

### Due Date/Time:

Submission must be in OAKS by  
11:59PM Thursday, August 29, 2010

### Learning objectives:

- Create a Python program on your own.
- Develop a simple Python program that asks for input, does arithmetic, and provides output.

### Assignment:

You and many of your friends will be buying cars and homes within the next few years. As a result, you have decided to write a Python program to calculate the principal payments and help everyone realize exactly how much interest they will pay over the period of their loans. In order to perform the appropriate calculations, you will need to know the initial loan amount (“principal”), the number of months of the loan (“months”), and the interest rate (“interest”). Your program should calculate the monthly payment, the amount paid over the life of the loan, and the total interest paid.

The formulas you will need are:

$$rate = \frac{interest}{1200}$$

$$monthly\ payment = \frac{principal * rate * (1 + rate)^{months}}{(1 + rate)^{months} - 1}$$

Notes: Have the user input the interest rate as it appears before dividing it by 100. For example, if the interest rate is 5.3% the user should enter 5.3 NOT .053.

Save your program as `Pgm1_usury.py`. Upload the program into the Assignment Dropbox for Program 1

### Guidance:

The key will be to apply the software development cycle! Ask yourself, and write the answers to, the following questions. Add your answers as a comment to your .py file.

1. What will the program do? (Purpose statement)
2. What will be the inputs and outputs? (Part of header.)
3. Provide a step-by-step list of what your program must do, aka an algorithm. (Remember this is in English! Add these to body of your code as comments for the code.)
4. Implement your code.

# Programming Assignment #1

## Usury

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5. Test your program using the sample runs below.

Principal/ Loan Amount	Months	Interest	Monthly Payment (calculated)	Total amount paid (calculated)	Total interest paid (calculated)
\$ 1000	36	5%	\$ 29.9708971047	\$ 1078.95229577	\$ 78.952295768
\$ 40000	60	7.5%	\$ 801.517943825	\$ 48091.0766295	\$ 8091.0766295
\$ 250000	360	7%	\$ 1663.25623795	\$ 598772.245661	\$ 348772.245661
\$ 10000	120	5.5%	\$ 108.52627796	\$ 13023.1533553	\$ 3023.15335526

**File to be submitted:**

Pgm1\_usury.py