Assignment No -: 2

Purpose: Implementation of a design model

**********BussinesLogic Package**********

1) GPS.java

```
package BusinessLogic;

public class GPS {

	TrackRoute tracks ;
	Screen sc;


	public GPS(TrackRoute tracks, Screen sc) {
		super();
		this.tracks = tracks;
		this.sc = sc;
	}
	//sc.StopRecording();
	public void StartRecording()
	{

		sc.displayMessage("Start Recording");
	}
	public void StopRecording()
	{

		sc.displayMessage("Stop Recording");
	}

	public void AvgVelocity()
	{
		tracks.calAvgVelocity();
		sc.displayMessage("Avarage Velocity : " +tracks.getAvgVelocity());

	}

	public void TotalLength()
	{
		tracks.calTotalDistance();
		sc.displayMessage("Total Length : " +tracks.getTotalDistance());
	}

}
```

2)Screen.java

```
package BusinessLogic;
public class Screen {

	public Screen(){
```

```
	}

	public void displayMessage(String message)
	{
		System.out.println(message);
	}


}
```

3) TrackPoint.java

```
package BusinessLogic;



public class TrackPoint {
	private double x;
	private double y;
	private double z;
	private double time;

	public TrackPoint(double x, double y, double z, double time) {
		super();
		this.x = x;
		this.y = y;
		this.z = z;
		this.time = time;
	}


	public TrackPoint() {
		super();
	}


	public double getX() {
		return x;
	}

	public void setX(double x) {
		this.x = x;
	}

	public double getY() {
		return y;
	}

	public void setY(double y) {
		this.y = y;
	}
```

```
	public double getZ() {
		return z;
	}

	public void setZ(double z) {
		this.z = z;
	}

	public double getTime() {
		return time;
	}

	public void setTime(double time) {
		this.time = time;
	}


}
```

4) TrackRoute.java

```
package BusinessLogic;

import java.util.ArrayList;

public class TrackRoute
{
	public String name;
	public double TotalDistance;
	public double AvgVelocity;
	private ArrayList<TrackPoint> trackpoints;

	int i = 0 ;

	public TrackRoute(String name, ArrayList<TrackPoint> points) {
		super();
		this.name = name;
		this.trackpoints = points;
	}

	public TrackRoute() {
		super();
	}

	public String getName() {
		return name;
	}

	public void setName(String name) {
		this.name = name;
	}
```

```
public double getTotalDistance() {
	return TotalDistance;
}

public void setTotalDistance(double totalDistance) {
	TotalDistance = totalDistance;
}

public double getAvgVelocity() {
	return AvgVelocity;
}

public void setAvgVelocity(double avgVelocity) {
	AvgVelocity = avgVelocity;
}

public ArrayList<TrackPoint> getTrackpoints() {
	return trackpoints;
}

public void setTrackpoints(ArrayList<TrackPoint> trackpoints) {
	this.trackpoints = trackpoints;
}

public void calTotalDistance()
{
	for (int i = 1; i < trackpoints.size(); i++) {

	  double tempFirst = trackpoints.get(i-1).getX();
	  double tempSecond = trackpoints.get((i)).getX();
	  double tempYFirst = trackpoints.get(i-1).getY();
	  double tempYSecond = trackpoints.get((i)).getY();
	  double tempZFirst = trackpoints.get(i-1).getZ();
	  double tempZSecond = trackpoints.get((i)).getZ();

	 double  xValue = tempFirst - tempSecond;
	  double yValue = tempYFirst - tempYSecond;
	  double zValue = tempZFirst - tempZSecond;

	  double tempX2 = Math.pow(xValue, 2);
	  double tempY2 = Math.pow(yValue, 2);
	  double tempZ2 = Math.pow(zValue, 2);

	  TotalDistance += Math.sqrt((tempX2 + tempY2 +tempZ2));


	 }
	 //System.out.println("Total Length = "+TotalDistance);

}

public void calAvgVelocity()
```

```
	{
		for (int i = 1; i < trackpoints.size(); i++)
		{
			double t1 = trackpoints.get(i).getTime();
			if(i+1 >= trackpoints.size())
			{
				//System.out.println(t1);
				AvgVelocity= TotalDistance/t1;
				//System.out.println("avrage velocity ="+AvgVelocity);
			}

		}


	}


}
```

**********Client Package**********

TClient.java

```
package TestClient;
import BusinessLogic.*;
import java.util.ArrayList;
public class TClient {

	/**
	 * @param args
	 */
	public static void main(String[] args) {
		// TODO Auto-generated method stub


//			TrackRoute tr=new TrackRoute("Track Route1");



			TrackPoint point1 = new TrackPoint(100,100,100,100);
			TrackPoint point2 = new TrackPoint(150,150,150,150);
			TrackPoint point3 = new TrackPoint(200,200,200,200);
			TrackPoint point4 = new TrackPoint(300,300,300,1000);

			 ArrayList<TrackPoint> points = new ArrayList<TrackPoint>();
			 points.add(point1);
			 points.add(point2);
			 points.add(point3);
			 points.add(point4);

			 TrackRoute trackroute = new TrackRoute("Karve Road",points);
			 Screen sc = new Screen();
			 GPS gps =new GPS(trackroute,sc);
				gps.StartRecording();
```

```
                System.out.println(trackroute.getName());
                // trackroute.calTotalDistance();
                 //trackroute.calAvgVelocity();
                gps.TotalLength();
                 gps.AvgVelocity();
                        gps.StopRecording();



                //System.out.println(point1.getX());


        }

}

 /*
```

Ouput-

```
Start Recording
Karve Road
Total Length : 346.41016151377545
Avarage Velocity : 0.34641016151377546
Stop Recording

*/
```