

TEXAS UIL ————— vol. 2  
— COMPUTER APPS



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# ACCESS CONCEPTS™

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Compatible with Office 2010 and 2013  
UPDATED FOR OFFICE 2016

# Computer Applications Concepts

## Volume 2

### Access - Office 2016

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# Computer Applications Concepts

## Volume 2

### Access – Office 2016

#### INTRODUCTION

This updates our Computer Applications Concepts - Volume 2 on Access to operate with Microsoft Office 2016, but it will still work with Office 2013 and 2010 and possibly other versions. This updated version has minor changes from Office 2013. These changes appear in the tab titles, command button titles, and the samples we have provided for dialog boxes, reports, etc. However, most features work approximately the same, and there is often more than one-way to complete a task. This book provides an in-depth study of some of the more confusing features of Access beginning at the very start of defining a database and learning to build a table. We have elected to cover facets of applications typically considered unique to Access databases and build to an elevated level of expertise.

The best way to understand a database is to think of a mom-and-pop shop that kept files on index cards. One file contained the employees with names, addresses, social security numbers, pay rate, etc. A second box contained each employee's weekly number of hours worked. Another box contained products with cost of product, selling price, number of product in inventory, etc. Yet another box contained the customer list with each customer's name, address, discount, accumulated total of purchases, etc. The entire business was run with the cards in these boxes. When a customer called to order, the clerk pulled the customer's data from the Customer index file and the product's data from the Product index file. She then typed an invoice for the customer for the products ordered, pulled the products, and shipped them. She then updated the inventory of each product on the index cards that were then returned to the Products index file, and she updated the accumulated total of sales on the Customer's index card and returned it to the right place. When payday came, the clerk picked up all the cards from the Work Hours box, pulled each employee's data card from the Employee index file, and calculated what each made and cut checks.

Today, that business is run with a database that contains all those various files that have built-in relationships so that information is automatically gathered to produce invoices, paychecks, inventory lists, statements for unpaid balances, quarterly reports for payroll taxes, etc. Some of these things can be done in Excel, but it doesn't have near the relationship capacity to automatically link a person's employment data to his/her hours worked in another worksheet, to a report that will print pay checks. This is a typical database application. The strength of a database is to contain large volumes of data, sort the data, generate reports, merge information into a Word Processing document, supply additional data from related tables, and filter the data to produce reports or merges.

The first section of the book is devoted to tutorials on various capabilities. The intent is to let the student use simple input to exercise the facilities included and to encounter some of the exceptions that occur. The second section of the book is devoted to practical activities. The activities fall short of actual tests since we felt that the students needed to concentrate on the actual facilities and capabilities covered and not get bogged down in building and formatting report output.

The **Appendix** contains answer keys for the exercises in the book, and a **Solutions CD** is available for purchase with the actual databases used in presenting the elements in this book, as well as the exercises.

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## Computer Applications Concepts Volume 2 – Access - Office 2016

### I. UIL Competition.

- A. Most Computer Applications Contest tests will require one printout from Excel or Access and one printout from Word. This concepts book will cover most features that appear in the Contest. Students should become proficient in the following tasks.
- B. Create a new database
- C. Create a new table including changing field properties
- D. Create an update, a select, and a crosstab query
- E. Add criteria and calculated fields to a query
- F. Create relationships and change join type
- G. Create formulas using the builder
- H. Merge, import, and export with Word and Excel
- I. Create and modify a report
  - 1. Group and sort
  - 2. Calculate sum/average
  - 3. Insert a header/footer
  - 4. Align, justify, and ensure nothing is truncated or wrapped
  - 5. Identify and understand report headers, report footers, page headers, page footers, group headers, group footers, and detail sections
  - 6. Add both text boxes and labels
  - 7. Add calculations using an unbound box in design view

### II. Contest Tips.

- A. Contests using Access may test any available feature or function. Students should study the contents of each tab, especially those who have worked in previous versions, since some items are not grouped the way they were before Office 2016.
- B. Practice changing features of queries and reports after they are created.
- C. Experiment with all options of the features covered in this booklet.
- D. Customize your Quick Access Toolbar. This will save time during contests.
- E. Always remember to Save (CTRL S) your worksheet/workbook often, especially prior to printing a test document.

