Introduction to Text Based I/O and Variables

helloWorldDemo and helloMyNameIs

1. Open project TextBasedIO in Netbeans.
2. The main function should have one line uncommented:

helloWorldDemo();

1. Run the project and note that the text “Hello World” appears in the console window.
2. Find function helloWorldDemo (lines 49-52). The only line in this function is

System.out.println( “Hello World” );

1. To print text to the screen, we use the method System.out.println( . . . );
2. The text that we want to appear on the screen is placed between a pair of double quotes: “ . . . ”
3. Now complete function helloMyNameIs. Choose a name for your computer and have the function print out the following lines (I chose the name “Lambda the Ultimate” for my computer):

Hello, my name is Lambda the Ultimate.

Lambda the Ultimate does not approve of puny humans.

Lambda the Ultimate will destroy you.

When you are done, uncomment the helloMyNameIs line in main and test.

variablesDemo and helloMyNameIsWithVariables

You’ve decided that you don’t like the name that you chose for your computer and want to change the last function so that it uses the new name. What would you need to do to make this change? What if you had a lot of places where the old name was used? How long would it take you to make all the changes? What if you forgot a location that doesn’t get used very often? What if you get tired of the new name? What if you wanted to give the user the ability to set the name of the computer?

1. In the main function, uncomment the line for variablesDemo and run the program. You should see the output

My programmer has brown hair and weighs 150 pounds and has a 3.4 GPA

1. Look at the code for variablesDemo and see that there are several variables declared and initialized:

String hairColor = “brown”;

int weight = 150;

double GPA = 3.4;

1. Look at the println that follows. Note that the line is NOT:

System.out.println( “My programmer has brown hair and weighs 150 pounds and has a 3.4 GPA” );

Rather, it uses the variables to stand in for the values that they represent.

1. Change the variable initializations so that the program describes you rather than me. Note that you DO NOT need to change the println statement. Rerun the program to make sure the output is correct.
2. Now, in function helloMyNameIsWithVariables, redo helloMyNameIs, but declare and use a variable to represent the name of the computer rather than repeating the literal name of the computer everywhere. Uncomment the helloMyNameIsWithVariables line in main and run to test.
3. Change the name of the computer by changing ONLY the value of the variable and rerun.

arithmeticDemo and circleAreaWithVariables

1. Look at function arithmeticDemo. It is possible to have the computer evaluate arithmetic expressions involving numbers and variables. Uncomment the arithmeticDemo line in main and run the program to see the results of this function.
2. Note that +, -, \* and () work as you would expect. The standard order of operations is in effect.
3. / works fine with doubles, but not (quite) as expected with ints.
4. There is no way to do exponentiation. If you want to square or cube a variable, use multiplication.
5. Strings can be added together to get new Strings
6. Now, complete function circleAreaWithVariables so that it prints out the area of a circle with a given radius. Use pi = 3.14. For example, if the radius is 5, it should print:

The area of a circle with radius 5.0 is 78.5

However, make sure that if I want to change the radius or the accuracy (by using a more accurate representation of pi), that I can do so easily (ie use variables for the quantities that may change later).

inputDemo and circleAreaWithInput

Programs which don’t get input from the user are boring… they always do the same thing!

1. Uncomment the line for inputDemo in main and run the program. The program should prompt you for your name, wait for you type in your name and then print a greeting to you from the computer.
2. Look at the function inputDemo. It declares a variable called keyboard of type Scanner, and initializes it:

Scanner keyboard = new Scanner( System.in );

A Scanner is a useful object which processes information from a Stream, in this case, the input coming from System.in (which is usually connected to the keyboard of your computer). Don’t worry too much about all that. The point here is that once you have declared and initialized keyboard, you can use it to read input that the user types.

1. The next line is a prompt for the user to type their name (System.out.println( . . . ); )
2. The next line reads the input that the user types, and stores the result in a variable:

String name = keyboard.next();

keyboard.next reads the next word from the input stream. Try running the program and typing your full name (first and last names) with a space between them. Notice that the computer only greets you using your first name.

1. The next line prints out a greeting to you (System.out.println( . . . );)
2. Remember how if the user types in two words, we only get the first one? What could we do to fix that? Try it. (Hint: there are actually two different ways to do this…)
3. Hey! Didn’t we define a variable for the computer’s name? Can we use it here instead of spelling it out again? Try it. What happened?
4. Complete and test function circleAreaWithInput. It should prompt the user to enter the radius of a circle, read in the radius from the keyboard (note: you’ll have to use a different function than keyboard.next()), and then print out the area of the circle (use pi = 3.14159). Here’s the output from my test run:

Enter the radius of the circle:

5

The area of a circle with radius 5.0 is 78.53975

Exercises:

Complete and test the following functions:

squarePerimeterWithInput() – prompt the user for the length of a side of a square and then report the perimeter of the square. Example run:

Enter the length of the side of the square:

5.3

The perimeter of the square with side 5.3 is 21.2

rectangleAreaWithInput() – prompt the user for the length and width of a rectangle and then report the area of the rectangle. Example run:

Enter the length of the rectangle:

7.2

Enter the width of the rectangle:

5.6

The area of a rectangle with length 7.2 and width 5.6 is 40.32

quotePrinter() – print out a famous quote by JFK. Hint: printing “ is not trivial:

"Ask not what your country can do for you but what you can do for your country" - John F. Kennedy

poemPrinter() – print out a silly poem. Hint: printing \ is not trivial either:

\Haikus are easy\

\But sometimes they don't make sense\

\Refrigerator\

tablePrinter() – print out a menu from a fast food restaurant. Hint: use \t to get everything aligned:

Item Price

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Hamburgers $5.00

Fries $1.50

Shakes $3.75

textagon() – print out an octagon:

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nameAgeFavoriteColorWithInput() – prompt the user for their name, age and favorite color. Then, prompt them for the same information for two other family members. Finally, report the information in a table:

Enter the first person's name:

Dave

Enter Dave's age:

38

Enter Dave's favorite color:

blue

Enter the second person's name:

Steph

Enter Steph's age:

38

Enter Steph's favorite color:

pink

Enter the third person's name:

Megan

Enter Megan's age:

4

Enter Megan's favorite color:

green

Name Age Favorite Color

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Dave 38 blue

Steph 38 pink

Megan 4 green