

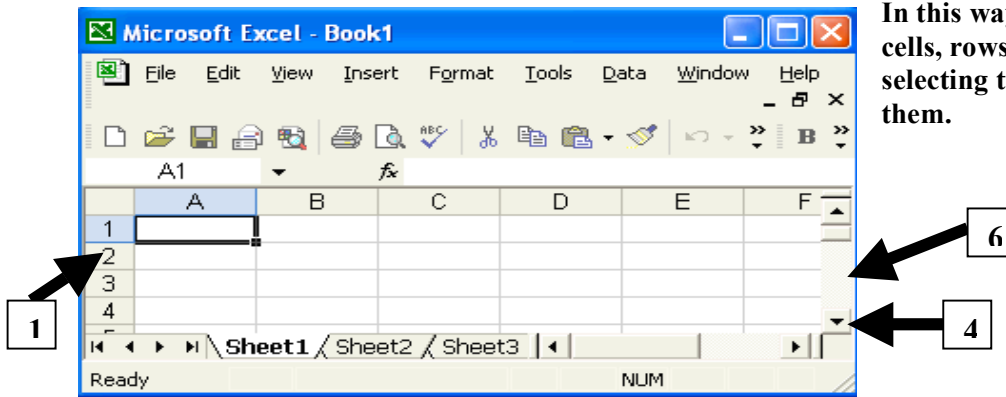
Exercise 3. Introduction to Excel

Purpose: This exercise will familiarize you with the basic operation of *Excel* and the procedures of data entry.

1. Select and open the *Excel* application icon.

5. With cell *A1* selected, hold the *shift* key and click on cell *D4*. In this way we can select an area of the spreadsheet for processing.

6. Select cell *A1* and then hold the *control* key and click on several other cells. In this way we can select specific cells, rows, or columns while not selecting those that lie between them.



Worksheet Features

Columns are identified with letters and rows with numbers. Note the characters *A1* in the small window to the left of the worksheet. (1) This is the currently active cell that is also indicated on the spreadsheet with a heavier outline. Also, the row and column of the selected cell are highlighted in blue on the spreadsheet margins.

At (2) are several tabs. You can have multiple spreadsheets within a file. Also, graphs you may generate can be on a sheet separate from the data. The chart will appear as a separate tab. To the left of the tabs are several arrows you can use to navigate through the different spreadsheets.

2. Select some different cells on the spreadsheet and note how these values change.

7. At (3) you can click on the corner and drag the edges of the spreadsheet to make it larger or smaller.

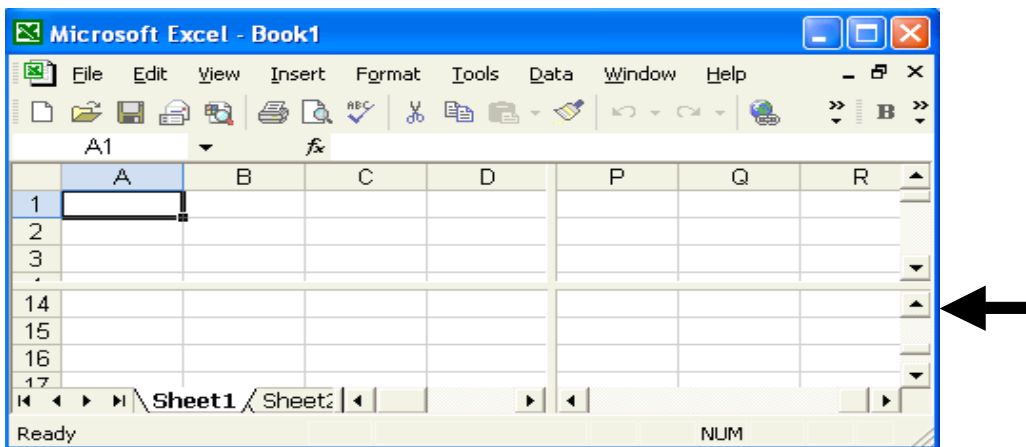
3. Now click on the margin letter *A* and note that all cells in the column are selected.