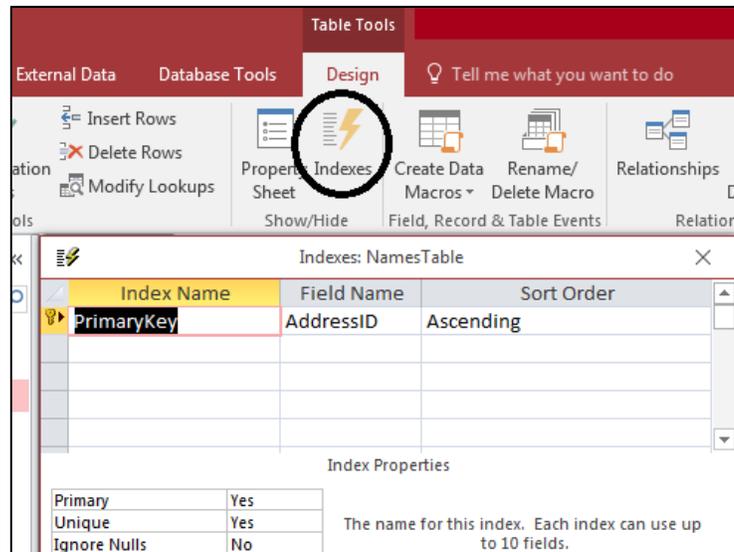
### III. Parts of a Database.

- A. **Tables** – At the core of an Access database are its *tables*. The proper design of the tables and how they relate to one another is key to the successful implementation of an Access database. The appearance of an individual table is very much like that of a spreadsheet. Spreadsheets can also be imported from Excel and used as a table. Tables are the primary data source for Access queries and reports.
- B. **Records** – Tables contain *records*. A record is a single row of storage cells.
- C. **Fields** – Records contain *fields*. Fields are storage cells arranged in a column with the field name at the top of the column. Each field carries a data type definition that characterizes the data the field will contain.
- D. **Field Data Types** – These include several options.

- e. If the grey box to the left of the field named AddressID has an arrow rather than a key in it, right click in the box and a menu appears as shown to the right. At the top are the words Primary Key, left click the **Primary Key** menu item.

Note: A *Primary Key* is a field that contains completely unique data for each record in a table. A field that is designated as a primary key can have no duplicates, and is typically a social security number, product code, or a field with an AutoNumber data type that creates a unique identifier. Access usually sets the first row as a default Primary Key.

- f. Field Properties – These are displayed at the bottom half of the screen. Click in the box to reveal a drop-down arrow and your choices will be revealed.
  - (1) *Field Size* should be Long Integer.
  - (2) *New Values* remains Increment (The other choice is Random).
  - (3) *Indexed* should show Yes (No Duplicates) instead of Yes (Duplicates OK). This change occurred because a primary key must be a completely unique number, hence no duplicates allowed.
- g. Index – From the Table Tools ribbon, click on the Design tab.
  - (1) In the Show/Hide section, click on the **Indexes** icon that has a yellow lightning bolt with dashes to the left.
  - (2) The window below appears.



- (3) Access no longer automatically creates an index on the Autonumber type fields. An index causes records to be sequenced by the unique data in the AddressID (in this case) field and allows quick searching for any specific record.
- (4) Close the Indexes window by clicking on the X in the upper right corner of the Indexes window.
- h. In the second row, under the Field Name column, type LastName, then tab to the Data Type column and it will default to Short Text with a field size of 225. Tab again into the Description column and enter "Individual's last name," then Tab once more to enter the Field Name column of the third row.

