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CERTIFICATE

This is to certify that Mr./Ms. _____ of MBA
I Year I Semester, bearing Hall Ticket Number _____ has
successfully completed his/her practical record work on Information
Technology Lab(IT Lab) in the academic year 2008-09.

Internal
Examiner

External
Examiner

Head of the
Department

INDEX

1. Ms Excel

- Introduction to Ms Excel
- Functions
- Charts
- Data Filter
- Macros

2. Ms Access

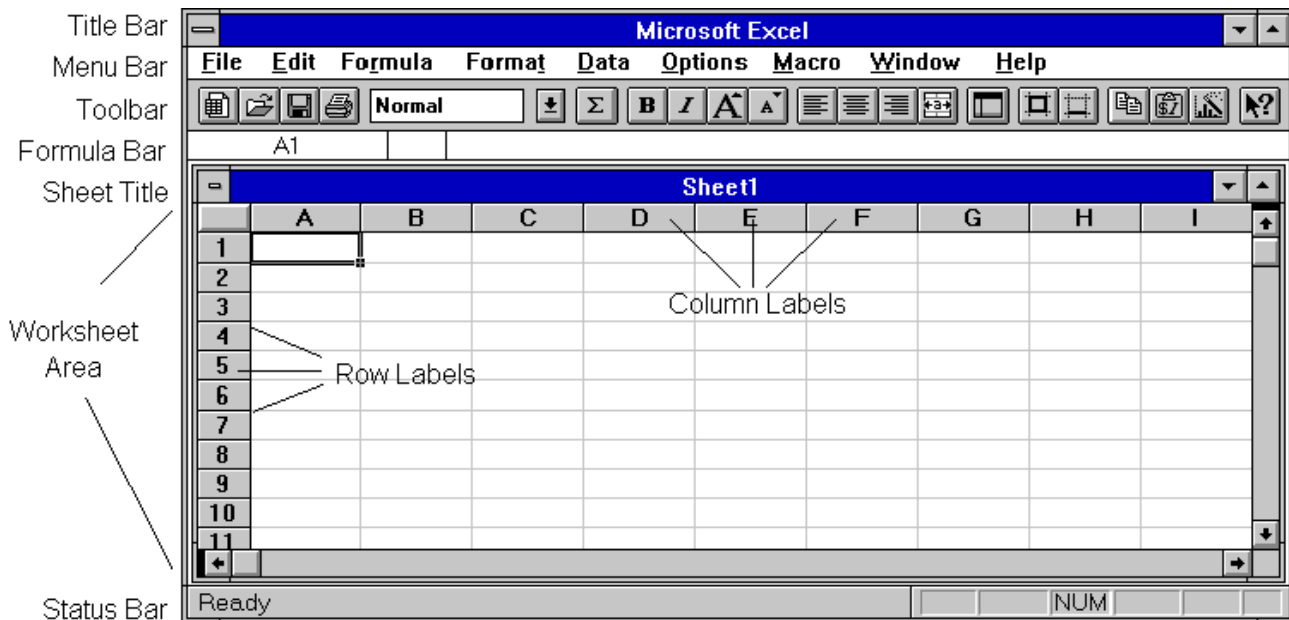
- Introduction to Ms Access
- Tables
- Queries
- Forms
- Reports

MS Excel

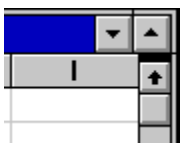
The Excel Screen

Objective To identify the parts of the Excel screen, and know how to use them effectively.

Instructions You will learn the parts of the Excel screen by observation and try out some common Excel tasks.




Activity 2.1 Familiarise yourself with the Excel worksheet window. If the worksheet is displayed on part of the screen, you can enlarge the worksheet window by clicking on the Maximise box to the right of the Title Bar.





Activity 2.2 The *columns* are labelled by letters and the *rows* by numbers. At the intersection of a row with a column is a box called a *cell*. Cells are referenced by both their *column label* and their *row number*.



Click on the cell D7 using the mouse. A black box appears around the cell. This is called the *cell highlight* and its presence denotes a *selected range*. Move the mouse slowly over the black border. Notice that the cursor changes from a thick white crosshair  when over the main part of the cell to

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a white arrow  when it is over the black border, and a black crosshair  when it is over the little black box in the bottom right hand corner of the cell highlight.

Activity 2.3 Now look at the *formula bar*. This has three areas. The lefthand area will have the text D7 in it. Excel can only edit the contents of one cell at a time, even when a range is selected. The editable cell is called the *active cell*. It is always highlighted and it's reference will be displayed in the left-hand area of the formula bar.

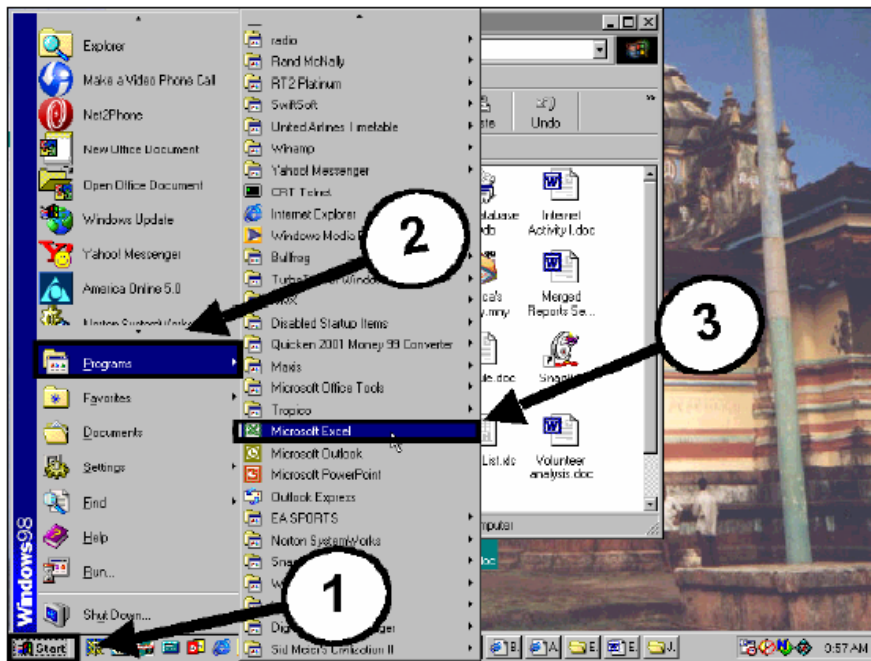
The right-hand area of the formula bar will display the contents of the active cell, and in here the contents can be changed. The middle area of the formula bar is used when the cell is being edited to confirm or cancel the changes.

Microsoft Excel: Exercise 2

In this exercise:

- Moving from one cell to another
- Entering information in cells
- Removing a hyperlink
- Center and merge
- Sort ascending
- Deleting a row or column

1. Open a new Excel workbook.



2. In cell A1 **Type** *Training for Employable Computer Skills*. Press the **ENTER** key.

3. In cell A2 **Type** *May-July 2001*. Press the **ENTER** key.

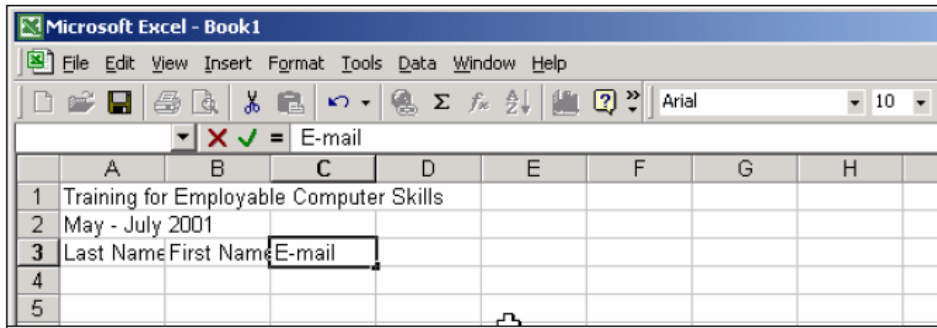
4. In cell A3 **Type** the words *Last Name*. Press the **TAB** key to move to the next cell.

5. In cell B3 **Type** the words *First Name*. Press the **TAB** key to move to the next cell.

6. In cell C3 **Type** *E-Mail*.

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Check your work. Your document should look like this:

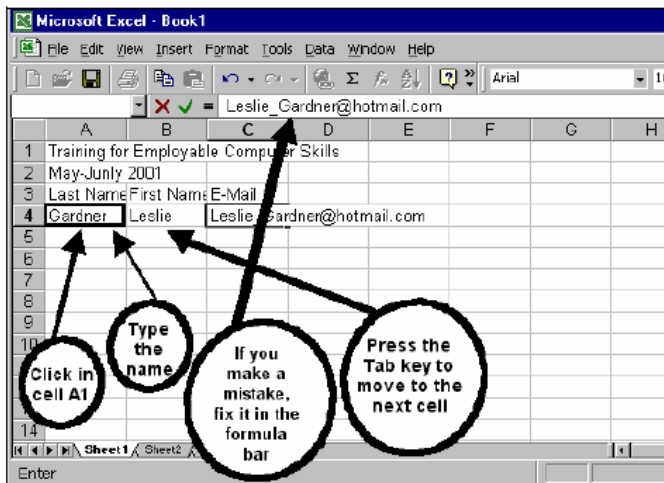


1. Now imagine that you have been asked to make a list of student e-mail addresses for another computer class. **Type** the names below into the cells on your screen. Don't worry if some of what you have typed is hidden. You will fix it later. If you need to edit, make changes in the formula bar.

- To make @ (called the AT sign) press Shift and the 2-key
- To make _ (called the UNDERSCORE) press Shift and the - (subtraction) key

8. Practice the first one:

Last Name	First Name	E-Mail
Gardner	Leslie	leslie__gardner@hotmail.com



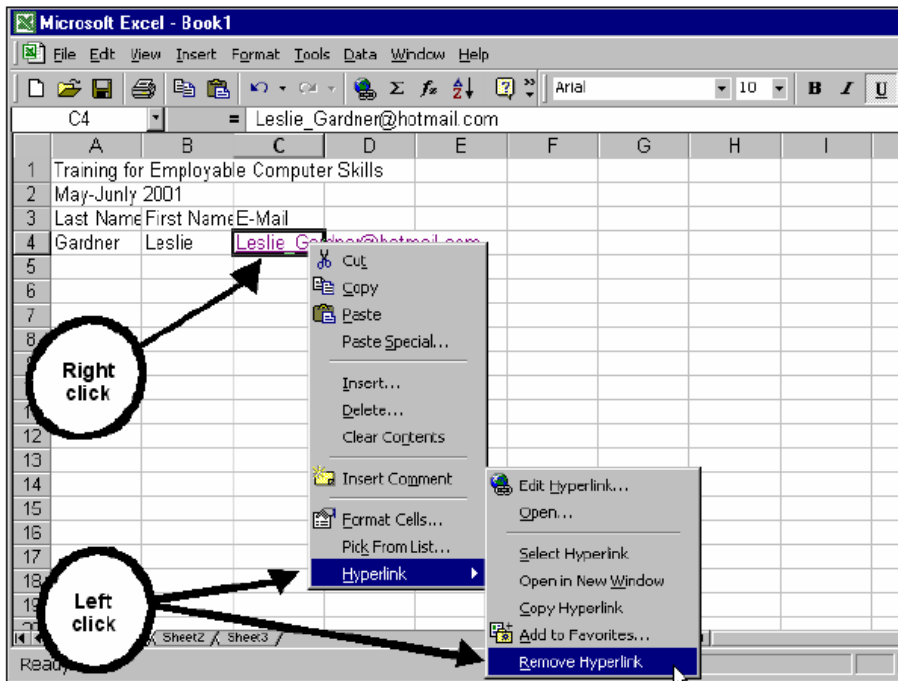
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For use with MS Excel 98, 2000, 2001, X

9. Now **Type** the names below in your spreadsheet.


Last Name	First Name	E-Mail
Kebber	Rachelle	rachellek@yahoo.com
Hussein	Rahima	Rahimahussein1@hotmail.com
Hussein	Abduljabar	abduljabar8@hotmail.com
Ali	Fakiha	Fakihaali3@hotmail.com
Moua	Xiong	Moua_Xiong@hotmail.com
Teferi	Tsige	ts_teferi@hotmail.com
Gomez	Mario	gomezm_2002@hotmail.com
Belew	Mulugeta	mulugetahbelew@hotmail.com
Brown	John	Browner5@yahoo.com
Mohamed	Abdullahi	mabenzi_299@hotmail.com
Kifleyesus	Selamawit	Skifleyesus1863@hotmail.com
Asfaw	Tsehay	tsehayasfaw@hotmail.com

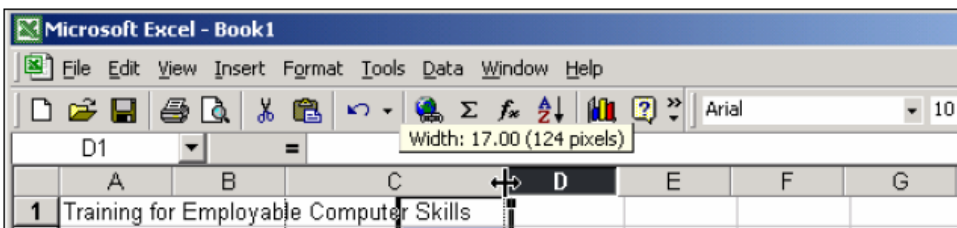
10. See that some of the e-mail addresses are blue and underlined. That means that it is a hyperlink. If you click on it you will open an e-mail program. Microsoft Excel has automatically created this hyperlink. **Follow the directions** to get rid of the hyperlink.



11. Now **Repeat** the last step to remove all of the hyperlinks.

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12. **Check your work.** Make sure that you have spelled EVERYTHING correctly. An e-mail address will not work correctly if there is a mistake in it. There should be no spaces in the e-mail addresses
13. **Click** in cell A1 and make the text **Bold**.
14. Change the font size in cell A1 to **20** pt.
15. **Highlight** cells A1-G1. **Place the cursor** in the middle of cell A1 **Click and Drag** over to G1.
16. **Click** on the **center and merge** button located in your toolbar.  Merge and Center changes many cells into one cell. Excel will also center the text in the middle of this merged cell.
17. Change the font size in cell A2 to **14** pt and **Bold** it.
18. **Highlight** cells A2 to G2 and **Click** on the **center and merge** button.
19. **Double click** on the line between the labels for Column A and B. Excel will automatically re-size the column to fit the text.
20. **Repeat** the same thing between column B and C, and C and D
21. To make the column size even bigger, **Click and drag** each border to the right until it says 125 pixels above the cursor.



22. **Bold** the titles in cell A3.
23. **Highlight** a block of cells starting at cell A4 and dragging over and down to cell D17.

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For use with MS Excel 98, 2000, 2001, XF

24. Click on the **Sort Ascending** button.  See how the names are in order from A to Z now.
25. **Delete** the Rachelle Kebber entry since she is no longer in the class. **Click** on the row number on the left of the screen. When you click on it, it will highlight the whole row.
20. Now, **Right-click** on this row. A menu will appear. **Click** on **DELETE**. Excel will delete row you selected and move the other rows up.
21. **Click** on **FILE**. **Click** on **PRINT PREVIEW**. **Check your work**.
22. When you have corrected the mistakes **Print** the document.
23. **Save** this file on your disk.

Microsoft Excel is an electronic spreadsheet program.

The Workbook

Most of the Excel screen is devoted to the display of the workbook. The workbook consists of grids and columns. The intersection of a row and column is a rectangular area called a **cell**.

Cells

The workbook is made up of cells. There is a cell at the intersection of each row and column. A cell can contain a value, a formula, or a text entry.

Rows, Columns, and Sheets

The Excel worksheet contains 16,384 rows that extend down the worksheet, numbered 1 through 16384.

The Excel worksheet contains 256 columns that extend across the worksheet, lettered A through Z, AA through AZ, BA through BZ, and continuing to IA through IZ.

The Excel worksheet can contain as many as 256 sheets, labeled Sheet1 through Sheet256. The initial number of sheets in a workbook, which can be changed by the user is 16.

Cell References

Cell references are the combination of column letter and row number. For example, the upper-left cell of a worksheet is A1.

Formulas

Formulas are entered in the worksheet cell and must begin with an equal sign "=" . The formula then includes the addresses of the cells whose values will be manipulated with appropriate operands placed in between.

Basic Functions

Functions can be a more efficient way of performing mathematical operations than formulas. For example, if you wanted to add the values of cells D1 through D10, you would type the formula "=D1+D2+D3+D4+D5+D6+D7+D8+D9+D10". A shorter way would be to use the SUM function and simply type "=SUM(D1:D10)". Several other functions and examples are given in the table below:

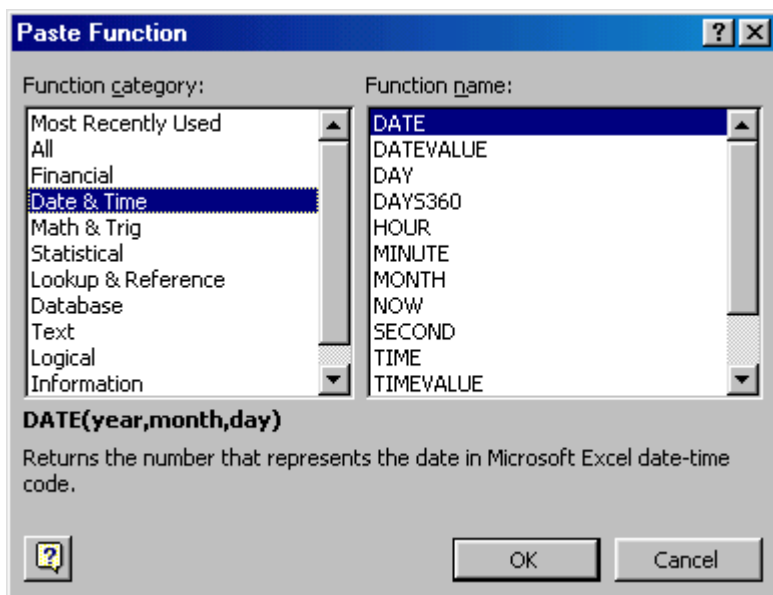
Function	Example	Description
SUM	=SUM(A1:100)	finds the sum of cells A1 through A100
AVERAGE	=AVERAGE(B1:B10)	finds the average of cells B1 through B10
MAX	=MAX(C1:C100)	returns the highest number from cells C1 through C100
MIN	=MIN(D1:D100)	returns the lowest number from cells D1 through D100
SQRT	=SQRT(D10)	finds the square root of the value in cell D10
TODAY	=TODAY()	returns the current date (leave the parentheses

		empty)
--	--	--------

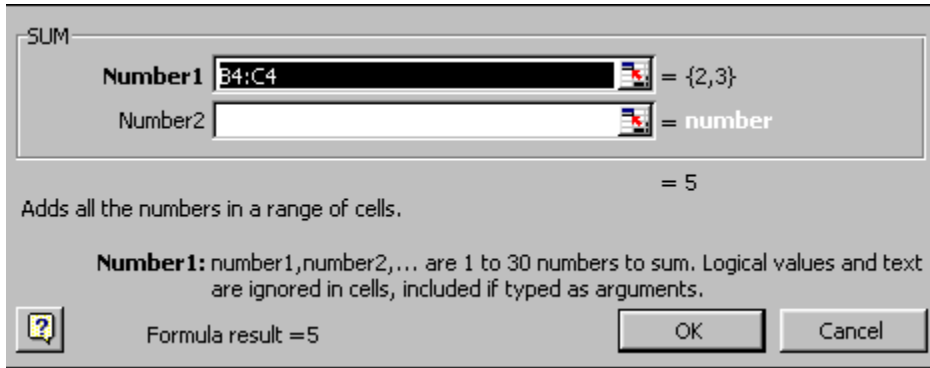
Function Wizard

View all functions available in Excel by using the Function Wizard.

