ASSIGNMENT – 3

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```python
import math
# Defining functions to find the volumes of cube, sphere and cylinder
def calculate_cube_volume(side_length):

    return side_length ** 3


def calculate_sphere_volume(radius):

    return (4/3) * math.pi * radius ** 3


def calculate_cylinder_volume(radius, height):

    return math.pi * radius ** 2 * height


print("Welcome to Volume calculator\n")
# Repeated loop by dealing with exceptions until result obtained
while True:
    try:
        print("You can find volume of Cube, Sphere, Cylinder\n")
        shape = input("Enter the shape for which you need to find volume : ").lower()
        if shape not in ['cube','cylinder','sphere']:
            raise ValueError("Invalid choice. Please choose from given list\n")
        if shape =='cube':
            a = float(input("Enter the side length of the cube : "))
            if a<=0:
                raise ValueError("The side length must be positive\n")
            else:
```

```python
            volume = calculate_cube_volume(a)
        elif shape =='sphere':
            r = float(input("Enter the radius of the sphere : "))
            if r<=0:
                raise ValueError("The sphere radius must be positive\n")
            volume = calculate_sphere_volume(r)
        elif shape=='cylinder':
            r = float(input("Enter the radius of the cylinder : "))
            h = float(input("Enter the height of the cylinder : "))
            if r<=0 or h<=0:
                raise ValueError("The radius and height must be positive values\n")
            volume = calculate_cylinder_volume(r,h)

        print(f"The volume of {shape} is : {volume}")
        break
    except ValueError as e:
        print(f"\nError occured, {e}")
    except Exception as e:
        print(f"An Error occured {e}")
```

OUTPUT

```
Welcome to Volume calculator

You can find volume of Cube, Sphere, Cylinder

Enter the shape for which you need to find volume : rect
Error occured, Invalid choice. Please choose from given list

You can find volume of Cube, Sphere, Cylinder

Enter the shape for which you need to find volume : sphere
Enter the radius of the sphere : 0
Error occured, The sphere radius must be positive

You can find volume of Cube, Sphere, Cylinder

Enter the shape for which you need to find volume : sphere
Enter the radius of the sphere : 5
The volume of sphere is : 523.5987755982989

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