



Excel 1

Module 6 – Data Lists

Module Overview

In this module we will be looking at how to describe a database and view desired information contained within for optimal use.

Module Objectives:

- Learn terminology for parts of a database
- Learn how field names (headings) are used by Excel in databases
- Learn how lists and tables are databases
- Learn how to filter and sort only the information needed
- Learn how to freeze a section of the database in the current view

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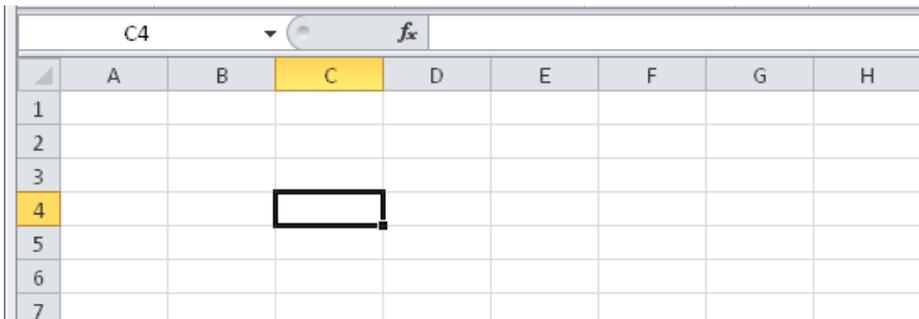
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1. Database Concepts

1.1. Database

A spreadsheet is a collection of rows and columns. In Microsoft Excel 2010 a spreadsheet can contain 16,384 columns and 1,048,576 rows of information. The columns are lettered A, B, C, etc., ending with XFD. The rows are numbered 1 through 1048576.

Every cell in the spreadsheet has an address created by combining the column letter with the row number. The cell C4 is the intersection of column C and row 4.



Follow Me

The Name Box

1. Open a blank spreadsheet.
2. Find the Name Box, above the column A header.
3. Watch the name box as you click around the various cells in the sheet. See that the letter of the column and number of the row you've selected appear in the name box, combined as the cell name.

A database is a collection of related information that is organized for a particular purpose. Examples of databases might include an address book, a store's inventory, information about a collection (art, music, coins, baseball cards) or a club membership list.

1.2. Records

The various pieces of information that relate to one individual or one item are called a database record. A record consists of multiple fields. If the database is designed for use as an address book, the field names might be First Name, Last Name, Address, City, State and Zip. The data entered in each field is called an entry.

| | A | B | C | D | E | F |
|---|------------------|-------------------|------------------|-------------|--------------|------------|
| 1 | Last Name | First Name | Street | City | State | Zip |
| 2 | Barrow | Ed | 319 N Washington | Hinsdale | IL | 60521 |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 | | | | | | |
| 6 | | | | | | |

For example, in this database:

| | |
|----------------|--|
| Database | Friends Addresses |
| Record | Barrow/Ed/319 N Washington/Hinsdale/IL/60521 |
| Field Name | First Name |
| Field or Entry | Ed |

1.3. Field Names

Excel only understands that you want to use it as a database because of certain patterns it sees as you enter data. The most important of these patterns is the creation of a header row.

| | A | B | C | D | E | F |
|---|------------------|-------------------|---------------|-------------|--------------|------------|
| 1 | Last Name | First Name | Street | City | State | Zip |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 | | | | | | |
| 6 | | | | | | |

Field Names

Look closely at the image above. How does Excel know that Street is a Field Name and not an Entry? How does Excel know that Hinsdale is an Entry and not a Field Name? You tell Excel by formatting the first row in a way which is significantly different from the rest of the entries. Here, Field Names are Bold and Red while Entries are Plain and Black.

Follow Me

Identify Field Names

1. Open a the Baseball Roster spreadsheet
2. Determine which cells contain the field names
3. Format the field names: Font Arial Black
4. Format the field names: Text Color Red

Also important is how you tell Excel what the boundaries of the database are. This is done by using empty cells. Excel first reads fields from left to right. When it encounters a completely empty column of cells it interprets that as the right edge of the database. Then it reads top to bottom. When it reaches a row of completely empty cells it interprets that as the bottom edge of the database. So you tell Excel about the size of the database by how you locate empty cells.

1.4. Fields

Before creating a database, determine the purpose served by the information. Then set the categories (Field Names) you will need in reports or that you want to use to sort or select specific records. Determining the scope focuses the information relevant to an individual or item in the database.