- Activate the cell where the function will be placed and click the **Function Wizard** button on the standard toolbar.
- From the **Paste Function** dialog box, browse through the functions by clicking in the **Function category** menu on the left and select the function from the **Function name** choices on the right. As each function name is highlighted a description and example of use is provided below the two boxes.



- Click **OK** to select a function.
- The next window allows you to choose the cells that will be included in the function. In the example below, cells B4 and C4 were automatically selected for the sum function by Excel. The cell values {2, 3} are located to the right of the **Number 1** field where the cell addresses are listed. If another set of cells, such as B5 and C5, needed to be added to the function, those cells would be added in the format "B5:C5" to the **Number 2** field.



- Click **OK** when all the cells for the function have been selected.

Creating Charts

Before you can draw a chart using Excel, the numbers that compose the chart must be entered in a workbook. There are five general steps in defining a chart.

Steps in Creating a Chart:

1. Enter the numbers into a workbook.
2. Select the data to be charted.
3. Choose **Chart** from the **Insert** menu.
4. Choose either **Chart Type** from the **Format** menu or click on the **ChartWizard** button.
5. Define parameters such as titles, scaling color, patterns, and legend.

These five steps should be performed in this order. Note that since the chart is linked to the workbook data, any subsequent changes made to the workbook are automatically reflected in the chart.

Creating a Pie Chart

Pie charts are used to show relative proportions of the whole, for one **data series** only.

Data series is a group of related **data points**.

A data point is a piece of information that consists of a category and value.

When you create a chart with Excel, the categories are plotted along the horizontal or X-axis, while the values are plotted along the vertical or Y-axis.

Data series originate from single worksheet rows or columns. Each data series in a chart is distinguished by a unique color or pattern. You can plot one or more data series in a chart except for pie charts.

An example of a data series is the population of the United States over ten years. Each data point would be made up of a year (the category) and the population in that year (value).

The first step in creating any chart is to enter the data on a workbook.

1. Find and open MS Excel if it is not already open.
2. Make sure your toolbars and formula bar is displayed.
3. Open a new workbook.
4. Save your workbook and name it "expenses".

Enter the following into **expenses** workbook:

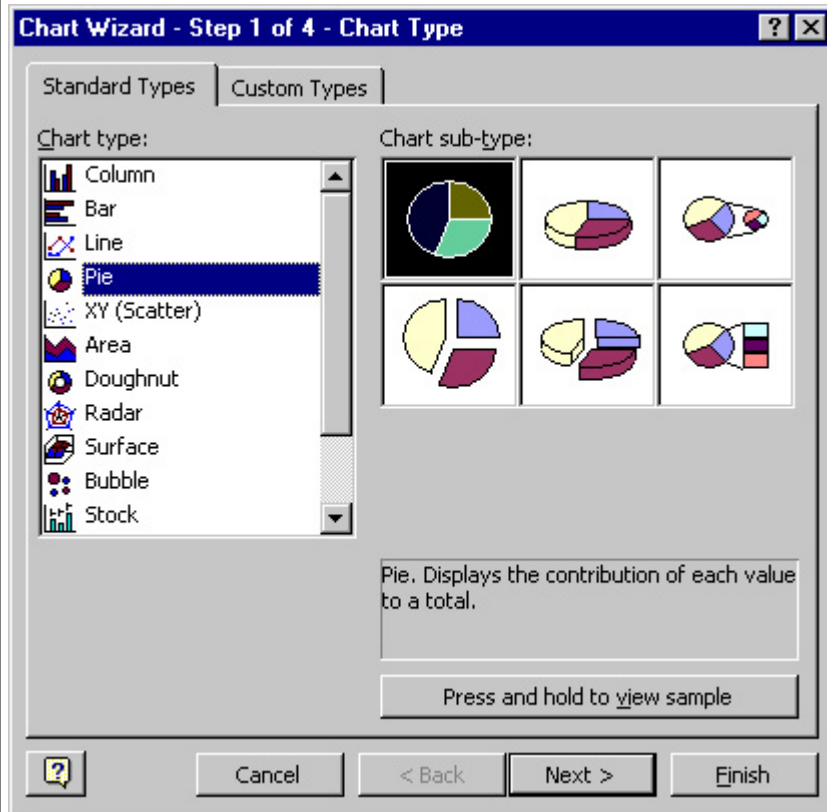
	A	B
1		Weekly
2	Food	40
3	Clothes	20
4	School Supplies	15
5	Bills	45
6	Recreation	25
7	Gas	10

You will be using the ChartWizard to create your pie chart.

Step 1: Select the data you just entered.

Step 2: Choose **Chart** from the **Insert** menu.

Step 3: Observe that the **ChartWizard's** first dialog box appears:



You want a regular pie chart not a 3-D pie chart.

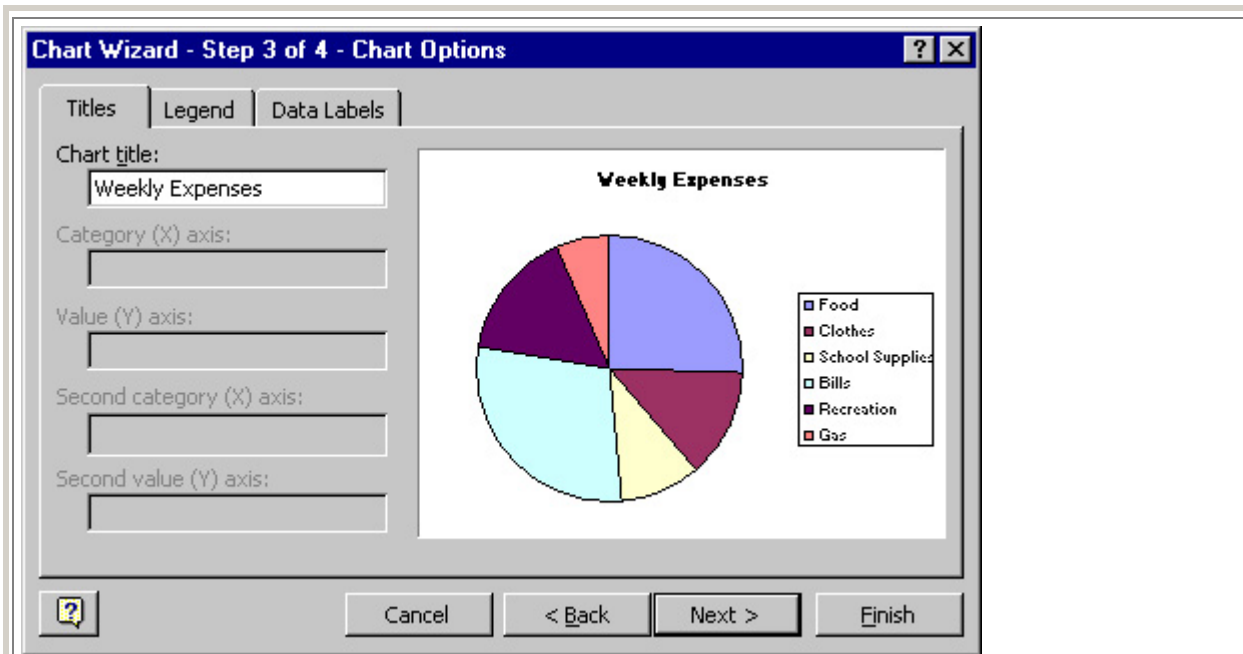
Step 4: Select the chart type: **Pie** and click on the **Next** button.

The following dialog should appear:

The screenshot shows the 'Chart Wizard - Step 2 of 4 - Chart Source Data' dialog box. It features two tabs: 'Data Range' and 'Series'. The 'Data Range' tab is active, displaying a pie chart titled 'Weekly' and a legend with the following categories: Food (blue), Clothes (red), School Supplies (green), Bills (yellow), Recreation (purple), and Gas (orange). Below the chart, the 'Data range' is set to '=Sheet1!\$A\$1:\$B\$7'. The 'Series in' section has two radio buttons: 'Rows' (unselected) and 'Columns' (selected). At the bottom, there are four buttons: 'Cancel', '< Back', 'Next >', and 'Finish'.

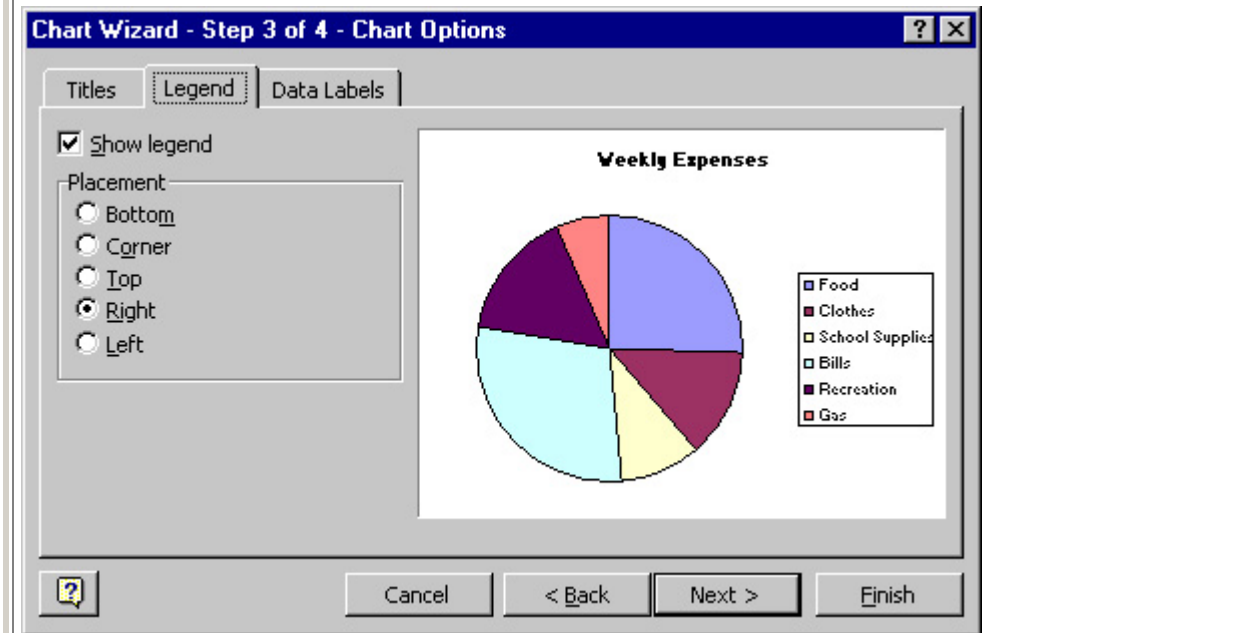
Step 5: Read the dialog box, make sure the range is correct and then click the **Next** button.

The following dialog should appear:

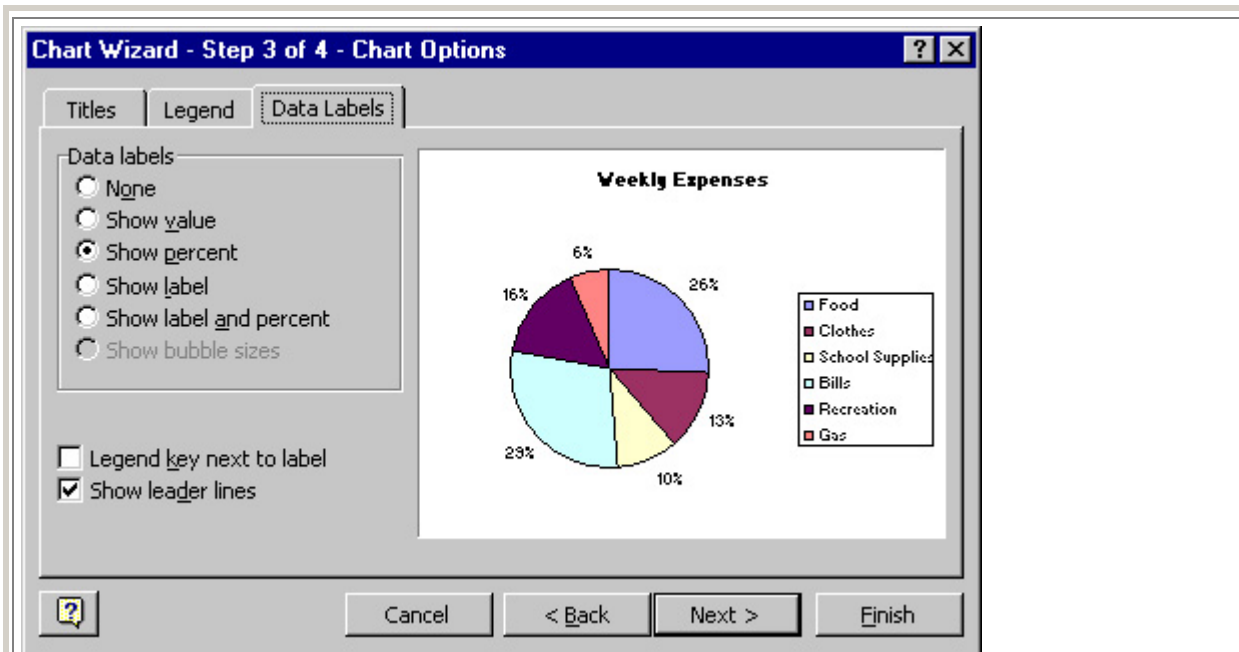


Step 6: Select the **Titles** tab and then enter "Weekly Expenses" as the chart title.

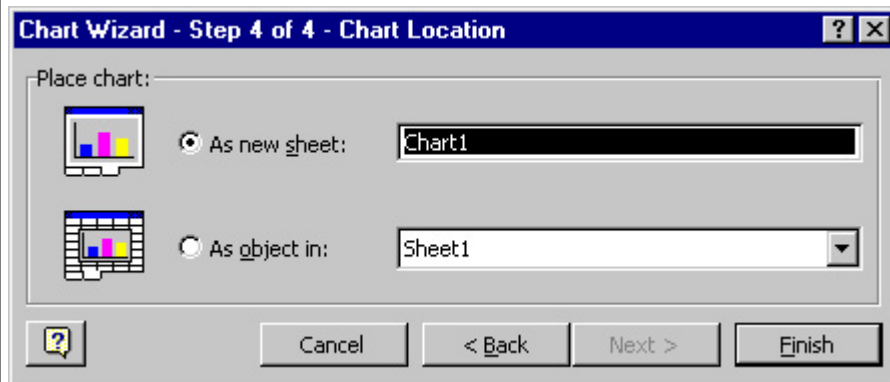
Step 7: Select the **Legend** tab and make the following adjustments:



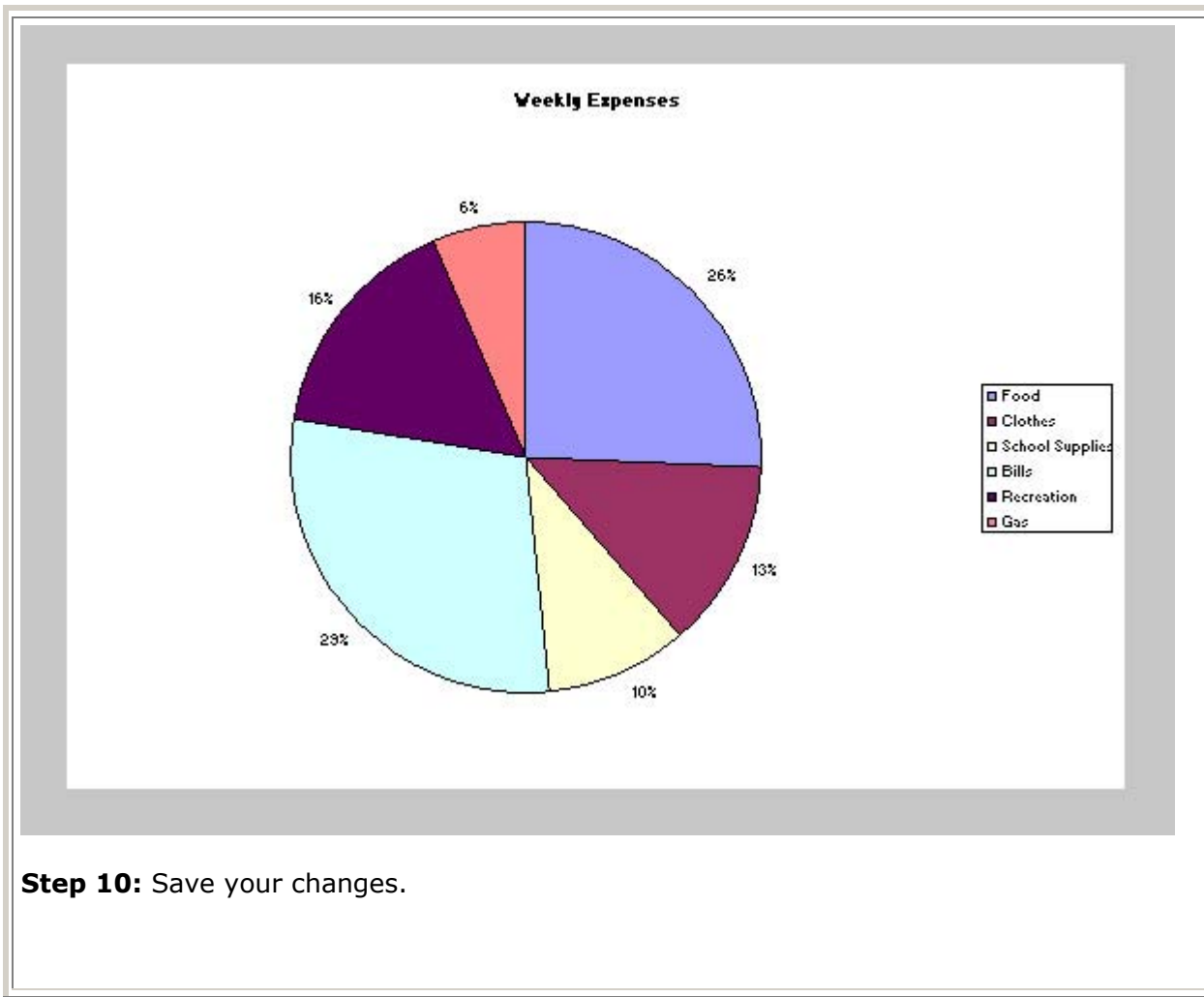
Step 8: Select the **Data Labels** tab and select the following options:



Step 9: Select the following options and then click the **Finish** button.