4. Click on the row number *1* and note all columns in that row are selected.

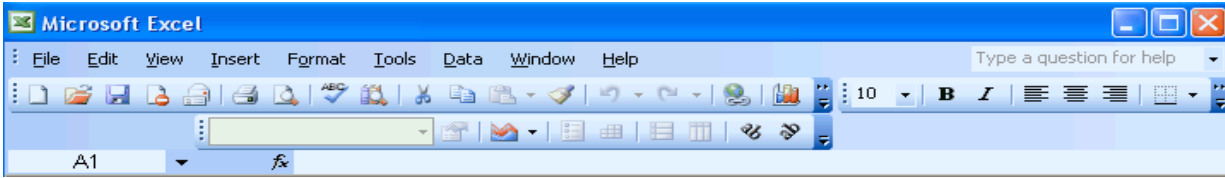
8. At (4) and (5) are two scroll bars. Click and drag each to move around the spreadsheet. If you click on the small arrows at the end of the scroll bars you can advance by single rows or columns. Remember you have a maximum of 255 columns and 15,756 rows to work with.

At (6) and (7) are two small bars. If you click and drag either you can divide the spreadsheet into two halves. This is a very useful feature for dealing with large census data files since you can click on the beginning row or column in the top or left sheet and then hold the shift key and click on the end of the row or column in the right or bottom spreadsheet. All cells in between your selection will be selected, though not visible, and you can fill out a formula without having to scroll over hundreds of rows or columns.

9. Drag the bar down to split the worksheet as shown in the illustration below. Then locate a similar bar on the bottom scroll bar and split the worksheet vertically. This feature is very important when performing calculations on large spreadsheets.



At this point you should be familiar with how to select a single cell, group of adjacent cells, or group of non-adjacent cells. You should be able to select an entire row and/or column and to scroll horizontally and vertically across the spreadsheet. You also should be able to divide the spreadsheet and to select a range of cells by clicking on a cell in each half of the divided sheet.

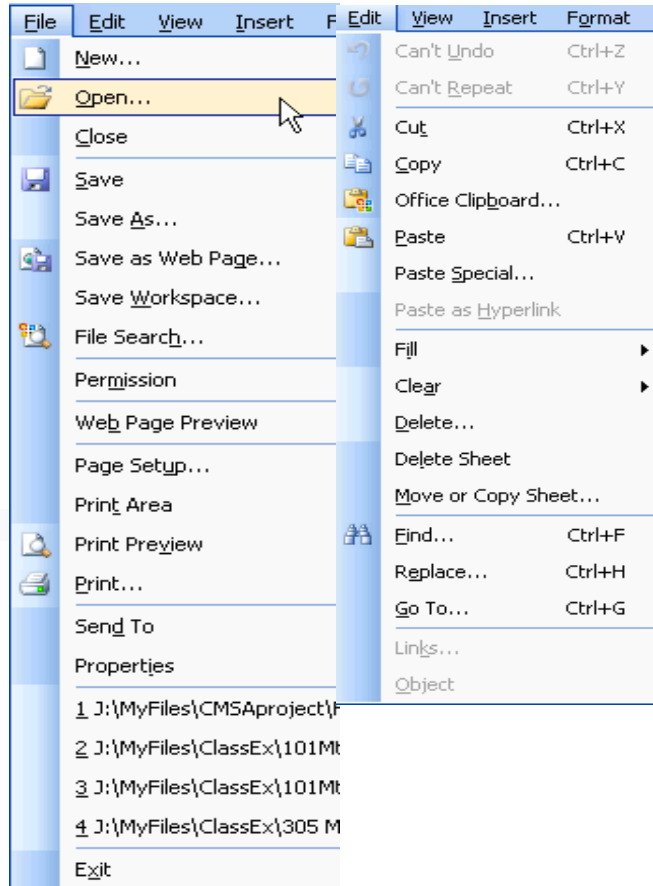


Look at the list of toolbars under the *View* menu and note which toolbars are now active (checked).

