

In [8]:

```

1  '''Python Program to solve basic problems of Mensuration.
2  Python features used in this program: Class, Object and function concepts of python'''
3
4  class Mensuration:
5      class Mensuration_3D:
6          def Cuboid():
7              l=int(input("Entre the lenght of the Cuboid : "))
8              b=int(input("Entre the breadth of the Cuboid : "))
9              h=int(input("Entre the height of the Cuboid : "))
10             v=0
11             s=0
12             d=0
13             Question=input("What do you want to find? : ")
14             if Question=="Volume" or Question == "volume":
15                 v=l*b*h
16                 print ("The volume of the cuboid is : ",v)
17             elif Question=="Total surface area" or Question=="total surface area" or Question=="TSA" or Question=="tsa":
18                 s=2*(l*b+b*h+h*l)
19                 print ("The total surface area of the cuboid is ",s)
20             elif Question=="Diagonal" or Question=="diagonal":
21                 import math
22                 d=math.sqrt((l**2)+(b**2)+(h**2))
23                 print ("The diagonal of the cuboid is : ",d)
24             else:
25                 print ("Sorry, The question is invalid")
26         def Cube():
27             l=int(input("Entre the side of the Cube : "))
28             v=0
29             s=0
30             d=0
31             Question=input("What do you want to find? : ")
32             if Question=="Volume" or Question == "volume":
33                 v=l**3
34                 print ("The volume of the cuboid is : ",v)
35             elif Question=="Total surface area" or Question=="total surface area" or Question=="TSA" or Question=="tsa":
36                 s=6*l**2
37                 print ("The total surface area of the cuboid is ",s)
38             elif Question=="Diagonal" or Question=="diagonal":
39                 import math
40                 d=l*math.sqrt(3)
41                 print ("The diagonal of the cuboid is : ",d)
42             else:
43                 print ("Sorry, The question is invalid")

```

```
44 def Cylinder():
45     r=int(input("Entre the radius of the Cylinder : "))
46     h=int(input("Entre the height of the Cylinder : "))
47     import math
48     v=0
49     s=0
50     d=0
51     Question=input("What do you want to find? : ")
52     if Question=="Volume" or Question == "volume":
53         v=(math.pi)*(r**2)*h
54         print ("The volume of the cylinder is : ",v)
55     elif Question=="Total surface area" or Question=="total surface area" or Question=="TSA" or Question=="tsa":
56         s=2*(math.pi)*r*(r+h)
57         print ("The total surface area of the cylinder is ",s)
58     elif Question=="Curved Surface Area" or Question=="curved surface area" or Question=="CSA" or Question=="csa":
59         d=2*(math.pi)*r*h
60         print ("The Curved Surface Area of the cylinder is : ",d)
61     else:
62         print ("Sorry, The question is invalid")
63 def Cone():
64     r=int(input("Entre the radius of the Cone : "))
65     h=int(input("Entre the height of the Cone : "))
66     import math
67     l=math.sqrt((r**2)+(h**2))
68     v=0
69     s=0
70     d=0
71     Question=input("What do you want to find? : ")
72     if Question=="Volume" or Question == "volume":
73         v=(1/3)*(math.pi)*(r**2)*h
74         print ("The volume of the cone is : ",v)
75     elif Question=="Total surface area" or Question=="total surface area" or Question=="TSA" or Question=="tsa":
76         s=(math.pi)*r*(r+l)
77         print ("The total surface area of the cone is ",s)
78     elif Question=="Curved Surface Area" or Question=="curved surface area" or Question=="CSA" or Question=="csa":
79         d=(math.pi)*r*l
80         print ("The Curved Surface Area of the cone is : ",d)
81     else:
82         print ("Sorry, The question is invalid")
83 def Sphere():
84     r=int(input("Entre the radius of the Sphere : "))
85     import math
86     v=0
```

```

87     s=0
88     Question=input("What do you want to find? : ")
89     if Question=="Volume" or Question == "volume":
90         v=(4/3)*(math.pi)*(r**3)
91         print ("The volume of the sphere is : ",v)
92     elif Question=="Total surface area" or Question=="total surface area" or Question=="TSA" or Question=="tsa":
93         s=4*(math.pi)*r**2
94         print ("The total surface area of the sphere is ",s)
95     else:
96         print ("Sorry, The question is invalid")
97 def Hemisphere():
98     r=int(input("Entre the radius of the Hemisphere : "))
99     import math
100    v=0
101    s=0
102    d=0
103    Question=input("What do you want to find? : ")
104    if Question=="Volume" or Question == "volume":
105        v=(2/3)*(math.pi)*(r**3)
106        print ("The volume of the Hemisphere is : ",v)
107    elif Question=="Total surface area" or Question=="total surface area" or Question=="TSA" or Question=="tsa":
108        s=3*(math.pi)*r**2
109        print ("The total surface area of the Hemisphere is ",s)
110    elif Question=="Curved surface area" or Question=="curved surface area" or Question=="CSA" or Question=="csa":
111        d=2*(math.pi)*r**2
112        print ("The Curved surface area of the Hemisphere is ",d)
113    else:
114        print ("Sorry, The question is invalid")
115 class Mensuration_2D:
116     def Square():
117         s=int(input("Entre the side of the Square : "))
118         import math
119         a=0
120         p=0
121         d=0
122         Question=input("What do you want to find? : ")
123         if Question=="Area" or Question == "area":
124             a=s**2
125             print ("The area of the square is : ",a)
126         elif Question=="Perimeter" or Question=="perimeter":
127             p=4*s
128             print ("The perimeter of the square is ",p)
129         elif Question=="Diagonal" or Question=="diagonal":

```

```
130         d=s*math.sqrt(2)
131         print ("The Diagonal of the square is ",d)
132     else:
133         print ("Sorry, The question is invalid")
134 def Rectangle():
135     l=int(input("Entre the length of the Rectangle : "))
136     b=int(input("Entre the breadth of the Rectangle : "))
137     import math
138     a=0
139     p=0
140     d=0
141     Question=input("What do you want to find? : ")
142     if Question=="Area" or Question == "area":
143         a=l*b
144         print ("The area of the rectangle is : ",a)
145     elif Question=="Perimeter" or Question=="perimeter":
146         p=2*(l+b)
147         print ("The perimeter of the rectangle is ",p)
148     elif Question=="Diagonal" or Question=="diagonal":
149         d=math.sqrt((l**2)+(b**2))
150         print ("The Diagonal of the rectangle is ",d)
151     else:
152         print ("Sorry, The question is invalid")
153 def Circle():
154     r=int(input("Entre the radius of the Circle : "))
155     import math
156     a=0
157     c=0
158     d=0
159     Question=input("What do you want to find? : ")
160     if Question=="Area" or Question == "area":
161         a=(math.pi)*(r**2)
162         print ("The area of the circle is : ",a)
163     elif Question=="Circumference" or Question=="circumference":
164         c=2*(math.pi)*(r)
165         print ("The circumference of the circle is ",c)
166     elif Question=="Diameter" or Question=="diameter":
167         d=2*r
168         print ("The Diameter of the circle is ",d)
169     else:
170         print ("Sorry, The question is invalid")
```

In [5]:

```
1 xyz=Mensuration
```

In [9]:

```
1 xyz.Mensuration_3D.Sphere()
```

Entre the radius of the Sphere : 8
What do you want to find? : mkmk
Sorry, The question is invalid

In []:

```
1
```