Your **expenses** workbook should look as follows:



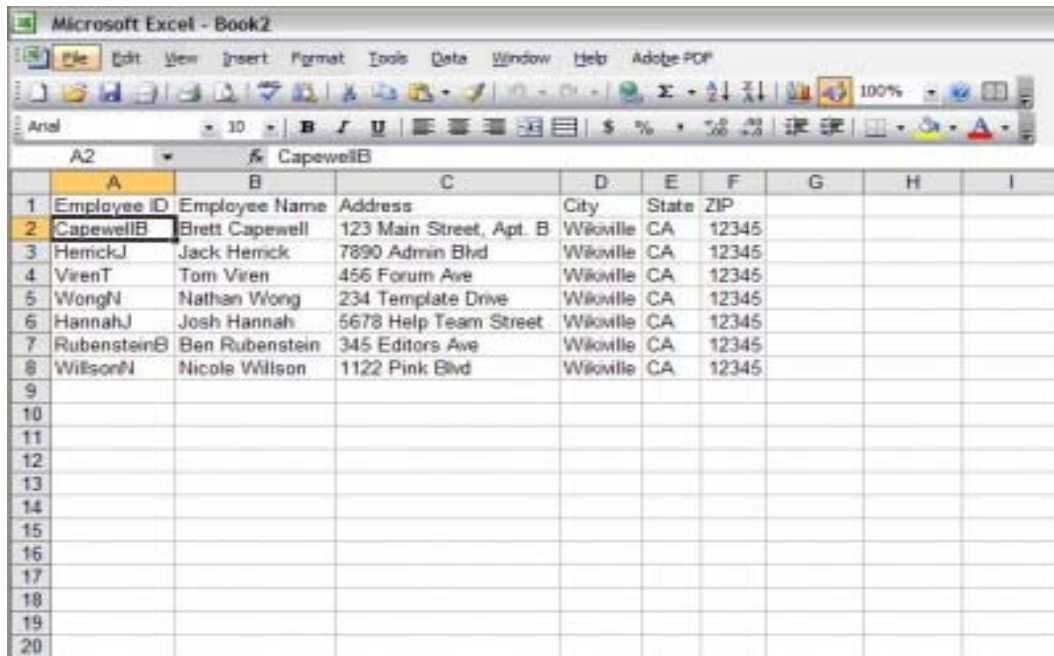
AutoFilter

For medium-to-large quantities of data, using Microsoft Excel's AutoFilter is a quick and simple way to filter through that information and find what you need.

Steps

1. Input all of your data, or open the spreadsheet that contains all of your data. It is best that your data have column heading such as categories to specify the data below it. If you don't already have these, input them before you filter.

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Microsoft Excel - Book2

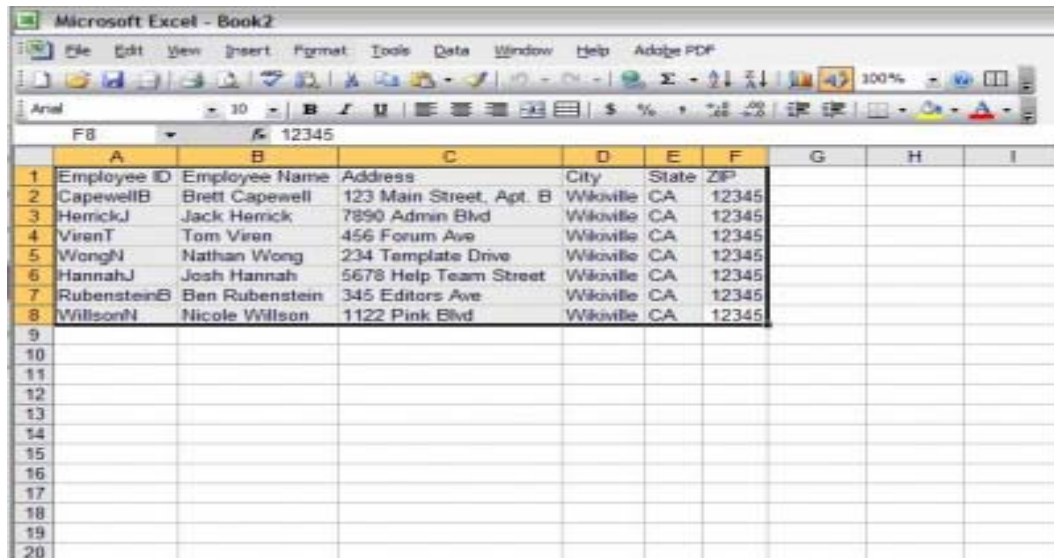
File Edit View Insert Format Tools Data Window Help Adobe PDF

Anal 10 B U \$ % 100%

A2 CapewellB

	A	B	C	D	E	F	G	H	I
1	Employee ID	Employee Name	Address	City	State	ZIP			
2	CapewellB	Brett Capewell	123 Main Street, Apt. B	Wikoville	CA	12345			
3	HerrickJ	Jack Herrick	7890 Admin Blvd	Wikoville	CA	12345			
4	VirenT	Tom Viren	456 Forum Ave	Wikoville	CA	12345			
5	WongN	Nathan Wong	234 Template Drive	Wikoville	CA	12345			
6	HannahJ	Josh Hannah	5678 Help Team Street	Wikoville	CA	12345			
7	RubensteinB	Ben Rubenstein	345 Editors Ave	Wikoville	CA	12345			
8	WillsonN	Nicole Willson	1122 Pink Blvd	Wikoville	CA	12345			
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									

2. Select all the data you wish to filter.



Microsoft Excel - Book2

File Edit View Insert Format Tools Data Window Help Adobe PDF

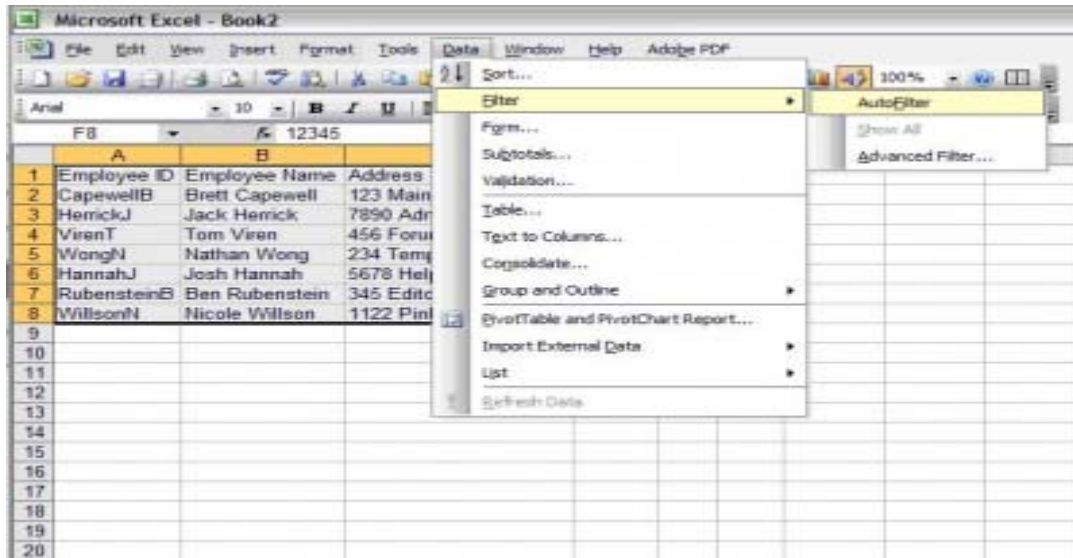
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F8 12345

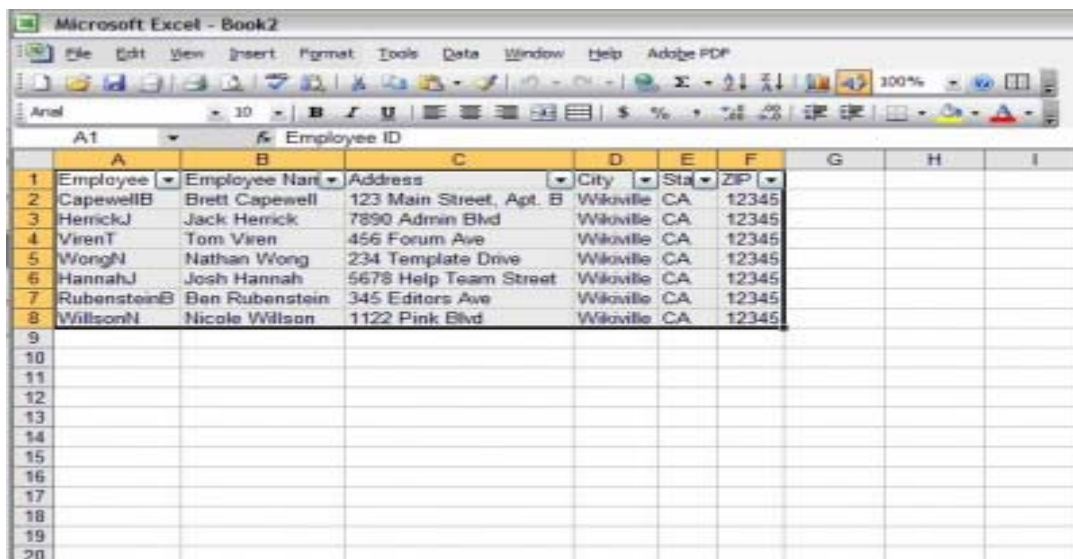
	A	B	C	D	E	F	G	H	I
1	Employee ID	Employee Name	Address	City	State	ZIP			
2	CapewellB	Brett Capewell	123 Main Street, Apt. B	Wikoville	CA	12345			
3	HerrickJ	Jack Herrick	7890 Admin Blvd	Wikoville	CA	12345			
4	VirenT	Tom Viren	456 Forum Ave	Wikoville	CA	12345			
5	WongN	Nathan Wong	234 Template Drive	Wikoville	CA	12345			
6	HannahJ	Josh Hannah	5678 Help Team Street	Wikoville	CA	12345			
7	RubensteinB	Ben Rubenstein	345 Editors Ave	Wikoville	CA	12345			
8	WillsonN	Nicole Willson	1122 Pink Blvd	Wikoville	CA	12345			
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									

3. Click "Data", then "Filter" which opens a sub-menu, then click "AutoFilter".

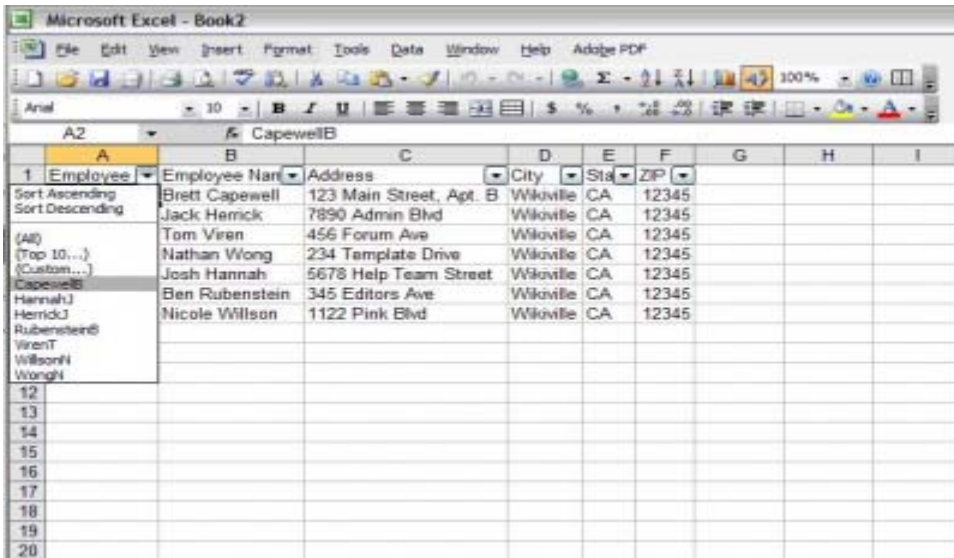
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4. You will immediately notice that the categories have drop-down buttons. Using these buttons, you can set your filter options.



- Sort Ascending: sorts data in ascending order based on the data in that column;
- Sort Descending: sorts data in descending order based on the data in that column;
- All: the default filter option, sorts data as it was originally entered into the spreadsheet; after filtering, return to this option to view data in its original order and format
- Top 10: The first 10 rows of data in your spreadsheet (when initial setting is "All") or the first 10 rows of data from the filtered selection
- Custom: You may customize how Excel sorts the data based on data ranges and information.
- Various data points: You may sort the data based on all other data points in that column. Excel combines data points that are the same. For example, employees that live in the same city can be sorted using only one data point.



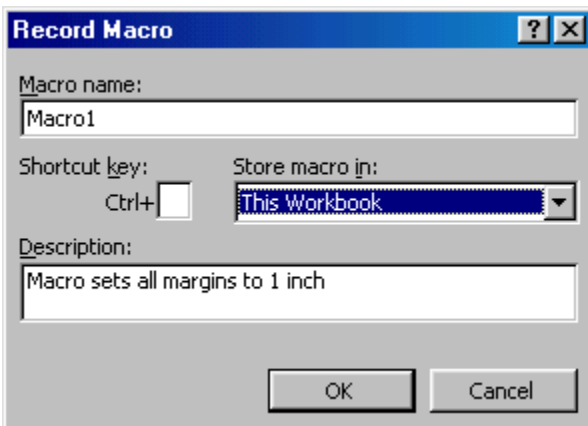
5. To turn off AutoFilter, repeat step 3 to uncheck the AutoFilter option.

Macros

Recording A Macro

Macros can speed up any common editing sequence you may execute in an Excel spreadsheet. In this example we will make a simple macro that will set all the margins on the page to one inch.

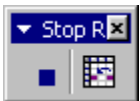
Click **Tools|Macro|Record New Macro** from the menu bar.



- Name the macro in the **Macro name** field. The name cannot contain spaces and must not begin with a number.

Information Technology Lab (MS Office)

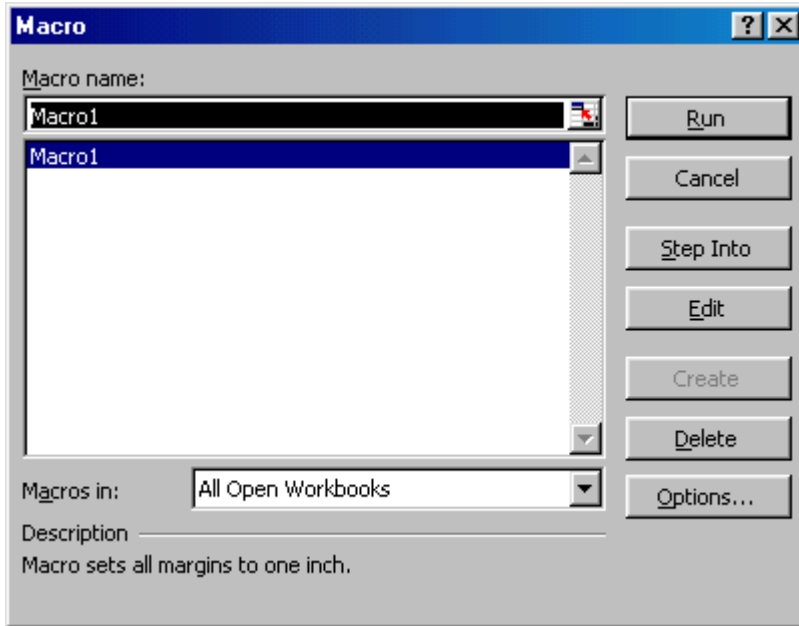
- If you would like to assign a shortcut key to the macro for easy use, enter the letter under **Shortcut key**. Enter a lower case letter to make a CTRL+number shortcut and enter an upper case letter to assign a CTRL+SHIFT+number shortcut key. If you select a shortcut key that Excel already uses, your macro will overwrite that function.
- Select an option from the **Store macro in** drop-down menu.
- Enter a description of the macro in the **Description** field. This is for your reference only so you remember what the macro does.
- Click **OK** when you are ready to start recording.
- Select options from the drop down menus and Excel will record the options you choose from the dialog boxes, such as changing the margins on the Page Setup window. Select **File|Page Setup** and change all the margins to 1". Press **OK**. Replace this step with whatever commands you want your macro to execute. Select only options that modify the worksheet. Toggle actions such as **View|Toolbars** that have no effect on the worksheet will not be recorded.



- Click the **Stop** button the recording toolbar. The macro is now saved.

Running A Macro

- To run a macro you have created, select **Tools|Macro|Macros** from the menu bar.
- From the **Macros** window, highlight the **Macro name** in the list and click **Run**.



- If the macro is long and you want to stop it while it is running, press **BREAK** (hold **CTRL** and press **PAUSE**).

Printing

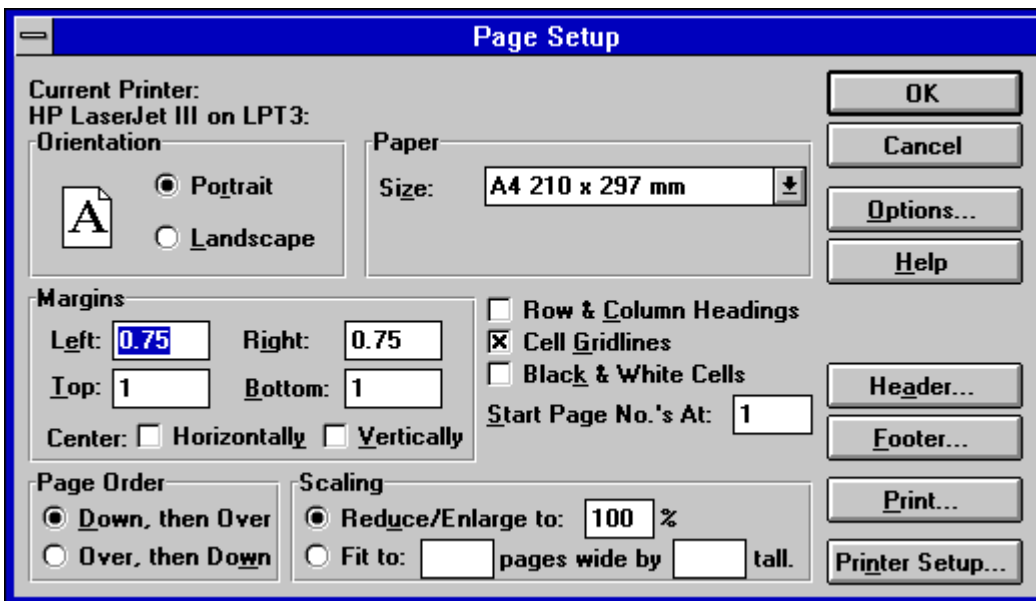
Objective To control the printing options.

Instructions You will use the Page Setup, Print Preview and Print commands from the File menu.

Comments Having gone to all this work to create your spreadsheet, you will want to take away a printed copy.

Activity 10.1 Before printing, you will need to ensure that Excel is 'talking' the right printer language and attached to the correct printer queue. To do this you should consult the document *Getting Started with Microsoft Windows* (BEG 2).

Activity 10.2 Once the right printer has been selected, you will probably want to check how your page is set up. Select the Page Setup... command from the File menu. You should get the dialogue box as shown below:



Click on the Centre Horizontally and Centre Vertically check boxes. Then click <OK>.

Activity 10.3 We will now preview the spreadsheet on screen. Previewing your spreadsheet, before committing it to the printer saves you time, effort and money so it is recommended. As a precaution you are advised to save your work beforehand.

From the File menu choose the Print Preview command. The screen will display a preview of the printout. To examine the worksheet more closely, click on the Zoom button. When you are satisfied with the Preview, click on the <Print> button. The spreadsheet window will reappear with a dialogue box checking that you are sending the print to the right place, how much of the sheet you want

printed and how many copies. Click <OK> and a small dialog box appears giving the progress of the printing. Wait until this disappears before continuing with your work.

NPV PROJECT

This segment will show you how to determine the NET PRESENT VALUE (NPV) of a series of cash flows.

In this example we have a series of cash flows starting at the beginning of Period 1, which we called Period 0. An outflow of 20 000, and then the next five years we have inflows of cash.

We would like to determine what the NET PRESENT VALUE is of these series of cash flows. In order to do this we can make use of the NET PRESENT VALUE function.

- if we click on the cell
- and go the Function Wizard
- go into the Financial categories
- and find the NPV function
- This will appear, we are asked to fill it in.
- The first criteria is to give it a Rate, which is a rate of discount over the length of one period. In this case it's this cell here,
- we now need to enter the Values and if you click on the first one you'll see that it tells you here its Value 1, 2 all the way up to 29 of income, equally space in time and occurring at the end of each period.

Now this is very, very important because if you look at our numbers, Period 0 is actually the beginning of Period 1 and then Period 1 that's the end, the end, the end.