Think of yourself for a moment. There is address information associated with your name. But there is also financial, physical, work history, and lots of other kinds of information associated with your name. If all of it is put into a single database, the database would quickly become unmanageable.

Multi-dimensional databases are complicated in Excel. Setting boundaries makes Excel most effective. Useful categories depend on the database purpose. For some purposes it is enough to have a field name called Name. For other purposes you may want to have fields for First Name, Last Name, Title, etc. For example, if you wish to be able to use only the first name in the salutation of a letter, you would set up your database with separate first and last name fields. While it is possible to add Field Names after the fact, it is often very time consuming. A useful database reflects good planning.

Follow Me

Database planning

1. Think about developing an employee directory for your place of work.
2. What fields would be helpful to have in an employee directory?

1.5. List

If a database has only one column in it, Excel calls it a List. This is a one-dimensional database, topped with a field name (column header) and bottomed with an empty cell. Below is a list of members of a team.

| | A | B |
|----|---------------------|---|
| 1 | Team Members | |
| 2 | Bobby Applebee | |
| 3 | Jim Tensen | |
| 4 | Allison Markle | |
| 5 | Jennie Cruz | |
| 6 | Sandra O'Toole | |
| 7 | Simon Mansdorfer | |
| 8 | Trevor Cannon | |
| 9 | Daniel Rather | |
| 10 | Ben Hollings | |
| 11 | | |
| 12 | | |

1.6. Table

If a database has several columns, Excel calls it a Table. This is a two dimensional database, topped with a header row, bound on the right side by an empty column, bottomed by an empty row. Below is a table of team members and their positions.

These terms are useful if you ever have to query Help. Querying “database” in Help yields results

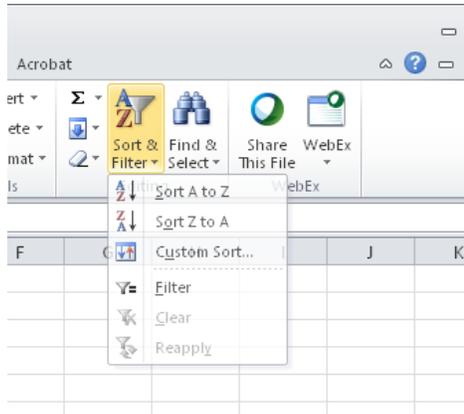
| | A | B | |
|----|---------------------|-----------------|--|
| 1 | Team Members | Position | |
| 2 | Bobby Applebee | Pitcher | |
| 3 | Jim Tensen | Catcher | |
| 4 | Allison Markle | First | |
| 5 | Jennie Cruz | Second | |
| 6 | Sandra O'Toole | Shortstop | |
| 7 | Simon Mansdorfer | Third | |
| 8 | Trevor Cannon | Right Field | |
| 9 | Daniel Rather | Center Field | |
| 10 | Ben Hollings | Left Field | |
| 11 | | | |
| 12 | | | |

about how Excel and Microsoft Access work together, rather than information on tables or lists.

2. Organizing Data

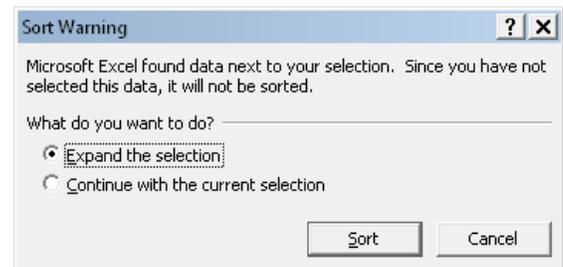
2.1. Sort

The information in a database can be sorted and records can be selected that match certain criteria. To sort information in a spreadsheet, first select the range of cells you want to sort. Second, select the Sort & Filter button on the Home tab, (Editing group) or the Sort command on the Data tab (Sort & Filter group).



Keep in mind, if you sort only one column without sorting the rest of the table, you will decouple that column from the others. Consider a name and address table like that shown earlier in the lesson. Sorting only column A results in decoupling last names from the other elements that make up the complete name and address – all of the information will become

