a template related to your requirements, enter a name in the **File name** field and you can also specify another location for your file if you want.

æ	Access		- 🗆 🛪 id Waqas - 🎇
lido	New		
New			
Open	A Home project D		
Save	Project management	× + igory	
Save As	Provided by: Microsoft Corporation	ness	124
Print	Untitled Create a project tracking database to track multiple projects, including time-sensitive deliverables, owners, and budgets, using	ects ect Management	
Close	this popular Access template. Navigate by projects, tasks, and employees keen an eve on costs priorities and status. Assign task		
	Project Data in Ingent Table and Produce useful reports such as Project Tasks and Tasks by Assigned To.	stry	
Account	Celegory (1) Orlegory W End Date trunty (2) Instruct W End Date Trunty (2) Instruct W End Date Download size: 569 KB	ect Plan	45
	tutur Net Started P Reform Days Should I create an Access 2013 app or an Access desktop database	2 tions	39
Options	Project management File Name	dules	
	MyDatabase.accdb	Vsis	
	Redget is Days 6.00 Fodget C:\Users\Muhammad.Waqas\Documents\ Total Tax Cot In Days 0.00 Four Tax Co	ation	
	Balance of Days 0.00 Such States	tprise	29
		reting	28
	Create	mology	
		100	
		Orientation	27
		Reports	23
	Time and billing Task management (SharePoint Updated: Task management	Personal	
		Picture	

Now, press the Create option. Access will download that database template and open a new blank database as shown in the following screenshot.

œ	AccessDatabase : Da	tabase- C:\Users\Muhammad.Waqas\Documents\A	ccessDatabase.accdb (Access 2007 - 2016 file form		uhammad Waqas
Info	New				
New					
Open	Home project		9	×	
Save		None Cesto fotoreal Data	Project management	-++ Y	
Save As		2 Project Octains	Provided by: Microsoft Corporation		124
Print		Gette	Create a project tracking database to track mi including time-sensitive deliverables, owners,	, and budgets,	
Close		Project Datails Frogert Tasko	using this popular Access template. Navigate tasks, and employees, keep an eye on costs, p	priorities, and ness	65
		Owner et and the Category (1) Category (1) Category (1) Category (1) End Cate	status. Assign tasks and produce useful repor Project Tasks and Tasks by Assigned To.	ts such as	
Account		Priority [2] Normal w Budget Status Not Started w Budget in Days	Download size: 569 KB		45 39
Options	Project management	Notes	Should I create an Access app or an Access de File Name	esktop database?	
Feedback			MyDatabase.accdb		
		Budget In Days 6.00 Budget Total Task Cost In Days 8.00 Total Task Co	C:\Users\Muhammad.Waqas\Documents\		
		Balance of Days 0.00 Balance Recent IX - 1 of 1 - N - 00 fatered Search			
			**		
			Create	19	
					27
			v	Charts	
				Orientation	24
	Time and billing	Task management (SharePoint	Updated: Task management	Reports Personal	

Now, click the Navigation pane on the left side and you will see all the other objects that come with this database.

rojects Navigation	View Paste Eiter	Ascending Ty Selection - Descending Advanced - Remove Sort Ty Toggle Filte	-	Spelling Fir	ab Replace → Go To * k Select *	B I U A	· · ≣ • 型 • ≙ • ≡]≘ 4 ≣ 4≣ 14 -	
Completed and Deferred Projects Filter Fayorites Save Filter Source Completed and Deferred Projects ID - Project List Image: Save Filter Source Image: Save Filter Source Project List ID - Project Name - Owner - Category - Priority - Status - Start - End - Budget Completed and Deferred Projects ID - Project Name - Owner - Category - Priority - Status - Start - End - Budget Completed and Deferred Projects ID - Project Name - Owner - Category - Priority - Status - Start - End - Budget Project List ID - Project Name - Owner - Category - Priority - Status - Start - End - Budget Project List ID - Project Name - Owner - Category - Priority - Status - Start - End - Budget Project Same Filter Save Save Save Save Save Save Save Save		Sort & Filter	Rec	ords	Find		Text Formatting		
ID Project Name Owner Category Priority Status Stat	Projects	Pro	-	Or walking offer	nala na List - Par	uite I			~
asks × pmployees ×	Project Details Project List Completed and Deferred Projects Open Projects	ID - Pro * (New)	ject Name 🔹	Owner	Category	- Priority	• Status •	Start -	the state of the s
	Project Tasks Tasks Employees Supporting Objects	*							

Click the Projects Navigation and select the Object Type in the menu.