If we assume the values of all these cells we'll be incorrect because Excel will assume that this 20 000 investment actually occurs at the end of Period 1. So in order to do this is our Value 1

- we highlight all cash flows that happen at the end of the period
- and when we push Ok
- you'll see we get a NET PRESENT VALUE

However we have to be very careful because what we've told it to do, is give us the NET PRESENT VALUE of all the cash flows at the end of the years. We have excluded this, now because it happens at the beginning of Period 1 we don't have to worry about present valuing it because the number is already present values.

So in order to get an accurate NET PRESENT VALUE, you need to subtract the initial investment.

- so you'll see we've got a cell here for Initial Investment,
- you make that, equal to the beginning period
- when we push enter
- you'll see I've summed these two,

so the NET PRESENT VALUE of these series of cash flows is actually this number here.

Returns the internal rate of return for a series of cash flows represented by the numbers in values. These cash flows do not have to be even, as they would be for an annuity. However, the cash flows must occur at regular intervals, such as monthly or annually. The internal rate of return is the interest rate received for an investment consisting of payments (negative values) and income (positive values) that occur at regular periods.

IRR(values,guess)

Values is an array or a reference to cells that contain numbers for which you want to calculate the internal rate of return.

- Values must contain at least one positive value and one negative value to calculate the internal rate of return.
- IRR uses the order of values to interpret the order of cash flows. Be sure to enter your payment and income values in the sequence you want.
- If an array or reference argument contains text, logical values, or empty cells, those values are ignored.

Guess is a number that you guess is close to the result of IRR.

- Microsoft Excel uses an iterative technique for calculating IRR. Starting with guess, IRR cycles through the calculation until the result is accurate within 0.00001 percent. If IRR can't find a result that works after 20 tries, the #NUM! error value is returned.
- In most cases you do not need to provide guess for the IRR calculation. If guess is omitted, it is assumed to be 0.1 (10 percent).
- If IRR gives the #NUM! error value, or if the result is not close to what you expected, try again with a different value for guess.

Remarks

IRR is closely related to NPV, the net present value function. The rate of return calculated by IRR is the interest rate corresponding to a 0 (zero) net present value. The following formula demonstrates how NPV and IRR are related:

$NPV(IRR(B1:B6), B1:B6)$ equals $3.60E-08$ [Within the accuracy of the IRR calculation, the value $3.60E-08$ is effectively 0 (zero).]

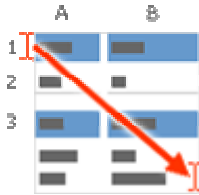
Example

The example may be easier to understand if you copy it to a blank worksheet.

[+ How to copy an example](#)

1. Create a blank workbook or worksheet.
2. Select the example in the Help topic.

Note Do not select the row or column headers.



Selecting an example from Help

3. Press CTRL+C.
4. In the worksheet, select cell A1, and press CTRL+V.
5. To switch between viewing the results and viewing the formulas that return the results, press CTRL+' (grave accent), or on the **Tools** menu, point to **Formula Auditing**, and then click **Formula Auditing Mode**.

	A	B
	Data	Description
	-70,000	Initial cost of a business
1	12,000	Net income for the first year
2	15,000	Net income for the second year
3	18,000	Net income for the third year
4	21,000	Net income for the fourth year
5	26,000	Net income for the fifth year
	Formula	Description (Result)
6	=IRR(A2:A6)	Investment's internal rate of return after four years (-2%)
7	=IRR(A2:A7)	Internal rate of return after five years (9%)
	=IRR(A2:A4,-10%)	To calculate the internal rate of return after two years, you need to include a guess (-44%)

Date Formulas and Functions

- Today's date and time: **=NOW()**
- Today's date only: **=TODAY()**
- Day of the month for a specific date: **=DAY(TODAY())**
- Day of the week for a specific date (set the cell format to custom format "dddd"):

=WEEKDAY(TODAY())

=TEXT(WEEKDAY(TODAY()),"dddd")

- Month of the year for a specific date: **=MONTH(TODAY())**
- Year for a specific date: **=YEAR(TODAY())**
- Date for a specific year, month and day (Example returns 6/12/2005):

=DATE(2005,6,12)

- Add days to a date (one week from today): **=TODAY()+7**
- Subtract days from a date (one week ago today): **=TODAY()-7**
- Last day of the this month: **=DATE(YEAR(TODAY()),MONTH(TODAY()+1,1)-1,1)**

or

=EOMONTH(TODAY(),0)

- Last workday of the current month:

=WORKDAY(DATE(YEAR(TODAY()),MONTH(TODAY()+1,1),-1,Holidays))

- First workday of the following month:

=WORKDAY(DATE(YEAR(TODAY()),MONTH(TODAY()+1,1)-1,1,Holidays))

- Number of workdays in the current month:

=NETWORKDAYS(DATE(YEAR(TODAY()),MONTH(TODAY()),1),EOMONTH(TODAY(),0),Holidays)

- Last workday in range of days (A1 is start date, B1 is number of days in the period):
=WORKDAYS(A1,B1,Holidays)

DATEDIF() Syntax & Examples

The DATEDIF() function uses the following syntax:

=DATEDIF(start_date,end_date,"code")

The start date must be less than the end date, or the function returns an error.

The following are the codes for the DATEDIF() function:

- "y" Years
- "m" Months
- "d" Days
- "md" Difference between days in a period; no month and years
- "ym" Difference between the months in a period, no days and years
- "yd" Difference between the days in a period, no years

Examples

- To calculate the number of years between two dates:

=DATEDIF(A1,TODAY(),"y") & " Years"

- To calculate the number of years and months between two dates:

=DATEDIF(A1,TODAY(),"y") & " Years, " & DATEDIF(A1,TODAY(),"ym") & " Months"

- To calculate the number of years, months, and days between two dates:

**=DATEDIF(A1,TODAY(),"y") & " Years, " & DATEDIF(A1,TODAY(),"ym") & " Months, "
& DATEDIF(A1,TODAY(),"md") & " Days"**

Using the TEXT() function to calculate dates.

You can use the TEXT() to get the number of days or weeks between two dates:

Examples

- Number of days:

=VALUE(TEXT((NOW()-\$A\$1)/24,"[h]"))

- Number of weeks:

=VALUE(TEXT((NOW()-\$A\$1)/168,"[h]"))

Using Date and Time Functions in Excel 2002

Have you ever wondered how long it has been since the first day of 1900? Maybe you haven't, but the designers of Microsoft Excel decided to base their time and date functions on this day. Trying to determine the date exactly 1000 days from today without a computer requires the use of several calendars and a lot of time. With the use of a spreadsheet program, such as Excel, the exact day can be displayed in moments. In this article, you will examine and use many of the date and time functions built into Excel.

When a date is entered into a worksheet cell, Excel immediately converts the date into a serial number. January 1, 1900 is serial number 1 and the serial number of the date entered is the number of days since January 1, 1900. In **Figure 1**, three dates entered into cells in column A have been copied into column B. The only difference is that the dates in column B appear in the General format rather than a Date format.

	A	B
1	Date Entered	Serial Number
2		
3	1/15/2002	37271
4		
5	5/24/2001	37035
6		
7	7/3/2004	38171
8		

Figure 1

Regardless of the format of the date, the value in memory is the serial number. Using date and time functions and arithmetic operators you may find the difference between two dates, determine the day of the week three months from the current day, or find the number of workdays within a given range of dates, excluding Saturday, Sunday, and holidays. Date and time functions in Excel fall into several categories, each of which is explored in the following sections.

Just Give Me the Number

Type in a date, as in 1/18/2002, and Excel immediately converts it into a date serial number. But what if you have the month, day, and year in different cells? The Date function requires three arguments, the month, the day, and the year. You can type in the pieces of the date directly into the function, or use the cell addresses containing the components. **Figure 2** illustrates both ways to use the Date function. Note that the order of the arguments is the year, followed by the month, and finally the day. If you enter the date directly into the function, each of the arguments must be enclosed within quotation marks.

	A	B	C
1	Date Function	Serial Number	
2			
3	"=DATE(2002,1,15)"	37271	
4			
5	"=DATE(C9,A9,B9)"	37765	
6			
7			
8	Month	Day	Year
9	5	24	2003
10			

Figure 2

The Datevalue function works in much the same way, except it only has one argument — the date you want to convert, enclosed within quotation marks, in the yyyy/mm/dd format. An example is DATEVALUE("2001/11/14").

Excel can also display the time with or without the date. As far as Excel is concerned, the time is no more than a fraction of a day. For instance, .5 days is 12 noon, .25 is 6 a.m., and so on. You can use the Time and Timevalue functions to display the time either by entering the time directly into the function or by referencing the time in cells. **Figure 3** shows the Time functions, and the result in both the General and the Time format. The Timevalue function lets you enter the time as hours, minutes, seconds as in TIMEVALUE("10:15:00") for 10:15 a.m.

	A	B	C
1	Time Function	General Format	Time Format
2			
3	"=TIME(15,14,26)"	0.635023148	3:14:26 PM
4			
5	"=TIME(A9,B9,C9)"	0.225381944	5:24:33 AM
6			
7			
8	Hours	Minutes	Seconds
9	5	24	33
10			

Figure 3

There are two special functions useful when you want your worksheet to display the current date and/or time whenever the worksheet is opened. The Today function displays the current day in the mm/dd/yyyy format. Although you must type in the parentheses after the function, you must not enter any arguments. Therefore, TODAY() will display 2/13/2002 on February 13, 2002, 12/9/2005 on December 9, 2005, and so on. The Now function does the same thing as the Today function, except the result is formatted to display the current time as well as the current date. Like the Today function, the Now function has no arguments, as in NOW().

Give Me a Piece of That

Sometimes you have to take a date serial number and convert it into a value that is more meaningful to people. For example, the Day function displays just the day of the month of a date, regardless of the format of the date. Likewise, the Month, Year, Hour, Minute, and Second functions extract a portion of the date or time. **Figure 4** illustrates each of these functions.

	A	B
1	Function	General Format
2		
3	"=DAY(A16)"	29
4		
5	"=MONTH(A16)"	10
6		
7	"=YEAR(A16)"	2003
8		
9	"=HOUR(B16)"	14
10		
11	"=MINUTE(B16)"	57
12		
13	"=SECOND(B16)"	36
14		
15	Date	Time
16	10/29/2003	14:57:36
17		

Figure 4

When Will That Be?

The above functions are the “plain vanilla” functions essential to many worksheets. Using these functions, and others, you can display and calculate the difference between dates, add or subtract days from a given date, and so on. But there are a number of specialized functions that perform tasks that would otherwise require many calculations and logical operations. For instance, the Weekday function returns the day of the week in which the date in the argument falls, 1 being Sunday, 2 Monday, 3 Tuesday, and so on. Another function, Weeknum, tells you the number of the week that a date falls within.

Then there are a group of functions that use two dates in their arguments, especially handy in accounting applications. Days360 figures out the number of days between two dates, based on a 360-day calendar (12, 30-day months). Yearfrac determines the fraction of a year represented by the two dates in the argument. **Figure 5** shows examples of these functions.

	A	B
1	Function	General Format
2		
3	"=WEEKDAY(A12)"	4
4		
5	"=WEEKNUM(A12)"	44
6		
7	"=DAYS360(A12,B12)"	61
8		
9	"=YEARFRAC(A12,B12)"	0.169444444
10		
11	Start Date	End Date
12	10/29/2003	12/30/2003

Figure 5

Accounting solutions may depend on determining the date a specified number of months away or the last day of that month. Edate uses two arguments — the start date and the number of months until the same day of another month. For example, the Edate of 2/7/2003 with a second argument of 2 would be 4/7/2003 — the same day two months away. If the second argument is a negative number, the answer is a date in the past. So, EDATE(B12,-3) would be a date three months before the date in cell B12.

Eomonth works just like Edate except it finds the last day of the month. Just as with Edate, the arguments are the start date and the number of months before or after the start date. Therefore, EOMONTH(C15,5) would return the date May 31, 2002 if the start date in C15 was any day in January 2002.

Finally, there are two date functions that can be very useful to accounting and human resource departments, among others — Workday and Networkdays. The Workday function finds the next workday from a specified date, excluding holidays. The function has three arguments — the start date, the number of days before or after the start date, and a range of cells containing holidays that should not be considered as work days. Networkdays calculates the number of work days between a start date and an end date, again excluding holidays. Check out the examples in **Figure 6** to see these amazing functions in action.

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	A	B
1	Function	Result
2		
3	"=WORKDAY(A8,33,A13:A14)"	2/25/2002
4		
5	"=NETWORKDAYS(A8,B8,A13:A14)"	38
6		
7	Start Date	End Date
8	1/7/2002	3/1/2002
9		
10		
11	Holidays	
12		
13	1/21/2002	Martin Luther King Day
14	2/18/2002	Presidents' Day
15		

MS Access

Access version 1.0 was released in November 1992, quickly followed in May of 1993 by an Access 1.1 release to improve compatibility with other Microsoft products and include the Access Basic programming language.

Microsoft specified the minimum hardware requirements for Access v2.0: Microsoft Windows v3.0 with 4 MB of RAM required, 6 MB RAM recommended; 8 MB of available hard disk space required, 14 MB hard disk space recommended. The product was shipped on seven 1.44 MB diskettes. The manual shows a 1993 copyright date.

Originally, the software worked well with relatively small databases but testing showed some circumstances caused data corruption. For example, file sizes over 10 MB were problematic (note that most hard disks were smaller than 500 MB at the time this was in wide use), and the *Getting Started* manual warns about a number of circumstances where obsolete device drivers or incorrect configurations can cause data loss. With the phasing out of Windows 95, 98 and ME, improved network reliability, and Microsoft having released 8 service packs for the Jet Database Engine, the reliability of Access databases has been vastly improved in both size and number of users.

With Office 95, Microsoft Access 95 became part of the Microsoft Office Professional Suite joining Microsoft Excel, Word, and PowerPoint and transitioning from Access Basic to Visual Basic for Applications (VBA). Since then, there have been releases of Microsoft Access with each release of Office. This includes Access 97 (version 8.0), Access 2000 (version 9.0), Access 2002 (version 10.0), Access 2003 (version 11.0), and Access 2007 (version 12.0).

The native Access database format (the Jet MDB Database) has also evolved over the years. Formats include Access 1.0, 1.1, 2.0, 95, 97, 2000, and 2002-2007. The most significant transition was from the Access 97 to the Access 2000 format which was not backward compatible, and Access 2000 required the new format. Since Access 2000, all newer versions of Access support the Access 2000 format. New features were added to the Access 2002 format which can be used by Access 2002, 2003, and 2007.

In Access 2007, a new database format was introduced: ACCDB. The ACCDB supports complex data types such as multivalued and attachment fields. These new field types are essentially recordsets in fields and allow the storage of multiple values in one field.

Access's initial codename was Cirrus; the forms engine was called Ruby. This was before [Visual Basic](#) - [Bill Gates](#) saw the prototypes and decided that the [BASIC](#) language component should be co-developed as a separate expandable application, a project called Thunder. The two projects were developed separately as the underlying forms engines were incompatible with each other; however, these were merged together again after [VBA](#).

Prior to the introduction of Access, the desktop database market was dominated by Borland with their Paradox and dBase programs, and FoxPro. Microsoft Access was the first mass market

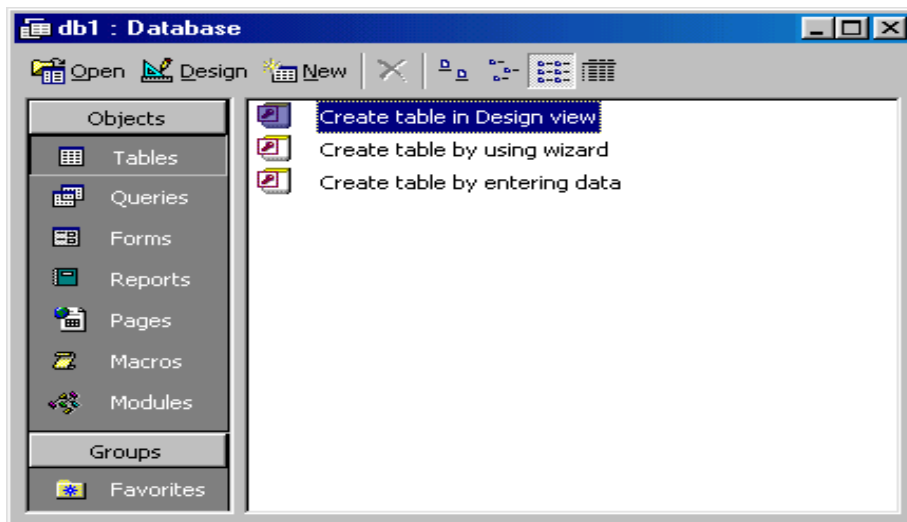
database program for Windows. With the purchase of FoxPro and incorporating its Rushmore query optimization routines into Access, Microsoft Access quickly became the dominant database for Windows effectively eliminating the competition which failed to transition from the MS-DOS world[1].

Access is a database program that stores information that can be manipulated, sorted, and filtered to meet your specific needs.

- A **database** is a collection of related information.
- An **object** is a competition in the database such as a table, query, form, or macro.
- A **table** is a grouping of related data organized in fields (columns) and records (rows) on a datasheet. By using a common field in two tables, the data can be combined. Many tables can be stored in a single database.
- A **field** is a column on a datasheet and defines a data type for a set of values in a table. For a mailing list table might include fields for first name, last name, address, city, state, zip code, and telephone number.
- A **record** in a row on a datasheet and is a set of values defined by fields. In a mailing list table, each record would contain the data for one person as specified by the intersecting fields.

Tables

Tables are grids that store information in a database similar to the way an Excel worksheet stores information in a workbook. Access provides three ways to create a table for which there are icons in the Database Window. Double-click on the icons to create a table.

