

CS-521 Homework Assignment 2

2021 Fall 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
 - No need to validate user input this week – that starts next week
- 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 user defined 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.

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Programming Problems

- 2.1: Write a Python program that does all the following steps. Make sure you label all your print output to explain what you are printing. This is required for all problems in this course.
- Prompts the user to enter a whole number from 1 to 7.
No validation required for this problem.
 - In one line of code/calculation, performs the following operations on the user supplied number in this exact order:
 - Multiply by 2
 - Add 10
 - Divide by 2
 - Subtract the user supplied number
 - Print the output of this calculation in part 'b' as an integer (no decimal places).
 - Now take the same user supplied number from part 'a' and convert it to a three-digit number with incrementing digits. Assign this number to a variable as an integer.
 - For example, if the user entered '3', the three-digit version is 345.
 - Add the three digits together and print the results.
 - For example, if the user entered 3, you would calculate $3+4+5 = 12$.
 - Divide the three-digit version by the resulting sum of its digits and print the results as a float.
 - For example, if the user entered 3, you would calculate $345 / 12$.
 - Reprint the output of part 'f' as a **truncated** integer (no decimal places).
- 2.2: Write a program that does the following:
- Prompt the user to enter a string or a number.
 - Print that input 3 times, as (1) a string, (2) an integer, and (3) a floating-point value.
 - Based on the user input, this program will crash sometimes!**
 - 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 docstring (triple quote) comment and explain why for your answer makes sense for all three data types listed in part b.

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2.3: Write a program that does the following:

- a. Prompt the user to enter a number
No validation required for this problem.
- b. Take that number (n) and compute the value of **n cubed, divided by n**
- c. Print the formula and results, replacing the 'n' variables with the user input.
 - o Limit result to 2 decimal places

Example Output:

```
Please enter a number: 8
8**3/8 = ###.##
(you will fill in ###.## with the correct number)
```

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.

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2.5: One of the most common beginning programming problems is the fizz-buzz challenge. Write a Python program as follows:

- a. After the program docstring, declare a constant variable named MAXVAL with a value of 30,
- b. Create a **for loop** that will loop through all values from 1 to 30, using MAXVAL to help define the end value of the **for loop**.
- c. For each number in the loop:
 - 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.
 - If the number is not divisible by 2,3 or 5, do not print a string
 - Print the output of each number in the loop on a single line as → n: <string>For example:

- 15 (3 & 5) would print → 15: barbaz
- 6 (2 & 3) would print → 6: foobar
- 30 (2 & 3 & 5) would print → 30: foobarbaz
- 7 would print → 7:

- d. After part 'c' is completed, print a separator line.
- e. Repeat step 'c' using a **while loop** from 1 to 30 (using the same MAXVAL constant to define the end of the range).

Note: 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!

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.