Problem Set 2 - Revised:

Handed out: Thursday, October 19th, 2023

Due: Thursday, October 26th, 2023

We will be writing five programs in this problem set. Please create a program for each part in this assignment, and name your programs 'ps2_part<Letter>_name.py'.

Part A:

This program will help determine the grade for a student. The program will ask for the grades on 3 exams. Depending on the average grade of these exams, the program should print the letter grade for the student.

The program should do the following:

1. Ask for the grade on exam 1.
2. Ask for the grade on exam 2.
3. Ask for the grade on exam 3.
4. If the average grade is greater than or equal to 90, then print that the student got an A
5. If the average grade is greater than or equal to 80 and less than 90, then print that the student got a B
6. If the average grade is greater than or equal to 70 and less than 80, then print that the student got a C
7. If the average grade is greater than or equal to 60 and less than 70, then print that the student got a d
8. If the average grade is less than 60, then print that the student got an F

Assume that the user always enters valid numbers for the grades.

For example, if the user enters 3 grades that average to be 90, then the output should look like the following:

```
What was the grade on exam 1? 89
What was the grade on exam 2? 90
What was the grade on exam 3? 91
You got an A.
```

For example, if the user enters 3 grades that average to be 85.67, then the output should look like the following:

```
What was the grade on exam 1? 85
What was the grade on exam 2? 90
```

```
What was the grade on exam 3? 82
You got a B.
```

For example, if the user enters 3 grades that average to be 56.33, then the output should look like the following:

```
What was the grade on exam 1? 60
What was the grade on exam 2? 57
What was the grade on exam 3? 52
You got an F.
```

Part B:

This program will count the vowels and consonants in a person's name.

The program should do the following:

1. Ask the user for their name.
2. Print out the number of vowels in their name.
2. Print out the number of consonants in their name. (treat 'y' as a consonant)

Assume that the user only enters a name with lowercase letters.

For example, if the user enters "justin":

```
What is your name? justin
You have 2 vowels in your name.
You have 4 consonants in your name.
```

Part C:

This program will print the summation of a given integer. To calculate a summation, you must add all the whole numbers smaller than that number down to 1.

The program should do the following:

1. Ask the user for an integer.
2. Print out the summation.

Assume that the user always enters a valid integer.

For example, if the user enters 4 the result should be 10 (since 4 + 3 + 2 + 1 = 10):

```
Enter an integer: 4
4 summation is 10.
```

For example, if the user enters 3 the result should be 6 (since 3 + 2 + 1 = 6):

```
Enter an integer: 3
3 summation is 6.
```

Part D:

This program will create a rectangle pattern based on dimensions that the user gives.

The program should do the following:

1. Ask the user for the number of rows.
2. Ask the user for the number of columns.
3. Print the rectangle pattern.

Assume that the user always enters valid integers for the number of rows and columns.

For example, if the user enters 4 for the number of rows and 6 for the number of columns:

```
How many rows? 4
How many columns? 6
******
******
******
******
```

For example, if the user enters 5 for the number of rows and 3 for the number of columns:

```
How many rows? 5
How many columns? 3
***
***
***
***
***
```

Part E:

This program will print the factorial of a given integer. To calculate a factorial, you must multiply all the whole numbers smaller than that number down to 1.

The program should do the following:

1. Ask the user for an integer.
2. Print out the factorial.

Assume that the user always enters a valid integer.

For example, if the user enters 4 the result should be 24 (since 4 * 3 * 2 * 1 = 24):

```
Enter an integer: 4
4 factorial is 24.
```

For example, if the user enters 3 the result should be 6 (since 3 * 2 * 1 = 6):

```
Enter an integer: 3
3 factorial is 6.
```

Part F (extra credit):

In this program, you will create a digital assistant - like Siri or Alexa.

The user should be able to interact and have a conversation with your program.

This digital assistant will be entirely your own creation - get creative! All I ask is that you use the following concepts at least once in your program.

- input
- if
- elif
- else

For example, you could make a digital assistant that tells the user jokes:

```
Hello, I am Robo-Justin
Would you like to hear a joke? (yes/no) yes
Why did the scarecrow win an award? why
Because he was out-standing in his field!
Would you like to hear another joke? (yes/no) no
OK, goodbye!
```

Or you could make a digital assistant that provides information about a non-profit:

```
Hello, enter 1 for information. Enter 2 for contact. Enter 3 for testimonials: 1
TEJI was founded in 2015. It offers a variety of computer education courses such
```

as Intro to Python, Video Game Design, and Web design.

Write whatever you want! Just make sure the digital assistant is PG :)

Grading:

Part A - 4 points

Part B - 2 points

Part C - 2 points

Part D - 2 points

Part E - 2 points

Part F - 2 bonus points