navttc-exam

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0.0.1 NAVTTC - Final Exam

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Advanced Python & Application

Implement a Shape Hierarchy using **Polymorphism**. Create a base class **Shape** with a method *area()* that raise a NotImplementedError. This will act as the base class for different types of Shapes.

Create Two Subclasses:

Rectangle class with attributes *width* and *height*, and an *area()* method that calculates the area of a circle. Implement a function **print_area(shape)** that accepts any shape object and prints the area by calling the *area()* method. Use polymorphism to handle different shapes.

[12]:
```
from math import pi


class Shape:
    def __init__(self, name):
        self.name = name

    def area(self):
        raise NotImplementedError("Subclasses must implement the area method.")
```

[14]:
```
class Rectangle(Shape):
    def __init__(self, width, height):
        super().__init__("Rectangle")
        self.width = width
        self.height = height

    def area(self):
        return self.height * self.width
```

[16]:
```
class Circle(Shape):
    def __init__(self, radius):
        super().__init__("Circle")
```

```
        self.radius = radius

    def area(self):
        return pi * (self.radius ** 2)
```

[18]:
```
def print_area(shape: Shape):
    print(f"The area of the {shape.name} is: {shape.area():.2f}")


rectangle = Rectangle(5, 10)
circle = Circle(7)

print_area(rectangle)
print_area(circle)
```

```
The area of the Rectangle is: 50.00
The area of the Circle is: 153.94
```