Name: _____

Practice Exercise – Day 1b

Data Types & Expressions

Overview

This series of exercises is designed to give you an introduction to variable assignment, expressions and user input from the keyboard.

We will be doing these exercises inside the main method. It is generally not good programming practice to only use a main routine, but we will do this for now for the purpose of demonstration and ease of learning.

Part 1: Assigning values to variables

Type the following code EXACTLY into your editor.

```
public class PE1b_1
{
   public static void main(String [] args)
   {
      int iValue;
      double dValue;

      iValue = 12345;

      dValue = 789.5;

      System.out.println("The integer is " + iValue);
      System.out.println("The double is " + dValue);
   }
}
```

Two variables will be used. The println() method will print the contents of these variables to the screen after compiling and running this program. Then, delete the .5 leaving 789 for the double assignment. Compile the file again.

What was printed? 789.0

Why was the .5 replaced with something else, rather than no value?

the type is Double, so a decimal is always a part of the number. A zero is used if the number is whole

Try again, only this time use 12345.0 for the integer assignment (leave the double alone) and compile.

What happened? error: incompatible types: possible lossy conversion from double to int

Finally, add (int) directly in front of the 123456.0 double literal value. Compile.

What was printed? 12345

Explain why using the correct programming terms?

The (int) forces or "casts" the double literal value to be an integer, accepting possible lossy conversion, as may be the case in explicit conversion.

Part 2: Expressions

The following code comes from the next example: Answer the following BEFORE copying and compiling the code!

10/2*5%5+100; What does this evaluate to? 100

100.0/25*4-16.0; What does this evaluate to? 0.0

Get your instructor's signature BEFORE entering the code: _____

Type the following code into your editor. You need practice typing in complete programs, do not copy/paste from the previous example.

```
public class PE1b_2
{
   public static void main(String [ ] args)
   {
      int integerValue;
      double doubleValue;

      integerValue = 10/2*5%5+100;

      doubleValue = 100.0/25*4-16.0;

      System.out.println("The integer is " + integerValue);
      System.out.println("The double is " + doubleValue);
   }
}
```

Compile and run the program.
Were your initial answers above correct? Yes
If not, find out where you went wrong.

Type the next example code into your editor.

```
public class PE1b_3
{
   //this is incomplete and won't compile!

   final static PI = 3.141579f;  // data type needed

   public static void main(String [ ] args)
   {
      int diameter = 25; // feet for a 25 foot diameter pool
      // poolArea;
      // radius = ;

      // calculation for swimming pool area

      System.out.println("The area of the pool is " +
                         poolArea + " square feet");
   }
}
```

This program is incomplete! You need to add three data types, a calculation to convert diameter to radius and an assignment statement to make the program

calculate the area of a 25 foot diameter pool (remember area = $\prod r^2$). Finish the code, compile and run it. Use the Math class constant for PI.

What is the area of that pool (show all digits)? 490.8738521234052

Part 3: User Input

Change the `PE1b_3` code to `PE1b_4`, and use File → Save As, to save it with the new name. Type the following changes into `PE1b_4`. This part of the lab provides instructions but requires you to determine where to really place the statements required.

- Add as first line in the program the import, so we can use Scanner.
- Class name should be PE1b_4.
- Define a scan object in the beginning of the main method:
- Don't set diameter to a value, ask the user for diameter, and get the diameter from the user:

Compile and run the program to ensure all works well. This program calculates the area of a pool after getting the user's diameter from the keyboard. With an entry of 15 you should get `176.71458676442586` (or somewhere close to it).

Next, change the program to get the user's first name (eg: Bob), then the last name (eg: Jones) and print out the whole name as in "Bob Jones". Use two separate prompts to get the names.

Using the example values used above, 15, Bob, and Smith, the final output line should look like:

The area of the pool owned by Bob Smith is 176.71458676442586 square feet.

Instructor/TA initials: _____