Menu Bar

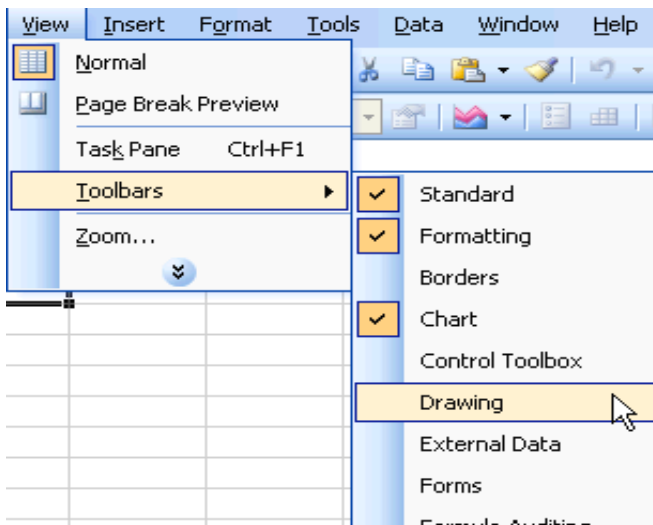
A menu bar extends across the top of the screen. It contains 10 pull down menus. These are indicated by the "Excel" symbol and the words: *File*, *Edit*, *View*, *Insert*, *Format*, *Tools*, *Data*, *Window*, and *Help*.

