Holly Do - COMP 614

The URL for your final CodeSkulptor file:

https://py3.codeskulptor.org/#user310_mOReIqo4qT_7.py

Question 4.F.i: How will the midpoint, slope, and perp functions help to find the center and/or radius of the circle?

The center of the circle is the intersect of two lines. First line has slope0 and a point it goes through, point0x, point0y. Second line has slope1 and a point it goes through, point1x, point1y.

The slope function takes the x- and y-coordinates of two points and returns the slope of the line segment from (point0x, point0y) to (point1x, point1y).

The midpoint function takes the x- and y-coordinates of two points and returns the midpoint between these two points.

The perp function takes the slope of the line segment and returns the perpendicular slope to that line. These are the slopes of the two lines we need to find the intersect of. That intersect is the center of the circle with coordinates represented as x_intersect and y_intersect.

Question 4.F.ii: How will the intersect function help to find the center and/or radius of the circle?

The intersect function takes two lines, where each is represented by its slope, slope0 and slope1, and the coordinates of the midpoints that the lines pass through them, point0x, point0y, point1x, point1y. It returns the coordinates of the intersection point of the two lines, which is also the center of the circle, represented as a tuple of x_intersect and y_intersect.

Question 4.F.iii: How will the distance function help to find the center and/or radius of the circle?

The distance function takes coordinates of the intersect and coordinates of a point on the circle as inputs, point0x, point0y, point1x, point1y. It returns the length of the distance between them, which is the length of the radius of the circle.

Describe an algebraic method for finding the center of the circle. Your answer should be in clear, precise English; no need to write any Python code!

(a,b) is the x coordinate and y coordinate of the center of the circle

r is the radius of the circle

Equation of a circle is (x-a)**2 + (y-b)**2 = r**2

We can plug in values point0x, point0y, point1x, point1y, point2x, point2y to get a system of three equations:

(point0x-a)**2 + (point0y-b) **2 = r**2

(point1x-a)**2 + (point1y-b) **2 = r**2

(point2x-a)**2 + (point2y-b) **2 = r**2

We can find a, b, and r by solving this system of three equations using matrix or substitution method. (a,b) is the center of the circle, r is the radius of the circle.

Homework Reflection:

1. What were the two most important concepts and/or skills that were reinforced by this assignment? Why do you believe that these concepts are important? (Your response must be 3-6 sentences.)

   Two most important concepts I've learned from this assignment is constructing helper functions and testing the code for correct outputs. Constructing helper functions breaks the problems in manageable pieces which are much easier to test

and debug. Testing the code on each section helps identify wrong logical implementations.

2. How do the skills and concepts that you applied in this assignment transcend the specific application/problem that you were tackling? How could you envision applying these skills and concepts again in the future? (Your response must be 2-4 sentences.)

   These skills make the assignment much easier to navigate and solve. I would definitely use these skills again for future assignments because it is a sufficient and clear strategy to build a program.

3. What do you believe you did well on this assignment? If you could do this assignment over, would you do anything differently? Why or why not? (Your response must be 2-4 sentences.)

   I think my docstrings and comments are clear. If I could so this assignment over, I would start with a smaller section at a time. I would test each function immediately if I can because it is harder to identify bugs when the functions are related to each other.

4. Do you think you're comfortable enough with the concepts covered in this assignment that you would be capable of teaching them to a peer? Why or why not? (Your response must be 2-4 sentences.)

   I am comfortable enough to teach to a peer. I'm excited about the concepts I've learned because they clearly make the programming process more manageable thus more enjoyable!