Personal Finance: Car Buying Technology Project

Spreadsheets are useful, but underutilized computer software tools. For the next three weeks, you will be using spreadsheets in a very practical set of lessons, buying a car and personal finance. Almost everyone needs to buy a car at some point in their lives; most people need to buy many cars. Choices like buy or lease, new or used, sell or maintain, need to made. While the ultimate decision is often a matter of personal preference, spreadsheets are helpful in seeing the implications of those choices.

You will use spreadsheets for comparison shopping, calculating possible savings, and graphing/charting. As a final project, you will create a PowerPoint in which you present your choice of automobile and the reasons why it makes sense.

To begin with let's set the stage:

You're approaching your 18th birthday. Your parents have offered to help pay for a car. Their requirements? You must:

a. research the options (Which car? Used or new? Buy or lease? How long to keep?)
b. Analyze your data in spreadsheets and graphs
c. Present a convincing case for your choice, using PowerPoint

IMPORTANT! Save all of your work---spreadsheets, charts, and other products. You may need them for the PowerPoint

If you have little or no experience with Excel, you may want to start with the tutorials at Washington University (http://www.cornerstone.wustl.edu/tutorials3.html) and BayCon: (http://www.baycongroup.com/excel.htm)

List of Prospective Cars

You could begin this project in a number of different places. Let's start by tackling the question of which car. Car buying can be a very emotional decision, made without much regard to cost and money. For the purpose of this exercise, you will need to be at least a little analytical. Start by making a list of cars you might like to own. Since this is for a technology course, type up your list.

Once you have at least three and no more than ten cars, we'll begin the research. You may know which one you want, but we want you to look at the test from an economic standpoint before making a commitment.

What would each car cost? Let's start by looking at the price of the car. Go to one of these sites and find the price of each car new.

Research the price of the cars new at three sites (or another one that you're familiar with):

http://autobytel.com/

http://www.carsdirect.com/index.asp?affil=DCLK&affil_id=kw_goto_autoshopping

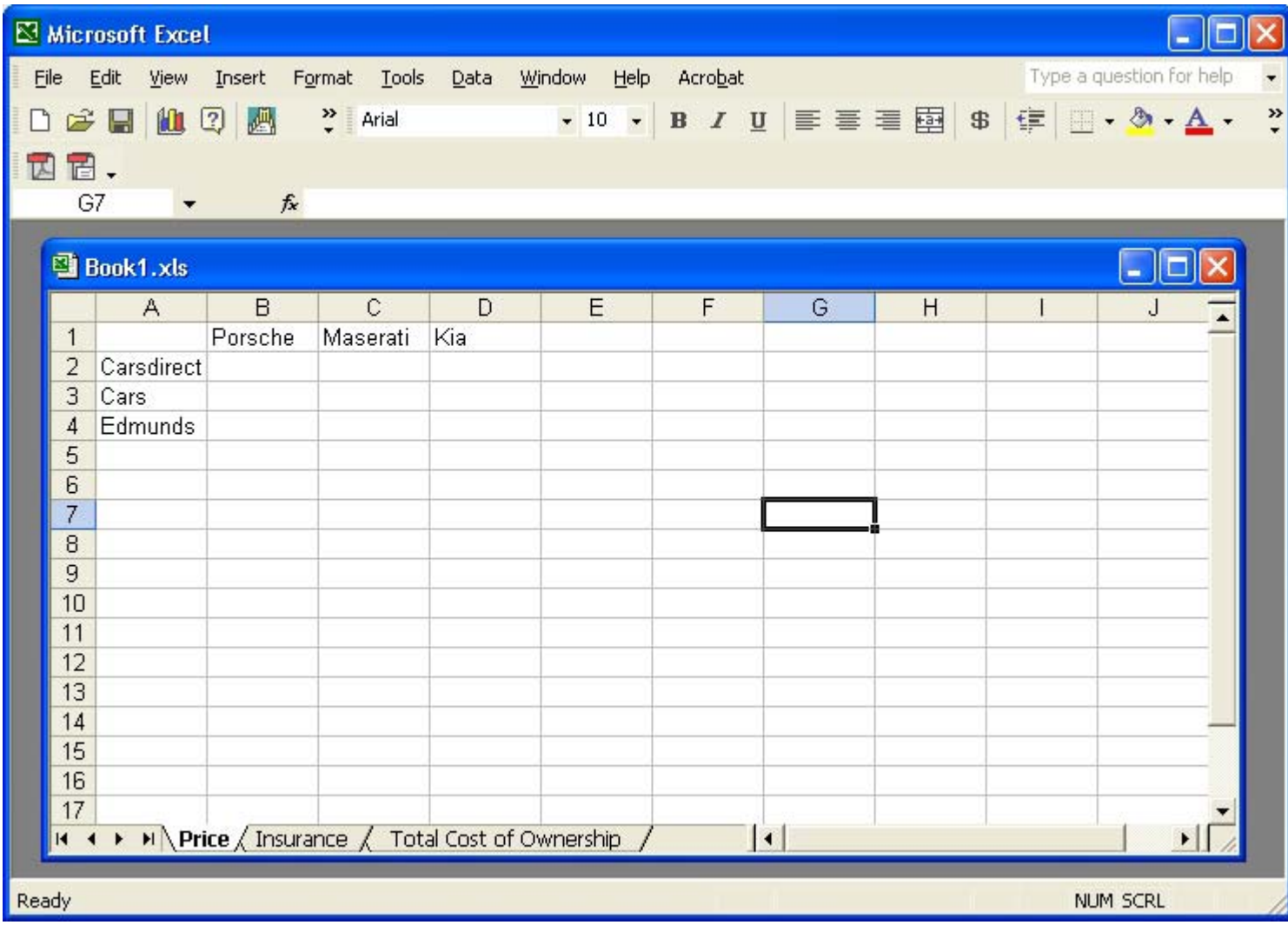
http://www.edmunds.com/
http://www.cars.com

Auto insurance is a big part of the cost of driving for young drivers. You may shop online for insurance at

Auto Web
Ins Web
Car Source
Auto Insurance Quotes
Insure Me
Automobile Insurance
Prudential Insurance
State Farm
Allstate Insurance
Geico Insurance

You will find that you will have to give some personal information in order to get an online quote. Price coverage with three companies for the cars that you are considering. Place that on another spreadsheet or tab. If you are using one sheet, it might look something like

this:



	A	B	C	D
1		Porsche	Maserati	Kia
2	Carsdirect			
3	Cars			
4	Edmunds			

(You can rename the tabs by right clicking on them and choosing “Rename”.

