

Lab 9A

Lab 9a - Code

IC1_SodaCan.py

```
1 class SodaCan:
2     def __init__(self, height, radius, canNumber):
3         self.height = height
4         self.radius = radius
5         self.canNumber = canNumber
6
7     def getSurfaceArea(self):
8         import math
9         pi = math.radians(180)
10        surfArea = (2 * pi * self.radius * self.height)
11        + (2 * pi * self.radius * self.radius)
12        result = "%.2f" % surfArea
13        print("The surface area of can %d (h = %d, r = %d) is %s" %
14              (self.canNumber, self.height, self.radius, result))
15        return float(result)
16
17    def getVolume(self):
18        import math
19        pi = math.radians(180)
20        volume = (pi * self.radius * self.radius * self.height)
21        result = "%.2f" % volume
22        print("The volume of the can %d (h = %d, r = %d) is %s" %
23              (self.canNumber, self.height, self.radius, result))
24        return float(result)
25
```

SodaCanDemo.py

```
1 from IC1_SodaCan import SodaCan
2
3
4 def main():
5     canNumber = 1
6
7     while True:
8         try:
9             height = input("Enter the height of the can (type a word, zero, or"
10                            " negative value to stop): ")
11             height = float(height)
12             if height <= 0:
13                 break
14         except ValueError:
15             break
16
17         try:
18             radius = input("Enter the radius of the can (type a word, zero or"
19                            " negative value to stop): ")
20             radius = float(radius)
21             if radius <= 0:
22                 break
23         except ValueError:
24             break
25
26         can = SodaCan(height, radius, canNumber)
27
28         can.getSurfaceArea()
29         can.getVolume()
30         print("*" * 100)
31
32         canNumber = canNumber + 1
33
34
35 main()
36
```

Lab 9 - Output

```
Python Shell: Wing
Python Shell

Commands execute without debug. Use arrow keys for history.

Python 3.10.9 (tags/v3.10.9:1dd9be6, Dec 6 2022, 20:01:21) [MSC v.1934 64 bit (AMD64)]
Type "help", "copyright", "credits" or "license" for more information.
>>> [evaluate SodaCanDemo.py]
Enter the height of the can (type a word, zero, or negative value to stop): 8
Enter the radius of the can (type a word, zero or negative value to stop): 4
The surface area of can 1 (h = 8, r = 4) is 201.06
The volume of the can 1 (h = 8, r = 4) is 402.12
*****
Enter the height of the can (type a word, zero, or negative value to stop): 5
Enter the radius of the can (type a word, zero or negative value to stop): 2
The surface area of can 2 (h = 5, r = 2) is 62.83
The volume of the can 2 (h = 5, r = 2) is 62.83
*****
Enter the height of the can (type a word, zero, or negative value to stop): 3.14159265359
Enter the radius of the can (type a word, zero or negative value to stop): 3.14159265359
The surface area of can 3 (h = 3, r = 3) is 62.01
The volume of the can 3 (h = 3, r = 3) is 97.41
*****
Enter the height of the can (type a word, zero, or negative value to stop): 2.7182818284590452353602874713527
Enter the radius of the can (type a word, zero or negative value to stop): 2.7182818284590452353602874713527
The surface area of can 4 (h = 2, r = 2) is 46.43
The volume of the can 4 (h = 2, r = 2) is 63.10
*****
Enter the height of the can (type a word, zero, or negative value to stop): STOP!!!
>>>
```

Lab 9 - Written Code

IC1_SodaCan.py

```
class SodaCan:
    def __init__(self, height, radius, canNumber):
        self.height = height
        self.radius = radius
        self.canNumber = canNumber

    def getSurfaceArea(self):
        import math
        pi = math.radians(180)
        surfArea = (2 * pi * self.radius * self.height)
        + (2 * pi * self.radius * self.radius)
        result = "%.2f" % surfArea
        print("The surface area of can %d (h = %d, r = %d) is %s" %
              (self.canNumber, self.height, self.radius, result))
        return float(result)

    def getVolume(self):
        import math
        pi = math.radians(180)
        volume = (pi * self.radius * self.radius * self.height)
        result = "%.2f" % volume
        print("The volume of the can %d (h = %d, r = %d) is %s" %
              (self.canNumber, self.height, self.radius, result))
        return float(result)
```

SodaCanDemo.py

```
from IC1_SodaCan import SodaCan

def main():
    canNumber = 1

    while True:
        try:
            height = input("Enter the height of the can (type a word, zero, or"
                           " negative value to stop): ")
            height = float(height)
            if height <= 0:
                break
        except ValueError:
            break

        try:
            radius = input("Enter the radius of the can (type a word, zero or"
                           " negative value to stop): ")
            radius = float(radius)
            if radius <= 0:
                break
        except ValueError:
            break

        can = SodaCan(height, radius, canNumber)

        can.getSurfaceArea()
        can.getVolume()
        print(" *" * 100)

        canNumber = canNumber + 1

main()
```