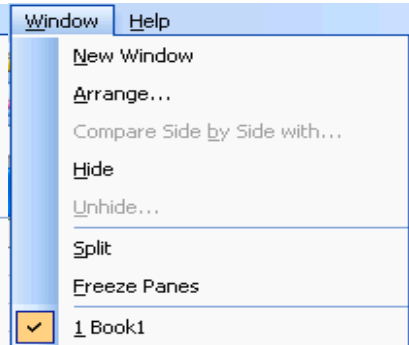
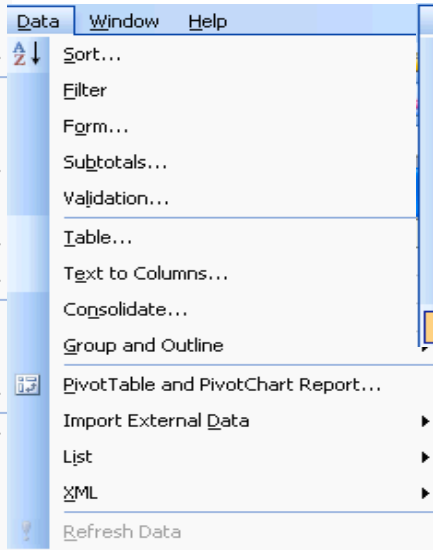
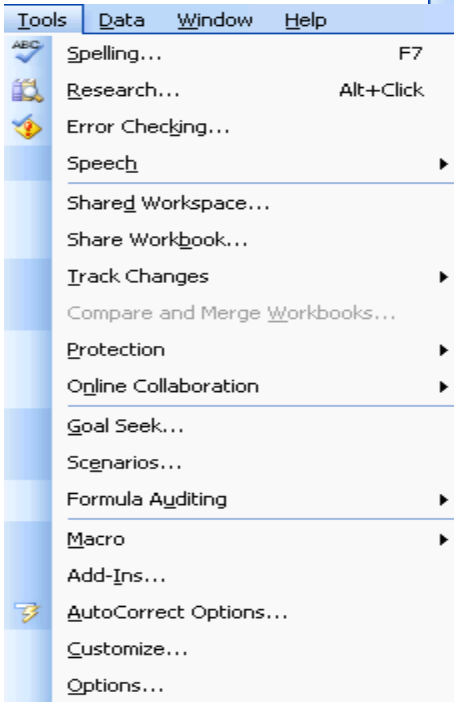
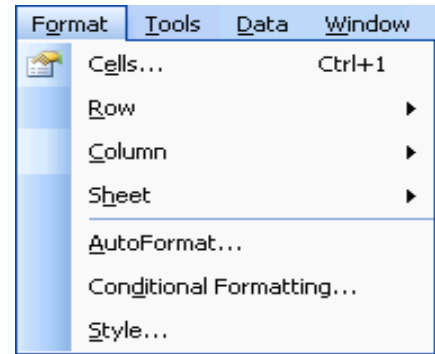
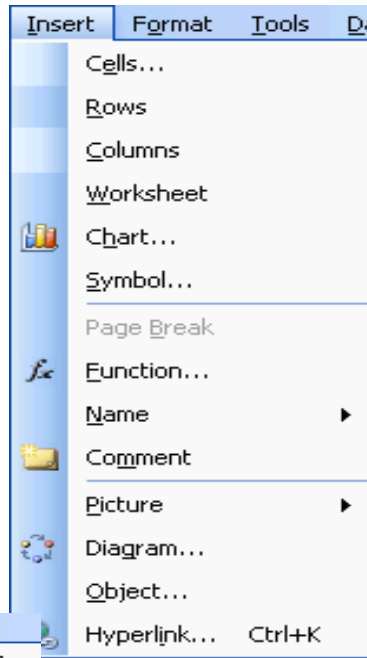
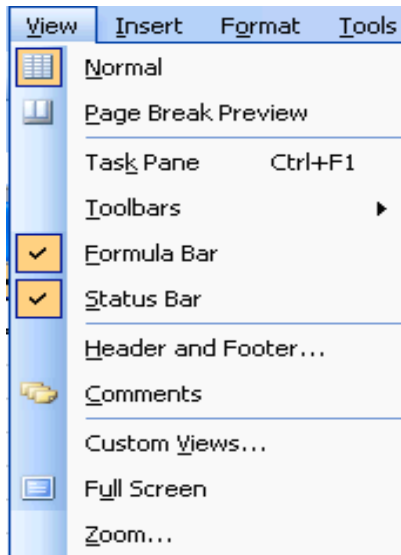
Select each *File* command in turn, except *Exit* with the selection arrow. Note that if two small arrows are visible at the bottom of the menu list that you may have to hold the cursor on them to see all menu options. For those options followed by a set of dots, an additional dialog box will appear with more options. Select the *Cancel* button for each of these additional dialog boxes.



Across the top of the spreadsheet and below the menu labels are a number of toolbar icons. More Toolbars may be invoked by selecting the *View* menu and the *Toolbars* option as shown right.

Select each of the other menus in turn from the menu bar and note the range of commands included in each.





	A	B	C	D	E	F	G	H
1	CNTY	ANPSADPI	AREALAND	P0010001	P0120001	P0120002	P0080003	P0080004
2	29	Kern County	21086815	543477	342300	28927	7239	16390
3	25	Imperial Coun	10813387	109303	32016	2573	1846	2171
4	37	Los Angeles C	10515327	8863164	3634722	946862	43689	955329
5	59	Orange Count	2045273	2410556	1557956	38825	12834	250136
6	65	Riverside Cou	18669111	1170413	757709	60063	11667	41556
7	71	San Bernardir	51961173	1418380	864830	110352	14271	58676
8	73	San Diego Co	10889601	2498016	1639845	150670	21509	198675
9	79	San Luis Obis	8558655	217162	177116	5066	2364	6319
10	83	Santa Barbara	7092635	369608	245074	9327	3889	16554
11	111	Ventura Count	4781006	669016	442015	14884	5041	34293
12								
13								
14								

B. Data Entry

1. Open a simple spreadsheet, *Ex3Excel.xls*, containing information related to several counties of Southern California.

2. The first thing is to replace the variable labels (columns) from the Census tables with more meaningful labels. Click on cell *A1*. and replace the variable name *CNTY* with *County*.

