CS130 Assignment #2

Date Assigned: 1/12/11
Date Due: 1/13/11 by 4pm
Points: 50

Continue adding the following worksheets to your Workbook called **PUNetIDExcel**:

Worksheet #3 – named "Mortgage"

Many believe that one of the best investments that anyone can make is buying a house. Houses in general will appreciate and the interest on the loan is tax deductible. Unfortunately, most of us become so mind boggled when presented with all of the paperwork for buying a house that we really don't understand much of what went on (trust me on this). For this problem, I want to concentrate on the mortgage loan.

Before you go out looking at houses, you need to have a price range in mind. That price range is based on how much the monthly payment is going to be. A monthly payment consists of principal, interest, taxes, and insurance (PITI). The principal is a portion of the actual loan that is being paid back. The interest is what you are paying as interest on the remainder of the loan each month. Taxes refer to property taxes and insurance is self-explanatory. The majority of the monthly payment is made up of (PI) which is principal and interest.

In order to figure out how much house we can buy, we need to know what the monthly payment is going to be. To figure out the monthly payment, we must do a what-if analysis. That is, what-if we are looking at an $87,000 house for example. Further, we must do a what-if on the interest rate. As an example, presently the interest rate is somewhere in the range of 4% to 5% (fixed). Here is an example of what I want your worksheet to look like:

	A	B	C	D	E	F	G	H	I
1	**Mortgage Calculator**								
2									
3	Enter Loan Balance	$87,000.00							
4	Enter APR	7.75%							
5	Enter Time In Years	30							
6	Enter Additional Payment	$0.00							
7									
8	Monthly Payment	-$623.28							
9	Total Interest Paid	$137,380.32							
10									
11		Loan	Monthly	Interest	Principal	Additional	Final		
12		Balance	Payment	Portion	Portion	Payment	Balance	Month	Year
13		$87,000.00	$623.28	$561.88	$61.40	$0.00	$86,938.60	1	1
14		$86,938.60	$623.28	$561.48	$61.80	$0.00	$86,876.80	2	1

If your table is correct, the final balance will zero out at month 360 if no additional payment is made.

You will notice that the additional payment column so far is zero. Here is the deal. When you buy your house, you want to make sure that along with the regular monthly payment (which does not change over the duration of the loan), the lending institution will allow you to make additional monthly payments toward the principal. This will enable you to pay off the loan several months in advance if you so desire. Many people want to get out from under the loan as soon as possible.

With this background information, the problem is as follows. You are to design a worksheet that allows the user the ability to enter:

1. the amount of the loan (in dollars)
2. the interest rate (as a percentage e.g. 0.075 for 7.5%)
3. the time of the loan in years
4. the amount of any additional payment toward the principal each month (in dollars)

With this input information, you are to create the above amortization table. Split the screen showing the first 10 rows and the last 8 rows of the worksheet.

Note: If I can't do a drag down of your worksheet from the second row of the amortization table, then you do not have a completely correct solution. Use named variables in your solution for all input information.

Worksheet #4 – named "Fleas"

You are to design a worksheet that simulates fleas on a dog over a 60 minute period of time. Your worksheet is to allow the user the ability to enter the following:

Cell	Meaning each minute	Value	Type
Flea Total	Number of fleas on the dog	50	Variable
Scratches	Number of scratches made by the dog	10	Variable
Scratch Rate		.05	Constant
Max Scratches	Maximum scratches the dog can make	20	Constant
New Fleas	Fraction of the fleas born or hopping on the dog	.2	Constant
Flea Death	Fraction of fleas dying or hopping off the dog	.1	Constant

For this simulation you are to use the above values in the following equations:

Scratches = the lesser of ((Scratch Rate * Flea Total) or Max Scratches)

$\text{Flea Total}_{next\_minute}$ = Flea Total + New Fleas * Flea Total – Flea Death * Fleas – Scratches

Make sure that you allow the user the ability to enter any arbitrary values for each piece of data described above. Then show a table of Scratches, Flea Total, and Minutes below the data entered. All constant cells are to be <u>named cells</u> with the names being used in the formulas instead of the cell reference name such as A1.

Your final worksheet is to display the results using the above values.

Finally, answer the following question starting with the initial values shown above:

1) What Scratch Rate will yield a Flea Total of 50 after 60 minutes? Place your answer as an Excel comment in cell D1. Make sure the comment is displayed when saving your worksheet.

Note1: You must use an IF formula to determine the number of scratches and no other functions with the IF formula.

Note2: I must be able to drag down your last row to get additional information.

The above problem idea came from <u>FORTRAN 77 For Humans</u> by Page.

How to Submit and Grading Policies

A copy of your single Excel file (properly named) with the two worksheets (properly named) is to be placed in the CS130 Drop folder by **4:00pm** on the due date to be considered on time.

Grading will be based on:

• Correctness of your results

• Completeness of your results

• Professional look of the worksheets as described above and discussed in class

• Ability to perform a what-if analysis by changing any of the user input data with accurate results computed and displayed in the worksheet.