Problem Set 4 Exercise #16: Points

Reference: Lecture 11 notes

Learning objective: Array of structures

Estimated completion time: 30 minutes

Problem statement:

Write a program **points.c** that defines a structure type **`point_t`** whose members are the *x*- and *y*-coordinates of a point. The coordinates are integers.

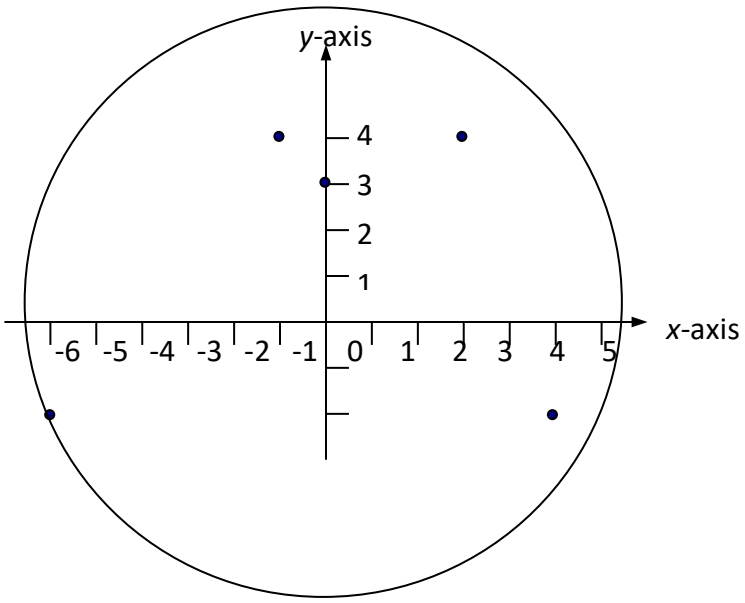
Your program should include a function **`read_points()`** to read the number of points and points' data into an array of points, and return the number of points read. Each point is represented by its *x*- and *y*-coordinates. An example of input data of 5 points is shown below.

You may assume that the input data contain at least 1 point and at most 10 points.

Your program should also include a function **`compute_circle_area()`** to return the area (of type **`double`**) of the smallest circle, with centre at the origin (0, 0), that encloses all the given points. You may assume that π is 3.14159.

You may write additional functions as necessary.

The following diagram illustrates sample run #1 where there are 5 points and the area of the smallest circle to enclose all of them is **125.66**.



Sample run #1:

```
Enter the number of points: 5
Enter x- and y-coordinates for 5 points:
3 4
-1 4
5 -2
-6 -2
0 3
Area of smallest circle = 125.66
```

Sample run #2:

```
Enter the number of points: 5
Enter x- and y-coordinates for 5 points:
-10 -5
-5 3
7 -4
6 3
4 11
Area of smallest circle = 430.40
```