ASSIGNMENT/ASSESSMENT ITEM COVER SHEET

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Course Code	Course Title
SENG2200	Programming Languages & Paradigms
(Example) A B C D 1 2 3 4	*(Example)* Intro to University

Campus of Study: Callaghan (eg Callaghan, Ourimbah, Port Macquarie)

Assessment Item Title: Assessment 1 Due Date/Time: 19/03/2021

Tutorial Group (If applicable): Word Count (If applicable):

Lecturer/Tutor Name:

Extension Granted: ○ Yes ◉ No Granted Until:

Please attach a copy of your extension approval

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THE UNIVERSITY OF NEWCASTLE AUSTRALIA

SENG2200 Programming Languages & Paradigms

Assignment 1 Report

The SENG2200 Programming Languages & Paradigms Assignment 1 was first written on 27/02/2021 and finished on 19/03/2021.

Abstract

For this assignment 1, aims to build a java programming in topics of class, inheritance, interface, and circular doubly-linked data structure. The purpose of this java program is to store the points and calculate the area of the polygons then display the polygon data in a required order. By adapting this functionality, I will be using different constructors and methods achieving the goal of this program.

Member Data Fields

Node.java private Polygon data; private Node next; private Node prev;	Point.java private double x; private double y;
Polygon.java private double area; / private Point [] points; private int i = 0;	MyPolygons.java private Node current; private final Node sentinel; private int size;
PA1.java private Polygon [] pol;	

Coding Details

On the 27/02/2021 16:00-17:00, the first thing I do when I starting an assignment is read though all the specification that has been provided by the course and draw down a brief concept of how many java classes that I must implement for the assignment which includes 6 java classes: Node.java, Point.java, Polygon.java, ComparePoly.java, MyPolygons.java and PA1.java.

On the 27/02/2021 17:00 – 17:20, I have first created the Node.java to declare what type of valuable should be store in Node.java. As well as setNext(Node),

setPrev(Node),getNext(),getPrev(),setData(Polygon) and getData() method. As we are passing in Polygons into the Node, I have initialed all the valuable in the Node (Polygon) as default value null.

On the 27/02/2021 17:20-17:45, I have created Point.java class which containing the Point () constructure which includes x and y valuable, setX(double setx),setY(double setY), getX(), getY(), toString() and distanceCalculate(double x,double y) method. As for the toString() method, I must consider the output string will be formatted according to the 3.2f specification by simply using the "%3.2f" method to output a floating-point number with up to 3 digits before the decimal point and up to 2 digits after it. And for the distanCalculate() method, use the math formular distance = (x + y) ^½. And return distance as double value.

On the 1/03/2020 16:00 – 18:15, I have been working on the Polygon.java class. The method that I first code in the program are: Polygon (int side), addPoint(double x, double y), setPoint(double x, double y), toString(),distanceClosest()and areaCal(int n). For the Polygon class, I have crated 3 private variables: double area, Point array points and number of points initial to value 0. There should be an empty point array, number of points and area of the Polygon been implemented and initial as 0 inside the Polygon (int class). For the addPoint(double x, double y) method, I start an if loot stated that if number of points less than the length of the Point array, then input the value into a new point by using the setPoint(x,y), if the number of points bigger than the point array length then will be print out an error message. For the toString() method, I first set-up an empty string and pass all the points into the empty string that crated earlier, finally returning a string including the "[]", output a floating-point number with up to 5 digits before the decimal point and up to 2 digits after it as well as the care of the points. As for the distanceClosest() method, I first decided to set the distance of the first point as the Minium by using distanceCalculate() method from Point.java class then do a for loop from index 1 till the length of the point's array and compare the distance with the other points. The value of shoelace formula is been used for implementing the areaCal(int n) method.

On the 1/03/2020 20:00 – 22:00, I try to create a PA1.java class so I can input some test points data into the Polygon and see how the Polygon.java run but did not run through and I realized that the method setPoint(double x, double y) in the Polygon.java class needs to pass an array of Point into its parameters to get the code working, so reset my setPoint(double x,double y) become setPoint(Point p,double x,double y). Once I done fixing the error, I can successfully pass the value into Point.java as well as Polygon.java. So, I decided continue coding MyPolygons.java and comparePoly.jave next time.

On the 5/03/2020 10:30 – 12:00, I have first created a ComparePoly.java class using the assignment given specification method interface ComparePoly and added a Boolean ComesBefore(Polygon pol) in the end of the Polygon.java class to compare the Polygon area according to the assignment specification.

On the 12/03/2020 12:00-15:20, I have been working on the new class MyPolygons.java. There are three private variables in the class which are Node current; final Node sentinel and integer size. The constructor MyPolygons() and MyPolygons(Polygon p). The meothod are: public void clear(), public void add(Polygon new_data), public String toString(), public boolean isEmpty(), public boolean hasCurrent(), public boolean hasNext(), public boolean hasPrev(), public Polygon getFirst(), public Polygon getLast(), public void prepend(Polygon obj), public void append(Polygon obj), public void insertBefore(Polygon

obj), public void moveNext(), public void resetCurrent(), public void removeHeaditem(), public Polygon get(), public void set(Polygon obj), public Polygon next(), public void addInOrder(Polygon new_data), public int getsize() and public void printNodes().

On the 13/03/2020 12:00-16:00, I have sarted the PA1.java class and focus on how to input data from file and I ran into some error while I was trying to scanner file once and added data into Polygons. It took me a while to code that I first must create a Polygon array to pass the data to node. So, I decided to scan though the file twice, the first time the scanner looking for string 'P' and count the number of Polygons are in the input file then create Polygon array with its size. For the second time file scan then I can successfully input the polygon's data into its array. Once I finished the inputFile() method in PA1.java class, I crated a run () method which I can call in public static void main (String [] args). For the run () method, I crated a list1 then add all the Polygons into the doubly linked list and print it out after. The list2 is created after list1 has completed print out and used the same way input data into list2 but used addInOrder instead. After all the coding done, list1 and list2both were not printing correctly way and it was only printing out one polygon, so I went back to MyPolygon.java class to check if I missing any code, but I could not solve the problem.

On the 14/03/2020 12:00-15:00, I have been working on MyPolygon.java class and try to solve the previous problem. When I was test run the program, the error was NullPointException. I realized that the problem why the doubly list was not print out might be some issues with passing the previous and next data into the node, so I have double checked MyPolygon.java and add this.sentinel.setPrev(sentinel) and this.sentinel.setNext(sentinel); inside the MyPolygons() construtor and finally fix the list1 print out problem. But list2's still was not print out any data.

On the 15/03/2020, 10:00-12:00 I bought out the question to our lab tutor and finally noticed that the addInOrder(Polygon new_data) was missing one of the case: if size of the list2 was equal to 0. so I added the case in and all the lists are printed out successfully.

One the 19/03/2020 12:00-16:00, I have been noticed that the marker will be using different txt or dat file to test the program, so I did some minor change in the PA1.java class, by adding the String FileName = args[0]; instead of "sample_in.txt" and deleted all the other method in the PA1 class. All the codes should be all inside the Public static void main(String[] args) throw IOException.

Conclusion

For this program, there were major 8 errors that I must fix in total and time spent on fixing the error is 7.5 hours. Given what we have covered in Topic 3(Inheritance), rectangles and squares can be implements in this assignment as interfaces classes because a interfaces class can used for multiple inheritance and all method s are public abstract.

Total time spent on this assignment including writing the report(3 hours) is 26 hours and 45min.

After the program completed, I have double check all the file to see if any class or name is missing before I zip all class and required file into one file.