Total Cost of Ownership

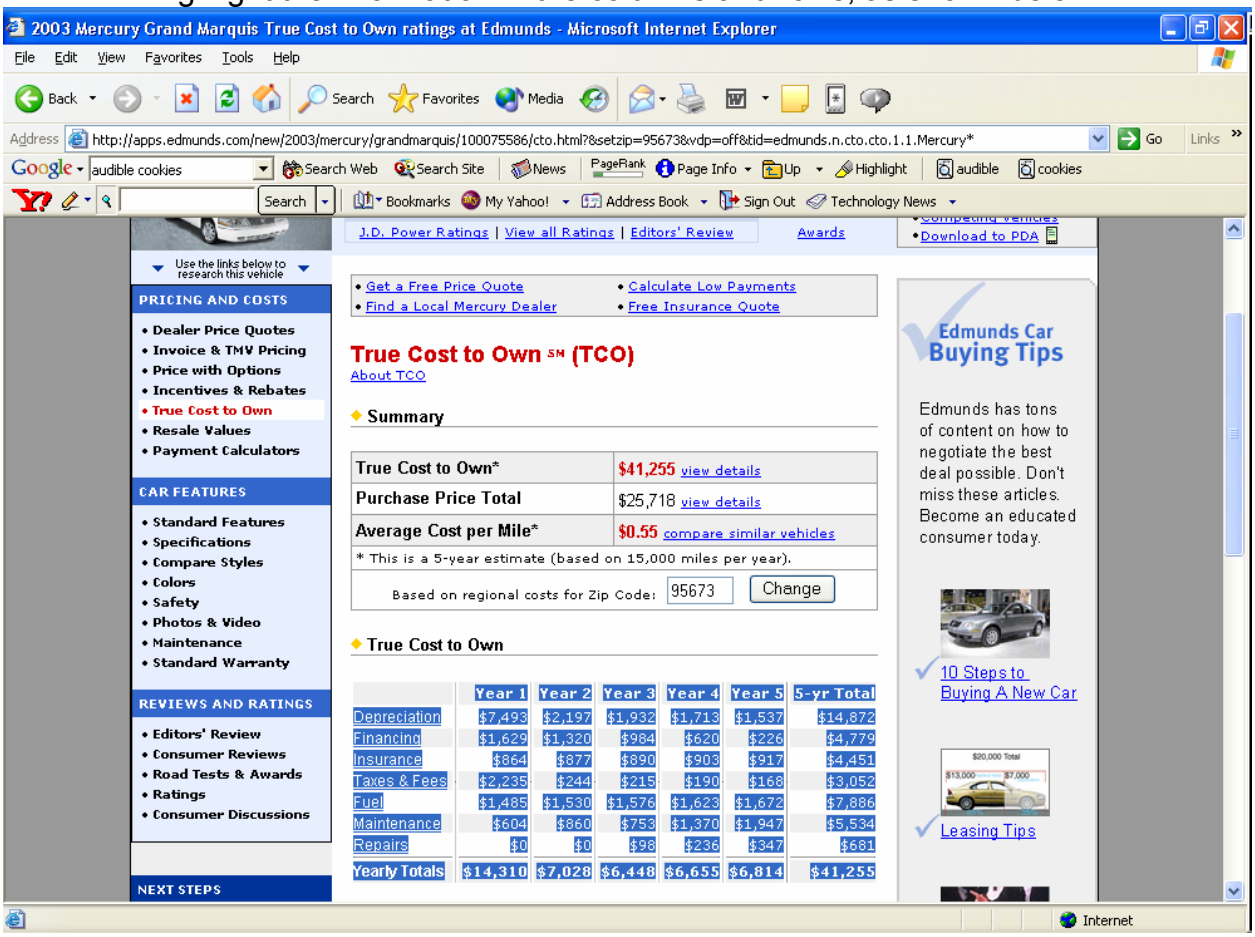
Did you notice the Total Cost of Ownership tab? Here’s an important concept: The cost of a car is much more than its price and insurance. Of course, there’s gas, but there’s also depreciation, maintenance, resale value, and other items. There are organizations that track these figures and you can access the information on the web. The insurance information is going to be the most inaccurate, since you are a teen driver, but you can still use the figures to compare which cars, relatively speaking, are the most costly.

For new cars, you can find this information at Edmunds and Kelly Blue Book. Go to www.edmunds.com and look for the True Cost of Ownership page on the bottom right hand side (the address is http://apps.edmunds.com/apps/cto/CTOintroController?tid=edmunds.h..directory.ownership.3.*) For Kelly Blue Book, select the Intellichoice 5 year cost of ownership option at the bottom of the “Build a Car Price Quote”. Take this information and plug into your spreadsheet. You can either start a new spreadsheet or click on the

sheets found in the bottom left corner of Excel and use a new sheet in the same worksheet. Here's how to copy the information:

Using the pull down menu, input the information for cars you are interested in. When you have retrieved the information about a car, copy it into Excel, following these steps:

1. Highlight the information in the columns and rows, as shown below:



You can now copy the columns by:

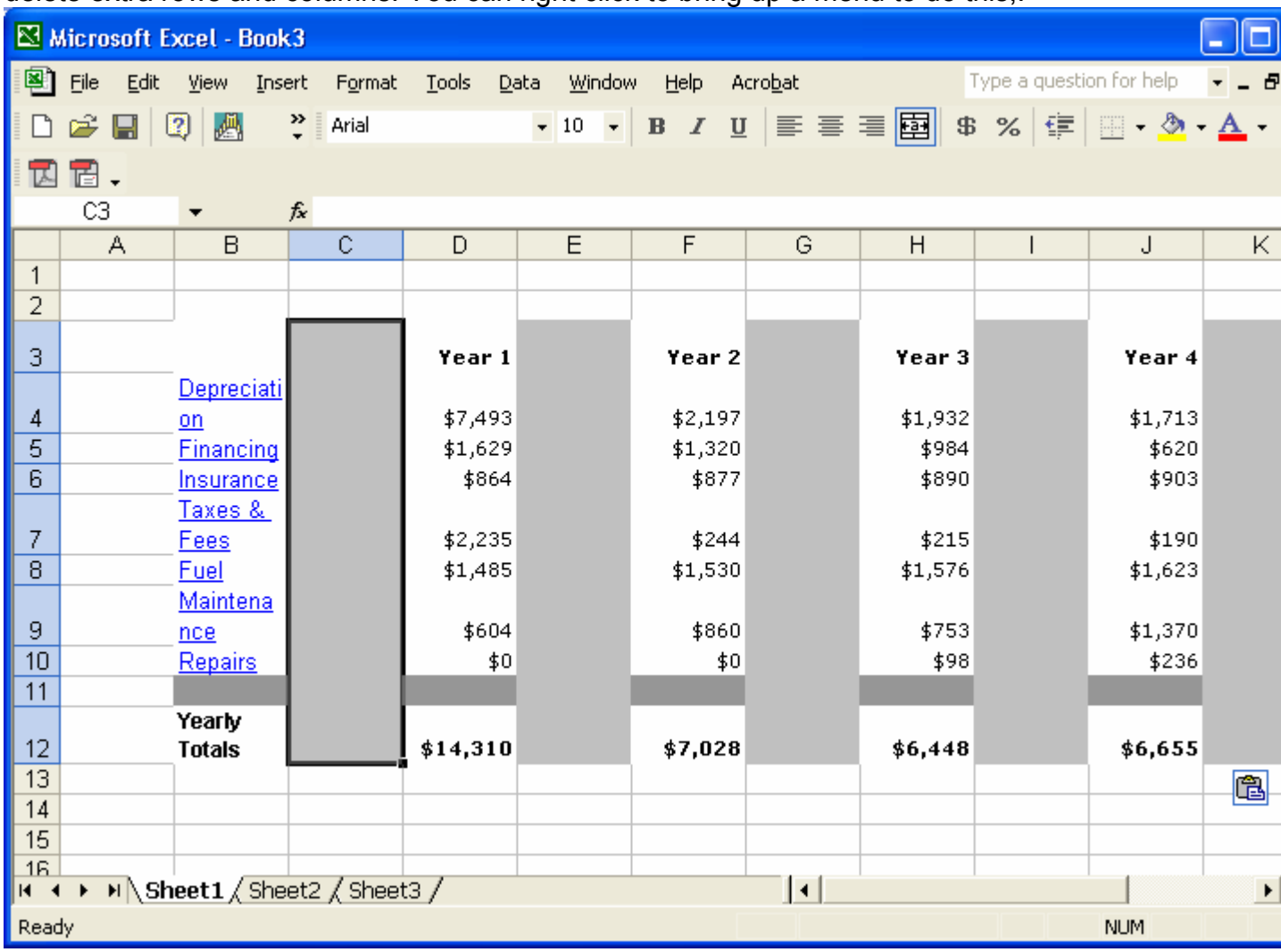
1. Holding down the right mouse button (PC) and selecting "Copy"
2. Holding down the Control and C key at the same time
3. Selecting Copy from the Edit menu.

Start up Microsoft Excel (or any other spreadsheet program) and paste in the information.