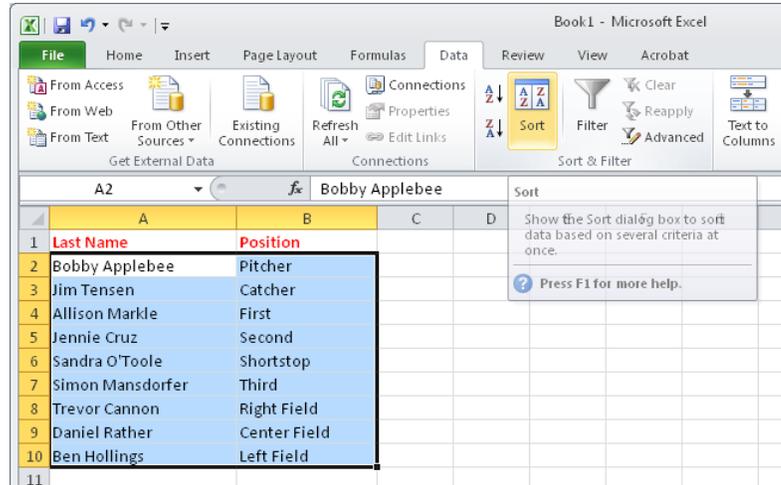
mismatched. This error occurs so often, Excel will issue a warning before it executes the sort.



| | |
|------------------|--|
| Follow Me | <p>Sort</p> <ol style="list-style-type: none"> 1. Open the Baseball Roster spreadsheet 2. Select all of the names of the team members 3. Click on Sort & Filter 4. Select Sort A to Z 5. Select Expand the selection to sort each player's position with their name. |
|------------------|--|

Most likely you want to sort all the columns of information together. Accepting the default option to *Expand the selection* is probably what you want. But Excel will only expand the selection to include columns which are touching (contiguous) and containing data. If your table contains a column which is empty, Excel interprets that column as a boundary of the table and the expansion will not include data in columns on the far side of that empty column. To prevent this, cancel the sort, reconsider what your intent is, possibly delete the empty column(s) and reselect the data to be sorted.

If you select a single cell in the table and then initiate the sort from the Data tab (Sort & Filter group), instead of the Sort Data/Filter button on the Home tab, Excel will highlight its interpretation of the table. It's a quick visual check to see if Excel is about to sort what you really want it to.



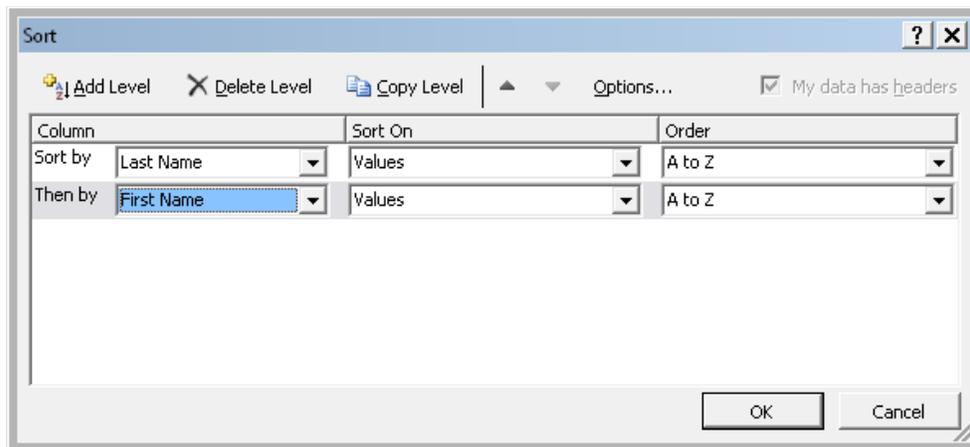
2.2. Custom Sort

For expanded or specific Sorting options, select Custom Sort from the Sort/Filter drop down menu in the home tab (Editing group).

If the table has column headers (Field Names) you can avoid sorting the titles with the other information by selecting the "My data has headers" check box. If the formatting of the header row is the same as the rest of the table then Excel will assume there is no header row and the default offered will be no header row.

The image below shows the Field Names Last Name and First Name, both to be sorted in ascending sequence.

Multiple levels of sort are possible using Custom Sort. The first priority sort is at the top of the dialog box. The next sort is performed second, and so on. To add additional levels of sorting, click on the "Add level" button.



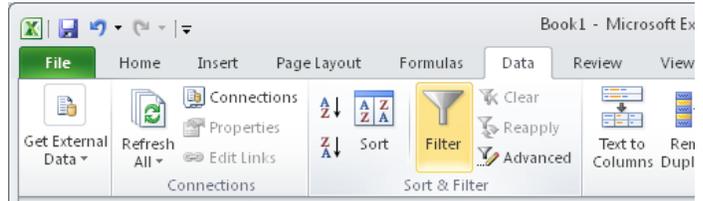
If the sort shown here were executed, the table would be sorted first name within last name just as a phone book is sorted. If there were no column headers used, the levels of sort would be based on Column A and Column B instead of column headers.