Image: Image	MyDa EXTERNAL DATA	atabase : Database- C:\U DATABASE TOOLS	Jsers\Muhammad.W	/aqas\Documents\M	/lyDatabase.	accdb (Access	2007 - 2013 file for	rmat) - Access		? - Muhammad Wa	
View Clipboard	rs Sor	nding TAdvanced - re Sort Toggle Filter rt & Filter		Spelling	Find R	Go To * Select * nd	I <u>U</u> A-	· · · · · · · · · · · · · · · · · · ·	13 12 (2) 2 2 2 - 2 - 2 2 -	нт - Ш - G	
Projects Navigation	» 🖲 م	Project List	ject List					Filter F	ayorites		×
Projects Navigation	* ects	A Second State	Collect Data	E-mail List	3 Employ	ree List <u>R</u> epo	rts	✓ Ø Provi	de Feedback	Save F	ilter 😭
Object Type Tables and Related Views Created Date Modified Date	ects	ID • Pro * (New) Total	ject Name • 0	Owner		Category • I) Category	Priority - (2) Normal	Status • Not Started	Start • 6/17/2016		Budget - \$0.00
Filter By Group Projects Tasks Employees Supporting Objects Show <u>A</u> II	» » »										
Form View		Record: H 4 1 of 1	вно Тро	o Filter Search	•				NUM LOCK		

A 5 € + + + + + + + + + + + + + + + + + +	MyDa NAL DATA	tabase : Database- C:\ DATABASE TOOLS	Jsers\Muhammad.W	aqas\Documents\M	lyDatabase.accdb (Acce	ess 2007 - 2013 file 1	format) - Access		? – Muhammad Wa	-
View Paste Format Painter	2# Remove	ding 🚡 Advanced • e Sort 🍸 Toggle Filte	1.000	Spelling	Find ⁸ ^b _{ac} Replace → Go To + Replace	B I U A	$\cdot \underline{\mathscr{Z}} \cdot \underline{\mathscr{A}} \cdot \equiv$	12 12 (2) + 2 2 2 2 - 1	<u>-</u>	
Views Clipboard r	Son	t & Filter	Red	ords	Find		Text Formatting		6	
All Access Objects	1075-01/10						Filter Fa	avorites		~
iearch_	P	Pro	ject List					-	Save Fi	
Tables Common Tasks	* 🔺	New Project	Collect Data	€-mail List	SEmployee List Be	ports	V Provid	le Feedback	ouren	
Employees			ject Name •	Owner	Category		Status	Start •	End +	Budget
Filters		* (New)	,	e miler	(1) Category		Not Started	6/17/2016		\$0.0
		Total	0		1-7					1
Projects										
Tasks	\$									
Queries Common Tasks Append	8									
Completed and Deferred Projects										
Employees Extended										
Open Projects										
Open Tasks										
Project Totals										
Common Tasks Update Add Field										
Forms	8									
Common Tasks										
Common Tasks Subform										
Completed and Deferred Projects										
Employee Details		-								
Employee List										
Filter Details										
Project Datasheet Subform				11						
orm View	*	Record: 14 4 1 of 1	P H M Too No	Search						e M

You will now see all the objects types — tables, queries, etc.

Create Blank Database

Sometimes database requirements can be so specific that using and modifying the existing templates requires more work than just creating a database from scratch. In such case, we make use of blank database.

Step 1: Let us now start by opening MS Access.



Step 2: Select Blank desktop database. Enter the name and click the Create button.