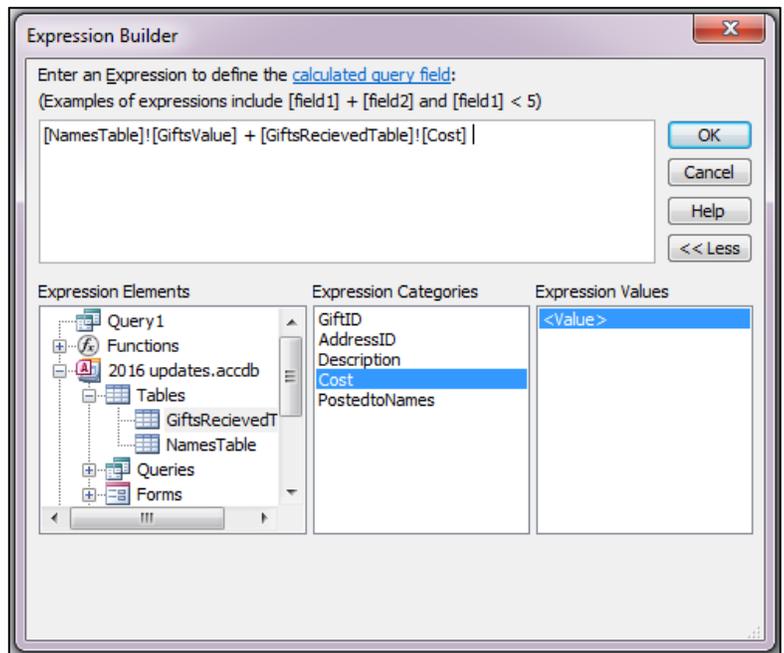
Note: For Access 2013/2016, *Short Text* is the text type throughout this book. If you are using Access 2010, then *Short Text* refers to *Text*, and *Long Text* refers to *Memo*.

- The gift list for Rose Merry is shown below.

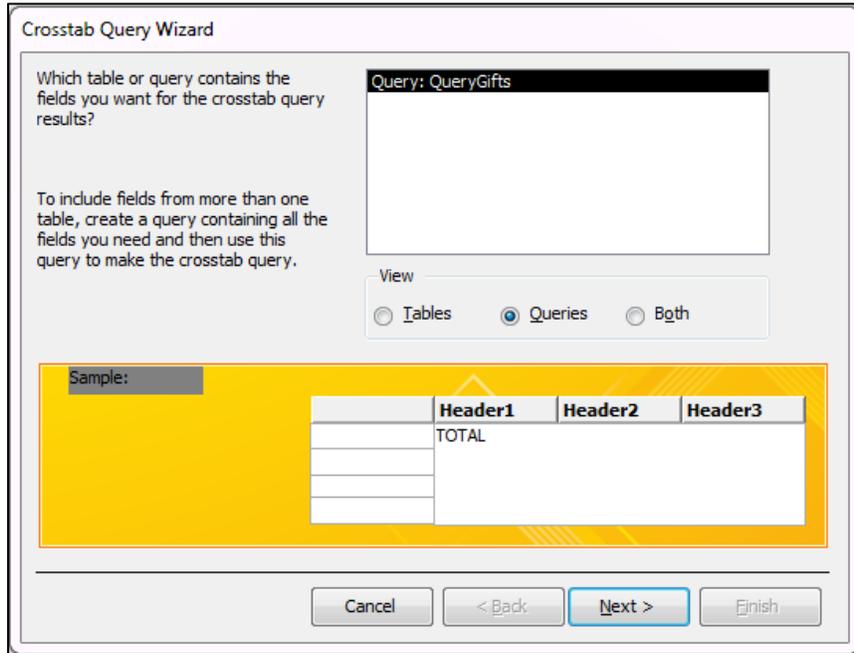
NamesTable																					
AddressID	LastName	FirstName	PostalAddress	Physic																	
1	Lee	Paris	PO Box 246	45 Gre																	
2	Merry	Rose	Null	86 Bri																	
<table border="1"> <thead> <tr> <th>GiftID</th> <th>Description</th> <th>Cost</th> <th>Click to Add</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Herb Book</td> <td>\$14.95</td> <td></td> </tr> <tr> <td>2</td> <td>Kitchen Utensils</td> <td>\$84.95</td> <td></td> </tr> <tr> <td>*</td> <td>(New)</td> <td>\$0.00</td> <td></td> </tr> </tbody> </table>						GiftID	Description	Cost	Click to Add	1	Herb Book	\$14.95		2	Kitchen Utensils	\$84.95		*	(New)	\$0.00	
GiftID	Description	Cost	Click to Add																		
1	Herb Book	\$14.95																			
2	Kitchen Utensils	\$84.95																			
*	(New)	\$0.00																			
3	Yan	Kai	Null	241 Ca																	
4	Spice	Al	PO Box 198	48 Gar																	
5	Spice	Noah	PO Box 198	48 Gar																	

- F. **Use an Update Query to Put a Calculated Value in a Field** – The following procedure takes the sum of the values of all gifts given by a single individual from the GiftsReceivedTable and posts the result to the NamesTable, adding the value to any existing value already in the NamesTable's GiftsValue field.