If the sort did not turn out as expected, remember you can always select the Edit Menu and Undo command to return the list to its original order.

2.3. Filter

It may be useful to narrow a very large spreadsheet down to a smaller portion of the data without seeing all the data that is not of interest. In fact, there are two methods, filtering the data and splitting the window. A filter lets you see only a portion of the data based on selection criteria. You set the filter criteria from the Sort & Filter button under the Home tab (Editing group) or the Data tab (Sort & Filter group).

AutoFilter is a toggle switch, selected (on) or not selected (off).



When AutoFilter is On, it puts a drop down menu at the top of every column in the database. If you click on a drop down arrow, all the different values in that column are shown. You can then select from that menu to display only the records containing a particular value or values.

| | A | B | C | D | E | F |
|---|------|--------------------------------|-----------------|----------|--------|---|
| 1 | Year | Title | Star | Genre | Studio | |
| 2 | 1939 | ADVENTURES OF HUCKLEBERRY FINN | ROONEY, MICKEY | Family | MGM | |
| 3 | 1939 | ADVENTURES OF JANE ARDEN, THE | GARGAN, WILLIAM | Suspense | RKO | |
| 4 | 1939 | ADVENTURES OF SHERLOCK HOLMES | RATHBONE, BASIL | Suspense | 20TH | |
| 5 | 1939 | ALLEGHENY UPRISING | WAYNE, JOHN | Western | RKO | |
| 6 | 1939 | ANDY HARDY GETS SPRING FEVER | ROONEY, MICKEY | Comedy | MGM | |
| 7 | 1939 | ANGELS WASH THEIR FACES, THE | REAGAN, RONALD | Drama | WB | |
| 8 | 1939 | ANOTHER TWIN MAN | DOMELL, WILLIAM | Suspense | MGM | |

The images below show a database of movies with AutoFilter selected, and then the same movie database filtered for the Star “Lucille Ball.” Note that the row numbers where “Lucille Ball” is found are also shown.

| | A | B | C | D | E | F |
|-----|------|----------------------------|---------------|-----------|--------|---|
| 1 | Year | Title | Star | Genre | Studio | |
| 46 | 1939 | FIVE CAME BACK | BALL, LUCILLE | Adventure | RKO | |
| 194 | 1940 | DANCE, GIRL, DANCE | BALL, LUCILLE | Drama | RKO | |
| 315 | 1940 | THAT'S RIGHT, YOU'RE WRONG | BALL, LUCILLE | Musical | RKO | |
| 322 | 1940 | TOO MANY GIRLS | BALL, LUCILLE | Musical | RKO | |
| 331 | 1940 | YOU CAN'T FOOL YOUR WIFE | BALL, LUCILLE | Comedy | RKO | |
| 333 | | | | | | |
| 334 | | | | | | |
| 335 | | | | | | |

Follow Me

Filter

1. Open the Movies spreadsheet
2. Click on Sort & Filter
3. Select Filter. Notice that dropdown arrows appear for each field name
4. Click on the dropdown for “Genre”
5. Uncheck Select All and Check Comedy
6. Click OK
7. Click on the dropdown for “Studio”
8. Uncheck Select All and Check MGM

| | A | B | C | D | E |
|-----|------|------------------------------|----------------|--------|--------|
| 1 | Year | Title | Star | Genre | Studio |
| 6 | 1939 | ANDY HARDY GETS SPRING FEVER | ROONEY, MICKEY | Comedy | MGM |
| 9 | 1939 | AT THE CIRCUS | MARX, GROUCHO | Comedy | MGM |
| 33 | 1939 | DANCING CO ED | TURNER, LANA | Comedy | MGM |
| 44 | 1939 | FAST & FURIOUS | SOTHERN, ANN | Comedy | MGM |
| 65 | 1939 | IDIOT'S DELIGHT | GABLE, CLARK | Comedy | MGM |
| 70 | 1939 | IT'S A WONDERFUL WORLD | STEWART, JAMES | Comedy | MGM |
| 74 | 1939 | JUDGE HARDY AND SON | ROONEY, MICKEY | Comedy | MGM |
| 83 | 1939 | LUCKY NIGHT | LOY, MYRNA | Comedy | MGM |
| 85 | 1939 | MAISIE | SOTHERN, ANN | Comedy | MGM |
| 100 | 1939 | NINOTCHKA | GARBO, GRETA | Comedy | MGM |
| 110 | 1939 | REMEMBER? | TAYLOR, ROBERT | Comedy | MGM |
| 136 | 1939 | THESE GLAMOUR GIRLS | TURNER, LANA | Comedy | MGM |

| | |
|------------------|--|
| Follow Me | <p>Clear Filters</p> <ol style="list-style-type: none"> 1. Click on the Genre dropdown 2. Click on the dropdown for “Genre” 3. Select Clear filter from Genre 4. Click on the dropdown for “Studio” 5. Select Clear filter from Studio |
|------------------|--|