When you begin to enter information in a cell the contents appear in the cell and in an editing window shown in the menu bar. See *CNTY* above. Additionally, three icons will appear in the menu bar (see below); one is an "X" which if selected, cancels data entry in the cell. The other contains a "check," which if selected, loads the information into the cell. The last opens a window of functions that may be used to modify the contents of a cell.

	A	B	C
1	County	ANPSADPI	AREA
2	29	Kern County	21

3. In addition to *CNTY* replace each variable name with the more descriptive name shown in the list below.

Select cell	Contents	Replacement
A1	CNTY	County
B1	ANPSADPI	Name
C1	AREALAND	Area
D1	P0010001	TotalPop
E1	P0120001	NHWhite
F1	P0120002	NHBlack
G1	P0080003	Amer.Ind
H1	P0080004	AsianPI
I1	P0100001	Hispanic

In raw form, the census summary files are labeled with a table number and item number as shown in the figure above. These are being replaced with eight character names that will be preserved when this table is converted to a dbf format file.

Simple Calculations

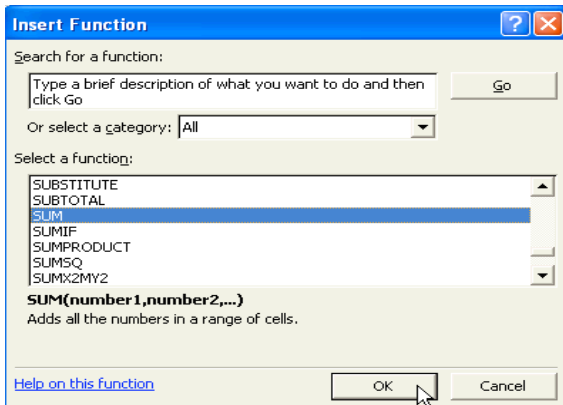
Excel can execute a broad range of arithmetic and statistical calculations which is why it is so popular for balancing check books and other numerical record keeping.. These functions are enabled through the creation of formulas in cells, columns, or rows.

1. Select cell *D13* and type in the "=" character. (see below)

	A	B	C	D
1	County	ANPSADPI	AREALAND	P0010001
2	29	Kern County	21086815	543477
3	25	Imperial Coun	10813387	109303
4	37	Los Angeles C	10515327	8863164
5	59	Orange Count	2045273	2410556
6	65	Riverside Cou	18669111	1170413
7	71	San Bernardir	51961173	1418380
8	73	San Diego Co	10889601	2498016
9	79	San Luis Obis	8558655	217162
10	83	Santa Barbara	7092635	369608
11	111	Ventura Count	4781006	669016
12				
13				=
14				

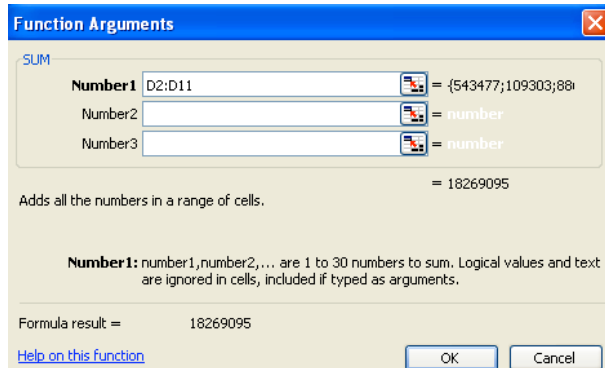
Anytime the "=" sign is entered, *Excel* expects a formula to follow. Note that as you type in cell *D13* the formula also appears in the formula bar at the top of the spreadsheet. If you wish to modify the formula later you will select the cell and then edit the equation in the formula bar, not the cell.

