Purpose

The purpose of this assignment is to give you practice with conditions using if else decision structures, and some more basic computation.

Problem

Your program should prompt the user for 2 pairs of (X,Y) co-ordinate values i.e. points (x1,y1) and (x2,y2) and do the following:

- In the X-Y Cartesian coordinate system, determine which quadrant or axis each point belongs to
- Calculate the distance between the two points given by the formula:
  $D = \sqrt{dx^2 + dy^2}$
  where dx is the difference between the x-coordinates of the points and dy is the difference between the y-coordinates of the points

To start this program, you should create a folder called 2L under your cs410 folder. In this new folder 2L you can copy the starter file called *cartesian.c* from the public folder for 2L. Compile the starter program, run it and see what it does. Read through the starter file, look at the comments indicated and start filling in the missing pieces.

Details

Given 2 pairs of X and Y coordinates (points) we want to find out where in the Cartesian plane the points exist. Your program should prompt the user for entering the pair of values. You need to print a message indicating where the point exists either on an axis or in the appropriate quadrant. You then print a message indicating the distance between the two points.

[50 pts] Correctly reports co-ordinates x1, y1, x2, y2
[30 pts] Correctly reports distance between (x1,y1) and (x2,y2) using the formula above

You will need to write your program utilizing the "if" conditional statement either type of "if" statements – either single or multiple alternative statements. You are welcome to use Nested If statements although we have not covered that in the lecture yet. Refer to the lecture notes for the syntax of the "if" statement. Hint: You will need one set of statements for determining the location of (x1,y1) and a similar set of statements for determining the location of (x2,y2).

Here's an example using single alternative "if" statements, each "if" statement is independent of another so each of the conditions will be tested although only one of them will be satisfied.

```
if (x == 0)
    printf("x is zero\n");
if (x > 0)
    printf("x is greater than zero\n");
if (x < 0)
    printf("x is less than zero\n");
```

Here's an example of using multiple alternative "if" with "else if" and "else" statements. The way the whole if block is structured, only one of the "if" conditions can be satisfied, otherwise it will default to the last "else" statement.

```
if (grade >= 90)
    printf("Grade: A");
else if (grade >= 80)
    printf("Grade: B");
else if (grade >= 70)
    printf("Grade: C");
else
    printf("Grade: F");
```

Input

[10 points] The input will come from standard input, that is, from a user at the keyboard. Input prompts must be accurate. You will test input redirected from an input file. There are sample input files available.

Output

[10 points] Output will be sent to standard output (the screen). Don't forget to look at the sample output files!

Testing

On all your assignments, including this one, it is crucial that you test your program thoroughly. Sample input and output files will provided which you can use for your testing and verifying your program output.

Programs that don't run receive a maximum of about 20 points. Do not add additional features that are not being asked for, since your program may not run against test inputs that I have created.

Submission

Submit this assignment with the code 4L:

`submit 4L` *`name-of-your-file`*