It's possible that you will find that the information is not truly in columns that you can use. The Landmark Project for Schools website (www.landmark-project.com), by David Warlick, has directions for turning the data into columnar information that will be more useful: Follow the directions at http://www.landmark-project.com/d3.html

When your information is in columns, delete extra columns and rows. This will enable you to use them for making calculations and graphs.

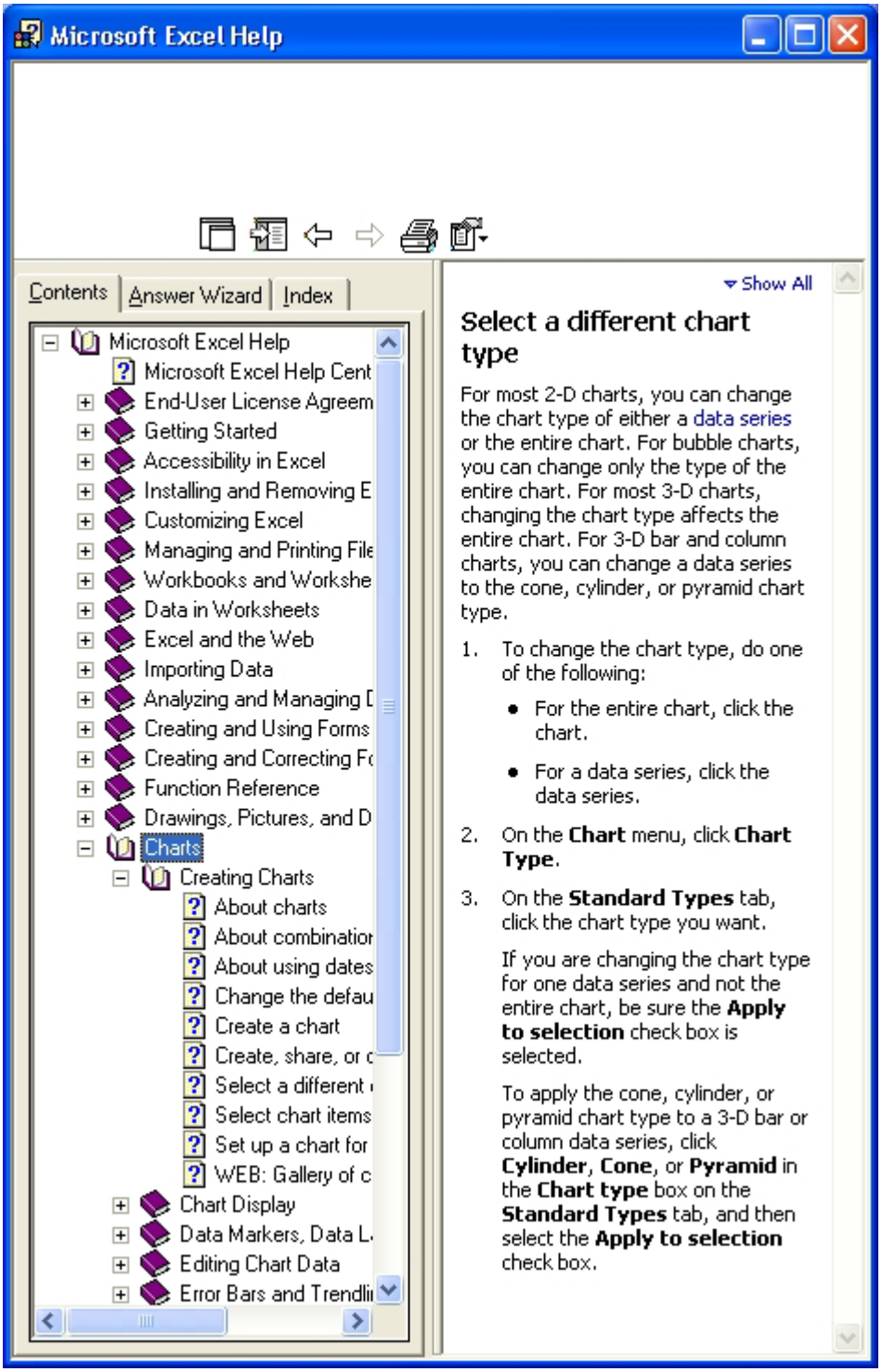
After you follow the directions above and turn your car information into tabular data, delete extra rows and columns. You can right click to bring up a menu to do this,.



Make sure you label your information for each car. Based on the information about true cost of ownership, which of the cars on your list would make the most sense?

Now, create a graph/chart to present your information in the way you think is most appropriate.

You can find directions for making charts under Help. You should select the Index and look under Chart, as shown below:



You can also find directions for making graphs at:
http://apsd.k12.ar.us/goza/ExcelGraphs.html
http://www.winplanet.com/winplanet/tutorials/1182/1/ or search under “Microsoft Excel charts” for other tutorials.

Before moving on to the next section, look at the Crash test results at the NHTSA, http://www.nhtsa.dot.gov/cars/testing/ How does your choice stack up now?

Upon completing this section, you should have the following:

- A list of potential cars

- A spreadsheet with data from Edmunds on the True Cost of Ownership
- A chart or series of charts presenting your information
- A written summary of the car that you have selected and why, including crash test information

New or Used

We've looked at buying new. There is nothing like the smell and a feel of a new car. Maintenance costs for the first few years are lower. However, two out of three car purchases are used cars and, practically speaking, you may not be able to afford a new car. Even people who can afford to buy a new car choose to buy a used car. Let's look at the pros and cons.

Here are some readings about the issue:
http://money.cnn.com/pf/101/lessons/17/page2.html
http://www.calcbuilder.com/cgi-bin/calcs/AUT1.cgi/Kiplinger - **Pay attention!** The calculations on this page are based on the depreciation of the new car, not just any used car you may buy.
http://www.womanmotorist.com/ucbg/used-new.shtml

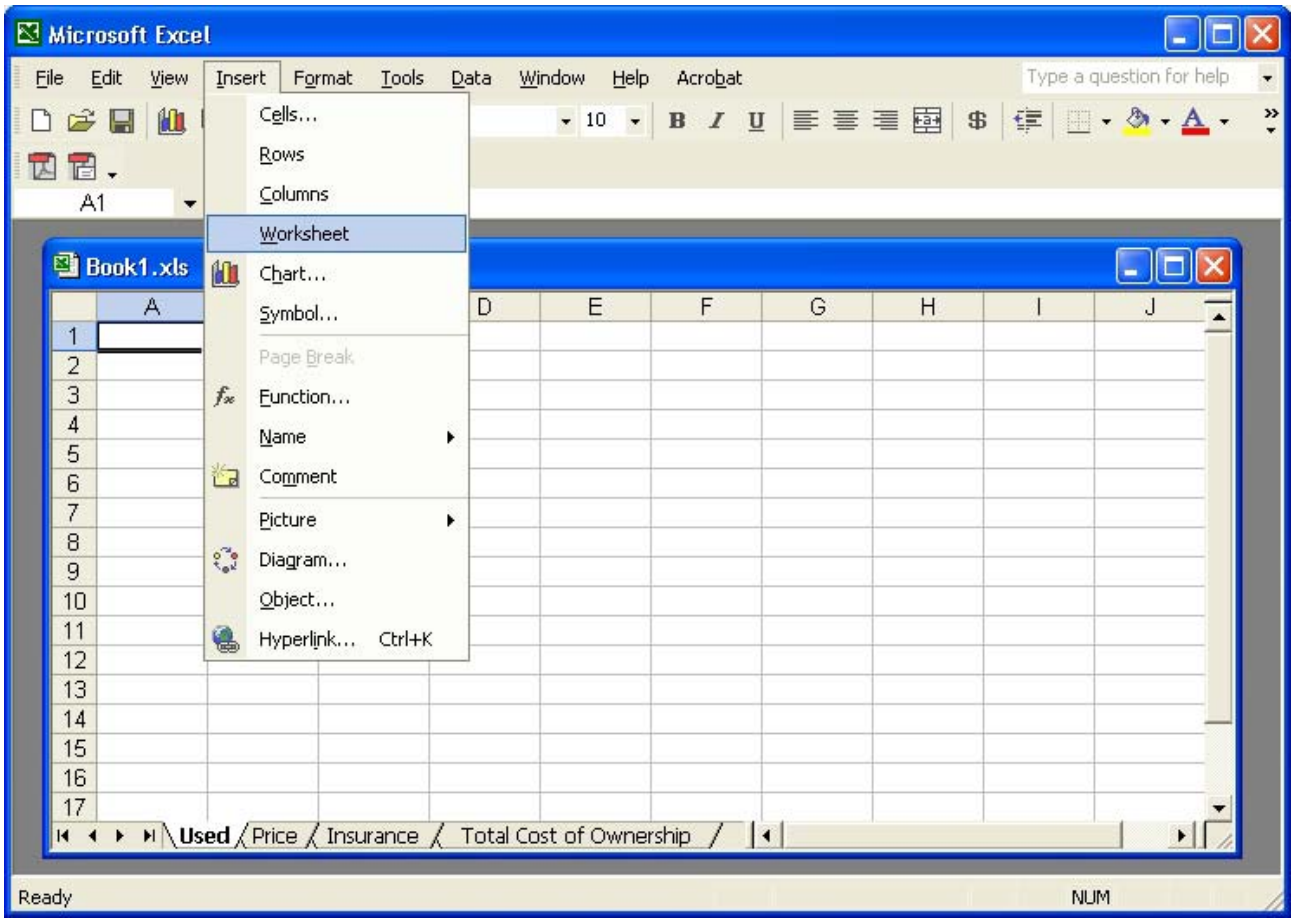
After looking at the pros and cons, let's look at the **how.** Here's a page written for teachers that does a good job of explaining the options in today's car marker:
http://www.nice.emich.edu/howtobuy.html