2. Open the *Insert* menu and select *Function...* option. A dialog box shown below will appear listing all the functions at your disposal. Scroll down to the function *SUM*. Check the explanation of the function below the Selection window. Then select *OK*



3. The *Function wizard* will appear to help you fill the necessary arguments for this function. In this case the function expects you to provide a range of cells to process. To do this you enter the beginning cell, a colon, and the last cell from a range of cells. The wizard will make a guess at what you want to do, but we do not wish to add cell *D12* since it is empty. Thus you will need to change the value of *D12* to *D11*.

Enter *D2:D11* in the *Number 1* box of the *Function wizard*.



Click *OK* and the function will appear in the formula bar and the value in Cell *D13*.

	A	B	C	D	E
1	County	Name	Area	Totpop	NHWhite
2	29	Kern County	21086815	543477	34
3	25	Imperial Coun	10813387	109303	3
4	37	Los Angeles C	10515327	8863164	363
5	59	Orange Count	2045273	2410556	155
6	65	Riverside Cou	18669111	1170413	75
7	71	San Bernardir	51961173	1418380	86
8	73	San Diego Co	10889601	2498016	163
9	79	San Luis Obis	8558655	217162	17
10	83	Santa Barbara	7092635	369608	24
11	111	Ventura Count	4781006	669016	44
12					
13				18269095	
14					

Please note that cell *D13* actually contains a formula, not the number shown. The cell is dynamically linked to the values above it and so if one of the cells above is changed, the sum will be updated. Also if you copy the contents of cell *D13* to another location you may get an error message because *Excel* can no longer find the values to process or you will get a wrong number because other columns are being accessed.

#REF!

To copy just the number to a new cell you must choose *Edit > Paste Special* and then click the *Value* option. This replaces the formula with the actual value. Keep this in mind since this operation is often used.

The equation also could have been typed directly in Cell *D13*. When complete, you would click on the "check box" to the left of the formula on the menu bar. The formula will disappear from the bar and the sum of the range *D2* to *D11* will appear in cell *D13*.

4. Select cell *D13* and drag to the right highlighting cells *E13* through *I13*.

5. Select *Edit > Fill > Right*. (See below) This will cause the original formula to be modified and inserted into each of the highlighted cells. In other words, we now know the sums of all the new columns without having to retype the equation. The sums of the ranges in columns *D* through *I* now appear. Click on some of the newly calculated cells and observe how the original formula values have been automatically modified.

	C	D	E	F	G	H	I
Area	Totpop	NHWhite	NHBlack	AmerInd	AsianPI	Hispanic	
21086815	543477	342300	28927	7239	16390	150558	
10813387	109303	32016	2573	1846	2171	71365	
10515327	8863164	3634722	946862	43689	955329	3306116	
2045273	2410556	1557956	38825	12834	250136	556957	
18669111	1170413	757709	60063	11667	41556	302286	
51961173	1418380	864830	110352	14271	58676	373632	
10889601	2498016	1639845	150670	21509	198675	498578	
8558655	217162	177116	5066	2364	6319	26869	
7092635	369608	245074	9327	3889	16554	97084	
4781006	669016	442015	14884	5041	34293	175414	
	18269095	9693583	1367549	124349	1580099	5558859	

6. Label cell *A13* as *TOTAL*.

7. Select cell *J2* and enter the following formula:

$$=E2 * 100 / \text{sum}(e2:i2)$$

(See below)

Select the check box next to the formula to accept it.

	C	D	E	F	G	H	I	J
Area	Totpop	NHWhite	NHBlack	AmerInd	AsianPI	Hispanic		
21086815	543477	342300	28927	7239	16390	150558	=E2*100/SUM	
10813387	109303	32016	2573	1846	2171	71365		
10515327	8863164	3634722	946862	43689	955329	3306116		

This is a very important and often-used formula for calculating percentages. Essentially it takes the contents of cell *E2* (Whites), multiplies it by *100* and then divides the result by the sum of all the population groups (to get a percentage).

