**Python Introduction Section 2**

**Python Reading**

Read the [General Introduction](http://interactivepython.org/runestone/static/thinkcspy/toc.html) from the section entitled *What is Debugging?* through the section entitled *Experimental Debugging*.

**Checking Your Understanding (16 pts total)**

Look over the [compound interest formula](http://qrc.depaul.edu/studyguide2009/notes/savings%20accounts/compound%20interest.htm) to familiarize yourself with how compound interest is calculated.

# ****Compound Interest Formula****

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| Regular Compound Interest Formula  **P** = principal amount (the initial amount you borrow or deposit)  **r**  = annual rate of interest (as a decimal)  **t**  = number of years the amount is deposited or borrowed for.  **A** = amount of money accumulated after n years, including interest.  **n**  =  number of times the interest is compounded per year |

**Example:**

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| An amount of $1,500.00 is deposited in a bank paying an annual interest rate of 4.3%, compounded *quarterly*. What is the balance after 6 years? |

**Solution:**

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| Using the compound interest formula, we have that **P** = 1500, **r** = 4.3/100 = 0.043, **n** = 4, **t** = 6. Therefore,  Example Solution  So, the balance after 6 years is approximately $1,938.84. |

Next open IDLE, click File and then click New File. Copy the following code exactly like I have it, paste it into the new file you just opened, and save it in your Python Programs folders as CompoundInterestCalculator: Once you have saved it, run the program using the following input: principal = 1000; percentage rate = 5; number of years = 10; number of times compounded = 4. When you run it, you will see a prompt to input the principal. That is when you input 1000 and hit enter. You will then see the next prompt.

print("Compound Interest :")

amount = input('Enter the principal amount: $')  
amount = float(amount)  
rate = input('Enter percentage rate : ')  
time = input('Enter number of years: ')  
time = float(time)  
compoundTimes = input('Number of times interest will be compounded each year: ')  
compoundTimes = float(compoundTimes)  
  
total\_amount = amount \* ((1 + ((float(rate)/100))/4)\*\*(compoundTimes\*time))  
print('\nTotal Amount = $%0.2f' %total\_amount)  
compound\_interest = total\_amount - amount  
print('Compound Interest = $%0.2f' %compound\_interest)

**Directions: Provide an answer for each question directly after the question on the copy of this document that you saved to your drive – please save it with the same name I have given it. When appropriate, you need to answer in complete sentences.**

1. What were the 2 lines of output produced from the program. (10 pts)

Total Amount = $1643.62

Compound Interest = $643.62

1. Describe a syntax error you could introduce into the above program. (2 pts)

If I were to remove one of the quotes from the strings above it would create a syntax error.

1. Describe a run-time error you could introduce into the above program. (2 pts)

If I were to put in a 0 in the float division it would create a runtime error.

1. Describe a semantic error you could introduce into the above program. (2 pts)

If I were to change the numbers that are supposed to be divided or multiplied to incorrect numbers, it would not correctly calculate the compound interest.