With these options in mind, let's go shopping for that used car! For this spreadsheet, pick one of the cars on your list. Shop for a three year old model of that car. Begin by looking at Kelley Blue Book (http://www.kbb.com/) and Edmunds (http://www.edmunds.com/used/index.html) for the price range you should expect to pay. Then try to find the car at four types of sources. The Sacremento Bee's car section is a good starting place for this. Autotrader (http://www.autotrader.com/) and E-Bay Motors (http://www.ebaymotors.com/) are a couple of other suggestions (If you choose an auction car at E-Bay or Autotrader, you must choose ones that offer a **buy now** option. For dealerships, you can look at the local dealership's online sites.

- Dealerships
- Independent Used Car Lots
- Rental Agencies
- Private Sales

Create a spreadsheet or worksheet with prices from all four types of sources. If you are out of worksheets, select Insert-

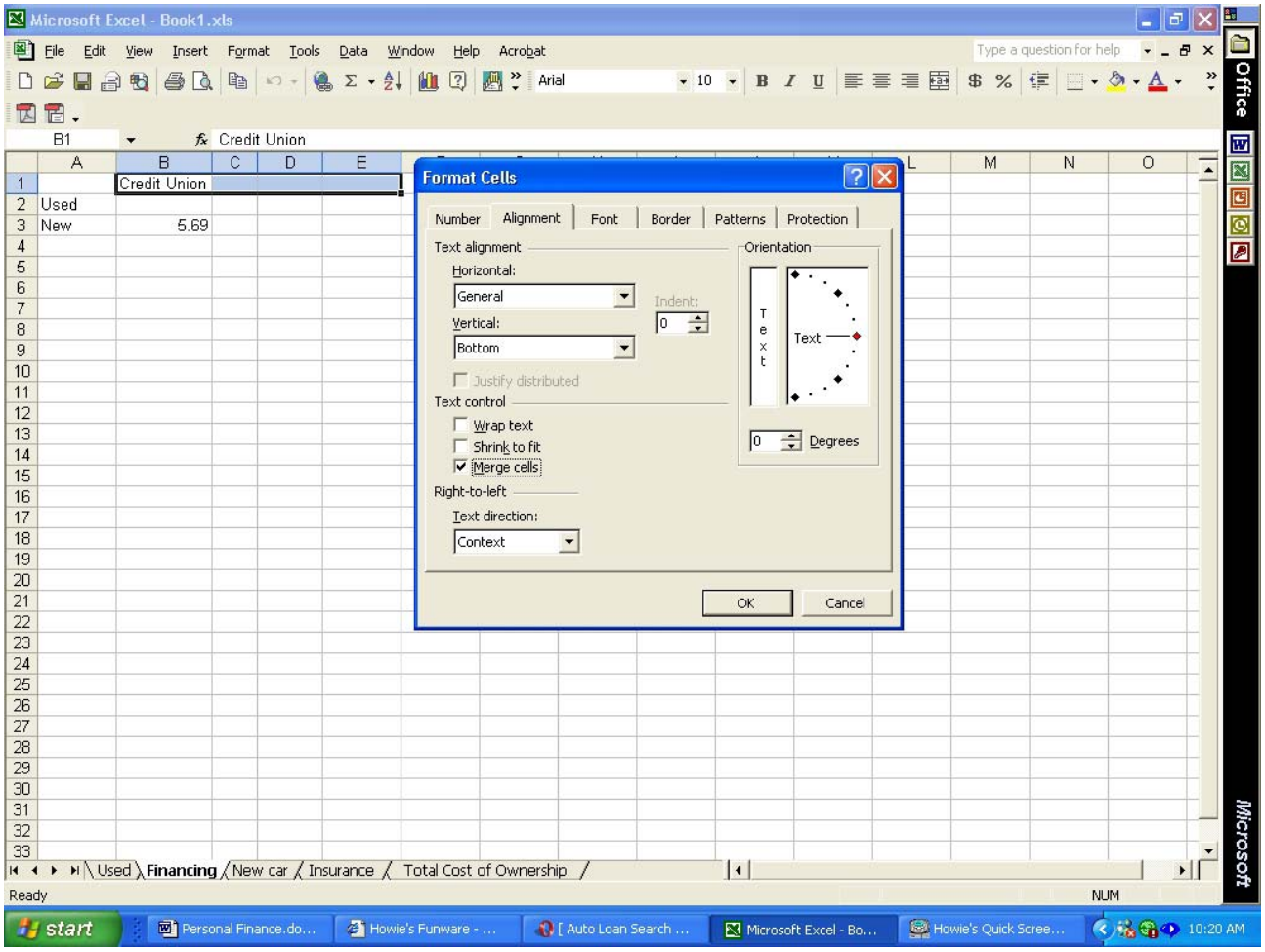
Worksheet



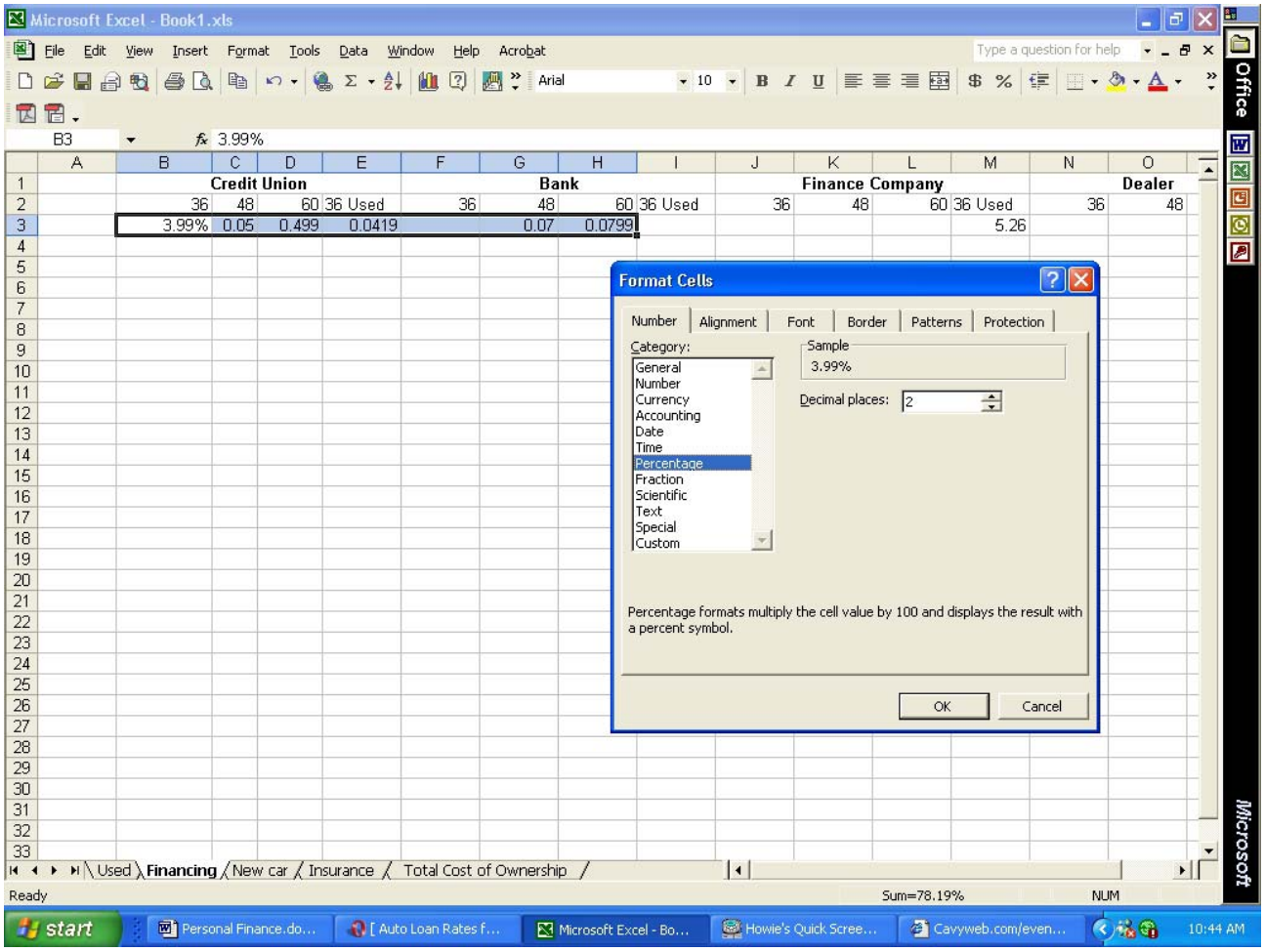
Financing Your Car

Now that you have the prices for your car, let's calculate what it would cost to finance your car. Take a new car and a used car price and put them onto separate lines of a worksheet. While you could try to get the rates from the credit union or the bank, the actual rate will depend on your credit rating, which means they can only give you the correct rate if you apply. For comparison purposes, get your rate from Bankrate.com (http://www.bankrate.com/yho/rate/auto_home.asp) At Bankrate you will discover something: rates vary depending upon the length of the loan and whether the car is new or used. You will need to set up a spreadsheet to reflect the different rates. You can get new car loans, typically, in ranges from 36 to 60 months. On the other hand, used car loans are usually for no more than 36 months and the rate is usually higher than for a new loan.