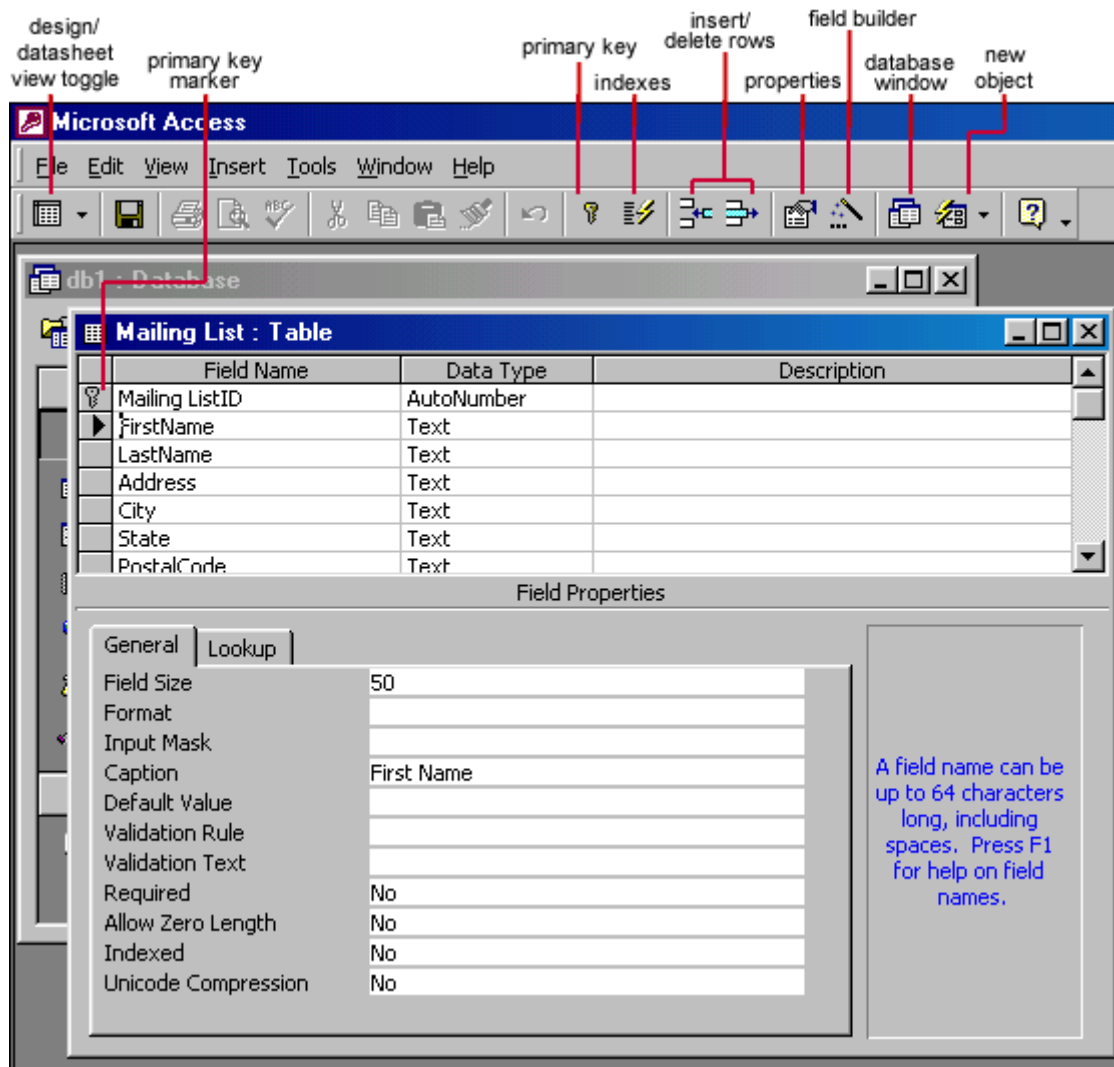


the Database Window

- **Create table in Design view** will allow you to create the fields of the table. This is the most common way of creating a table and is explained in detail below.
- **Create table using wizard** will step you through the creation of a table.
- **Create table by entering data** will give you a blank datasheet with unlabelled columns that looks much like an Excel worksheet. Enter data into the cells and click the **Save** button.

Creating a Table in Design View

Design View will allow you to define the fields in the table before adding any data to the datasheet. The window is divided into two parts: a top pane for entering the field name, data type, and an option description of the field, and a bottom pane for specifying field properties.



- **Field Name** - This is the name of the field and should represent the contents of the field such as "Name", "Address", "Final Grade", etc. The name can not exceed 64 characters in length and may include spaces.
- **Data Type** is the type of value that will be entered into the fields.

- **Text** - The default type, text type allows any combination of letters and numbers up to a maximum of 255 characters per field record.
 - **Memo** - A text type that stores up to 64,000 characters.
 - **Number** - Any number can be stored.
 - **Date/Time** - A date, time, or combination of both.
 - **Currency** - Monetary values that can be set up to automatically include a dollar sign (\$) and correct decimal and comma positions.
 - **AutoNumber** - When a new record is created, Access will automatically assign a unique integer to the record in this field
 - **Yes/No** - Use this option for True/False, Yes/No, On/Off, or other values that must be only one of two.
 - **OLE Object** - An OLE (Object Linking and Embedding) object is a sound, picture, or other object such as a Word document or Excel spreadsheet that is created in another program. Use this data type to embed an OLE object or link to the object in the database.
- **Description** (optional) - Enter a brief description of what the contents of the field are.
-

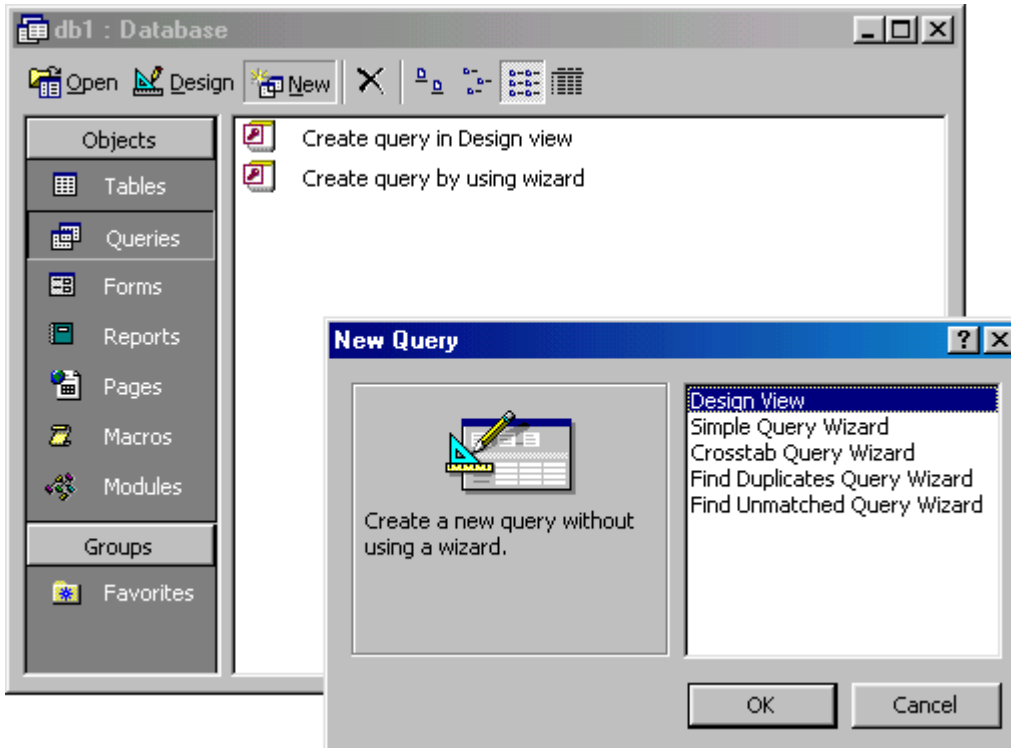
Queries

Queries select records from one or more tables in a database so they can be viewed, analyzed, and sorted on a common datasheet. The resulting collection of records, called a **dynaset** (short for dynamic subset), is saved as a database object and can therefore be easily used in the future. The query will be updated whenever the original tables are updated.

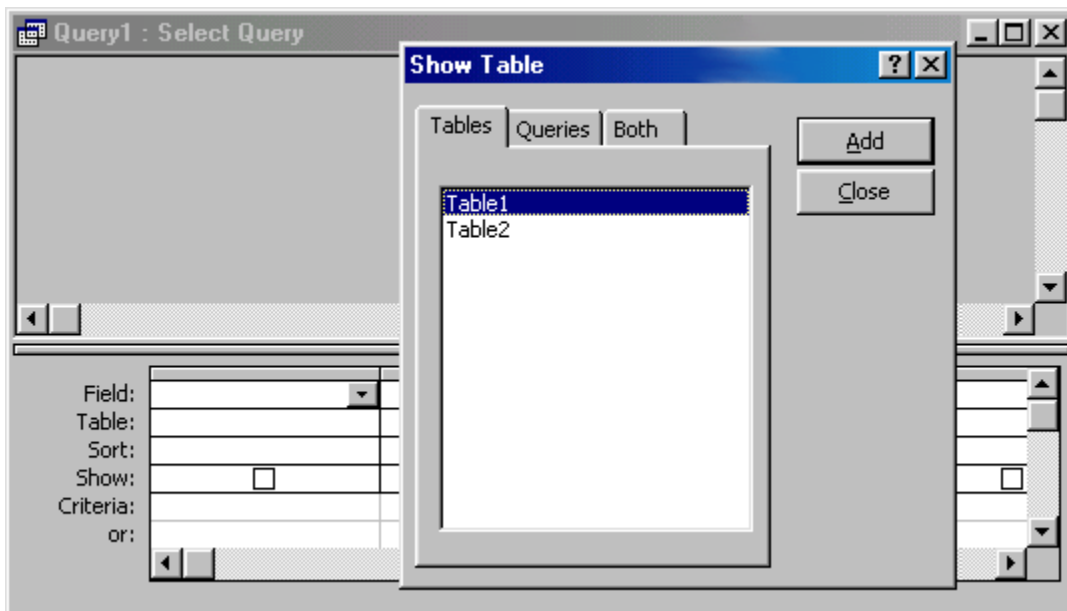
Creating a Query in Design View

Follow these steps to create a new query in Design View:

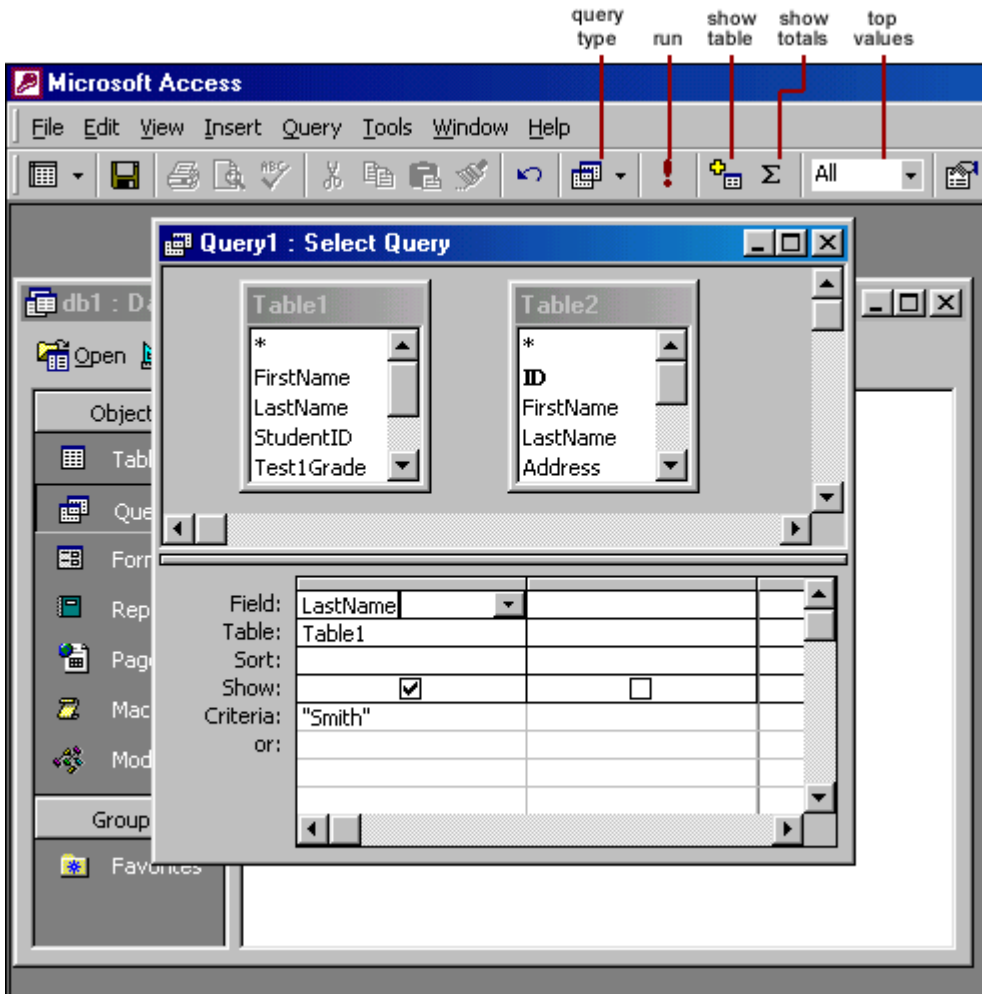
- From the Queries page on the Database Window, click the **New** button.




- Select Design View and click **OK**.
- Select tables and existing queries from the **Tables** and **Queries** tabs and click the **Add** button to add each one to the new query.
- Click **Close** when all of the tables and queries have been selected.



- Add fields from the tables to the new query by double-clicking the field name in the table boxes or selecting the field from the **Field:** and **Table:** drop-down menus on the query form. Specify sort orders if necessary.



- Enter the criteria for the query in the **Criteria:** field. The following table provides examples for some of the wildcard symbols and arithmetic operators that may be used. The **Expression Builder**  can also be used to assist in writing the expressions.

Query Wildcards and Expression Operators	
Wildcard / Operator	Explanation
? Street	The question mark is a wildcard that takes the place of a single letter.
43th *	The asterisk is the wildcard that represents a number of characters.
<100	Value less than 100
>=1	Value greater than or equal to 1
<>"FL"	Not equal to (all states besides Florida)

Between 1 and 10	Numbers between 1 and 10
Is Null Is Not Null	Finds records with no value or all records that have a value
Like "a*"	All words beginning with "a"
>0 And <=10	All numbers greater than 0 and less than 10
"Bob" Or "Jane"	Values are Bob or Jane

- After you have selected all of the fields and tables, click the **Run** button on the toolbar.
- Save the query by clicking the **Save** button.

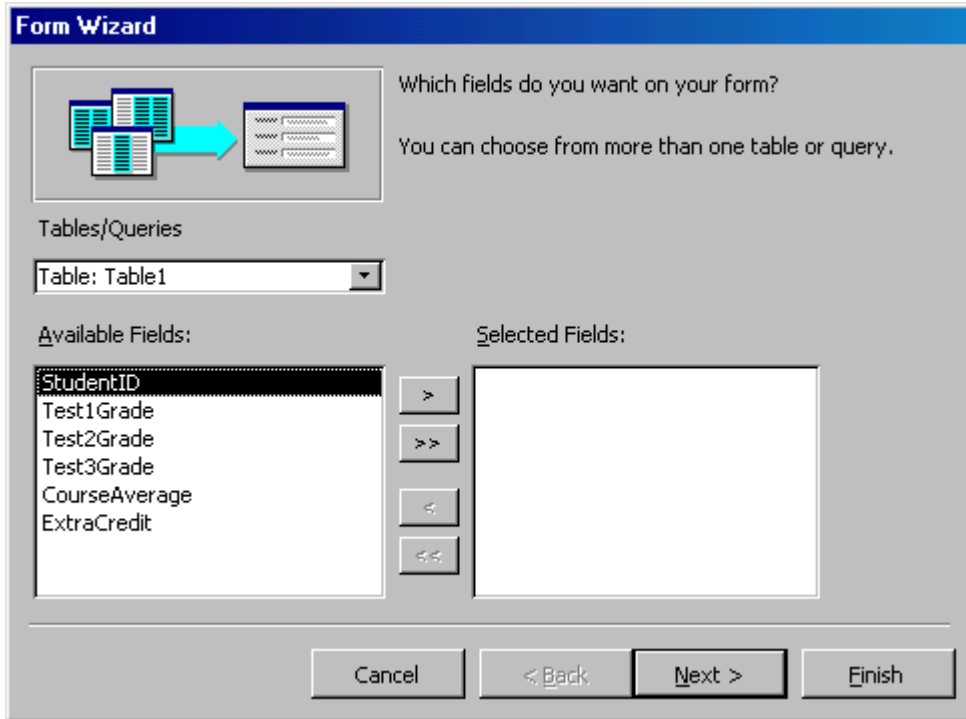
Forms

Forms are used as an alternative way to enter data into a database table.

Creating a Form by Using Wizard

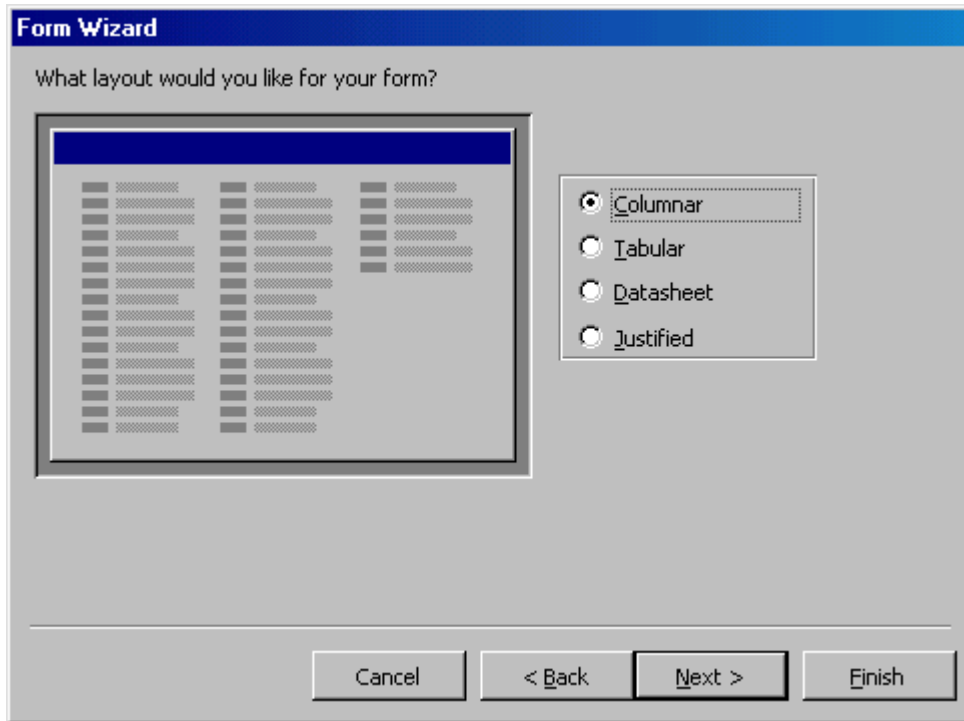
To create a form using the assistance of the wizard, follow these steps:

- Click the **Create form by using wizard** option on the database window.
- From the **Tables/Queries** drop-down menu, select the table or query whose datasheet the form will modify. Then, select the fields that will be included on the form by highlighting each one the **Available Fields** window and clicking the single right arrow button **>** to move the field to the **Selected Fields** window. To move all of the fields to Selected Fields, click the double right arrow button **>>**. If you make a mistake and would like to remove a field or all of the fields from the Selected Fields window, click the left arrow **<** or left double arrow **<<** buttons. After the proper fields have been selected, click the **Next >** button to move on to the next screen.

