CSCI 1310 Introduction to Programming
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Assignment 2
Due Monday, January 26 by 13:00

Instructions: For each of the problems, generate a separate .py file with a name that identifies the problem number, such as Problem1.py. Zip the files for each answer together and submit them to the Moodle as *FirstName_LastName_Assignment2.zip*. All problems are equally weighted. Please also include comments in your code to describe what your code is doing.

Problems:

1. A very important idea in finance is the time value of money. The formula for the future value of a sum invested today is:

   $FV = PV * (1 + i)^n$

   Where PV is the present value or initial investment; i is the annual interest rate; and n is the number of years that your money is invested. By way of example, if you invest $100 today at 10% for two years, you will have $\$100*(1.10)^2 = \$121$.

   Write a Python program that takes PV, n and i as inputs and calculates the future value. As a test case, use an initial investment of $1,000,000, an annual interest rate of 5% and n = 10 years. Your output should read something like "The future value of your investment will be X."

   Hint: Use the power function (pow()) for exponential calculations.

2. The U.S. Census provides information about the current U.S. population as well as approximate rates of change. Three rates of change are provided:
   a. There is a birth every 7 seconds
   b. There is a death every 13 seconds
   c. There is a new immigrant every 35 seconds

   Using those three rates of change, and a current U.S. population of 330,357,870, write a program to calculate the U.S. population in exactly one year (365 days). Your program should output the result in a nicely formatted print statement: "The population will be X".

   Hints: You will need to calculate the number of seconds in one year. Also, a population cannot have fractional people, e.g there can be 10 people, but not 10.2 people.

3. I have to drive from Denver to Boulder every day so that I can have the great pleasure of teaching my classes at University of Colorado. One way, the trip is 35 miles and my gas guzzling jeep gets 13 miles/gallon. Assuming that I can fill up at $2.00/gallon, write a program that calculates:

    a. The cost of a round trip.
    b. The monthly cost.
    c. The yearly cost.

    The program should have a print statement for each calculation.