Assignment 6

Due time: 03/20/2022, 11:59pm

Total credits: 100

Submission guide:

1. Create a folder and name it with the format FirstName_LastName_Aassigment6 for example Chunyu_Yuan_Assignment6

2. Inside the folder, you should have 3 java files (Point2D.java, Point3D.java, TestPoint.java)

3. compress your file to .zip format and submit it to the blackboard,

4. if you have any question, please send email to cyuan1@gradcenter.cuny.edu

1. Inheritance

This question is to understand the inheritance relationship between different classes.

Implement superclass Point2D class (You can implement it based on your previous assignment) (10)

Data fields: x, y, private int,

Constructors: one default constructor, one constructor with argus

Methods:

setter methods:

- **setX()**
- **setY()**

getter methods:

- **getX(int x)**
- **getY(int y)**

getDistance(Point2D point): return double distance result

toString(): return String point information like "Point: X=?, Y=?"

Implement subclass Point3D (30) (you have to apply the knowledge of super, extands and overriding, overloading, and some methods below may not need to re-implement)

Data fields: x, y, z, private int,

Constructors: one default constructor, one constructor with argus

Methods:

setter methods:

- **setX()**
- **setY()**
- **setZ()**

getter methods:

- **getX(int x)**
- **getY(int y)**
- **getZ(int z)**

getDistance(Point3D point): return double distance result

toString(): return String point information like “Point: X=?, Y=?, Z=?”

Implement TestPoint class and answer below questions using your code with given datasets.(60)

In data.txt, there are a lot of records that is 2D point information (no Z) or 3D point information. And there are duplicate records (same point information)

How many distinct 2D points in the data.txt?

How many distinct 3D points in the data.txt?

Create one 2D point object point_a x=-1, y=1; If the record in data.txt is 2D point, what is the distance between the record and point_a? (You can use a arraylist of Point2D, and print the calculated result one by one)

Create one 3D point object point_b x=0, y=10, z=-5; If the record in data.txt is 3D point, what is the distance between the record and point_b? (You can use a arraylist of Point3D, and print the calculated result one by one)

What is the total distance sum between point_a with distinct Point2D? (Please use BigDecimal)

What is the total distance sum between point_b with distinct Point3D? (Please use BigDecimal)

BigDecimal was the topic in class 5