HW4

For HW4, you will write a program that will display a menu to the user and make various calculations. First, show the user the following menu by calling a function that will display the menu.

```
print ("Enter 1 to calculate the area of a circle")
print ("Enter 2 to calculate the surface area of a sphere")
print ("Enter 3 to calculate the volume of a sphere")
print ("Enter 4 to quit")
```

If the user enters a string that cannot be interpreted as a number, display the error message: `Choice should be a number`. If the user enters a float, display the error message: `Choice should be an int, not float`. If the user enters an integer other than 1-4, display the error message: `Choice should be in range of 1-4.`

Assuming the choice is 1-3, ask the user for the radius. If the user enters a string that cannot be interpreted as a number, display the error message: `Radius needs to be a number`. If the user enters a non-positive number, display the error message: `The radius has to be positive`. Don't proceed with the rest of the program until the user enters a positive radius (it can be an int or a float). Once you have a positive radius, for choice 1, calculate the area of a circle by calling a function that calculates and returns the area. For choice 2, calculate the surface area of a sphere by calling a function that calculates and returns the surface area. For choice 3, calculate the volume of sphere by calling a function that calculates and returns the volume. Your program should continue to display the menu, error check, and make calculations, until the user enters choice 4.

Use the sample below as a guide for developing your program and for the format of the prompts and the outputs. Don't add anything extra and create your program to exactly match the specifications given above and in the sample. For full credit, you must write the code for the functions described above (please review the coding conventions for how to document your functions). All variables must be local to functions, but you should have a global constant variable to hold the value of PI (=3.14159) In the sample runs, the user input is shown in bold so you can easily distinguish input from program generated text (it does not have to show up as bold in your program).

Sample run 1

```
Enter 1 to calculate the area of a circle
Enter 2 to calculate the surface area of a sphere
Enter 3 to calculate the volume of a sphere
Enter 4 to quit
Enter your choice: hello
Choice should be a number

Enter 1 to calculate the area of a circle
Enter 2 to calculate the surface area of a sphere
Enter 3 to calculate the volume of a sphere
Enter 4 to quit
Enter your choice: 5..6
Choice should be a number

Enter 1 to calculate the area of a circle
Enter 2 to calculate the surface area of a sphere
Enter 3 to calculate the volume of a sphere
Enter 4 to quit
Enter your choice: $5.25
Choice should be a number

Enter 1 to calculate the area of a circle
Enter 2 to calculate the surface area of a sphere
Enter 3 to calculate the volume of a sphere
Enter 4 to quit
Enter your choice: 5.6
Choice should be an int, not float

Enter 1 to calculate the area of a circle
Enter 2 to calculate the surface area of a sphere
Enter 3 to calculate the volume of a sphere
Enter 4 to quit
Enter your choice: 5
Choice should be in range of 1-4.

Enter 1 to calculate the area of a circle
Enter 2 to calculate the surface area of a sphere
Enter 3 to calculate the volume of a sphere
Enter 4 to quit
Enter your choice: 1
Enter the radius: hello
Radius needs to be a number
Enter the radius: -10
The radius has to be positive
Enter the radius: 10.5
The area is: 346.36

Enter 1 to calculate the area of a circle
Enter 2 to calculate the surface area of a sphere
Enter 3 to calculate the volume of a sphere
Enter 4 to quit
Enter your choice: 2
Enter the radius: 10
The surface area is: 1256.64

Enter 1 to calculate the area of a circle
Enter 2 to calculate the surface area of a sphere
Enter 3 to calculate the volume of a sphere
Enter 4 to quit
Enter your choice: 3
Enter the radius: -10
The radius has to be positive
Enter the radius: error checking is fun
Radius needs to be a number
Enter the radius: 20
The volume is: 33510.29
```

```
Enter 1 to calculate the area of a circle
Enter 2 to calculate the surface area of a sphere
Enter 3 to calculate the volume of a sphere
Enter 4 to quit
Enter your choice: 4
End of the program
```

When you've finished your homework, use the submit command to submit the file.

You must be logged into your account and you must be in the same directory as the file you're trying to submit.

At the Linux prompt, type

```
submit cs201 HW4 hw4.py
```

After entering the submit command shown above, you should get a confirmation that submit worked correctly:

```
Submitting hw4.py...OK
```

If not, check your spelling and that you have included each of the required parts and try again.

You can check your submission by entering:

```
submitls cs201 HW4
```

You should see the name of the file that you just submitted, in this case hw4.py