To set up your spreadsheet to handle the different rates, combine cells by doing a right click on the cell and merging cells (If you aren't using Excel, look at your Help menu and search on "merge cell". Here's what the merge window looks like in Excel:



Enter the rates as decimals and then go to Format Cells and change the number to percentage. You will be doing calculations with these numbers so they need to be decimals. Here's what the number formatting looks like:



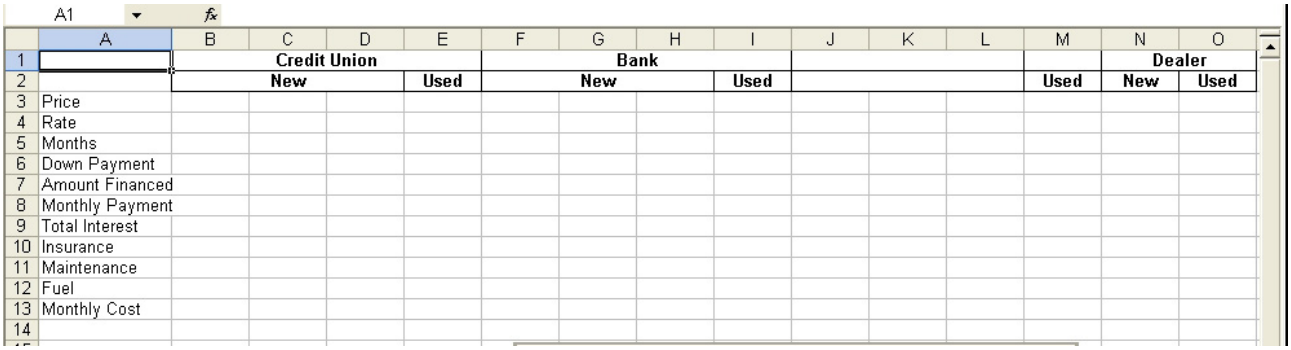
With the rate, period of the loan and the amount financed, you have the basics that are needed to calculate monthly payments and total cost of financing. If you are not familiar with Excel, you might want to look at a tutorial on formulas and functions. Here's a tutorial from USC: http://www.usc.edu/isd/doc/productivity/excel/formula_function.html
You may remember from your elementary math that the formula for interest is I=prt, or Interest = Principal x Rate x Time. Since the rate is an annual one, you will need to divide it by 12 to get the rate for the formula. Here's how you might write it for a $15,000 loan at 7% for 48 months:

- Interest=15,000 x (.07/48) x 48.
- To enter it into Excel, you will put an = sign into the entry field (you can click on the = sign in the newer versions of Excel), and then write in the others, like this: =15000*(.07/48)*48.
- The answer would be the amount of interest that you would pay on the loan.
- Then if you add that to the original amount, and divide the total by 48, you have your monthly payment.

To make you do all of that would be denying you the power of the spreadsheet.

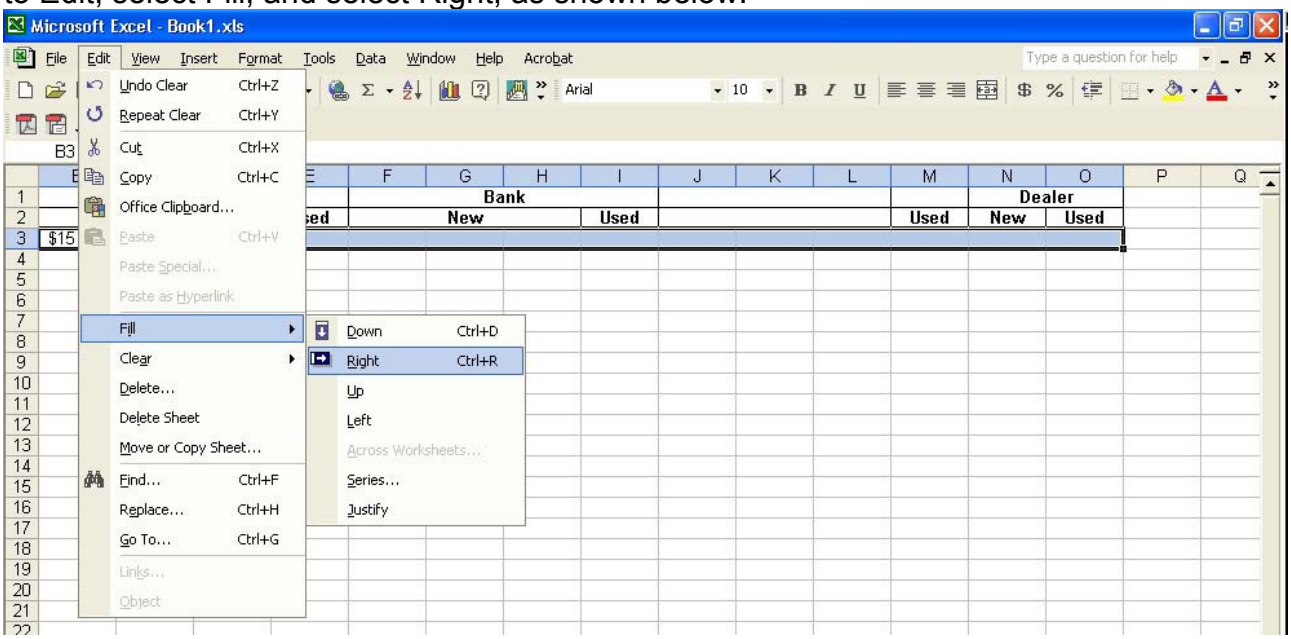
What do we mean?

