Assignment 1 Example
CS 2ME3/SE 2AA4

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Outline

1 Building CircleADT

2 Building Statistics

Reading the specification

- The first thing we have to do is read the specifications or requirements if any are provided, in this case we are using the specification from last years assignment 1, located in the gitlab repo here
- The specification provided is similar to the one provided to you in this years assignment 1.
- A constructor (CircleT) that takes three real numbers x, y and r as input and assigns them to private instance variables. The x and y values define the centre of the circle and r defines its radius.

Live Coding Demo Building CircleADT

Now we will go over the thought process and coding of CircleADT.

Building CircleADT

```python
3  class CircleT:
4      def __init__(self, x, y, r):
5          self.__x = x
6          self.__y = y
7          self.__r = r
8
```

- Python uses __init__ for the constructor of class objects
- Instance variables are declared with self.variableName
- Now we will add some getter methods according to specification
- Three getters named xcoord, ycoord and radius that return the x and y coordinates of the centre of the circle and the radius of the circle, respectively.

Building CircleADT


```python
 9    def xcoord(self):
10        return self.__x
11
12    def ycoord(self):
13        return self.__y
14
15    def radius(self):
16        return self.__r
```

- What could we do to test these methods?
- Now we are going to implement the rank function from the Statistics specification of the assignment

Rank

- A function named rank that takes a list of instances of CircleT and returns a listed ranked by radius. A ranking list provides for each element in the list the position it would hold if the list were sorted in descending order of radius. The maximum entry in the list will have a rank of 1. For instance, the rank of radii [6.0, 5.0, 11.0, 9.0] would be [3, 4, 1, 2].
- Before we write this function, what important details are missing?

Rank

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- Before we write this function, what important details are missing?
- What happens for ties?
- Is there a algorithm/solution for this problem already that we can implement?
- https://en.wikipedia.org/wiki/Ranking

Live Coding Demo Rank Function

Now we will go over the coding and the thought process for the rank function.