CS100J Lab 01. Expressions, variables, declarations, and assignments Fall 2003

Name _____ Section time _____ Section instructor _____

This lab deals with expressions and their evaluation in Java. Below are a list of expressions, somce followed by questions. Type each expression into DrJava, hit the enter key to have it evaluated, record its value after the expression on this paper, and answer any question to the best of you ability. Do not simply write down what you think is the value of an expression; write down only what DrJava says is its value.

Rather than type an expression character for character, open this page in a browser, copy an expression from the browser page, and paste it into the DrJava Interactions pane. That will save you time and prevent you from making typing mistakes. However, from time to time, it may make sense when in the Interactions pane to hit the uparrow key to obtain a previous expression, edit it, and it the return key to have the modified expression evaluated.

The last part of this lab assignment concerns variables, declarations, and assignment statements, so you will be typing in declarations and assignments as well.

If you finish this assignment early, don't leave. Instead, experiment with DrJava. If there is a topic that you feel you don't fully understand, then type in some expressions that deal with that topic and gain the understanding.

At the end of the lab, show this sheet to your lab instructor, who will record that you did it. Quite likely, you will not finish this complete assignment. In that case, finish it within the next few days and show this sheet to your lab instructor the next time you see them.

Don't waste time! If there is something you don't understand, ask your lab instructor or a consultant immediately! For example, you should understand HOW each expression is evaluated, and if the answer doesn't make sense to you, ask someone immediately.

The lab instructors and consultants are in the lab to help. They will look over your shoulder every once in a while and give you advice on what you are doing.

int expressions	
5 + 2	
5 + 2 * 5	(5 + 2) * 5
4 - 3 - 3	4 - (3 - 3)
-4 - -4 - -4	
6 / 2	6 / 3
6 / 4	Why isn't 6/4 = 1.5?
7 % 2	8 % 3
6 % 3	What is the name of operator %?
Integer.MIN_VALUE	Integer.MIN_VALUE - 1
Why does Integer.MIN_VALUE - 1 have such a funny value?	
Integer.MIN_VALUE	Integer.MIN_VALUE + 1
Integer.MAX_VALUE	Integer.MAX_VALUE - 1

Integer.MAX_VALUE + 1	
double expressions	
5.0 + 2.0	1 + 1.99
(5 + 2.1) * 5	
4.0 - 3 - 3	4.0 - (3 - 3)
-4.0 - -4 - -4	
6.0 / 2	6.0 / 4
6.0 % 3	6 % 4
-6.0 % 3	-6.0 % 4
Double.MIN_VALUE	Double.MIN_VALUE - 1
Double.MAX_VALUE	Double.MAX_VALUE + 1
Double.MAX_VALUE + Double.MAX_VALUE	
casting	
(**double**) 4	(**int**) 4
(**double**) 7 / 4	(**double**) (7 / 4)
Which operator has higher precedence, casting or division?	
(**int**) 5.3	(**double**) (**int**) 5.3
(**int**) (**int**) 5.3	(**double**) (**double**) 4
(**int**) 5.3	(**int**) - 5.3
5 + 7 / 4	(**double**) 5 + 7 / 4
5 + 7 / (**double**) 4	
boolean expressions	
true	**true** && **false**
true || **false**	What is the name of operator &&
false	**true** && **true**
true || **true**	What is the name of operator ||
!**true**	What is the name of operator !
!**false**	!!**false**
true && **false** && **true**	**true** || **false** || **true**
true || (**false** && **true**)	**true** && (**true** || **false**)

3 < 5	3 < 5 && 5 < 3
0 <= 4 && 4 < 5	
String expressions	
"Truth " + "is " + "best"	("Truth " + "is ") + "best"
"Truth " + ("is " + "best")	56 + "" + 56
"" + 4 / 2	("" + 4) / 2 —Gives an error message. Why?
"" + (4 / 2)	What does + do if at least one operand is +
4 + 2 + ""	4 + (2 + "")
Function calls	
Math.min(25, 4)	In the function call on the left, what are the two constants 25 and 4 called?
Math.max(25, 4)	Math.min(25, Math.max(27, 4))
Math.abs(25)	Math.abs(- 25)
Math.ceil(25.6)	Math.floor(25.6)
Math.ceil(- 25.6)	Math.floor(- 25.6)
Math.abs(Math.min(-25, -4))	
Variables, declarations, and assignment statements	
int j;	(There will be no answer from the declaration to the left)
j	Does a newly declared variable have a value?
j= 2;	(To the left is your first assignment statement)
j	
j+4	
j= j + 9;	
j	(You can see what assigning to j did)
int k= 5;	(This is an initializing declaration)
k	j + k
int w= j + k;	w
w;	(if you follow an expression with a semicolon, you don't see its value)