**TITLE PAGE**

**Course:** CS1073

**Section:** FR03B

**Assignment number:** 3

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A)

import java.util.Scanner;

/\*\*

This is a class for determining people's

eligibility to apply for a Peer Mentor Position.

@author Zohaib Khan 3740572

\*/

public class Peer {

public static void main (String[] args) {

Scanner sc = new Scanner(System.in);

System.out.println("Please answer the following questions with

either a yes or a no.");

System.out.println("Are you an undergrad student?");

String input1 = sc.nextLine();

if (input1.equals("yes")) {

System.out.println("Will you be on a study term?");

String input2 = sc.nextLine();

if (input2.equals("yes")) {

System.out.println("Is you GPA at least 2.7?");

String input3 = sc.nextLine();

if (input3.equals("yes")) {

System.out.println("You should apply!");

}

else if (input3.equals("no")) {

System.out.println("Sorry, you cannot apply");

}

else {

System.out.println("Invalid input");

}

}

else if (input2.equals("no")) {

System.out.println("Sorry, you cannot apply");

}

else {

System.out.println("Invalid input");

}

}

else if (input1.equals("no")) {

System.out.println("Are you a grad student?");

String input2 = sc.nextLine();

if (input2.equals("yes")) {

System.out.println("Do you have your supervisor's

permission?");

String input3 = sc.nextLine();

if (input3.equals("yes")) {

System.out.println("You should apply!");

}

else if (input3.equals("no")) {

System.out.println("Sorry, you cannot apply");

}

else{

System.out.println("Invalid input");

}

}

else if (input2.equals("no")) {

System.out.println("Sorry, you cannot apply");

}

else{

System.out.println("Invalid input");

}

}

else {

System.out.println("Invalid input");

}

}

}

B)

Text

Description automatically generated

C)

/\*\*

This class represents a triangle shape using 3 points.

@author Natalie Webber

@author Zohaib Khan 3740572

\*/

public class Triangle {

private CartesianPoint pointA;

private CartesianPoint pointB;

private CartesianPoint pointC;

public Triangle (double x1, double y1,

double x2, double y2,

double x3, double y3) {

pointA = new CartesianPoint (x1, y1);

pointB = new CartesianPoint (x2, y2);

pointC = new CartesianPoint (x3, y3);

}

public Triangle (CartesianPoint p1,

CartesianPoint p2,

CartesianPoint p3) {

pointA = p1;

pointB = p2;

pointC = p3;

}

public double getPerimeter () {

return pointA.distance(pointB)

+ pointB.distance(pointC)

+ pointC.distance(pointA);

}

/\*\*

This method tells if the triangle is equilateral triangle or not.

@return true if the triangle is an equilateral triangle, false

otherwise.

\*/

public boolean isEquilateral () {

double ab = pointA.distance(pointB);

double bc = pointB.distance(pointC);

double ac = pointA.distance(pointC);

// Setting the tolerance to compare floating point numbers for

equality.

double TOLERANCE = 1E-13;

if ((Math.abs(ab-ac) < TOLERANCE) &&

(Math.abs(ab-bc) < TOLERANCE)) {

return true;

}

else {

return false;

}

}

/\*\*

This method tells if the triangle is a right-angle triangle or

not.

@return true if the triangle is a right-angle triangle, false

otherwise.

\*/

public boolean isRight () {

double ab = pointA.distance(pointB);

double bc = pointB.distance(pointC);

double ac = pointA.distance(pointC);

// Setting the tolerance to compare floating point numbers for

equality.

double TOLERANCE = 1E-13;

if ((Math.abs(ab\*ab + ac\*ac - bc\*bc) < TOLERANCE) ||

(Math.abs(ab\*ab + bc\*bc - ac\*ac) < TOLERANCE) ||

(Math.abs(ac\*ac + bc\*bc - ab\*ab) < TOLERANCE)) {

return true;

}

else {

return false;

}

}

}

D)

/\*\*

This is a driver class for the triangle class.

@author Zohaib Khan 3740572

\*/

public class TriangleTest {

public static void main (String[] args) {

// Creating two instances of triangle class.

Triangle t1 = new Triangle (-0.5, 0.0, 0.5, 0.0, 0.0,

Math.sqrt(3)/2);

Triangle t2 = new Triangle (0.0, 0.0, 8.0, 0.0, 0.0, 8.0);

// Calling both methods on t1.

if (t1.isEquilateral() == true) {

System.out.println("The triangle t1 is an equilateral

triangle.\n");

}

else {

System.out.println("The triangle t1 is not an equilateral

triangle.\n");

}

if(t1.isRight() == true) {

System.out.println("The triangle t1 is a right-angle

triangle.\n");

}

else {

System.out.println("The triangle t1 is not a right-angle

triangle.\n");

}

// Calling both methods on t2.

if (t2.isEquilateral() == true) {

System.out.println("The triangle t2 is an equilateral

triangle.\n");

}

else {

System.out.println("The triangle t2 is not an equilateral

triangle.\n");

}

if(t2.isRight() == true) {

System.out.println("The triangle t2 is a right-angle

triangle.\n");

}

else {

System.out.println("The triangle t2 is not a right-angle

triangle.\n");

}

}

}

E)

The triangle t1 is an equilateral triangle.

The triangle t1 is not a right-angle triangle.

The triangle t2 is not an equilateral triangle.

The triangle t2 is a right-angle triangle.