It would also be nice if we could calculate the percentage of the total population for all the other groups. However, you must modify the equation before this will work.

6. Select *J2* and drag the cursor down highlighting cells *J2* through *J11*.

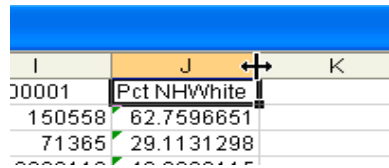
7. Select *Edit > Fill > Down*. This will cause the formula to be executed for each of the succeeding rows. Cells with formulas are linked dynamically to other cells.

	G	H	I	J
AmerInd	AsianPI	Hispanic		
7239	16390	150558		62.7596651
1846	2171	71365		29.1131298
43689	955329	3306116		40.9006115
12834	250136	556957		64.4660422
11667	41556	302286		64.580352
14271	58676	373632		60.8280857
21509	198675	498578		65.3512944
2364	6319	26869		81.3451275
3889	16554	97084		65.892861
5041	34293	175414		65.8106118
124349	1580099	5558859		

Note that each of the percentage values is different. This means that during the Fill Down procedure that each of the cell formula components was updated to access successive rows. That is, *J3* accesses columns *e3* to *i3*, *J4* accesses columns *e4* to *i4*, and so on. This feature makes calculations based on many rows very quick to execute.

8. Select *J1* and type *PNHWhite* Select the "check box" in the menu bar.

9. To enlarge column J, place the cursor on the vertical line separating column J from column K. (See right.)



A new cursor will appear as shown.

Press down the mouse button and drag to the right of the last letter in J1. This procedure allows columns to be enlarged, shrunk, or hidden.

10. To calculate the percent of the total population for the other groups you must make an important change to the formula. By adding a \$ sign before the cell identifiers for the total population the value can be fixed so that it will not increment upward whenever a Fill operation is done. Thus the number of persons in each group will be divided by the sum of the same set of cells. Enter the following in J2.

$$=E2 * 100 / \text{sum}(\$e2:\$i2)$$

11. Click on cell J2 and then hold the shift key and click in cell N2 so all between are highlighted. Select Edit > Fill > Right.

	J	K	L	M	N
1c	PctNHWhite				
50558	62.7596651	6.30367757	1.32724866	3.00505671	27.6043519
71365	29.1131298				
06116	40.9006115				
56957	64.4660422				
02286	64.580352				
73632	60.8280857				
98578	65.3512944				
26869	81.3451275				
97084	65.892861				
75414	65.8106118				
58859					

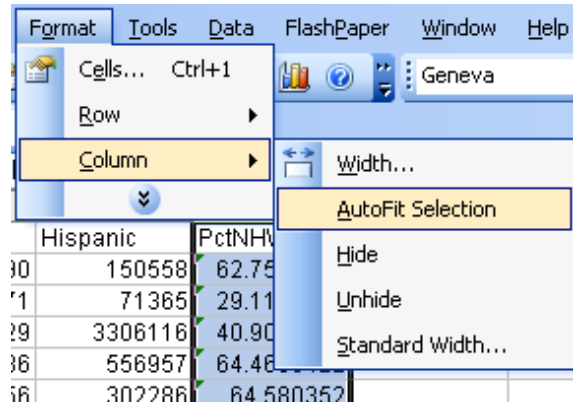
Click on some of the new columns and compare the numerator cells to the denominator cells. The denominator cells are fixed by the dollar sign while those in the numerator increment upward.

12. Now click on cell J2 and while holding the shift key, click on cell N11. Select Edit > Fill > Down. Percentage values will be calculated for all cells.

13. Place an appropriate label at the top of each percent column.

14. In the upper left corner of the spreadsheet click in the open box to the left of letter A and above the number 1 to highlight all cells in the sheet.

Select Format > Column > Autofit Selection. (See below.) This will ensure no values will be hidden - an essential property when working with dbf files later. Hidden numbers will be truncated when saved as dbf files.



