

South Louisiana Community College  
ASDV 1220, Programming Fundamentals

### Learning Objectives

After completion of this lab, you should be able to

1. Understand evaluation of algebraic expressions

1. Create project Lab4, add the following below.
2. Before you run it try to PREDICT the output.
3. Write your **prediction (calculation by hand) in the worksheet**( you will not be graded for the worksheet)

```
1 package lab4;
2 public class Lab4
3 {
4     public static void main(String args[])
5     {
6         int i = 11,
7           j = 22;
8         double x = 11.11,
9           y = 22.22;
10
11         System.out.println("\n" + i + " + " + j + " = " + (i + j));
12         System.out.println("\n" + x + " + " + y + " = " + (x + y));
13     }
14 }
```

4. Run the program and see if your prediction was correct.

5. Remove the parenthesis around  $(i + j)$  in line 11. Run the program again. Make sure you understand what happened and the output now is incorrect. If not, ask your instructor or the lab assistant. Then, put the parenthesis back.

6. For the following table that shows the variables of the code. Do the calculations **by hand** in the table below and write the values in the worksheet.

i	j	x	y	x / y	i / j	i % j
4	1	4.0	1.0			
4	2	4.0	2.0			
4	3	4.0	3.0			
4	4	4.0	4.0			
4	5	4.0	5.0			
4	6	4.0	6.0			
4	7	4.0	7.0			
4	8	4.0	8.0			
4	9	4.0	9.0			

7. Test if your calculations of the previous step are correct. By modifying the output statements( System.out) in the source program of class Lab4, according to the table, for int variables i and j, and double variables x and y (Hint: To speed things up, either do all of the values at once, or add an input statement that allows you to enter the values for i, j, x and y from the keyboard):

8. Fill out the following in the worksheet: Suppose that ABCD are the 4 digits of an integer value. With or without the computer, give the values of the following expressions in terms of A, B, C and D:

$ABCD / 1 =$ _____	$ABCD \% 1 =$ _____
$ABCD / 10 =$ _____	$ABCD \% 10 =$ _____
$ABCD / 100 =$ _____	$ABCD \% 100 =$ _____
$ABCD / 1000 =$ _____	$ABCD \% 1000 =$ _____

## Problem 2

Create the classes and fix the problems

All classes should be INSISE project Lab4 and Not separate projects.

1. Fix the compiling errors and run it.

```
1 package lab4;
2 public class Debug1
3 {
4     public static void main(String[] args)
5     {
6         i = 1;
7         j = i * i * i;
8         System.out.println( j );
9     }
10 }
```

2. Unintentionally, this program prints zero. Why does it display zero? Make sure you understand why.

Then, fix it so it displays 30 whole number int and NOT 30.0 double. Variable j should remain of type int.

```
1 package lab4;
2 public class Debug2
3 {
4     public static void main(String[] args)
5     {
6         int i = 9;
7         int j = 5 / 6 * (i * 4);
8         System.out.println(j);
9     }
10 }
```

3. What is the output of this program? Why is it not correct? Fix it that it displays the correct result 2147483648 WITHOUT introduction any extra line(s) of code. Hint: Use typecast.

```
1 package lab4;
2
3 public class Debug3
4 {
5     public static void main(String[] args)
6     {
7         System.out.println(2147483647 + 1);
8     }
9 }
10
```

4. The program displays 1 + 2 is 12. Fix it to display 1 + 3 is 3 WITHOUT introducing any new lines of code but forcing and WITHOUT using `System.out.println("1 + 2 is " + 3)`;. In other words you want 1 + 2 to evaluate to 3 without writing 3.

```
1 package lab4;
2
3 public class Debug5
4 {
5     public static void main(String[] args)
6     {
7         System.out.println("1 + 2 is " + 1 + 2);
8     }
9 }
```

### Problem3

(Financial application: payroll ) Write a program that reads the following information and prints a payroll statement:

Employee's name (e.g., Smith)

Number of hours worked in a week (e.g., 10)

Hourly pay rate (e.g., 6.75)

Federal tax withholding rate (e.g., 20%)

State tax withholding rate (e.g., 9%)

Sample RUN

Enter employee's name: Smith ENTER KEY

Enter number of hours worked in a week: 10 ENTER KEY

Enter hourly pay rate: 6.75 ENTER KEY

Enter federal tax withholding rate: 0.2 ENTER KEY

Enter state tax withholding rate: 0.09 ENTER KEY

Employee Name: Smith

Hours Worked: 10.0

Pay Rate: \$6.75

Gross Pay: \$67.5

Deductions:

    Federal Withholding (20.0%): \$13.5

    State Withholding (9.0%): \$6.07

Total Deduction: \$19.57