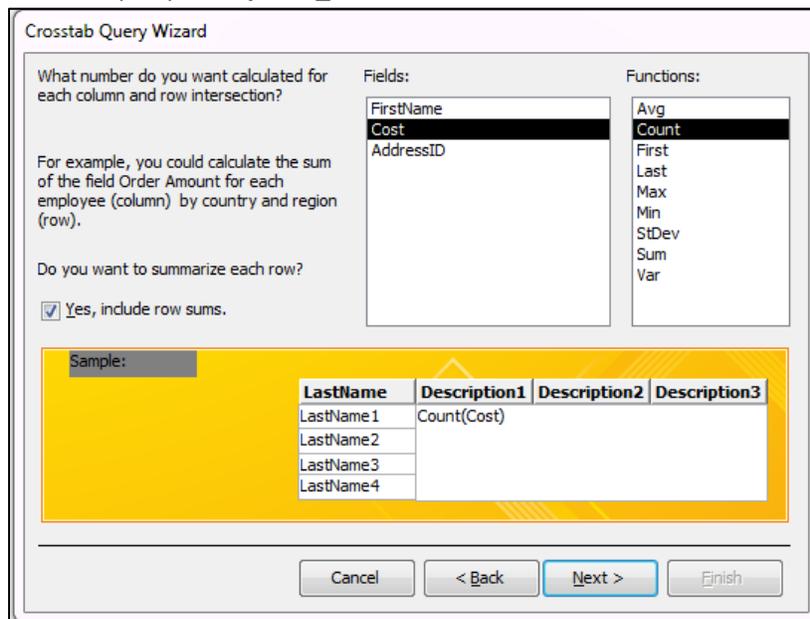
- From the Create tab, click Query Design (ALT, C, QD).
- Add both the tables to the Query and Close the Show Table form.
- Click to change the Query from a Select to an Update Query in the Query Type section. (ALT, JQ, D).
- Double click on the GiftsValue field of the NamesTable.
- The Update Query in the Design View includes a line that the other queries do not, which is the **Update To** line. Here, you will enter the data type you are looking to update. In this case, we are going to update the GiftsValue field from the NamesTable with the data from the Cost field in the GiftsReceived Table. In the GiftsValue column right click on the row labeled Update To and select Build.
- In the Expression Elements section of the Expression Builder, double click on the file name MyAddressBook (in this case). Then double click Tables.
- Click on the NamesTable. Then in the Expression Categories section double click on the GiftsValue field to select it.
- Type a plus sign (+).
- Click the GiftsReceivedTable in the Expression Elements section and double click on the Cost field in the Expression categories section.
- The result is shown at right.



- c. Select the QueryGifts as shown below, and click Next.



- d. In the Available Fields list, select LastName and click the > icon to Add to the Selected Fields List and click Next. This action designates LastName as the row headings.
- e. Select the Description field and click Next. This action designates the gift Description as the column headings.
- f. Select the Cost field to let Access know where to find the data to be cross-tabulated and that it should select the Sum function.
- g. Make sure Check Box labeled "Yes, include row sums" is checked and click Next.
- h. Name the query **QueryGifts\_Crosstab** and click Finish.