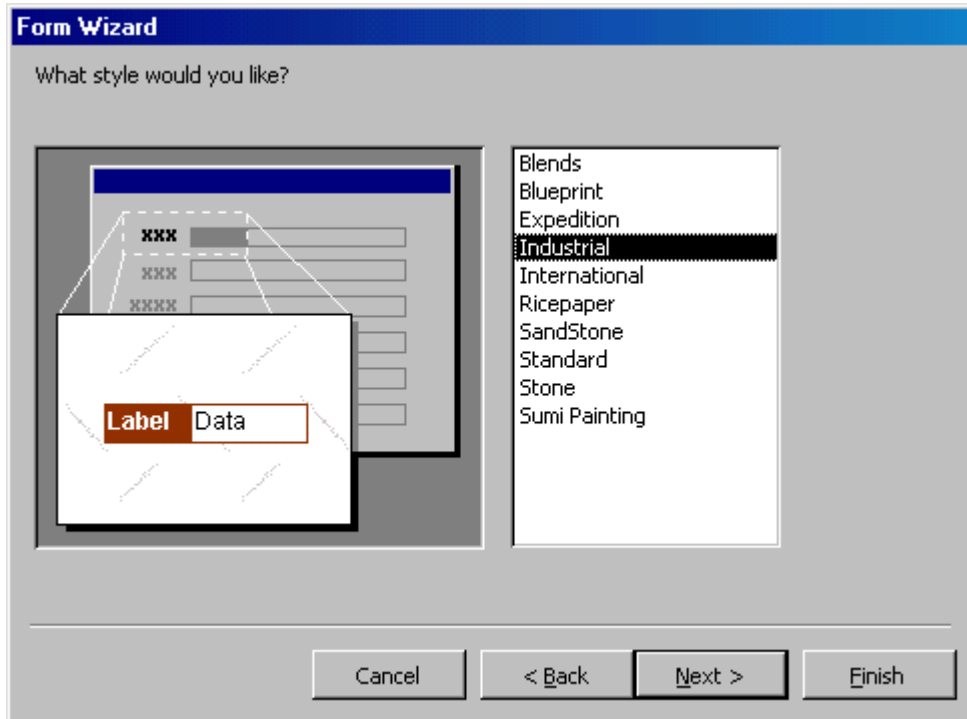


- On the second screen, select the layout of the form.
 - **Columnar** - A single record is displayed at one time with labels and form fields listed side-by-side in columns
 - **Justified** - A single record is displayed with labels and form fields are listed across the screen
 - **Tabular** - Multiple records are listed on the page at a time with fields in columns and records in rows
 - **Datasheet** - Multiple records are displayed in Datasheet View

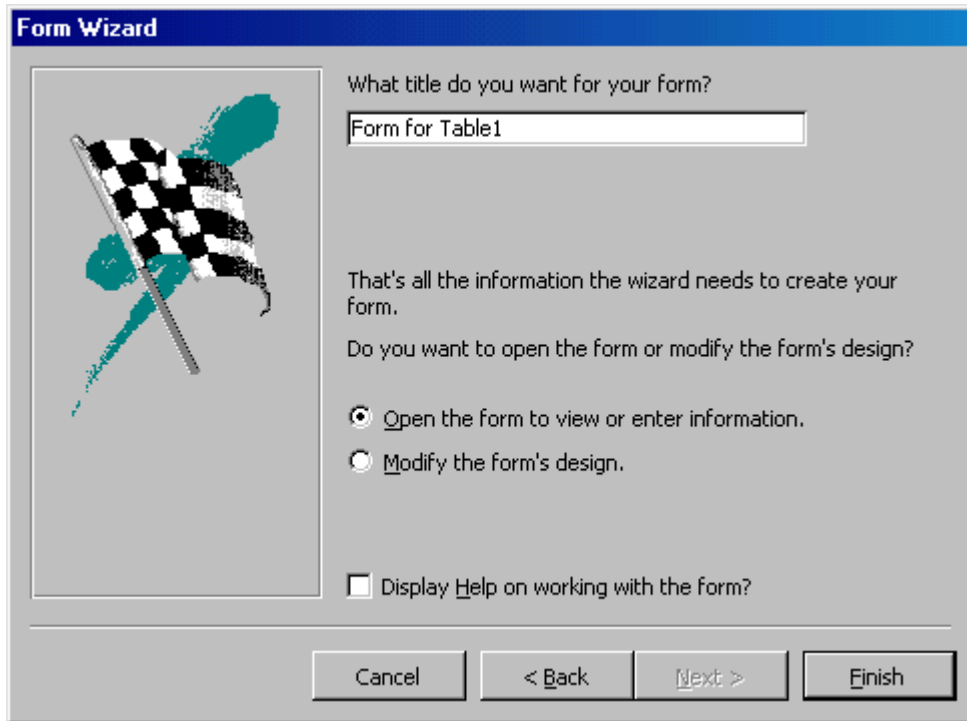
Click the **Next >** button to move on to the next screen.



- Select a visual style for the form from the next set of options and click **Next >**.



- On the final screen, name the form in the space provided. Select "Open the form to view or enter information" to open the form in Form View or "Modify the form's design" to open it in Design View. Click **Finish** to create the form.



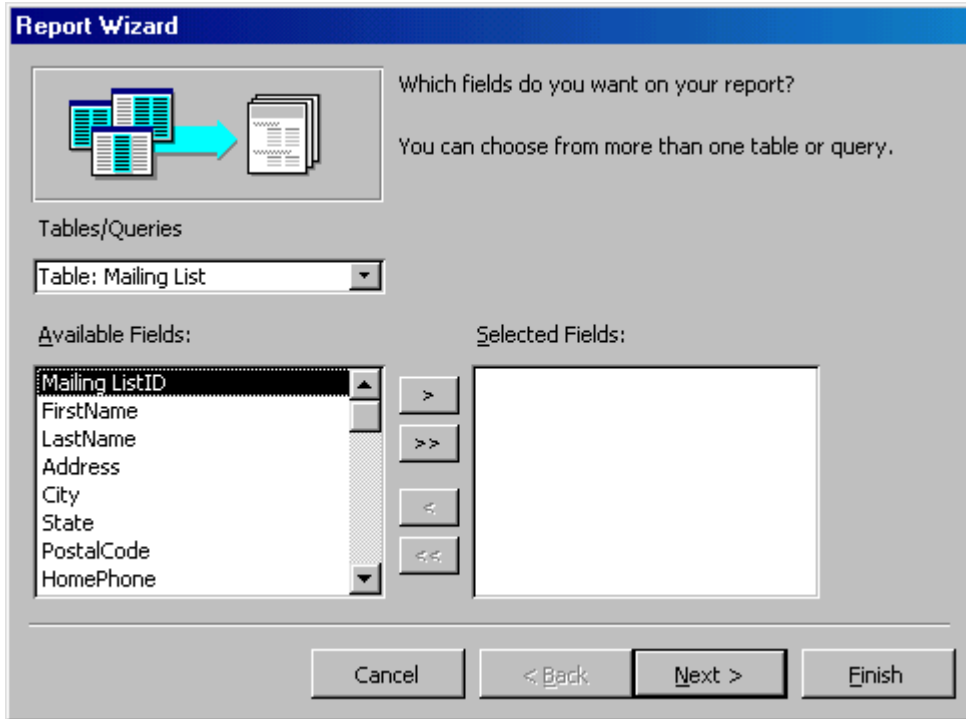
Reports

Reports will organize and group the information in a table or query and provide a way to print the data in a database.

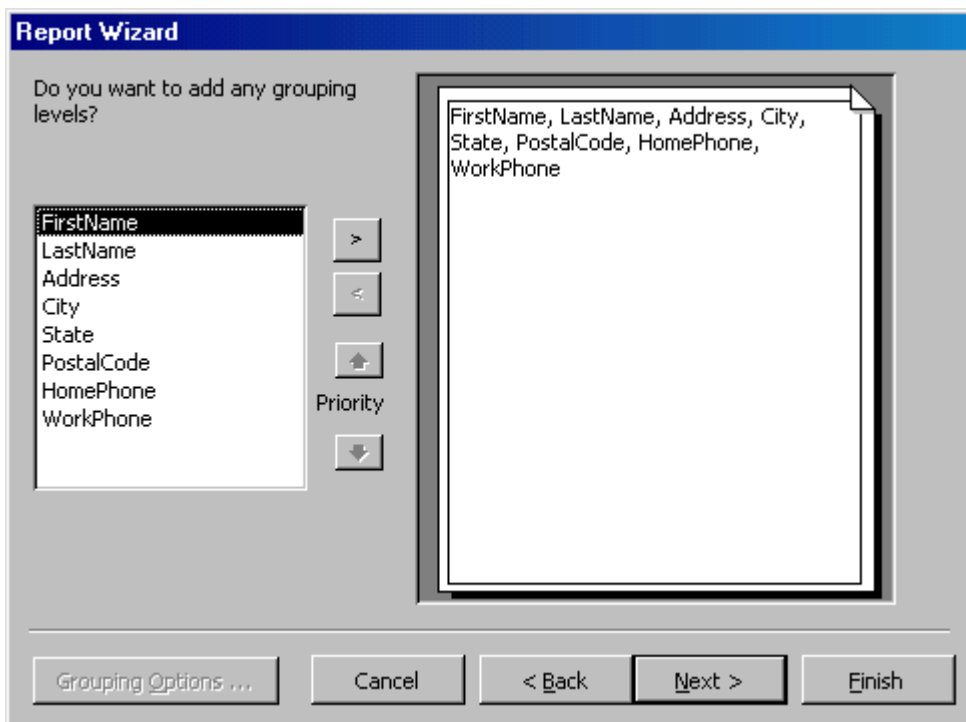
Creating a Report by Using the Wizard

Create a report using Access' wizard by following these steps:

- Double-click the "Create report by using wizard" option on the Reports Database Window.
- Select the information source for the report by selecting a table or query from the **Tables/Queries** drop-down menu. Then, select the fields that should be displayed in the report by transferring them from the **Available Fields** menu to the **Selected Fields** window using the single right arrow button > to move fields one at a time or the double arrow button >> to move all of the fields at once. Click the **Next >** button to move to the next screen.



- Select fields from the list that the records should be grouped by and click the right arrow button > to add those fields to the diagram. Use the **Priority** buttons to change the order of the grouped fields if more than one field is selected. Click **Next >** to continue.



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- If the records should be sorted, identify a sort order here. Select the first field that records should be sorted by and click the A-Z sort button to choose from ascending or descending order. Click **Next >** to continue.

Report Wizard

What sort order do you want for your records?

You can sort records by up to four fields, in either ascending or descending order.

1 LastName [A-Z] [Z-A]

2 FirstName [A-Z] [Z-A]

3 [A-Z] [Z-A]

4 [A-Z] [Z-A]

Buttons: Cancel, < Back, Next >, Finish

The dialog box shows a preview of a report with four columns labeled 1, 2, 3, and 4. The first two columns are highlighted in blue, indicating they are selected for sorting. The 'Next >' button is highlighted.

- Select a layout and page orientation for the report and click **Next >**.

Report Wizard

How would you like to lay out your report?

Layout:

- Columnar
- Tabular
- Justified

Orientation:

- Portrait
- Landscape

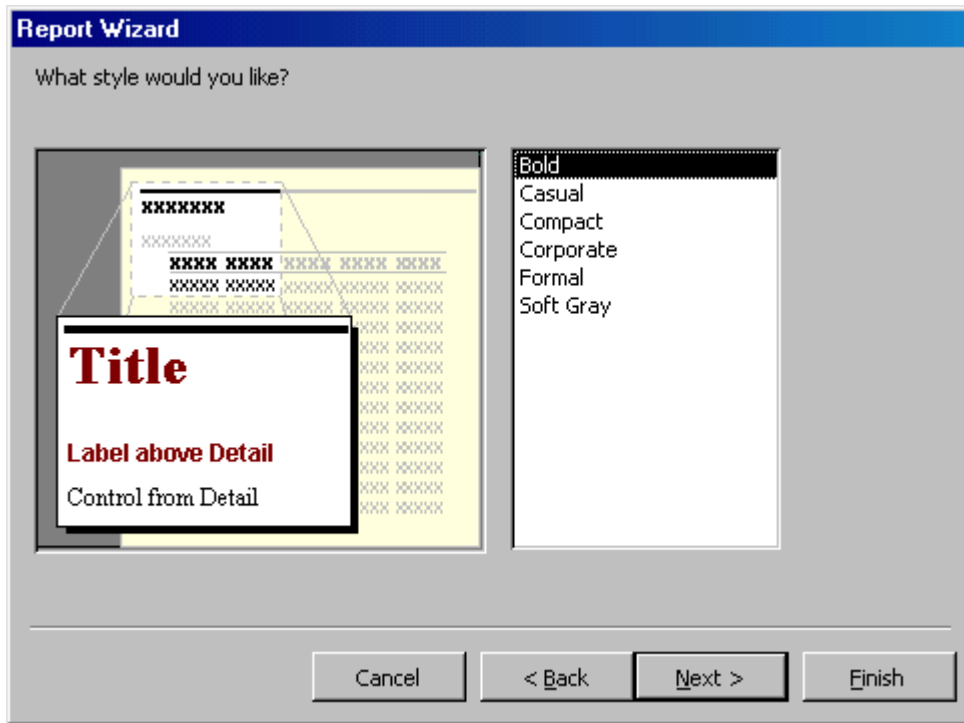
Adjust the field width so all fields fit on a page.

Buttons: Cancel, < Back, Next >, Finish

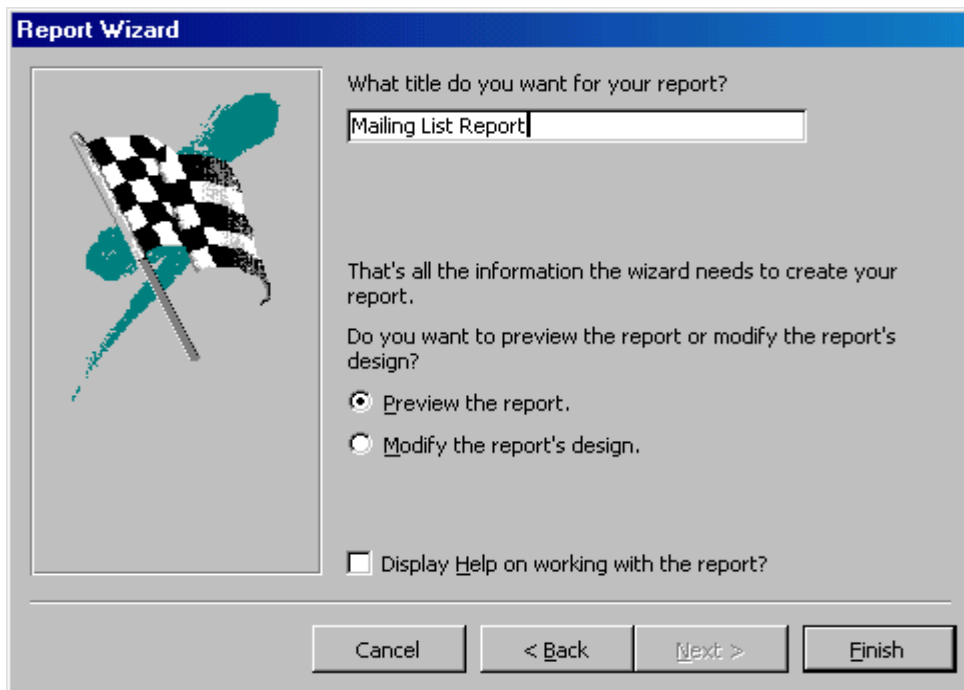
The dialog box shows a preview of a report with a single column of text. The 'Landscape' orientation is selected, and the 'Adjust the field width' checkbox is checked. The 'Next >' button is highlighted.

Information Technology Lab (MS Office)

- Select a color and graphics style for the report and click **Next >**.



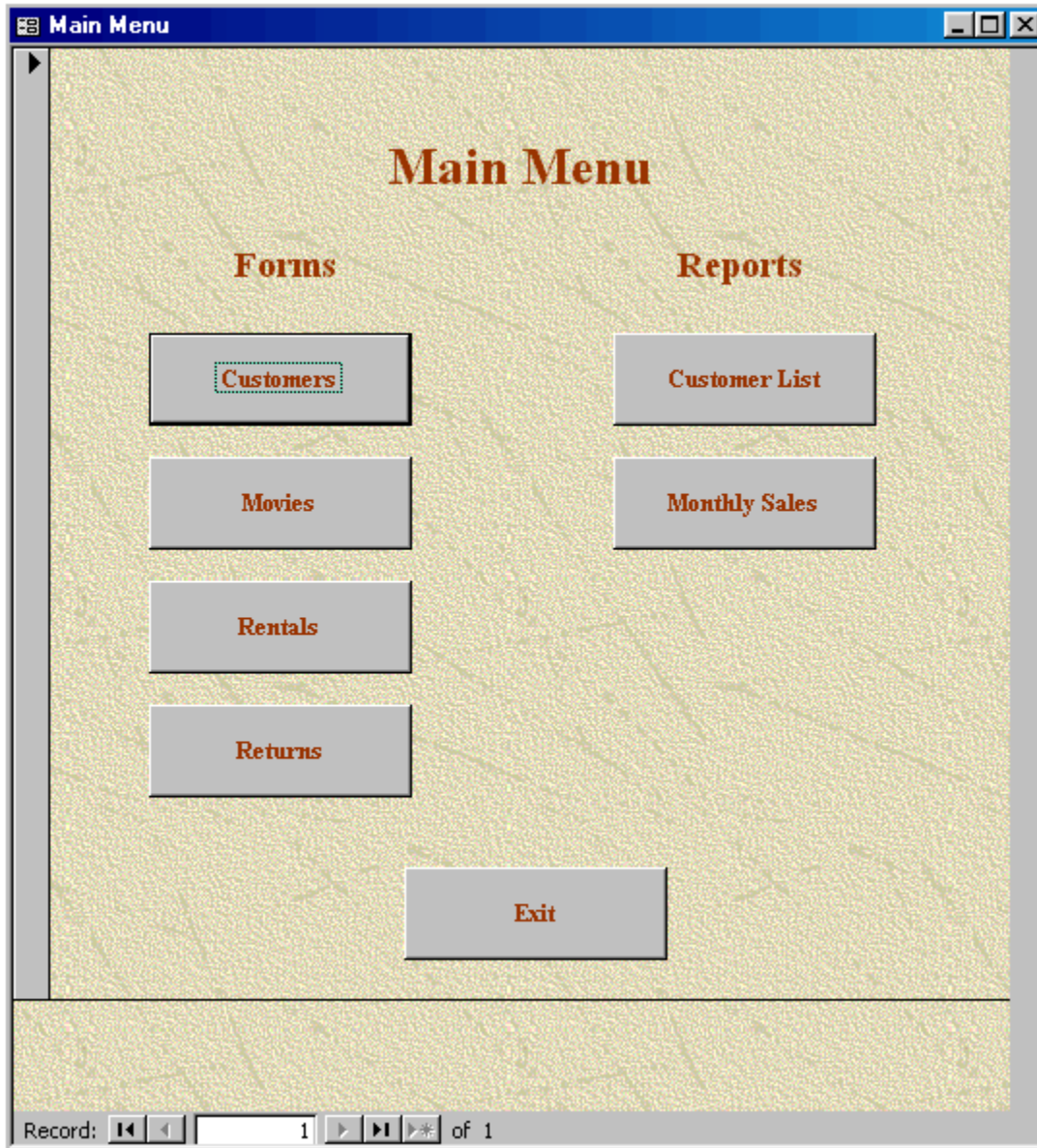
- On the final screen, name the report and select to open it in either Print Preview or Design View mode. Click the **Finish** button to create the report.



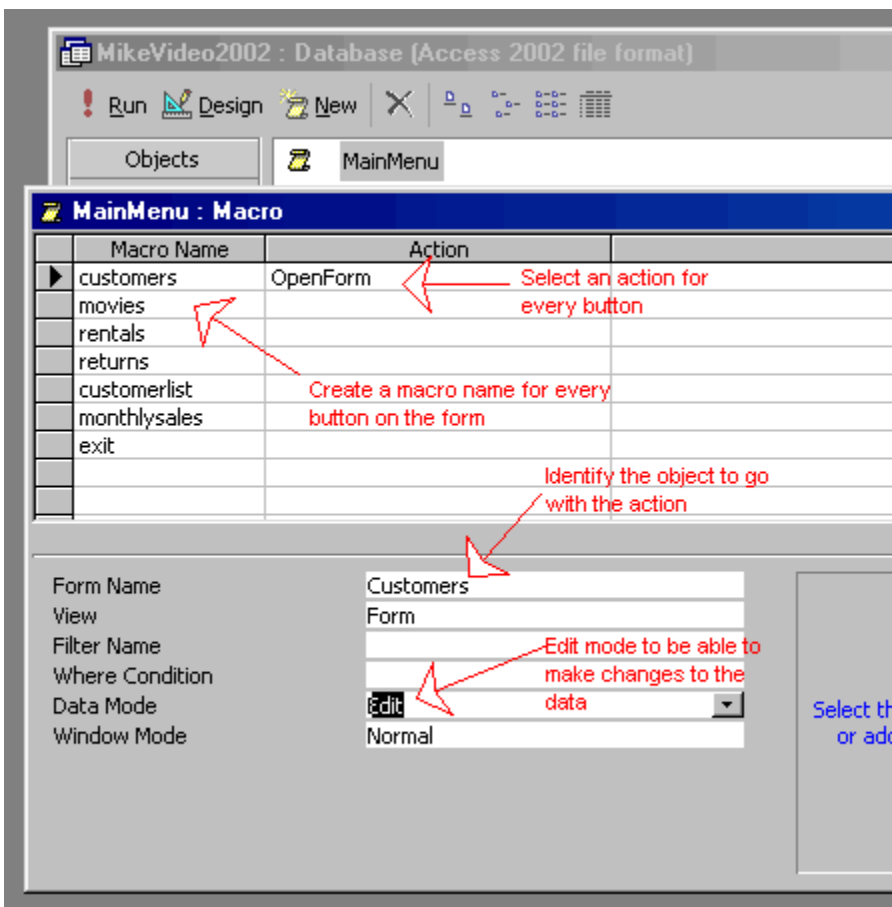
Macros

When you want to control the flow of activities in the [application](#) there are several ways you can go. We'll look at a couple of them.

