University of Washington Bothell

CSS 340: Applied Algorithmics

Program 1: Intro Class Design

Purpose

This programming assignment will introduce the Python language to the student. A simple class is designed and coded. The purpose is to start coding something quick in Python and also design a simple class using the proper coding style guidelines.

The Circle

Design a class which represents a **Circle** in the *(x,y)* coordinate plane. A **Circle** object is initialized with three input arguments. The center of the circle specified as the first two inputs *(x,y)* and the radius of the circle. By default the circle will be centered at (0, 0) with a radius of 1.

```
c = Circle(0, 0, 1)
```

The **Circle** class should provide proper getters/setters for the x and y coordinates of the center as well as the radius. The circle should also have a getArea() and getPerimeter() method. Finally, the circle should have a method called, isPointWithinCircle(x, y) which takes as augments the x and y coordinate of a point and determines whether the point lies within the circle. It should return a boolean indicating whether the point is within the circle.

Turn In

A .**zip file** which contains the python module geometry.py. The file will contain the class definition for Circle.

Here is some test code which should work with your module.

```
from geometry import Circle
print("Partial Testing for CSS340 Lab1")

c1 = Circle(3, 3, 7)
c2 = Circle()

print("First Circle Perimeter: " + str(c1.getPerimeter()))
print("First Circle Area: " + str(c1.getArea()))

c2.setX(3)
```

```
c2.setY(3)
c2.setRadius(2)
if c2.isPointWithinCircle(4, 3.7):
    print("(4, 3.7) is within circle two")
else:
    print("(4, 3.7) is not within circle two")

print("Moving second Circle")
c2.setX(3 + c2.getX())
if c2.isPointWithinCircle(4, 3.7):
    print("(4, 3.7) is within circle two")
else:
    print("(4, 3.7) is not within circle two")
```