**C. Word Play.**

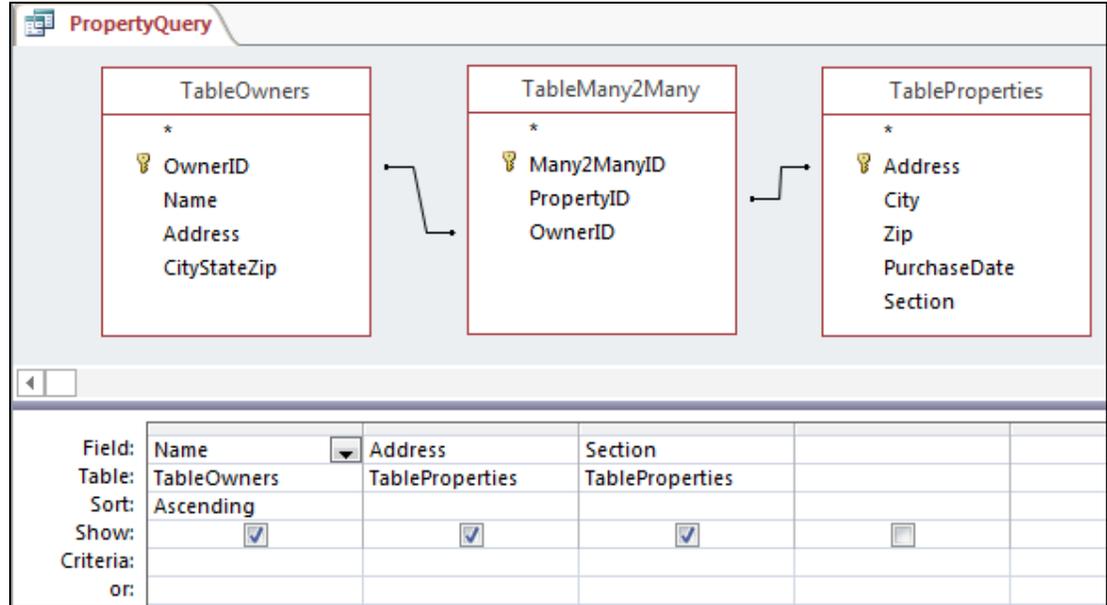
1. Create a new database named **TableWords** and create a table named **TableWords** with the following fields and properties.

TableWords		
Field Name	Data Type	
RecordID	AutoNumber	Primary Key
Word	Short Text	50 characters
NewWord	Short Text	50 characters

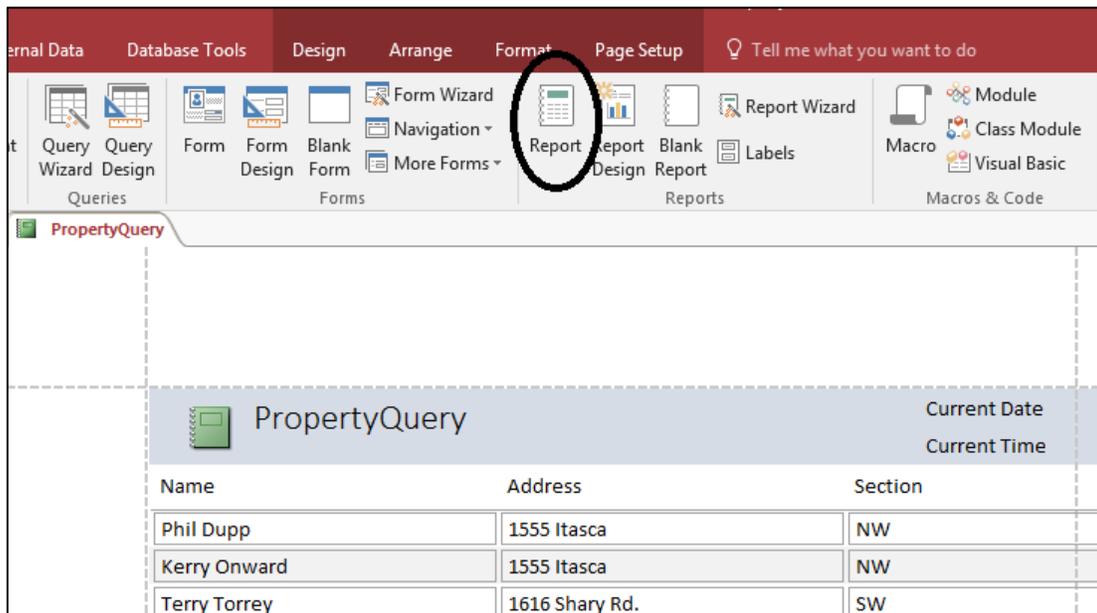
2. Enter the data at the right into the **Word** field.
3. Create an Update Query named **UpdQry** with the following specifications.
  - a. Use the **IIf**, **Left**, **Right**, **InStr**, **Len**, and **Mid** functions to alter the letters in each **Word** field to create a **New Word**.
  - b. If the first two letters of **Word** are **SH**, then replace these with **CH** to create a **New Word**.
  - c. If the second letter of **Word** is **O**, replace the **O** with **A** to form a **New Word**.
  - d. If the sequence **BA** appears anywhere in **Word**, eliminate the **BA** to form a **New Word**.
  - e. Note the formula is long with several parts. It is often easier to troubleshoot this type of formula if you break it down into segments and test each one separately. Also, make sure to look for missing/extra commas and unmatched parenthesis.
4. Results are found in **Appendix III**.

