

Python Calypso's Cylinder Calculator OOP

Time required: 60 minutes

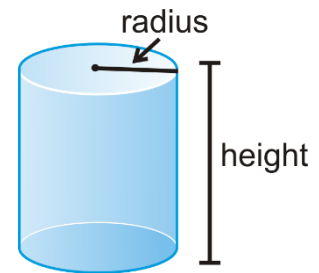
- Comment each line of code as shown in the tutorials and other code examples.
- Follow all directions carefully and accurately.
- Think of the directions as minimum requirements.

Pseudocode or TODO

1. Write pseudocode or TODO for the exercise.
2. Comment your code to show evidence of understanding.

Requirements

Ask the user to enter the radius and height of a cylinder. Calculate and display the cylinder's surface area and volume.



1. Create a Python program named **cylinder.py** with a **Cylinder** class. A separate file is the preferred way to create a class.
NOTE: A class stores data and calculates with methods. There aren't any print statements.
2. Store all object data as private attributes.
3. Create each of the following methods.
 - **set_radius()** - This method will set the cylinder's height.
 - **set_height()** - This method will set the cylinder's height.
 - **get_volume()** - This method will return cylinder's volume as a float.
Volume of a cylinder: $v = \pi r^2 h$
 - **get_surface_area()** - This method will return the cylinder's surface area as a float.
Surface area of the cylinder: $a = 2\pi r h + 2\pi r^2$
 - **__repr__() or __str__** - Return a concatenated string of the results of the calculations.

1. Create a Python program named **cylinder_app.py**
2. Create a main function to run the program.
 - a. Create a print_title() function.
3. Create a program object.
4. Call each method from the program object.

__repr__ or __str__ Method

In Python, the **__repr__** method is a special dunder (double underscore) method used to define a string representation of an object. Its primary goal is to provide a clear and unambiguous representation of the object. You can also use the **__str__** dunder method.

Example program:

```
class Car:
    def __init__(self, make, model, year):
        self.make = make
        self.model = model
        self.year = year

    def __repr__(self):
        return f"Car: {self.make}, {self.model}, {self.year}"

my_car = Car("Toyota", "Corolla", 2020)
print(my_car)
```

Example run:

```
Car: Toyota, Corolla, 2020
```

Example run:

```
-----
|           Circe's Circle Calculator in Python           |
| Calculate the diameter, area, and circumference of a Circle |
|-----|
Enter radius: 2563.36
Radius entered: 2563.36
      Diameter: 5,126.72
      Area: 20,642,822.53
Circumference: 16,106.07
```

```
-----  
|           Circe's Circle Calculator in Python           |  
| Calculate the diameter, area and circumference of a Circle |  
-----  
Enter radius: 100.2  
You entered:   radius 100.2  
Diameter:     200.40  
Area:         31,541.72  
Circumference: 629.58
```

Challenges

- Make a Tkinter GUI program importing the cylinder.py file.

Assignment Submission

1. Use pseudocode or TODO.
2. Comment your code to show evidence of understanding.
3. Attach the program files.
4. Attach screenshots showing the successful operation of the program.
5. Submit in Blackboard.