

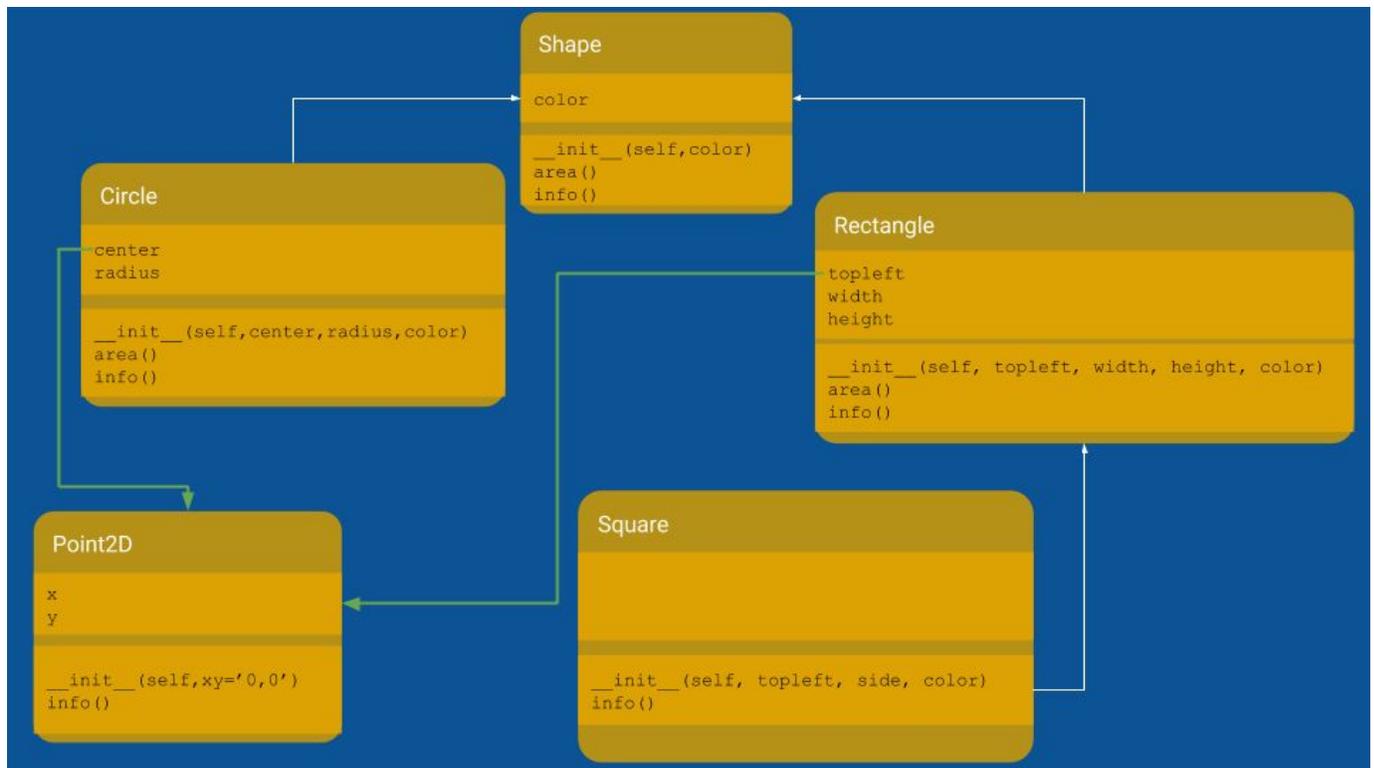
MATH5061: Week 5 Assignment

Instructions

Please submit answers to this assignment as a .tar.gz file of the directory containing the python solution source files via email to math5061@temple.edu. Make sure to use the subject line (without quotes) "MATH5061:Assignment 05:ACCESSID" Where ACCESSID is your AccessNet ID, for example tue86537

Q1

Implement the classes Point2D, Shape, Rectangle, Circle and Square with each of them related to each other as illustrated in the diagram below. White lines indicate an inheritance (or is-a) relationship and green lines indicate a composition (or has-a) relationship. A description of the methods is below



Shape

- color: String with color of the shape
- area(): raises NotImplementedError
- info(): returns the string 'This is a <color> shape'
<color> is the value of the color attribute

Circle

- center: attribute of type Point2D representing the center of the circle
- radius: radius of the circle
- area(): returns the area of the circle
- info(): returns the string 'This is a circle with center <point2d> and radius <radius>'
<point2d> is the string returned by the xy() method of Point2D type
<radius> is the radius of the circle

Rectangle

- topleft: attribute of type Point2D representing the top left corner
- height: height of the rectangle
- width: width of the rectangle
- area(): returns the area of the rectangle
- info(): returns the string 'This is a rectangle with corner <point2d>, width <width> and height <height>'

Square

- info(): return string 'This is a square with corner <point2d> and side <side>'

Point2D

- x: x coordinate
- y: y coordinate
- info(): return a string '<x>, <y>'

Sample output:

Input program:

```
arect = Rectangle('1,3',5,2, 'brown')
asqr = Square('0,0',5,'red')
acir = Circle('25,6.6', 3, 'yellow')
print(arect.info())
print(acir.info())
print(asqr.info())
print(arect.area())
print(acir.area())
print(asqr.area())
```

Output

```
This is a rectangle with corner 1.0, 3.0, width 5 and height 2
This is a circle with center 25.0, 6.6 and radius 3
This is a square with corner 0.0, 0.0 and side 5
10
28.259999999999998
25
```