TableWords		
RecordID	Word	NewWord
1	SHIP	
2	RHUMBA	
3	SHOP	
4	TORT	
5	SHORE	
6	RABAT	
7	SOIL	
8	BALANCE	
9	BORN	
10	FOLLOW	
11	SHAM	
12	FORM	
13	SHILL	
14	SHOW	
15	CABARET	
16	SHOCK	
17	ABASHES	
18	POINT	
19	DOLE	
20	DOTE	
21	BABOON	

3. Create a Select Query named **PropertyQuery** using the TableOwners, TableMany2Many, and TableProperties tables.
  - a. From the TableOwners, select the **Name** field and sort ascending on this field.
  - b. From the TableProperties, select the **Address** and **Section** fields.
  - c. The Select Query will have the following appearance.



4. With the PropertyQuery open in Datasheet View, create a Basic Report by clicking on the Report icon. The Layout view will appear as below.



- a. While in the Layout View, right click on the Name label at the top of the first column and scroll down to select Group on Name.
- b. Right click on the Section label, and specify to sort A to Z.

## Glossary of Terms

**alignment** – refers to horizontal data or object position between left and right margins or within a column, cell, or other text area. Alignment can be to the right, left, or centered within a cell, text area, line, or column

**ampersand** – the *and* sign (&) used in concatenation of string data

**area chart** – type of multiline graph in a spreadsheet which fills the area between lines to clearly illustrate differences

**argument** – parameter entered in a function and used in making calculations (i.e. in the function SUM(A1:B1), the range described by A1:B1 is the argument for the function)

**arithmetic operator** – symbols used to indicate addition (+), subtraction (-), multiplication (\*), division (/), and exponentiation (^) in formulas

**ascending order** – sequence of arrangement with the smallest number or letter closest to the front of the alphabet coming first (i.e. 1 to 99 or A to Z)

**attribute** – characteristics ascribed to something, a property

**autonumber** – this function generates an automatic number for each new record created

**bar chart** – data graphically illustrated with a series of vertical bars (*Microsoft Excel calls this a column chart, and refers to a bar chart as the horizontal version of this.*)

**block** – selected set of items, such as words, cells, columns, etc.

**border** – lines drawn around the perimeter of a cell, field, range of cells, block of data, a page, paragraph, drawing, or a box that emphasizes the selection. Each cell has four *borders* in a database and spreadsheet, left, right, top, bottom and these may be manipulated separately or in combination

**break point** – a specified change in a report when a Summary Total Line is inserted; triggered by a change in a particular field; Group in a report is terminated at a break point

**calculated field** – field having a mathematical expression as its source of data

**category label** – label describing what the x-axis of a spreadsheet chart represents; printed along the x-axis under the related bar or data point

**chart** – visual representation of data in a graph or tabular format

**clipboard** – area of computer memory where selected data or information is temporarily copied from an application; contents from clipboard can then be pasted into another application

**column chart** – Microsoft's term for a bar chart which is a graph represented by vertical bars

**column designators** – alphabetic character(s) that are displayed above each column of a spreadsheet

**column headings** – also called column labels; data that appears at the top of a column in a spreadsheet

**column labels** – also called column headings; data that appears at the top of a column in a spreadsheet

**compound If** – also called an embedded or complex If; If function embedded within another If function

**complex If** – also called an embedded or compound If; If function embedded within another If function

**conditions** – criteria; specifications or tests on which decisions or selections are made