Muhammad Shas K T
EMP ID: 281775

Assignment 3 - Exception Handling for Robust Programs (Error Handling & Debugging)

Task:-

- Design a Python program that calculates the volume of various shapes (e.g., cube, sphere, cylinder) based on user input.
- Allow the user to select the desired shape and provide the necessary dimensions.
- Implement exception handling (try-except blocks) to: Validate user input and ensure it's a valid numerical value. Handle potential errors specific to each shape calculation (e.g., negative radius for a sphere).
- Display informative error messages in case of invalid input or incompatible values.
- Provide clear instructions on how to rectify the error and continue using the program.

Code:-

```python
import math

print("\nWelcome to Volume Calculator")

while True:
 input_number = int(input(
 "\n1. Find volume of cube\n"
 "2. Find volume of sphere\n"
 "3. Find volume of cylinder\n"
 "4. Exit program\n\n"
 "Press a number between 1-4: "))

 if input_number == 1:
     flag = 1          #Flag for return to entering data after an exception occured
     while flag:
       try:
           edge = float(input("\nEnter the edge length of cube: "))
           if edge<=0:
               raise exception
           volume = edge**3
           print("The volume of the sphere is ",volume)
           flag = 0
       except:
           print("Please enter a positive value for edge length")

 elif input_number == 2:
```

```python
        flag = 1
        while flag:
            try:
                radius = float(input("\nEnter the radius of sphere: "))
                if radius<=0:
                    raise exception
                volume = (4/3)*math.pi*(radius**3)
                print("The volume of the sphere is ",volume)
                flag = 0
            except:
                print("Please enter a positive value for radius")

    elif input_number == 3:
        flag = 1
        typed_radius = 0      #Flag for keeping already entered radius value even with
exception of height
        while flag:
            try:
                if typed_radius == 0:
                    radius = float(input("\nEnter the radius of cylinder: "))
                    if radius<=0:
                        raise exception
                    typed_radius = radius
                height = float(input("\nEnter the height of cylinder: "))
                if height<=0:
                    raise exception
                volume = math.pi*(radius**2)*height
                print("The volume of the cylinder is ",volume)
                flag = 0
            except:
                print("Please enter a positive value")

    elif input_number == 4:
        print("\nThank you for using Volume Calculator")
        exit()
```

Result:

```
Welcome to Volume Calculator

1. Find volume of cube
2. Find volume of sphere
3. Find volume of cylinder
4. Exit program

Press a number between 1-4: 3

Enter the radius of cylinder: 0
Please enter a positive value

Enter the radius of cylinder: 3

Enter the height of cylinder: -4
Please enter a positive value

Enter the height of cylinder: 5
The volume of the cylinder is  141.3716694115407
```

```
Welcome to Volume Calculator

1. Find volume of cube
2. Find volume of sphere
3. Find volume of cylinder
4. Exit program

Press a number between 1-4: 2

Enter the radius of sphere: -2
Please enter a positive value for radius

Enter the radius of sphere: 4
The volume of the sphere is  268.082573106329
```

```
Press a number between 1-4: 4

Thank you for using Volume Calculator

=== Code Execution Successful ===
```