	7 - C ×
Access	Search for online templates Suggested searches: Database Business Logs Industry Small Business Lists Personal Muhammad.Waqas@bentley.com Switch account
Den Other Files	Blank desktop database Should I create an Access 2013 app or an Access desktop database? File Name AccessDatabaseJaccdb C:UJsers\Muhammad.Wagas\Documents\
	Updated: Asset tracking Updated: Contacts Updated: Students

Step 3: Access will create a new blank database and will open up the table which is also completely blank.

Views Clipboard to	T Advanced v	Refresh All •	Q Tell me what you wa New ∑ Totals Save Save [™] S Spelling Delete □ More * Records	nt to do Pic Replace → Go To * Replace → Go To * Replace → Go To * Find	Calibri (Detail) • 11 B I <u>U</u> <u>A</u> • ^a <u>V</u> - <u>A</u> • Text Formatt	
View Paste Format Painter Views Clipboard Sort 8 All Access Objects Sort 8 Remove S Clipboard Sort 8	Advanced - Sort Toggle Filter & Filter Table1 ID - Click to	All - X	Save Spelling Delete - More -	Find Go To *	B I <u>U</u> <u>A</u> • ≝ - <u>A</u> •	${\bf F} \equiv {\bf F} \mid {\bf F} \cdot \mid {\bf F} \cdot$
Rearch.	ID - Click to	oAdd +				
Tables	(c)	o Add 🔸				
	(11211)					
	ord: M ≺ 1of 1 → J		o Filter Search			

5. MS Access — Data Types

Every field in a table has properties and these properties define the field's characteristics and behavior. The most important property for a field is its data type. A field's data type determines what kind of data it can store. MS Access supports different types of data, each with a specific purpose.

- The data type determines the kind of the values that users can store in any given field.
- •
- Each field can store data consisting of only a single data type.

Here are some of the most common data types you will find used in a typical Microsoft Access database.

Type of Data	Description	Size
Text	Text or combinations of text and numbers, including numbers that do not require calculations.	Up to 255 characters.
Memo	Used for storing comments.	Up to 65,536 characters.
Number	Numeric data used in mathematical calculations.	Integers, Bytes, Single, Double, Decimal types
Date/Time	Date and time values for the years 100 through 9999.	8 bytes.
Currency	Currency values and numeric data used in mathematical calculations involving data with one to four decimal places.	8 bytes.
AutoNumber	A unique sequential (incremented by 1) number or random number assigned by Microsoft Access whenever a new record is added to a table.	4 bytes (16 bytes if set to Replication ID).
Yes/No	Yes and No values and fields that contain only one of two values (Yes/No, True/False, or On/Off).	1 bit.

• If you use previous versions of Access, you will notice a difference for two of those data types.

- In Access 2013, we now have two data types short text and long text. In previous versions of Access these data types were called text and memo.
- The text field is referred to as short text and your memo field is now called long text.

Here are some of the other more specialized data types, you can choose from in Access.

Data Types	Description	Size
Attachment	Files, such as digital photos. Multiple files can be attached per record. This data type is not available in earlier versions of Access.	Up to about 2 GB.
OLE objects	OLE objects can store pictures, audio, video, or other BLOBs (Binary Large Objects)	Up to about 2 GB.
Hyperlink	Text or combinations of text and numbers stored as text and used as a hyperlink address.	Up to 8,192 (each part of a Hyperlink data type can contain up to 2048 characters).
Lookup Wizard	The Lookup Wizard entry in the Data Type column in the Design view is not actually a data type. When you choose this entry, a wizard starts to help you define either a simple or complex lookup field. A simple lookup field uses the contents of another table or a value list to validate the contents of a single value per row. A complex lookup field allows you to store multiple values of the same data type in each row.	Dependent on the data type of the lookup field.
Calculated	You can create an expression that uses data from one or more fields. You can designate different result data types from the expression.	You can create an expression that uses data from one or more fields. You can designate different result data types from the expression.

These are all the different data types that you can choose from when creating fields in a Microsoft Access table.