First, if you don't want to use the Menu Manager discussed in the previous lesson, you can create your own menu using a simple form, as in the example below.



It's important to save the macro and name it. Give it the same name as the form it's on. That will simplify your life later. If you use macros you'll probably end-up with dozens in the application. Trust me: if you use names like macro1 and macro2 and so on, you'll tear your hair out later in trying to find what each one does. So, name the macro the same as the form it's on and name the actions inside the macro the same as the buttons.



MikeVideo2002 : Database [Access 2002 file format]

Run Design New

Objects MainMenu

MainMenu : Macro

Macro Name	Action	
customers	OpenForm	
movies	OpenForm	
rentals	OpenForm	
returns		
customerlist		
monthlysales		
exit		

For Rentals you Add Data Mode because you want the form to open on a blank page every time. You dont want to edit a Rental Form.

Form Name InvoiceMaster
View Form
Filter Name
Where Condition
Data Mode Add
Window Mode Normal

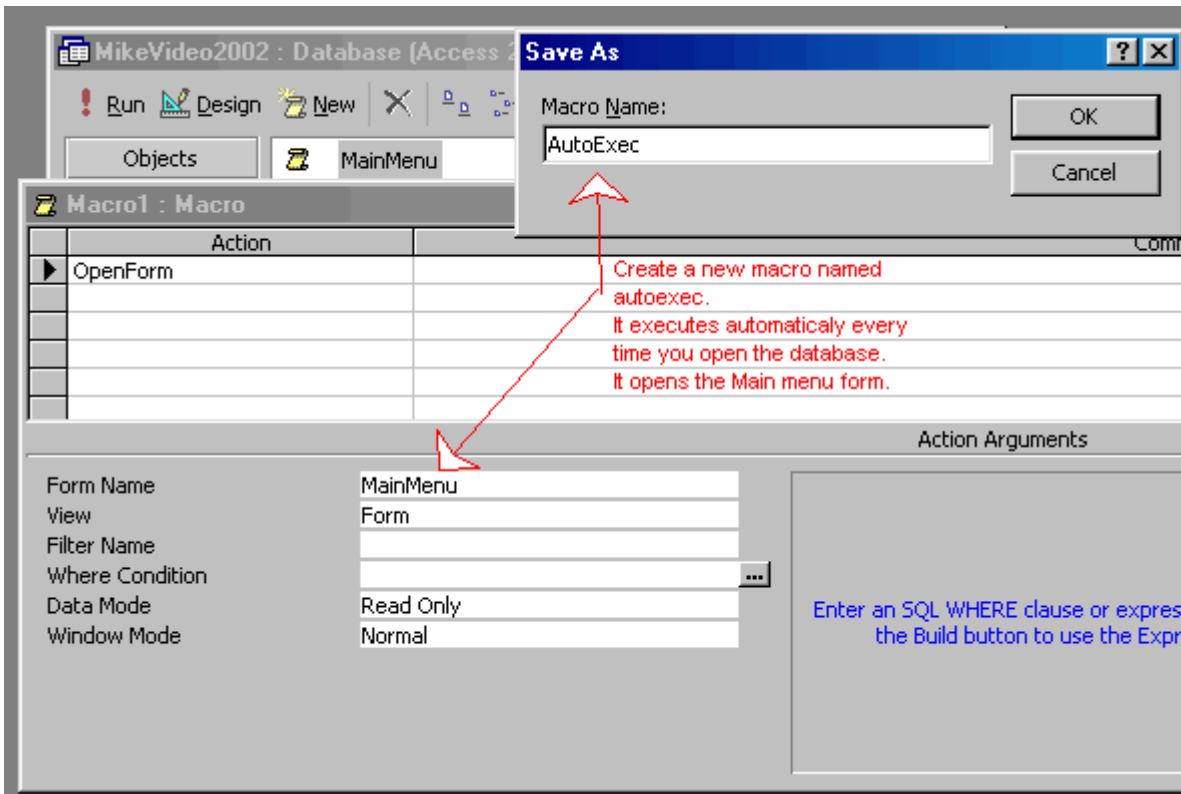
Opens

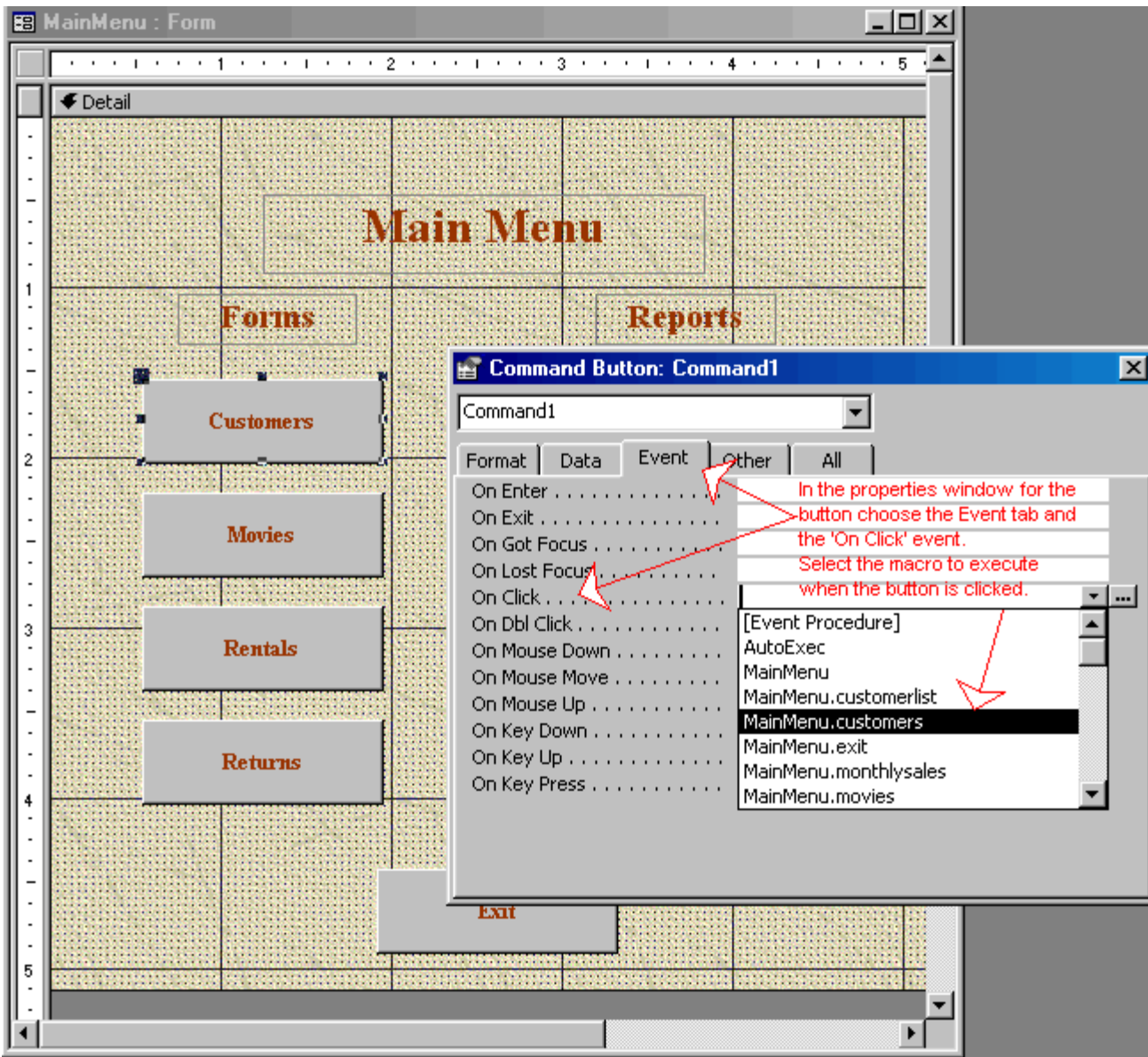
The screenshot shows the Microsoft Access Macro Designer interface. The title bar reads "MikeVideo2002 : Database (Access 2002 file format)". The menu bar includes "Run", "Design", and "New". The "Objects" pane shows "MainMenu". The main area is titled "MainMenu : Macro" and contains a table with the following data:

Macro Name	Action
customers	OpenForm
movies	OpenForm
rentals	OpenForm
returns	OpenForm
customerlist	OpenReport
monthlysales	OpenReport
exit	Quit

Red arrows point to the "OpenForm" action for "customerlist" and the "Quit" action for "exit". A red text box says: "Use the appropriate action for all other functions in the Menu".

Below the table, the "Options" pane is visible. A "Save All" button is highlighted with a red arrow. Red text below it reads: "Quit will Save all unsaved data close the database and exit Access. If you just want to close a form, use the Close action instead."





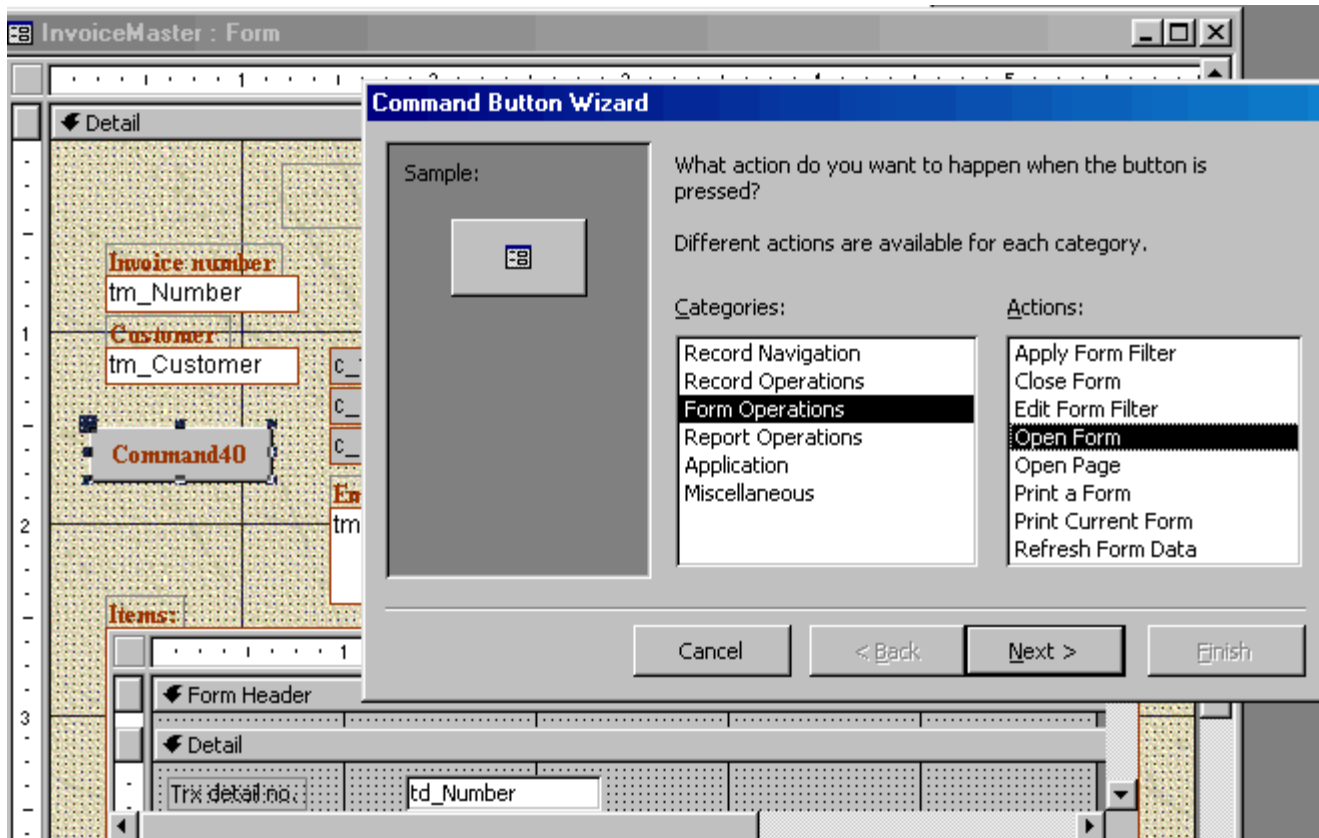
Macros can also be used to open a form from another form.

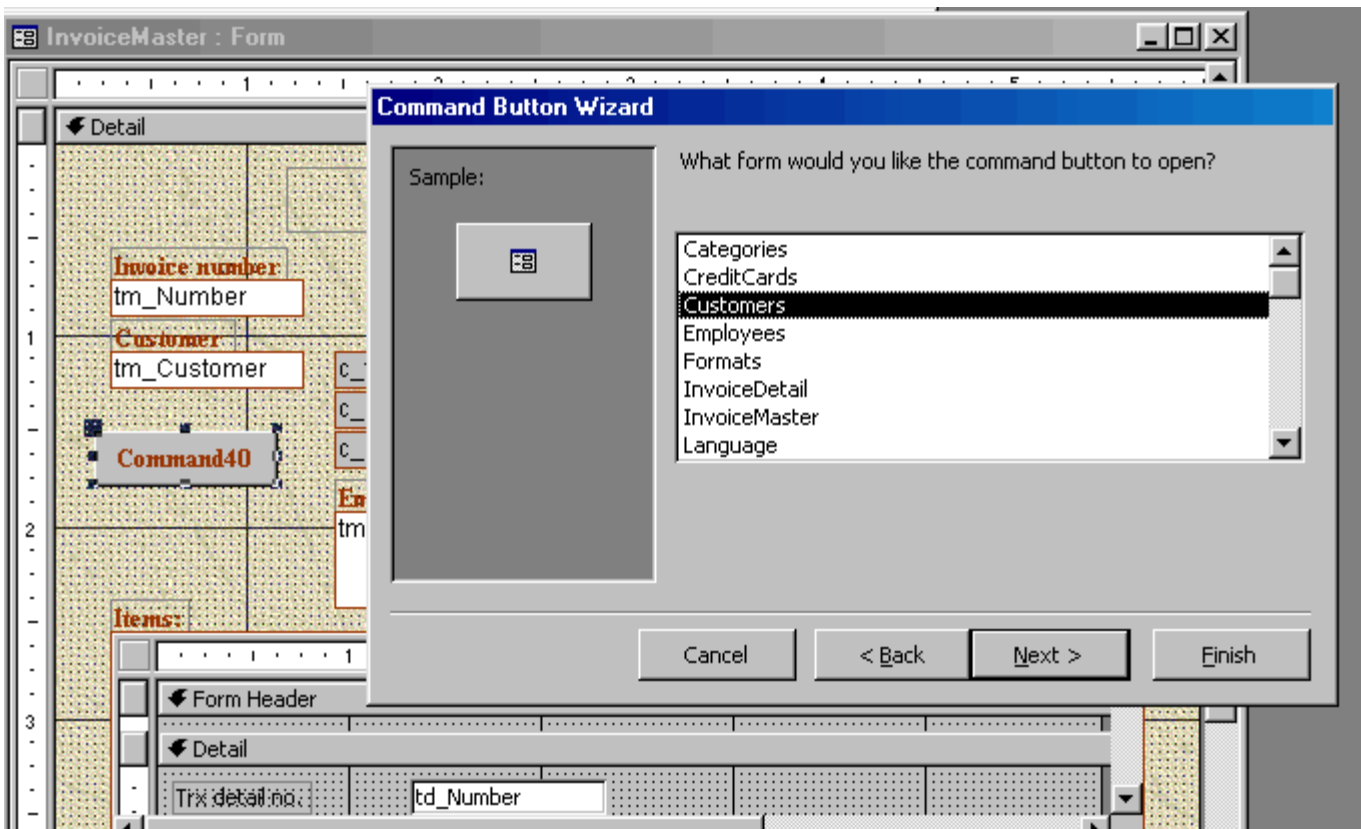
For example, if you have to change the customer's address while the customer is renting a movie, you don't do the change in the Invoice form. You call the Customers form from the Invoice form. The trick is to make sure that the Customers form that opens is the one for the customer who is on the invoice.

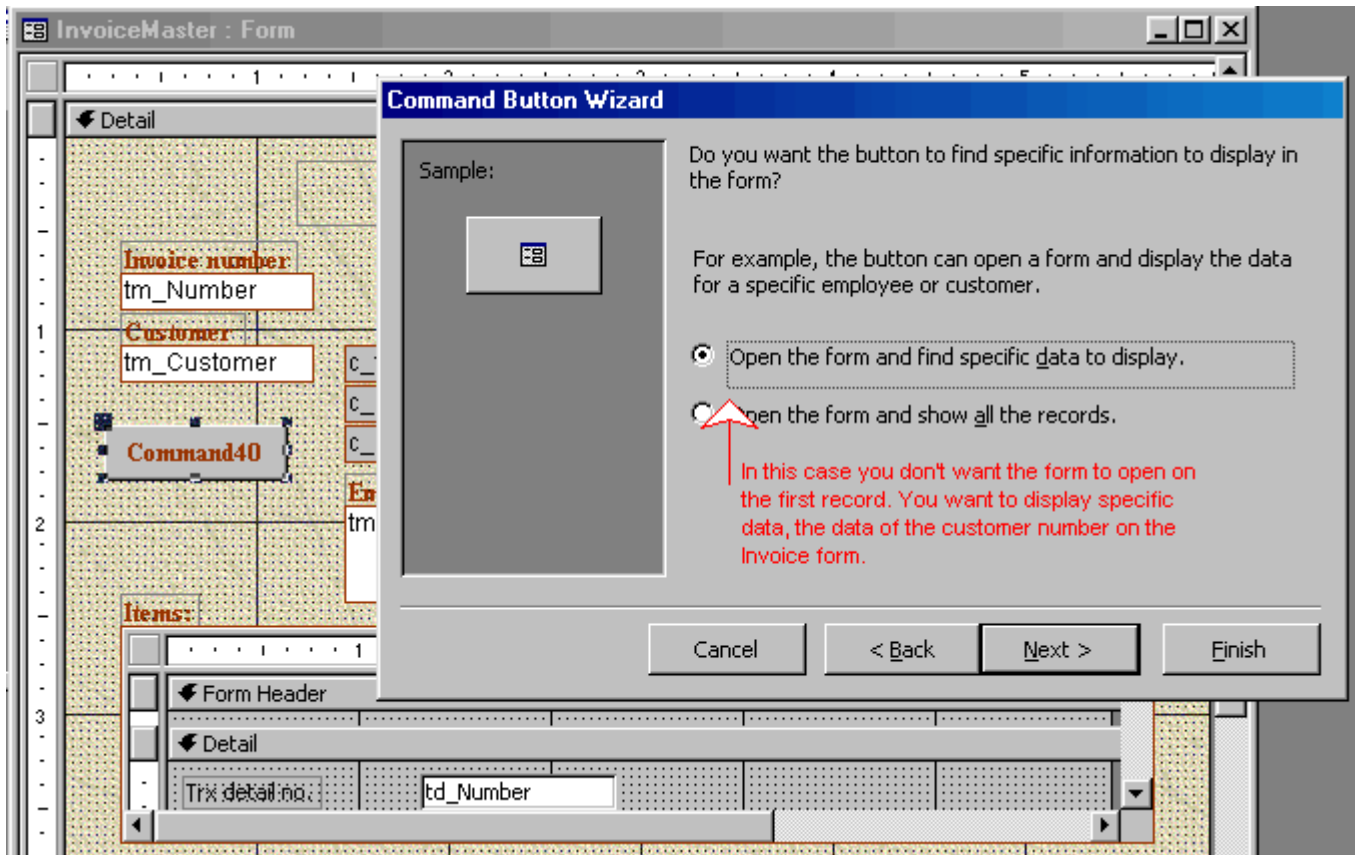
We could create a macro for that.

