2a: Area of Common 2D shapes

Aim:

To write a Python program to calculate the area of different common two-dimensional shapes, i.e. that of a square, rectangle, triangle or circle, based on the user's input.

Program Code:

```
#Area of shapes
print ("1. Square")
print ("2.Rectangle")
print ("3.Triangle")
print ("4.Circle")
print ("5.Exit")

while True:
choice=input("\nEnter choice 1-5:")
if choice=='1':
print ("Area of square.")
side=float(input("Enter the side: "))
print ("Area is: ", side*side)
elif choice=='2':
print ("Area of Rectangle.")
l=float(input("Enter the length: "))
b=float(input("Enter the breadth: "))
print ("Area is: ",l*b)
elif choice=='3':
print ("Area of triangle.")
b=float(input("Enter the base: "))
h=float(input("Enter the height: "))
print ("Area is: ",0.5*b*h)
elif choice=='4':
print ("Area of Circle.")
r=float(input("Enter the radius: "))
print ("Area is: ",3.14*r*r)
elif choice=='5':
print ("Goodbye")
break
else:
print ("Enter valid choice 1-4 !!!")
```

Sample I/O:

```
1. Square
2.Rectangle
3.Triangle
4.Circle
5.Exit
Enter choice 1-5:1
```

```
Area of square.
Enter the side: 2.5
Area is:  6.25
Enter choice 1-5:5
Goodbye
```

2a: Volume of a cone

Aim:

To write a Python program to calculate the volume of a cone.

Program Code:

```
r = int(input("Enter radius: "))
h = int(input("Enter height: "))
print("Volume is: ")
print (0.33333*r*r*3.14*h)
```

Sample I/O:

```
Enter radius: 2

Enter height: 2

Volume is: 8.3732496000000012
```

2a: Volume of a Cylinder

Aim:

To write a Python program to calculate the volume of a cylinder.

Program Code:

```
r = int(input("Enter radius: "))
h = int(input("Enter height: "))
print("Volume is: ")
print (r*r*3.14*h)
```

Sample I/O:

```
Enter radius: 3

Enter height: 4
```

```
Volume of cylinder:
113.03999999999999
```

2a: Volume of a Cube

Aim:

To write a Python program to calculate the volume of a cube

Program Code:

```
r = int(input("Enter side: "))
print("Volume is: ", x**3)
```

Sample I/O:

```
Enter side: 2

Volume is: 8
```

2a: Volume of a Sphere

Aim:

To write a Python program to calculate the volume of a sphere.

Program Code:

```
r = int(input("Enter radius: "))
print (“Volume is: “, 1.66667*3.14*(r**3))
```

Sample I/O:

```
Enter radius: 3

Volume is: 141.300002826
```

2.b.Calculating the Simple Interest

Aim:

To write a Python program to find the simple interest, for a given principal amount, rate of interest and time in years using the formula:

$$SI = \frac{PTR}{100}$$

Program Code:

```
p = float(input("Enter the principal: "))
t = float(input("Enter the no. of years: "))
r = float(input("Enter the rate %: "))
print ("SI is: ", p*t*r*0.01)
```

Sample I/O:

```
Enter the principal: 25000

Enter the no. of years: 3

Enter the rate %: 10

SI is:  7500.0
```

2.C.Solving a Quadratic Equation

Aim:

To write a Python program to find the real roots of a quadratic equation based on the quadratic formula:

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Program Code:

```
a = float(input("Enter a: "))
b = float(input("Enter b: "))
c = float(input("Enter c: "))

D = (b**2 - 4*a*c)**0.5

print ("The 2 roots are: ", (-1*b + D)/(2*a), " and ", (-1*b - D)/(2*a))
```

Sample I/O:

```
Enter a: 1
Enter b: -2
Enter c: 1
The 2 roots are: 1.0 and 1.0
```