First, Set up your spreadsheet so that it has columns and rows with labels similar to this example (You may actually think of a better way to organize the information; this is just a suggestion that works):



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1		Credit Union				Bank								Dealer	
2		New			Used	New			Used				Used	New	Used
3	Price														
4	Rate														
5	Months														
6	Down Payment														
7	Amount Financed														
8	Monthly Payment														
9	Total Interest														
10	Insurance														
11	Maintenance														
12	Fuel														
13	Monthly Cost														
14															

Since the new price is the same for all of the new cars, you can use the Fill command. Let's say the new price is $15,000. Put 15000 in the first box. Then go to Edit, select Fill, and select Right, as shown below:



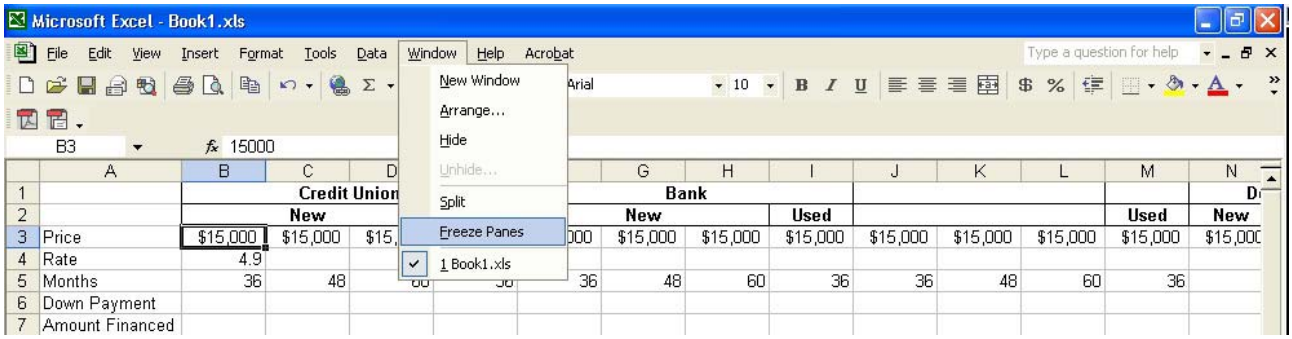
The $15,000 fills across all of the fields. The used car fields can be entered manually, writing over the $12,000. Fill is a very powerful feature. You can not only fill the same number, you can fill formulas and dates. Read more about Fill in the Help menu or in the tutorials listed at the beginning of the lessons.

You may find that you are scrolling off the screen when you try to input the data. You could go to the view and choose a smaller percentage, but if your spreadsheet got much larger, you'd need a magnifying glass.

Freezing the pane is a better solution.

- Click in the upper right cell that you are entering data in with the labels that you want visible. In the example above, it would be B3
- Go to the Windows menu and select Freeze Pane. Now the rows above and to the left stay visible as you move around the spreadsheet.

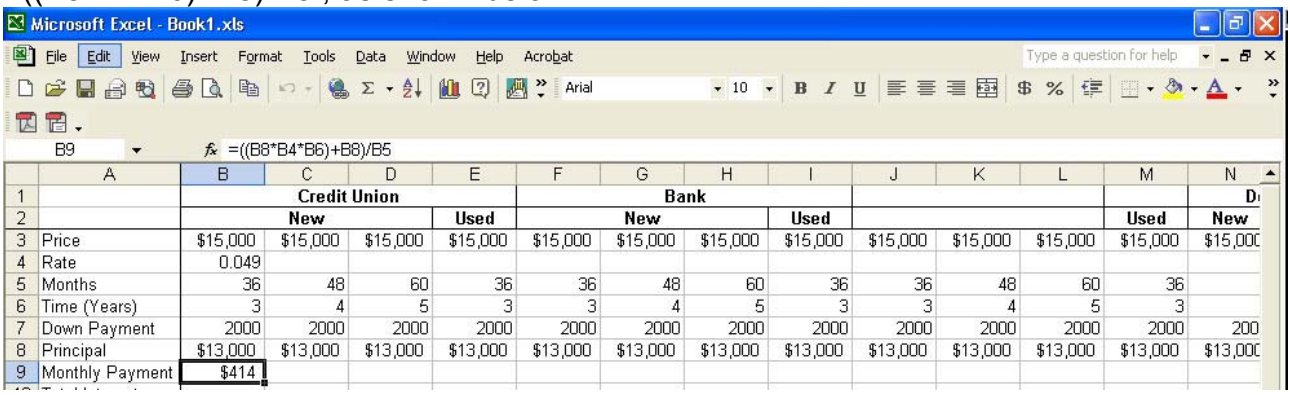
Here's what the freezing the panes looks like:



After freezing the pane, enter all of the other information you have. For the down payment, we'll use $2000. To arrive at the amount financed, use the formula =B3-B6. You can click on the formula to enter the cell references or enter the numbers by hand. Hit "Enter" to finish placing the formula in the cell.

Once you have one formula entered, you can use Fill to put the formula in all of the other cells. For example, here's the way we entered the formula to calculate the monthly payment:

=((B8*B4*B6)+B8)/B5 , as shown below:



