CS-521 Homework Assignment 2

Assignment Directions

Complete the 5 python programming problems below. Each is worth 10 points for a total of 50 points (100%).

Individual programs must be named with your BU email prefix (the part before @bu.edu) and the problem number. If your email is alex@bu.edu, then your first program in this assignment would be called: alex_hw_2_1.py

The programs must all be combined into a single zip file named with your email prefix and the assignment number. alex@bu.edu would name their submission alex_2.zip.

Style Requirements

For all assignments, follow the guidelines in the PEP8 Standards and Best Practices that have been shared to date, along with course specific requirements. Remember these to avoid minor deductions:

- Include a program docstring
- Stay under 80 characters on all code and comment lines
- Ask for input() with descriptive prompts telling users what is expected
- Print output that clearly explains what is being printed (where necessary)
    - In other words, don't just print a '5' unless it's clear what that 5 represents.

Do NOT use functions for this assignment.

Assignment Notes

- Some of these problems require you to take user input and others do not. Pay careful attention to whether input is required: if the problem does not say to prompt for user input, you must not prompt for user input!
- Some of the problems require a docstring to answer questions about the problem. You must use a docstring (triple-quotes) for this, and not a line comment. Place your docstring with answers below any code written, at the bottom of your program.
- For problems that provide sample output, take a careful look at the sample output vs. the output of running your code. Make sure your code's output matches the sample output in any meaningful way. For instance, if the problem requires certain outputs on a single line or in a particular order, you must present your output in the same way. However, you do not have to make your prompts or descriptions use the same wording.

Assignment

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2.1: Write a Python program does the following:

a. Prompt the user to enter a number from 1 to 9.
   - Validation of user input not required until week 3.
b. In one line of code, perform these operations in this exact order:
   - Multiply the number by 2
   - Add 10
   - Divide the number by 2
   - Subtract the original number
c. Print the output of this calculation as an integer (no decimal places).
d. Now take the original number and convert it to a three-digit number with the same digits.
   - For example, if the user entered '3', the three-digit version is '333'.
e. Add the digits together.
   - For example, if the user entered '3', you would calculate 3+3+3 = 9.
f. Divide the three-digit version by the resulting sum of its digits.
   - For example, if the user entered '3', you would calculate 333 / 9.
g. Print the output of this second calculation as an integer (no decimal places).

2.2: Write a program that does the following:

a. Prompt the user to enter a string or a number.
b. Print that input as (1) a string, (2) an integer, and (3) a floating-point value.
   - **Based on the user input, this program will crash sometimes!**
c. What data types can be input that will print without generating **any errors**?
   - Answer this question **at the end of your code** by using a docscring comment and explain why for your answer makes sense for all three data types listed in part b.

2.3: Write a program that does the following:

a. Prompt the user to enter a number
b. Take that integer (n) and compute the value of **n+n/3+n*n*n+n*n**3 = ?**
c. Print the formula, replacing the 'n' variables with the user input, and the ? with the calculation results.
   - Use an f-string or .format() instead of string concatenation to print the result.
   - Numbers greater than 1,000 must have a comma separator.
   - Limit to 2 decimal places using string formatting only

Example Output:

```
Please enter an integer: 8
8+8/3+8*8*8+8*8**3 = 4,618.67
```

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2.4: Write a **three-line program (3 commands)** that will

a. prompt for a number
b. convert the input to an integer
c. print the number 0 if the user input is even and the number 1 if the user input is odd
   - Hint: One way to determine whether an integer is even or odd is to divide the number by two and check the remainder.

Additional Rule: You can NOT use an 'if statement' in this program.

2.5: One of the most common programming challenges is the fizz-buzz challenge. We're going to write a variation of it! Write a Python program that does the following:

a. For each number in a range:
   - If the number is divisible by 2, print the word foo
   - If the number is divisible by 3, print the word bar
   - If the number is divisible by 5, print the word baz
   - If the number is divisible by more than one of these, print the combination on the same line. For example:
     - 15 (3 & 5) would print barbaz
     - 6 (2 & 3) would print foobar
     - 30 (2 & 3 & 5) would print foobarbaz
   - If the number is divisible by none of these, print an empty string.
   - Your output must present these in the correct order (foo first, then bar, then baz).
   - HINT: The modulo operator will help you out with this!
b. Using a **for loop** from 1 to 30 inclusive, print the output for the above.
   - The upper limit of 30 must be a CONSTANT, declared at the top of your program
   - Before printing the number outputs, print the beginning and end of the range
   - Print the output of each number on a single line as → n: <string>
c. Print a separator line.
d. Repeat step 'b' using a **while loop**.

Where to submit?

Click Assignments in the Navigation Area and then click on the title of the assignment to enter the submission area and upload your response.