2.4. Count

| | A | B | C | D |
|-----|------|--------------------------------|-------------------|-------|
| 1 | Year | Title | Star | |
| 2 | 1939 | ADVENTURES OF HUCKLEBERRY FINI | ROONEY, MICKEY | Famil |
| 3 | 1939 | ADVENTURES OF JANE ARDEN, THE | GARGAN, WILLIAM | Susp |
| 4 | 1939 | ADVENTURES OF SHERLOCK HOLME | RATHBONE, BASIL | Susp |
| 5 | 1939 | ALLEGHENY UPRISING | WAYNE, JOHN | West |
| 6 | 1939 | ANDY HARDY GETS SPRING FEVER | ROONEY, MICKEY | Come |
| 7 | 1939 | ANGELS WASH THEIR FACES, THE | REAGAN, RONALD | Dram |
| 8 | 1939 | ANOTHER THIN MAN | POWELL, WILLIAM | Susp |
| 9 | 1939 | AT THE CIRCUS | MARX, GROUCHO | Come |
| 10 | 1939 | BABES IN ARMS | GARLAND, JUDY | Music |
| 11 | 1939 | BACHELOR MOTHER | ROGERS, GINGER | Come |
| 12 | 1939 | BAD LITTLE ANGEL | WEIDLER, VIRGINIA | Music |
| 10R | 1939 | BALALAIKA | EDDY, NELSON | Music |
| 14 | 1939 | BARRICADE | FAYE, ALICE | Adver |
| 15 | 1939 | BEAU GESTE | COOPER, GARY | Actio |

Excel performs some basic counting functions to provide some additional information which may be helpful if the user knows where to look.

Excel counts the number of rows as you select them. As seen below, the number of rows selected is shown by the final row number. “10R” indicates that ten rows are selected.

The same functionality applies to columns.

In the image below, some cells are selected. In the status bar, Excel gives the average of all of the numerical values in the selected cells, the number of cells selected, and the sum of all of the values in the cells. Here, those are 115.18, 11, and 1267, respectively.

| | | | | | | | | | | |
|----|---------------------------------|---------|----------|-------|-------|-----|------|------|--------|-----------|
| 1 | The Watson's 1999 Yearly Budget | | | | | | | | | |
| 2 | Expenses: | | | | | | | | | |
| 3 | | January | February | March | April | May | June | July | August | September |
| 4 | Rent | 400 | 400 | 400 | 400 | 400 | | | 200 | |
| 5 | Phone | 60 | 60 | 60 | 60 | 60 | | | 60 | |
| 6 | Entertainment | 60 | 60 | 60 | 60 | 60 | | | 60 | |
| 7 | Church | 100 | 10 | 10 | 10 | 10 | | | 100 | |
| 8 | Food | 200 | 200 | 200 | 200 | 200 | | | 75 | |
| 9 | Dues | | 20 | | 20 | | | | 20 | |
| 10 | Hygiene | 9 | | 9 | | 9 | | | | |
| 11 | Clothes | 150 | 20 | 20 | 20 | 20 | | | 150 | |
| 12 | Utilities | 85 | 85 | 70 | 65 | 90 | 120 | 180 | 175 | |
| 13 | Car Payment | 123 | 123 | 123 | 123 | 123 | | | 123 | |
| 14 | Auto Insurance | 50 | 50 | 50 | 50 | 50 | | | 50 | |
| 15 | Gasoline | 30 | 30 | 30 | 30 | 30 | | | 30 | |
| 16 | Repairs | | 15 | | 15 | | | | 15 | |

Ready | Average: 115.1818182 | Count: 11 | Sum: 1267 | 100%

Follow Me**Count selection**

1. With the movies spreadsheet open
2. Filter the spreadsheet by Comedy and MGM
3. Select the names of the movies in column B that are from 1939
4. Look to the status bar to see how many Comedy movies were made by MGM studios in 1939. (12!)

