

# CS130 Assignment #1

**Date Assigned:** Wednesday, September 6, 2017  
**Date Due:** Wednesday, September 13, 2017 2:15 pm  
**Points:** 50

In a Workbook called **PUNetIDExcel**, create each of the following worksheets:

## Worksheet #1 – Name it **Forest Defoliation**

A forester counts the number of egg masses on 1/40 of an acre the preceding fall to determine the amount of defoliation that will be caused by the gypsy moth during the current year. The percent of defoliation  $y$  is approximated by  $y = \frac{300}{3+17e^{-1.57x}}$  where  $x$  is the number of egg masses **in thousands**. (Source: Department of Environmental Resources)

You are to design a worksheet with the title **Forest Defoliation** merged across A1-B1, and two columns of information under the headings **Egg Masses** in cell A3 and **Percent of Defoliation** in cell B3. Underneath the Egg Masses heading, display values that go from 0 to 2000 in increments of 100. For each egg mass value, calculate and display the percent (e.g. 12.45%) of defoliation in the corresponding row and column for the given egg mass. Display percentages to two decimal places. This worksheet is to look professional. Column headings and values are to be right aligned and the worksheet heading is to be centered. Make sure the columns are wide enough to display all information as well as a little spacing between each column.

NOTE: If I drag down on the last row of your table, your worksheet is to continue doing correct calculations without me having to do any table modifications.

	A	B
1	Forest Defoliation	
2		
3	Egg Masses	Percent of Defoliation
4	0.00	15.00%
5	100.00	17.11%

## Worksheet #2 (Name it **Investment**)

One of the tougher things in life (I've found) is to prepare yourself for future events BEFORE you think you have to ... if I would have only known then what I know now!!! One topic that is most likely farthest from your thoughts is retirement. A thought more relevant might be, what am I going to do upon graduation? The two are not mutually exclusive.

As I was researching this topic, I came across a fun fact. A study by the National Institute on Retirement Security showed that 62% of working households between the ages of 55 and 64 have retirement savings that are less than one times their annual income. One other fun fact is that by the time you retire, unless something radically changes, you can expect to live well into your 80's.

Here are a few questions I would like you to think about when completing this assignment:

1. After you finish all of the schooling you plan on doing, what job will you be doing?

2. What is the average starting salary for the job you listed in 1?
3. How long do you plan on working?
4. How much money will you need to have saved for retirement?
5. Are you a conservative or aggressive investor?

FYI, I would not have been able to answer a single question after my undergraduate degree!!!!!! How is that possible? Answer: No one made me think about what I was doing in school.

I would like you to design a worksheet that you can use to help you in life. Below you will find the beginnings of the worksheet.

	A	B	C	D	E
1			Investment for Retirement		
2					
3	Starting Salary	\$30,000.00			
4	Yearly Investment Rate	3.00%			
5	Inflation Rate	3.00%			
6	Rate of Return	8.00%			
7	Present Value	\$0.00			
8					
9		Year	Salary	Yearly Investment	Balance
10		1	\$30,000.00	\$900.00	\$933.74
11		2	\$30,900.00	\$927.00	\$1,973.00

Once you decide what you might want to do after graduation, you can research a starting salary. I have put \$30,000 into the above worksheet as an example. Someone working 50 weeks a year, for 40 hours per week, at \$15 per hour would make \$30,000. The next line indicates how much of your salary you want to invest each year which I put in as 3%. The inflation rate since 1920 has been close to 3%. Fun fact: One dollar in 1920 has the same buying power as \$12.69 today. The rate of return is how much you will make on your investment, and most of us start out with nothing which is the \$0.00.

What isn't obvious about this worksheet is that while the yearly investment total is \$900, you will be investing on a monthly basis; therefore, for the first year, \$900/12 will be invested at the end of each month. In order to produce a correct worksheet, you will need to use the following formula:

$$fv = pv \left(1 + \frac{r}{k}\right)^{nk} + pmt \frac{\left(1 + \frac{r}{k}\right)^{nk} - 1}{\frac{r}{k}}$$

where fv is the future value, pv is the present value, r is the rate of return, k is the investment frequency, n is the number of years, and pmt is the investment amount.

For the above worksheet pv starts out at 0, r is 8% or .08, n is 1 year, k is 12 since the amount invested is per month, and pmt for the first year is (3%\*\$30,000)/ 12 which is \$900/12.

You are to show the worksheet for 45 years which means a 22 year old graduate would be retiring at age 67.

In cell D1 you are to place an Excel comment that answers the question: What do you expect your job title to be after graduation and what do you expect your starting salary to be. Make sure your answer and comment are showing when I open the worksheet.

### **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 CS130-01Drop Box by **2:15pm** 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.

For each worksheet:

1. Clearly label all the data, and use the cell formatting options to make this spreadsheet easy to read and to give it a professional look.
2. Use Named Cells where appropriate. Any cell that contains user input is to be named for sure.
3. You may not use any built-in Excel functions for Worksheet #2.

You are to print and turn in a 1 page copy of each worksheet with Worksheet #1 entirely displayed and readable on the front and Worksheet #2 on the back of the single page. Make sure any comments are showing. I found the easiest way to do this is to copy all cells of the worksheet to the clipboard and then paste into a Word document as a picture. This printout is due exactly at 2:15pm.