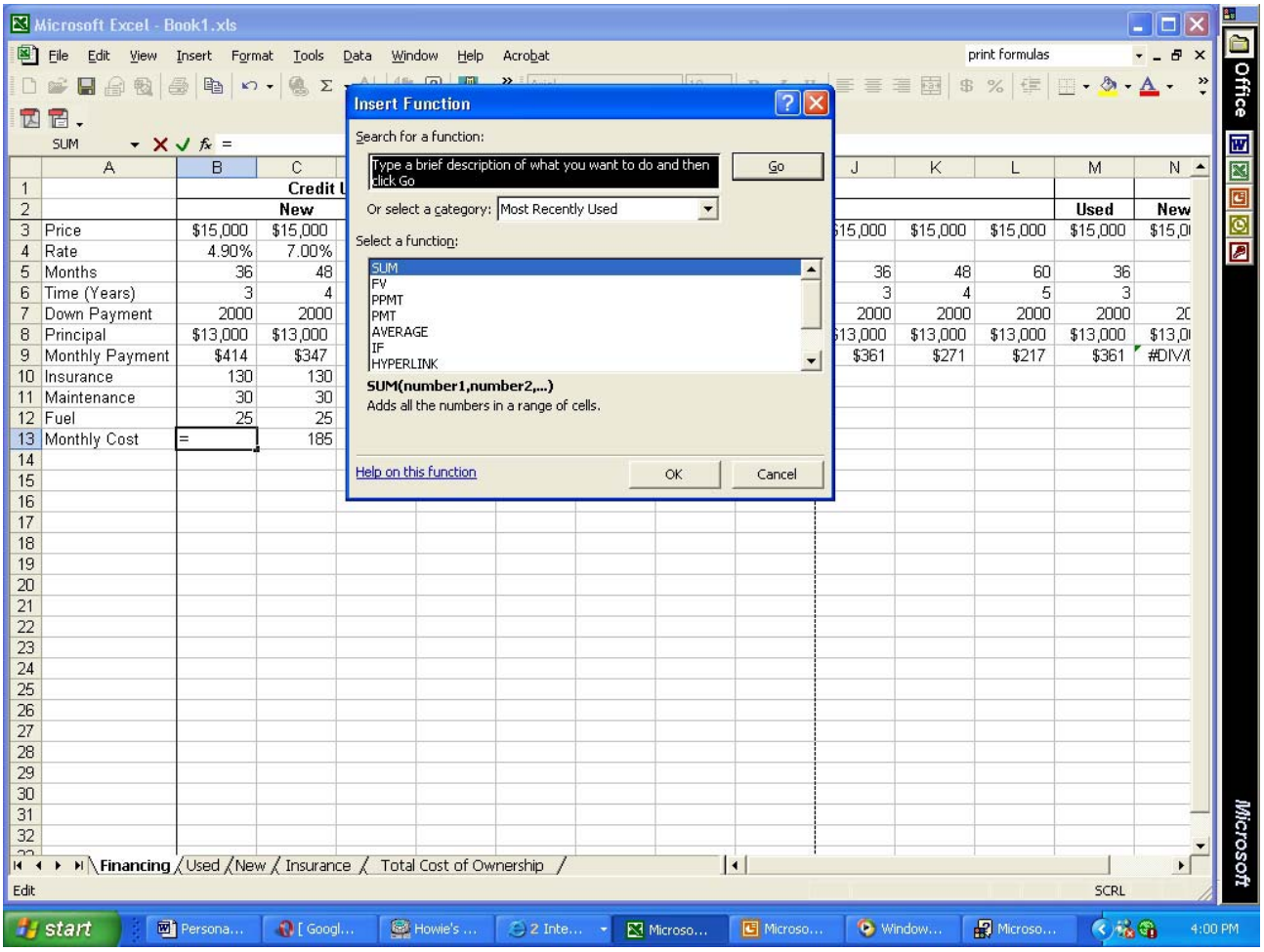
First we put in the = to indicate a formula was being entered. We put in parentheses to make sure that everything was properly multiplied and divided. B8 is the principal (Amount financed in the previous pane) multiplied by the rate (B4) and the time in years (B6). That formula gives us the total paid in interest. To figure out the monthly payments, we need to add the principal to the interest and then divide the sum by the number of months (B5). Once the formula is in the first column cell, we can do the Fill Right command and save entering all of those numbers again and again!

To calculate the total amount you would pay for each car with a 36, 48, or 60-month loan using the following formula:

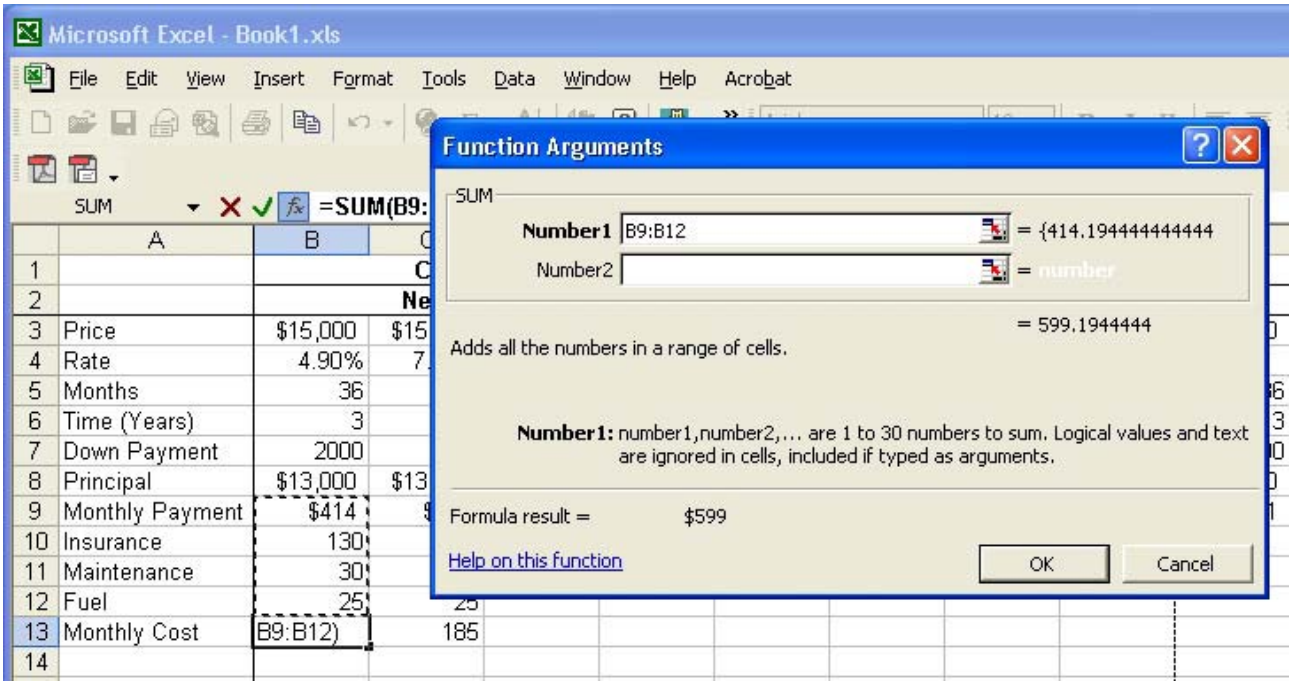
A. Find interest paid: Interest=(rate)(time in years)(original amount)

