

CSC 110 Winter 2016 Quiz 4 - Take Home
Write clear code. Comment as necessary.

Submit your quiz 4 python answers in a .py file using your full name + Qz4 for the filename, e.g., ClarkeWellmanQz4.py.

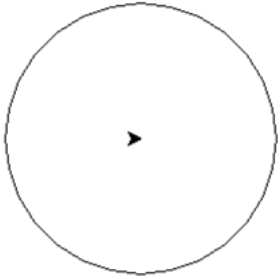
Submit screen shots of your sample runs for each question (in the turtle canvas screen) in a Word or Powerpoint file using your fullname + Qz4Runs for the filename, e.g., ClarkeWellmanQz4Runs.pptx or ClarkeWellmanQz4Runs.docx.

Submit your 2 files through the Upload Link by noon this coming Tuesday. Late quizzes will not be accepted. Do the best you can working by yourself.

1. Use the BIF, `circle(r)`, [look it up in the python documentation] in the turtle module to write a function, `circleCntr(Rad)`, which draws a circle of radius `Rad`. The turtle should begin in circle center and end in circle center. The initial and final heading of the turtle should be the same. Supplement `circleCntr(Rad)` with 2 helper functions, `center2edge(Rad)`, which moves the turtle from circle center to the circle, and `edge2center(Rad)`, which puts the circle back in circle center after drawing the circle.[This question requires 3 functions and is thus worth 30 pts.]

Sample output:

```
>>> circleCntr(100)
```

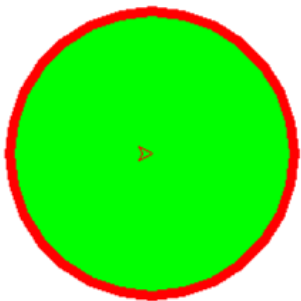


2. Write a function, `CircleClr(Rad,lineSize,lineColor,fillColor)`, which uses `circleCntr(Rad)` as a helper function to draw a circle with radius `Rad` using line size `lineSize` & line color `lineColor`, which fills the circle with color `fillColor`. The turtle should start and end at circle center. Instead of specifying color with a string (e.g., 'blue'), use (r,g,b) to specify how much red (r), how much green (g), and how much blue (b) to use. Each of r,g and b are ints from 1 to 255, inclusive specifying how much of each is to be used. To use the rgb color mode, you need to use the following python command:

```
win.colormode(255)
```

Sample output:

```
>>> CircleClr(100,7,(255,0,0),(0,255,0))
```



3. Write a function, `ranColor()`, which uses `randint(a,b)` from the `random` module to return a tuple of 3 ints, each int being from 1 to 255 inclusive, the first of which is `r`, the second of which is `g` and the third of which is `b`.

Sample output (The for loop is simply used to test out `ranColor()` several times.):

```
>>> for i in range(3):  
    print(ranColor())
```

```
(33, 49, 186)  
(195, 111, 45)  
(100, 130, 75)
```

4. Write a function, `fourCrclsInACrcl(Rad)`, which draws a large circle and then draws 4 smaller circles inside the large circle. The radius of the smaller circles is related to the radius of the larger circle (see below) . Each of the smaller circles has a random line color and random fill color provided by `ranColor()`. `fourCrclsInACrcl(Rad)` will use the following helper functions: `circleCntr(Rad)`, `CircleClr(rad,lineSize, lineColor,fillColor)` and `ranColor()`.

Math hints: $r = \text{Rad} / (1 + \sqrt{2})$, where r = radius for small circle, Rad = radius for outer larger circle. To get from the center of the larger outer circle to the center of one of the smaller circles, the turtle needs to move a distance $d = r + r * (\sqrt{2} - 1)$. That should get you going.

Sample output:

```
>>> fourCrclsInACrcl(200)
```