C. Removal of Formulas from Derived Data Ranges

Data manipulation often requires the elimination, insertion, and copying of cells, rows or columns. When such procedures are invoked, derived values may be altered because data contained in formula referenced cells has changed. In particular, when formula-based values are copied to new locations, their calculated contents will not be preserved.

In order to avoid this confusion the following procedure should be executed if automatic recalculation is no longer desired.

1. Select cell J2 and drag the cursor down to cell J11. Select Edit > Copy. This will cause the highlighted cells to be copied into the Clipboard (memory).

2. Now select *Edit > Paste Special....* A dialog box (below) will appear.

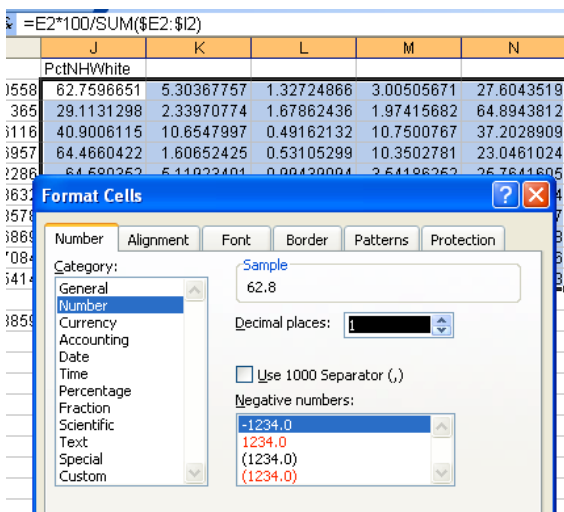


3. In the dialogue box select the *Values* button and click *OK*. This will cause only the values and not the formulas to be pasted into the cell range *J2* through *J11*.

D. Modifying Number Formats

Spreadsheet viewing frequently requires redefinition of number formats. For example cells *J2* through *J11* contain many more decimal places than necessary.

1. Select range *J2* through *N11*. Then select *Format > Cells*.

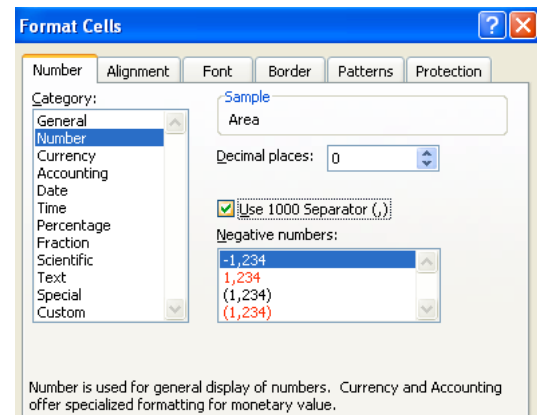


2. Select the *Number* tab and then under the *Category* window select *Number* and set the *Decimal places* to *1*. Click *OK*.

Note the percent columns have just one decimal. Make sure all your percent columns have just one decimal.

3. Now click on columns *C* through *I* so that all rows are highlighted. Again select *Format > Cells*.

In the *Format Cells* palette click the *Number* tab and the *Number Category*. Set the *Decimal places* to *0* and then click the *Use 1000 Separator* button. Then click *OK*.



4. Click on row *1* so that all columns in it are highlighted. Then select *Format > Cells > Alignment tab > Horizontal Alignment: > Center*.

Then select the *Font* tab and set the text to *Arial Bold*. Click *OK*. Note the changes.

To this point we have covered the basic steps for entering and modifying data in *Excel*. These include:

- Calculating a percent
- Entering a function in a cell
- Filling rows and columns
- Freezing cell values in an equation during a fill
- Replacing a formula with its numerical value
- Setting the number of decimals in a display
- Changing the cell font
- Aligning numbers in a cell

Don't hesitate to go back and review anything that seems unclear to this point.