Assignment 2

```
//GPS.java
package ccoew.it.businesslogic;

import java.util.ArrayList;

public class GPS
{
	private int id;
	ArrayList<Track_Route>tr=new ArrayList<Track_Route>();

	public int getId()
	{
		return id;
	}

	public void setId(int id)
	{
		this.id = id;
	}

	public void start_recording()
	{
		System.out.println("ID "+getId()+"  START RECORDING");
	}

	public void stop_recording()
	{
		System.out.println("ID "+getId()+"  STOP RECORDING");
	}
}

//Track_point.java

package ccoew.it.businesslogic;

public class Track_Point
{

	private double x;
	private double y;
	private double z;
	private double time;

	public Track_Point(double x, double y, double z, double time)
	{
		super();
		this.x = x;
		this.y = y;
		this.z = z;
		this.time = time;
```

```
	}

	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;
	}


}

//Track_Route.java

package ccoew.it.businesslogic;

import java.util.ArrayList;

public class Track_Route
{
	private String name;
	ArrayList<Track_Point> tp=new ArrayList<Track_Point>();
	int i;
	double total, length,length1,breadth,breadth1,time,velocity;
	double height,height1,total1,total2,total3,final_total,sum=0.0;
	public Track_Route(String name)
```

```
{
	super();
	this.name = name;
}

public String getName()
{
	return name;
}

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

public ArrayList<Track_Point> getTp()
{
	return tp;
}

public void setTp(ArrayList<Track_Point> tp)
{
	this.tp = tp;
}

public void addTrack(Track_Point track_point)
{
	tp.add(track_point);
}

public void calculate_length(ArrayList<Track_Point> tp1)
{
	for(i=0;i<(tp.size()-1);i++)
	{
		length=tp.get(i).getX();
		length1=tp.get(i+1).getX();
		total=length-length1;

		breadth=tp.get(i).getY();
		breadth1=tp.get(i+1).getY();
		total1=breadth-breadth1;

		height=tp.get(i).getZ();
		height1=tp.get(i+1).getZ();
		total2=height-height1;
		final_total=Math.sqrt((total*total)+(total1*total1)+(total2*total2));
		sum=sum+final_total;

	}
	int size=tp.size()-1;
	time=tp.get(size).getTime();
	velocity=sum/time;
```

```
                System.out.println("Length is "+sum);
                System.out.println("velocity is"+velocity);
        }
}


//Test.java
package ccoew.it.client;

import java.util.ArrayList;

import ccoew.it.businesslogic.*;


public class Test
{

        public static void main(String[] args)
        {

                        GPS gps =new GPS();
                        gps.start_recording();
                        Track_Route tr=new Track_Route("Track_Route1");

                        System.out.println(tr.getName());
                        ArrayList<Track_Point> tp1=new ArrayList<Track_Point>();

                        Track_Point tp_new=new Track_Point(10,10,10,10);
                        tr.addTrack(tp_new);

                        Track_Point tp_new1=new Track_Point(0,0,0,20);
                        tr.addTrack(tp_new1);

                        Track_Point tp_new2=new Track_Point(10,10,10,30);
                        tr.addTrack(tp_new2);

                        Track_Point tp_new3=new Track_Point(30,30,30,40);
                        tr.addTrack(tp_new3);

                        Track_Point tp_new4=new Track_Point(50,50,50,50);
                        tr.addTrack(tp_new4);

                        Track_Point tp_new5=new Track_Point(60,60,60,60);
                        tr.addTrack(tp_new5);

                        tp1=tr.getTp();
                        tr.calculate_length(tp1);

                        gps.stop_recording();


        }
```

```
}


//OUTPUT

ID 0  START RECORDING
Track_Route1
Length is 121.24355652982142
velocity is2.0207259421636903
ID 0  STOP RECORDING
```