

Practice Exercise #17: Nearest Points

http://www.comp.nus.edu.sg/~cs1020/4_misc/practice.html

Objectives:

1. Using **ArrayList** class.
2. Using **Point** class.

Task statement:

Write a program **NearestPoints.java** to read in a list of points, each represented by its integer x- and y-coordinates, and create an array (using **ArrayList** class) of these points (using **Point** class).

Your program should print out the distance between two nearest points in the list, correct to two decimal places.

Note that the distance between two points $A(x_A, y_A)$ and $B(x_B, y_B)$ is calculated as follows:

$$distance = \sqrt{(x_A - x_B)^2 + (y_A - y_B)^2}$$

The input consists of an integer n , the number of points on the first line. You may assume that $n > 1$. The next n lines contain the integer x- and y-coordinates of the points.

Your program should contain the following methods:

- **double distance(Point ptA, Point ptB)** to return the distance between ptA and ptB
- **double distClosestPair(ArrayList<Point> points)** to return the distance of the closest pair of points in the ArrayList points

Sample run #1:

```
5
-5 4
0 2
3 -3
1 5
7 6
Minimum distance = 3.16
```

Sample run #2:

```
8
0 5
0 10
0 34
0 1
0 38
0 12
0 30
0 20
Minimum distance = 2.00
```