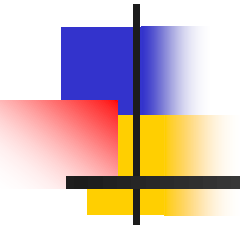


Project 4: Computing Distance

Computing Distance

- Write a program to compute the distance between two points.

- Recall that the distance between the two points (x1, y1) and (x2, y2) is computed by taking the square root of the quantity $(x1 - x2)^2 + (y1 - y2)^2$.

- Get the point coordinates from the user as floating point values.
- Use methods of the Math class to compute the distance.
- Display your result rounded to three decimal places.
  - Use the DecimalFormat class to format your output.

Computing Distance

Test your program using the following data:

- The distance between (0, 0) and (3, 4) is 5.0
- The distance between (3.5, 17) and (8.5, 10) is 8.602
- The distance between (-33,49) and (-9, -15) is 68.352

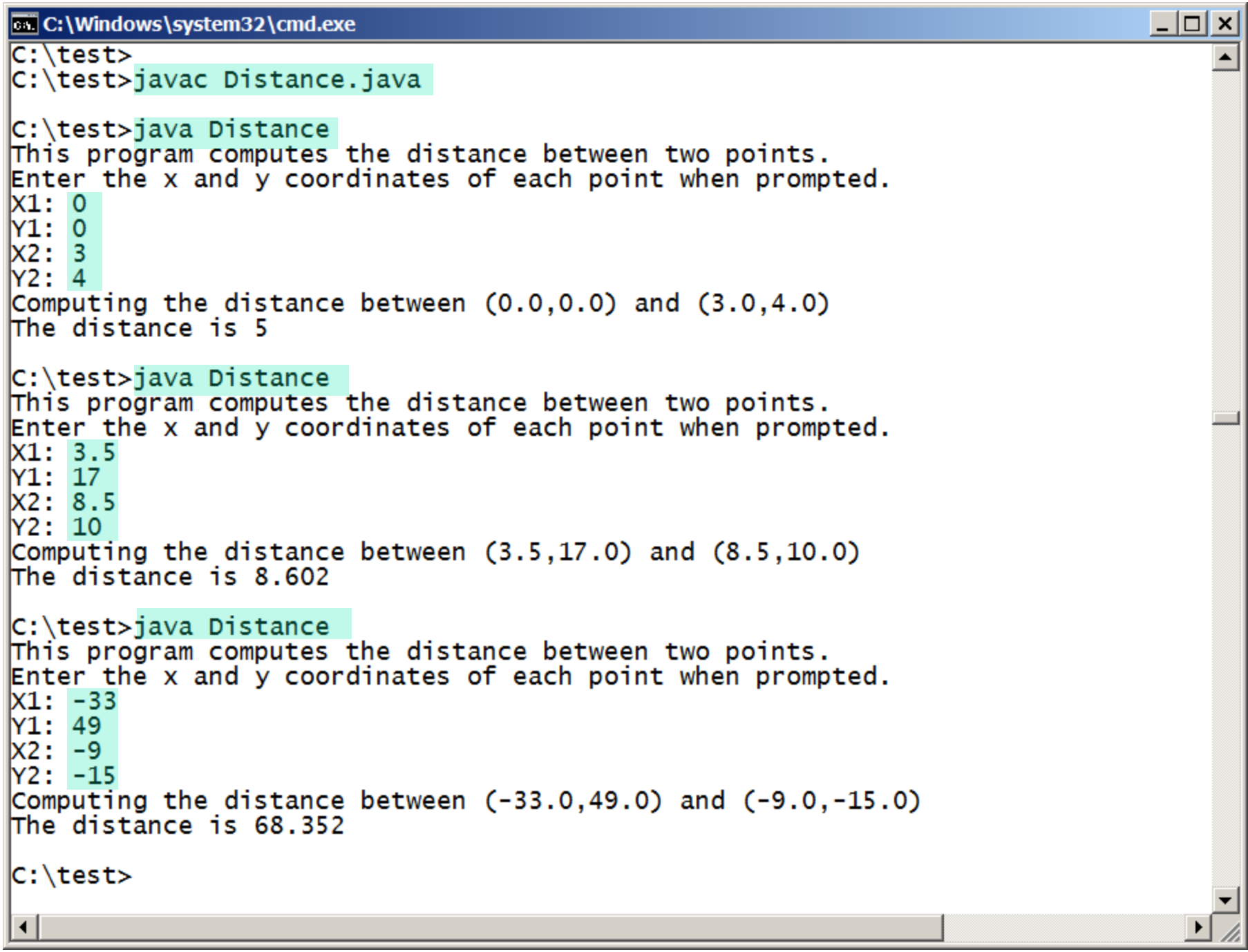
General outline of your main function

- Declare your variables
  - Think about what variables you need.
  - You need to input four pieces of information
  - You need some variables for your calculations.
- Get the input from the user.
- Compute the distance.
- Format the result and display.

Sample Run

- Your output should be similar in format to that shown in the sample run shown on the next slide.

- Note that low order zeroes are not shown.
  - A distance of exactly 5 is displayed as 5, not 5.000
  - This is how the DecimalFormat object works.


C:\Windows\system32\cmd.exe
C:\test>
C:\test>javac Distance.java
C:\test>java Distance
This program computes the distance between two points.
Enter the x and y coordinates of each point when prompted.
X1: 0
Y1: 0
X2: 3
Y2: 4
Computing the distance between (0.0,0.0) and (3.0,4.0)
The distance is 5
C:\test>java Distance
This program computes the distance between two points.
Enter the x and y coordinates of each point when prompted.
X1: 3.5
Y1: 17
X2: 8.5
Y2: 10
Computing the distance between (3.5,17.0) and (8.5,10.0)
The distance is 8.602
C:\test>java Distance
This program computes the distance between two points.
Enter the x and y coordinates of each point when prompted.
X1: -33
Y1: 49
X2: -9
Y2: -15
Computing the distance between (-33.0,49.0) and (-9.0,-15.0)
The distance is 68.352
C:\test>

Writing the Program

- Start with a stub
  - Just output the initial message.
  - Compile and test after each step.
  - Always have a working program!

- Add code to get the inputs.
  - Declare variables for the inputs.
  - Instantiate a Scanner
  - Output the user instruction "Enter the x and y ..."
  - Prompt the user for each coordinate.
  - Read each input from the keyboard.
  - Temporarily output the value received
    - (So that you can verify that they are correct.)

Writing the Program

- Output the "Computing the distance ..." message.
- Declare variables for intermediate results:
  - x_distance_squared
  - y_distance_squared
  - distance_squared
- Add code to compute the intermediate results.
  - Temporarily output the intermediate results.
- Add code to compute the distance
  - Square root of distance_squared.
  - Temporarily output the distance without formatting.

Writing the Program

- Instantiate a DecimalFormat object.
- Declare a variable to hold the formatted distance.
- Format the distance.
- Output the formatted distance.
  - This is your final result.

- Clean up.
  - Once the program is working correctly, delete the temporary output statements.

Submission

- Put your Java source file into a folder and zip it.
- Submit your zipped Java source file via Canvas Assignments.

- Project is due by 11:59 PM
  - Sunday, February 7 Sections 001 and 002
  - Monday, February 8 Sections 003 and 004

Ground Rules

- Do not share your code with other students
- Before or after submitting the project.
  - OK to *discuss* the project.
- Do not copy any other student's code.
  - Or even look at it.
- Do not let anyone copy or examine your code.