

CS-521 Homework Assignment 2

Assignment Directions

For all assignments, follow the guidelines in the PEP8 Standards for this Class document in the Student Docs section. Your programs and zip files must be named correctly, contain a docstring heading and include the other style requirements taught to this point. Individual programs should be named with your BU email prefix (the part before @bu.edu). If your email prefix is 'alex', then your first program would be called: alex_hw_2_1_1.py

Be sure that your user prompts and print outputs are descriptive.

The specific instructions for these problems are adapted from problems shown in the textbook. Make sure to follow the specific instructions in THIS document.

Each of the 7 program assignments is worth 10 points for a total of 70 points (100%).

Chapter 1 Exercises

2.1.1: Write a Python program that prompts the user to enter a number. In one calculation, take that number, add 2, multiply by 3, subtract 6, and divide by 3. Use an IF statement to check whether the input matches the calculated value and print the result of this check in a descriptive message.

2.1.2: Prompt user for input and then print that input as a string, an integer, and a floating-point value. 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 comment.

2.1.3: Write a Python program that asks the user to enter an integer (n) and computes the value of $n+n*n+n*n*n+n*n*n*n = ?$. The program must then print the formula, replacing the 'n' variables with the user input, and the ? with the calculation results. Numbers greater than 1,000 must have a comma separator. Print using a formatted string or the format function.

Example Output:

```
Please enter an integer: 5
5 + 5 * 5 + 5 * 5 * 5 + 5 * 5 * 5 * 5 = 780
```

2.1.4: One way to determine whether an integer is even or odd is to divide the number by two and check the remainder. Write a **three-line program** that (1) prompts for a number, (2) converts the input to an integer and (3) prints the number 0 if the user input is even and the number 1 if the user input is odd.

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- 2.1.5: Body Mass Index (BMI) is a number calculated from a person's weight and height. The metric formula for BMI is: ***weight / height²***
where weight is in kilograms and height is in meters.

Write a program that:

- clearly prompts user for weight and height in one input
- performs BMI calculation
- prints BMI calculation with an appropriate description

Example Output:

Enter Weight in kilograms and Height in meters (separated by a space): **110.2 1.83**
Body Mass Index (BMI) for Weight 110.2 and Height 1.83: 32.91

Chapter 2 Exercises

- 2.2.6: Using a 'for loop', write a program that calculated and prints all the leap years from 1899 to 2021. Make sure that you understand the rules for determining a leap year and use the modulo operator to manually calculate leap years. *Do not use the calendar library.*

Then perform this calculation a second time using a 'while loop'.

For each looping method, print all the year results on one comma separated line.

- 2.2.7: Rewrite this following 'for loop' as a 'while loop' and create a working program:
(Note that X is upper case because it is defined as a constant)

```
X = 10
for i in range(1, X + 1):
    if X % i == 0:
        print(i)
```

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.