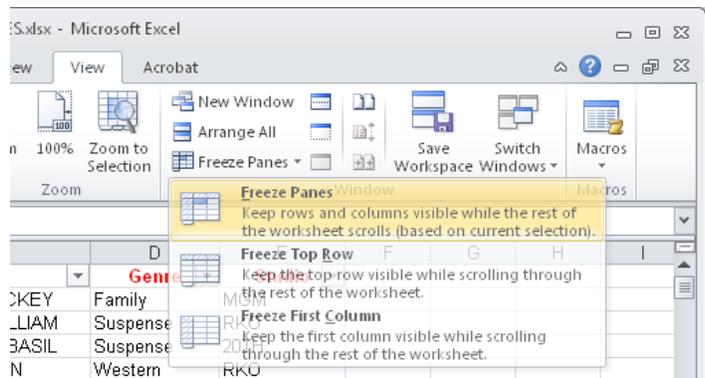
| | | | | | |
|-----|------|----------------------------|-------------------|--------|-----|
| 83 | 1939 | LUCKY NIGHT | LOY, MYRNA | Comedy | MGM |
| 85 | 1939 | MAISIE | SOTHERN, ANN | Comedy | MGM |
| 100 | 1939 | NINOTCHKA | GARBO, GRETA | Comedy | MGM |
| 110 | 1939 | REMEMBER? | TAYLOR, ROBERT | Comedy | MGM |
| 135 | 1939 | THESE GLAMOUR GIRLS | TURNER, LANA | Comedy | MGM |
| 162 | 1940 | ANDY HARDY MEETS DEBUTANTE | ROONEY, MICKEY | Comedy | MGM |
| 169 | 1940 | BELOVED BRAT | GRANVILLE, BONITA | Comedy | MGM |

Ready 26 of 331 records found Count: 12 100%

Also in the Status bar, on the left hand side next to the word “Ready”, you can see the results of your filters. In this case, out of a total of 331 records in the Movie table, 26 records met the criteria of Genre = Comedy and Studio = MGM.

3. Freeze Panes

Often when you are working many rows or columns deep in a spreadsheet you can no longer see the headers of columns and rows. It is helpful to “freeze” the row and column titles in their respective places and use them as a guide when you are entering data. Excel provides a command called Freeze Panes located on the View Tab (Window group).



Horizontal and vertical solid lines appear in the spreadsheet to the top and left of whichever cell is currently selected. These lines are a visual clue that the titles will not scroll out of sight. Now you try!

| | |
|------------------|--|
| Follow Me | <p>Freeze panes</p> <ol style="list-style-type: none"> 1. Open the Family Budget spreadsheet 2. Click on the cell B4 3. On the View tab, Select Freeze Panes dropdown 4. From the menu, select Freeze Panes 5. Note that a vertical line appears to the left and a horizontal line appears above. 6. Try scrolling vertically and horizontally and see how the headers remain frozen. |
|------------------|--|

| | A | B | C | D | E | F | G | H | I | |
|----|---------------------------------|---------|----------|-------|-------|-----|------|------|--------|-----|
| 1 | The Watson's 1999 Yearly Budget | | | | | | | | | |
| 2 | Expenses: | | | | | | | | | |
| 3 | | January | February | March | April | May | June | July | August | Sep |
| 4 | Rent | 400 | 400 | 400 | 400 | 400 | | | 200 | |
| 5 | Phone | 60 | 60 | 60 | 60 | 60 | | | 60 | |
| 6 | Entertainment | 60 | 60 | 60 | 60 | 60 | | | 60 | |
| 7 | Church | 100 | 10 | 10 | 10 | 10 | | | 100 | |
| 8 | Food | 200 | 200 | 200 | 200 | 200 | | | 75 | |
| 9 | Dues | | 20 | | 20 | | | | 20 | |
| 10 | Hygiene | 9 | | 9 | | 9 | | | | |
| 11 | Clothes | 150 | 20 | 20 | 20 | 20 | | | 150 | |

To remove the freeze, select the Freeze Panes button located on the View Tab, Window group and choose Unfreeze Panes from the dropdown menu.

4. Exercises – Now You!

- In the Movies database, Freeze the header row with the field names.
- Use Sort and Filter as well as Count to determine:
 - Which Movie star made the most movies in 1940?
 - Who was the only actor in a Fantasy movie?
 - How many comedies did RKO make in 1939?
 - Were there more action movies made in 1939 or 1940?
 - How many films starred Ginger Rogers or Fred Astaire?