B. Total amount paid=Total amount of car + Total interest paid

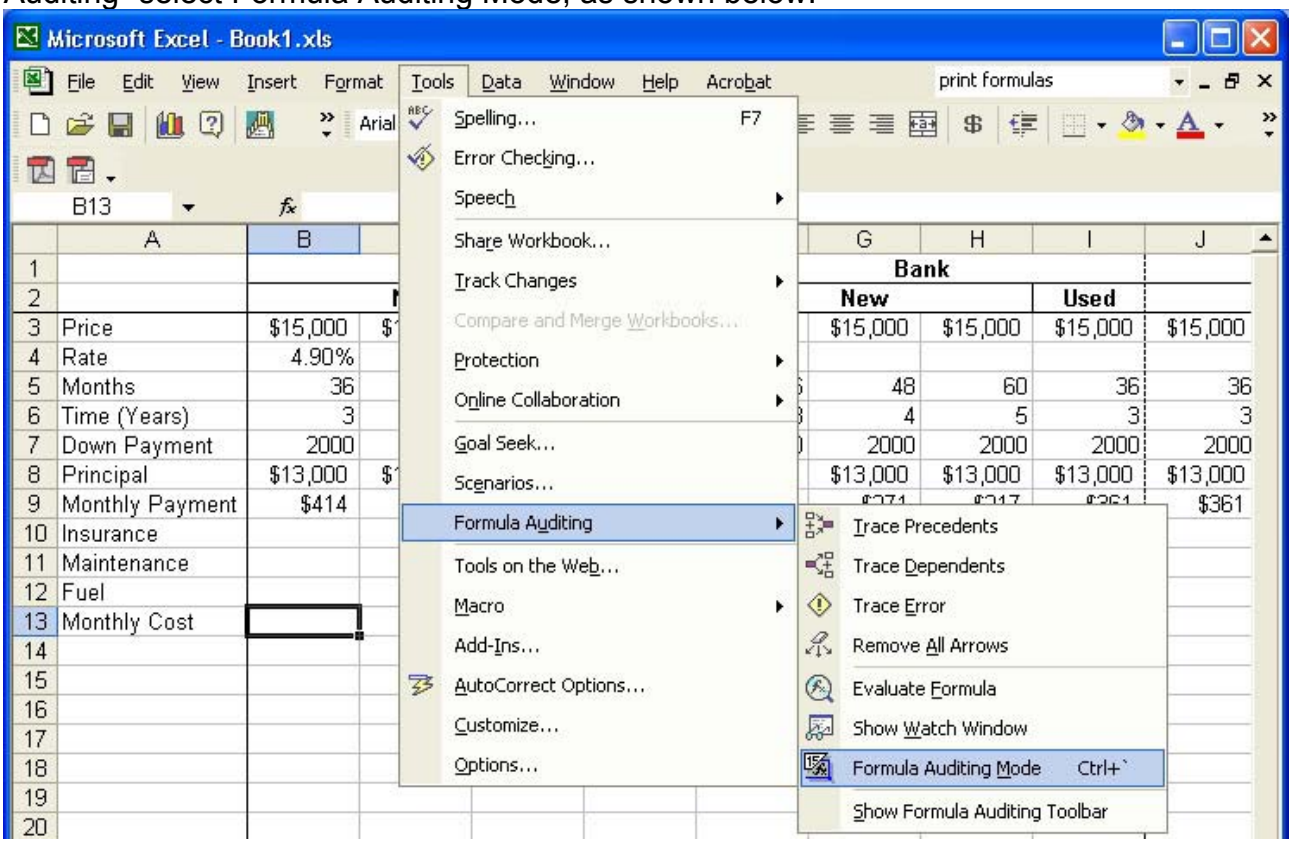
Finish filling out the spreadsheet, using the Total Cost of Ownership amounts for maintenance, the monthly insurance amounts that you found in your insurance research, and gas based on the average cost of gas now and the amount you'd probably drive. To add together these costs, use the Sum function. Place your cursor in the square where you are entering the monthly totals, then click on the fX beside the data entry window.



After you select Sum by clicking on it and hitting OK, you will have to define the area that you are totaling. The default is the entire column, which won't work because you have percents, years, months, and other items that are not the same. Drag your cursor over the cells that you want to include and then click OK.



Once you have monthly totals, **print out two sheets: one of formulas and the other with the amounts as shown.** Printing the sheet as you see it is no problem; go to File and select Print-Active Area. To print the formulas, go to Tools-Formula Auditing- select Formula Auditing Mode, as shown below:



(Notice the shortcut next to the Formula Auditing Mode! You could do this simply by holding down the Control key and +.)

Choose landscape mode in Page Setup and print the Formula Auditing Mode. Return and make a bar or line graph comparing the costs.

What About Leasing?

Leasing is a popular option, especially since cars have become so expensive. What are the pros and cons of leasing?

Eastern Michigan University has provided a worksheet with some guidelines for thinking about buying versus leasing. Fill it out to start this section. Then look over the Federal Consumer Leasing Act Disclosures we're providing. What do the terms mean? Cars.com has a plain English explanation of the terms (http://www.cars.com/carsapp/national/?srv=parser&act=display&tf=/advice/financing/loanlease/loanleaseadd4.tmpl), Smart Money has information (http://www.att.net/channels/finance/evergreen/buylease.htm) and the Motley Fool has some practical, cynical definitions and examples (http://www.fool.com/Car/CarGlossary/GlossaryLeasing.htm) . A more positive, but still honest, look at leasing is at the Leasingguide.com (http://www.leaseguide.com/lease03.htm) Once you are familiar with the terms, get the basic information you need to compare leasing and buying by going to Leasecompare.com (http://www.leasecompare.com/index) Set up a spreadsheet with the basics and get more details for comparison at Bank Rate's Lease or Buy page and their calculator at http://www.bankrate.com/brm/cgi-bin/lease.asp?nav=autos&page=calc_home Make a graph showing the difference in monthly rates and total cost of ownership over the time of the lease.

Base on what you've learned about leasing, **write a 1-2 page summary of the reasons why buying or leasing best fits you**. Support your reasons.

Keeping a Used Car

Now that you've used the spreadsheet to compare used vs. new and leasing versus buying, you have one more task to do. If a person leases a car all of their life, how much does that cost compared to someone who buys a car every, say eight years? Over a lifetime, what would the difference be?

Begin by reading the article at Kiplinger's on keeping the old clunker: http://www.kiplinger.com/spending/car/buying/buying4.html. In that article, you find the following chart:

	OLD CAR	NEW CAR
Mileage at end of four years	120,000	60,000
Total car payments	$0	$18,246
Gas and oil	3,456	3,348
License, registration, taxes	1,347	1,882
Insurance	3,457	3,946
Repairs, maintenance, tires	5,022	2,744
Resale value at end	451	7,408
Total expenses	**$13,282**	**$30,166**
(minus resale value)	-451	-7,408

Total costs	**$12,831**	**$22,758**
Difference		***$9,927***

Source: Runzheimer International

Make a spreadsheet for three families:

A. Family A buys a new car every eight years. The years that they don't have car payments, they invest what they don't pay in additional maintenance at 5%. (Historically, stockmarket returns have been about 7%; looking to the future, experts now say that 6 or 6 ½ % may be more realistic.)
B. Family B buys a new car every four years.
C. Family C leases a car and invests the difference between purchasing and leasing.

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You have the figures that you came up with, so for our example of how to go about this comparison, we'll have to make up a hypothetical case. Let's have each new car cost $18,246 listed above, although if historic inflation holds true, the prices of future cars will probably go up. We'll have the car buying and saving go on over a 40 year payment. Family A will have five cars and Families B and C will have ten cars over that period. We'll fill in the dates so that we can keep track of where we are over time.

Here's what the spreadsheet looks like in the beginning. The assumptions made appear to have made leasing the favorite. The maintenance, gas, oil, and insurance have been added to the lease cost calculated at the Bankrate for 4 years. The difference has been multiplied by the 5% interest rate (divided by 12) and compounded monthly, with the previous month's accumulated interest having the money saved over purchasing added to it. The formula cell I88, for example, is =I87+J87+99.15, where I87 is the accumulated principal with interest from the cell above with the new interest calculated for I87 added in and the savings of $99.15 added in.

Family B makes a monthly payment to "own" their car for 40 years, so the savings and interest column have N/A (not applicable) since they pay more than either the leasing family or the family who keeps their car for 8 years and then buys a new one.

Family A buys a car every 8 years has the same payments as B for the four years and then for four years their formula looks like this: =C52+D52+206.8125 . Since they have no car payment at all, their monthly car bill is the increased maintenance, gas ,and oil for driving an older car, which is much less than the lease payment. After 4 years, the payment resumes, but the money saved continues to collect interest monthly.

Finish your own spreadsheet. Create a graph that represents the results. Print it out and save it to disk..

In this scenario, leasing appears to beat out buying a new car every eight years, with no car payments for eight years, and buying a car every four years and trading it in. Analyze what factors could be changed in the scenario to come up with different results. Write your explanation.

PowerPoint Presentation

Scenario: Your parents have agreed to help you with the down payment that you have chosen for the car if you pay the monthly insurance They've asked you to prepare a

presentation that shows that you have researched your choice and that it makes sense. Use the information that you have gathered to create a PowerPoint presentation which you will present to your advisor who will be playing the role of a parent. The presentation should include:

- a picture of the car that you have chosen
- comparisons with other cars that you considered, showing its advantages over the others
- graphs of financing options
- an explanation of which type of acquisition (buy/lease new, used) makes the most sense for you and why
- demonstration that you have researched the insurance

The presentation needs to be well-organized, making the most of PowerPoint, without overwhelming the audience with too many animations or sounds, but making use of PowerPoint's features when appropriate

The presentation will be judged according to