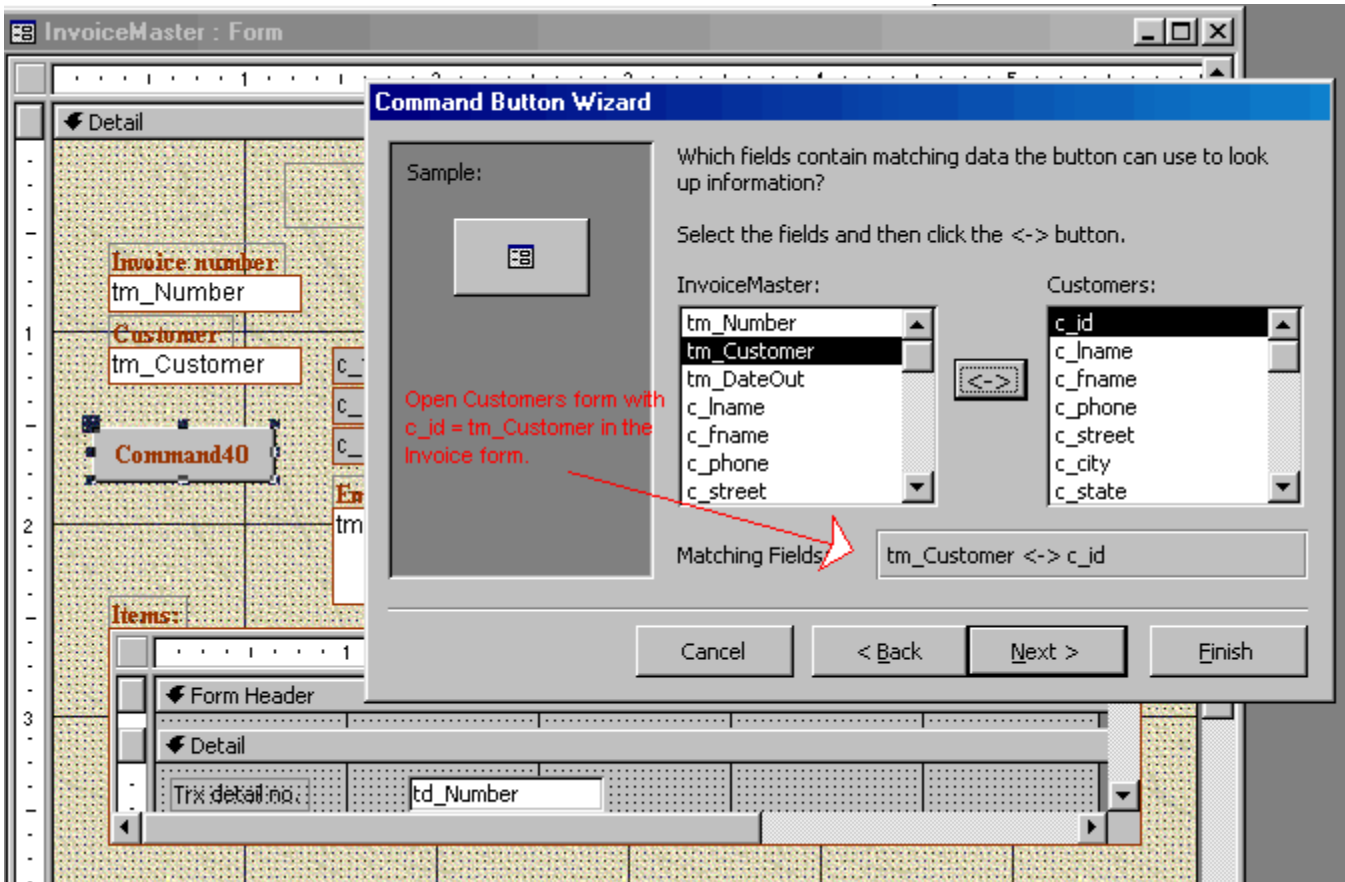
However, it's more easily done by using the Wizard. Make sure the Wizard is activated in the

Toolbox (the magic wand) and it will be called automatically when you create the button.









Invoice

Invoice number: 2
Date: 2003-02-02
Customer: 10
Phone: 415 986-7020

Customer Form

Customers

CUSTOMERS

Customer ID: 10
First name: Marjorie
Last name: Green
Address: 123 Main St., Oakland, CA 94618
Date of birth: 1947-06-07
Sex: F
Phone: 415 986-7020
email: cust@aol.com

Items:

Movie no.
5
7

Record: [Navigation buttons]

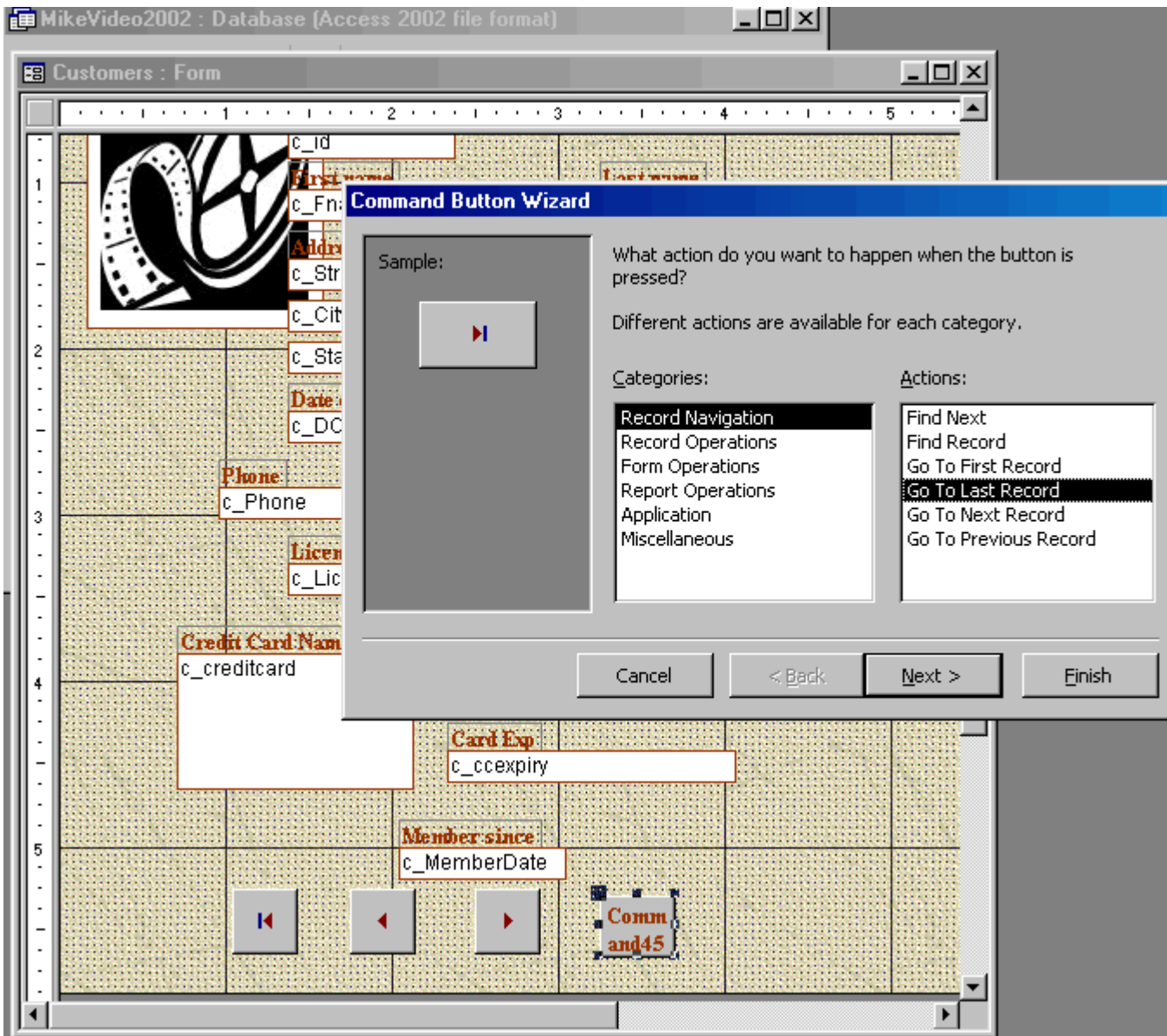
Correct form opened.

To change customer's address, use Customers form, not Invoice.

Finally, you should add navigation buttons to all forms.

You may have noticed that the navigation bar at the bottom of every form, although it is functional, it is small and hard to work. Adding navigation buttons makes it easier for the [user](#).

Every form should have the standard buttons: First, Previous, Next, Last, New record, Close form



Using reports

Reports are printed [documents](#) showing information from the [database](#).

Like forms, reports can be based on tables or queries. However, unlike forms, reports are for output only. Obviously, since they are output to the [printer](#), reports cannot accept input from the [user](#).

Creating the report

Before you launch the report editor, know where the information for the report is coming from.

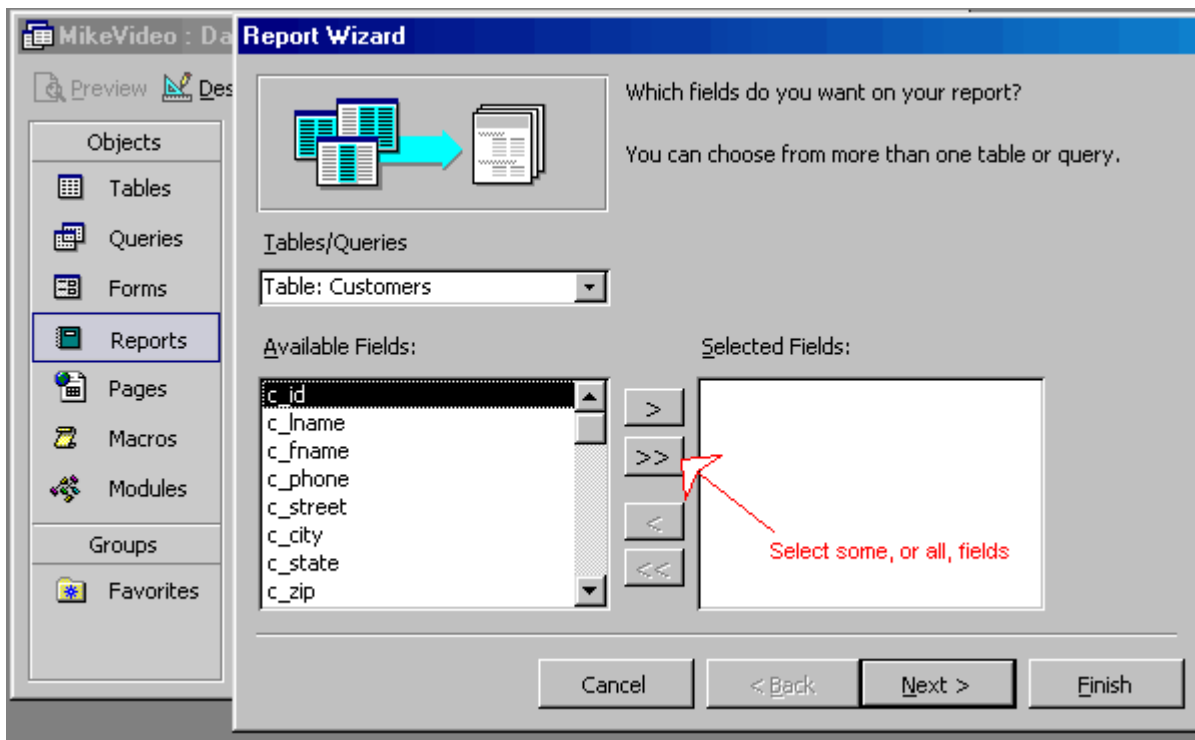
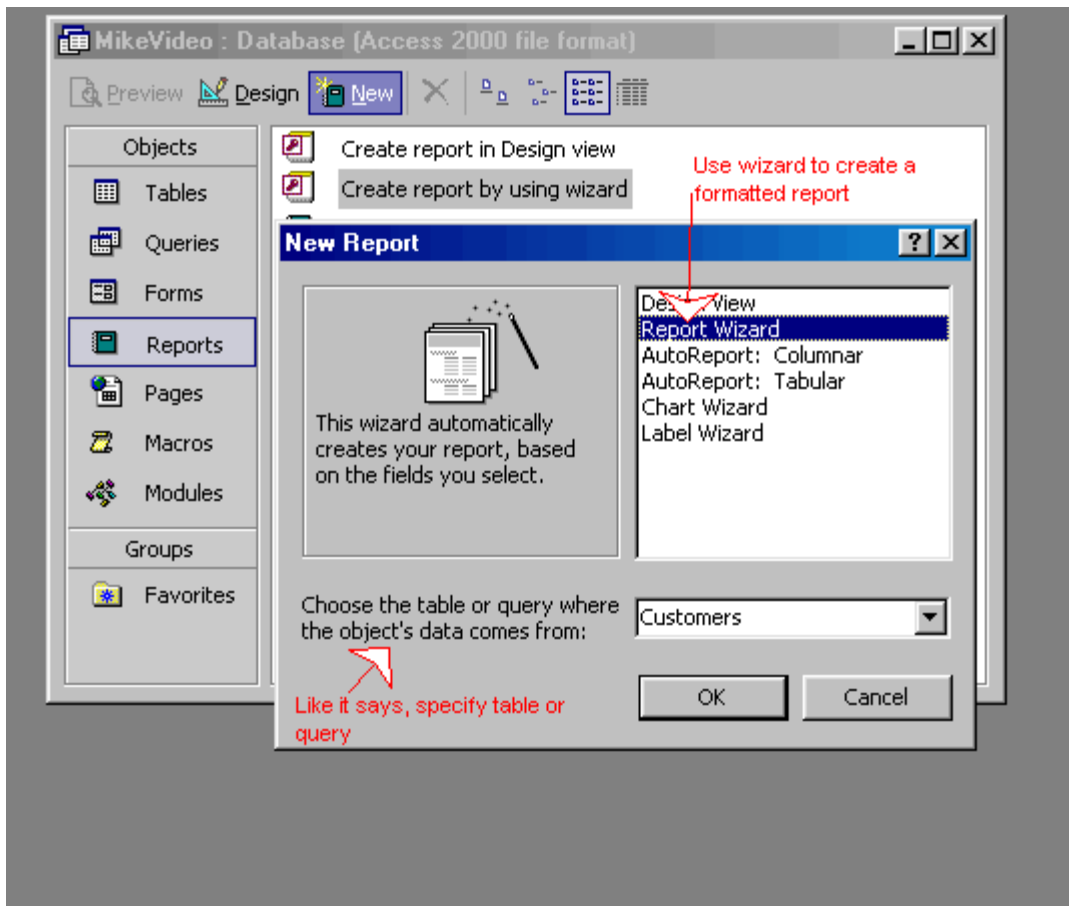
Actually it would be helpful to draw a draft on paper (with a pencil!) to show where to put the columns, how to align them, where to put totals, etc.

If the data is in several tables, you will first create a query to get everything together.

Using the Report wizard is the easiest way of building the report.

The normal form is called **tabular**, meaning that the information will appear as a table with headings at the top of the page.

For the first example we will print a simple list of customers.



Customer List

<i>c_id</i>	<i>c_lname</i>	<i>c_fname</i>	<i>c_ph</i>	<i>c_street</i>	<i>c_city</i>	<i>c_st</i>	<i>c_zip</i>	<i>c_email</i>	<i>mbdate</i>
1	Hunter1	Sheryl1	415 7	123 Main St.	Lawrence	KS	94301	cust@aol.com	1947-10-16
2	Straight1	Dean1	415 7	123 Main St.	Oakland	CA	94609	cust@aol.com	1950-07-12
3	Bennet1	Abraham1	415 7	123 Main St.	Berkeley	CA	94705	cust@aol.com	1953-04-07
4	Stringer1	Dirk1	415 7	123 Main St.	Oakland	CA	94609	cust@aol.com	1956-01-02
5	Karsen1	Livia1	415 6	123 Main St.	Oakland	CA	94609	cust@aol.com	1958-09-28
6	White3	Johnson2	408 6	123 Main St.	Merlo Par	CA	94025	cust@aol.com	1961-06-24
7	White	Johnson	408 4	123 Main St.	Merlo Par	CA	94025	cust@aol.com	1964-03-21
8	White4	Johnson3	408 7	123 Main St.	Merlo Par	CA	94025	cust@aol.com	1966-12-15

Page: 1

Editing the report

In design mode you can edit the layout of the report.

The first draft, created by the Wizard, needs some work. To fit all the columns on the page, some has to be shortened, etc.

Note that the important section is **Detail**. That's where the data is printed. Headers and footers contain headings and summaries.

The height of each section can be adjusted by clicking on the lower margin of the section.

You edit the contents of the headings, titles, etc. like on the form editor.

Report1 : Report

Report Header

Customer List

Page Header

<i>c_id</i>	<i>c_lname</i>	<i>c_fname</i>	<i>c_ph</i>	<i>c_street</i>	<i>c_city</i>	<i>c_sta</i>	<i>c_zip</i>	<i>c_email</i>	<i>memberdate</i>
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Detail

<i>c_id</i>	<i>c_lname</i>	<i>c_fname</i>	<i>c_ph</i>	<i>c_street</i>	<i>c_city</i>	<i>c_stat</i>	<i>c_zip</i>	<i>c_email</i>	<i>c_memberdate</i>
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Page Footer

=Now() = "Page " & [Page] & " of " & [Pages]

Report Footer

Report contains 4 sections:
Report Header will print once for entire report
Page header will print at top of every page
Page footer will print at bottom of every page
Detail prints once for every customer

The screenshot displays the Microsoft Report Builder interface for a report titled "Report1 : Report". The report is organized into several sections:

- Report Header:** Contains the title "Customer List" in a large, stylized font. Annotations indicate "Title has been moved to Page header" and "Headings have been corrected".
- Page Header:** Contains a table with columns: *Id*, *Name*, *Address*, *Phone*, *email*, and *Sign-up date*.
- Detail:** Contains a table with columns: *c_id*, *c_lname*, *c_fname*, *c_street*, *c_phone*, *c_email*, *c_memberdate*, *c_city*, *c_sta*, and *c_zip*. Annotations include "Section height can be adjusted by clicking on margin" (pointing to the left margin), "Line object from toolbox" (pointing to a horizontal line), and "Any white space you leave here will appear on report" (pointing to a white space in the table).
- Page Footer:** Contains the expression `=Now()` and the expression `= "Page " & [Page] & " of " & [Pages]`. Annotations include "Print today's date at bottom of every page" (pointing to `=Now()`) and "Print number of pages in report" (pointing to the page number expression).
- Report Footer:** A large grey area at the bottom of the report.

The interface includes a ruler at the top (pages 1-6) and a vertical ruler on the left (lines 1-2).