Introduction to Inheritance and Object Oriented Programming

Example Instruction Demo

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Outline

Section 1 - sub a

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Section 1 - sub b

Blah blah blah blah blah

Section 2

Stuff

Folder Structure

```
code/
├── main.py
└── shapes/
    ├── shape.py
    ├── circle.py
    └── rectangle.py
```

main.py

```python
#!/bin/env python3
from shapes.rectangle import Rectangle
from shapes.circle import Circle


circ = Circle(3)
print(f"circ area: {circ.area():.2f}")

circ2 = Circle(5)
print(f"circ2 area: {circ2.area():.2f}")

print(f"circ.area() > circ2.area(): {circ.area() > circ2.
    area()}")

rect = Rectangle(4, 5)
print(f"rect area: {rect.area()}")

print(f"circ.area() > rect.area(): {circ.area() > rect.area
    ()}")
```

main.py – cont

```
1
2
3 print(f"circ > circ2: {circ > circ2}")
4 print(f"circ > rect: {circ > rect}")
```

shapes/shape.py

```python
from abc import ABC, abstractmethod

class Shape(ABC):
    @abstractmethod
    def area(self):
        pass

    def __eq__(self, other) -> bool:
        if isinstance(other, Shape):
            return self.area() == other.area()
        else:
            return self.area() == other

    def __gt__(self, other) -> bool:
        if isinstance(other, Shape):
            return self.area() > other.area()
        else:
            return self.area() > other
```

shapes/circle.py

```python
1  from shapes.shape import Shape
2  import math
3
4  class Circle(Shape):
5      def __init__(self, radius: float):
6          self.radius = radius
7
8      def area(self):
9          return math.pi * math.pow(self.radius, 2)
```

shapes/rectangle.py

```python
from shapes.shape import Shape

class Rectangle(Shape):
    def __init__(self, length: float, width: float):
        self.length = length
        self.width = width

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