Lab 01 – Integrated Development Environment (IDE)

Objectives:

- Learn to use Netbeans IDE to create, debug, compile, and execute a project
- Perform some basic programming tasks with Java

1. Here is a walk-through of the basic functions in **Netbeans**. Follow the instructions from your tutors and finish it carefully.

A. **Create an Empty Project**

i. From the menu bar, choose: File > New Project
ii. Select “Java” in the Categories and “Java Application” in the Projects
iii. Enter the project name and location and uncheck the “Create Main Class” option
iv. Click “Finish” to create the project

B. **Add a New Class and a New Package**

i. Right click the project and choose: New > Java Class
ii. Enter the class name and package name (if no package name is provided, you will see the new class is created in a default package)
iii. Using the same procedure, add a new package to your project: New > Java Package
iv. Try to drag and drop your class around different packages. You will be prompted for “Refactoring”. Click to confirm
v. After refactoring, see what change is applied to your source code
vi. Also, look at your project folder, see how the source code file (*.java) is organized under different packages

C. **Create the Main Method and Print to Screen**

i. Double click your new class in the project window and it will be opened in the code editor on right panel
ii. Enter the main method code and print out “Hello World!” to the console
iii. Press **Ctrl-S** to save your code, and press **F6** to compile and run your project
iv. Look at your project folder again, see where the bytecode file (*.class) is generated

D. **Import Class from JDK and Get Input**

i. Enter the following line to your main method:
String value = JOptionPane.showInputDialog("Enter something:");
ii. You will be warned that the JOptionPane class is not known. Press **Ctrl-Shift-I** to automatically import the required class. See what happen to your source.
iii. Run your program again, and you will be prompted to enter a value.
iv. What you typed in the popup dialogue will be stored in the string variable *value*.
v. Print out the *value* to verify the result.

E. **Two Useful Hotkeys**

i. When your code is not properly formatted or indented, try to press **Alt-Shift-F (Auto Format)**
ii. When you forget the spelling of certain class/method/variable name, try to press **Ctrl-Space (Code Complete)**

F. Formatted Printing and Data Type Conversion

i. Rewrite your main method as follow:

```
public static void main(String[] args) {
    String value = JOptionPane.showInputDialog("Enter something:");
    double halfValue = Double.parseDouble(value) / 2;
    System.out.printf("Halve the value: %.2f\n", halfValue);
}
```

ii. Run the program and enter a number for testing

iii. What is the use of command: Double.parseDouble(…) ? (check API)

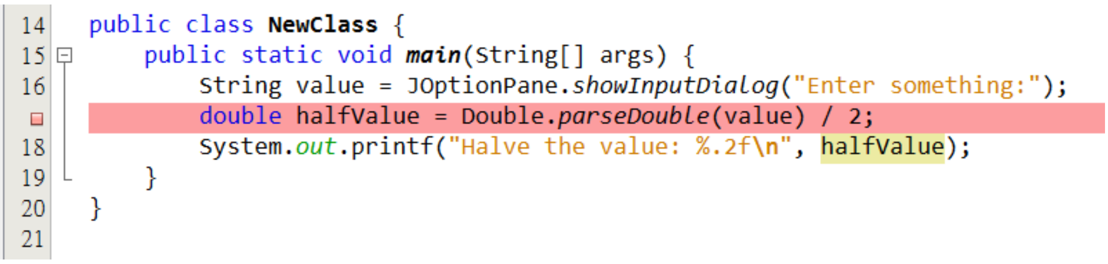
iv. What is the use of System.out.printf(…) ? (check API)

v. What is the naming convention used by variable and method name?

vi. What is the naming convention used by class name?

G. Set Breakpoint and Run Debugger

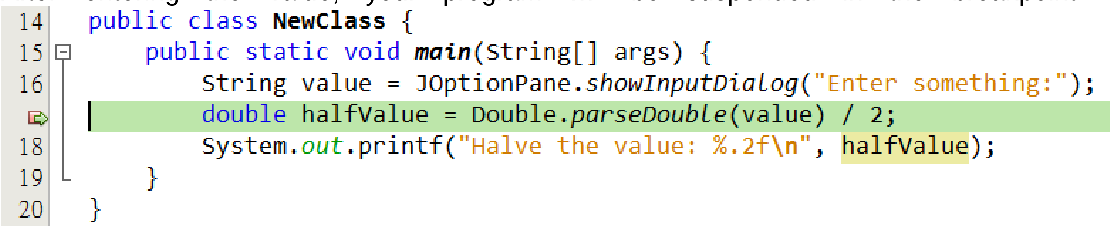
i. In your code editor panel, you can set a breakpoint by clicking the line number located in its left hand side



```
public class NewClass {
    public static void main(String[] args) {
        String value = JOptionPane.showInputDialog("Enter something:");
        double halfValue = Double.parseDouble(value) / 2;
        System.out.printf("Halve the value: %.2f\n", halfValue);
    }
}
```

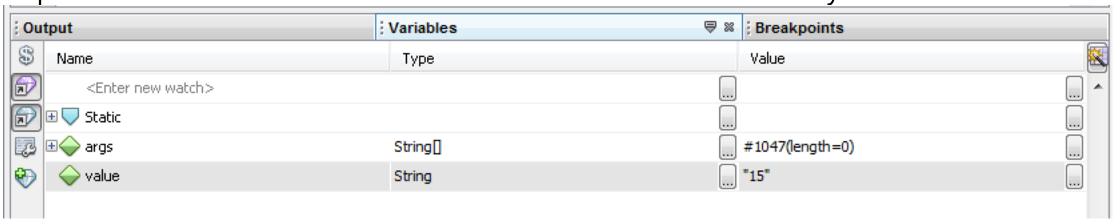
ii. Now you can run your program in debug mode by pressing **Ctrl-F5**

iii. After entering the value, your program will be suspended in the breakpoint



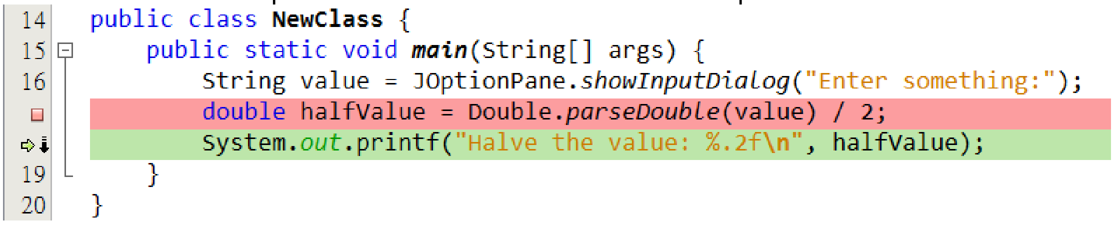
```
public class NewClass {
    public static void main(String[] args) {
        String value = JOptionPane.showInputDialog("Enter something:");
        double halfValue = Double.parseDouble(value) / 2;
        System.out.printf("Halve the value: %.2f\n", halfValue);
    }
}
```

iv. In the lower part of Netbeans, you will see the opened "Variables" window, in which you can inspect the variables in your code



Name	Type	Value
<Enter new watch>		
Static		
args	String[]	#1047(length=0)
value	String	"15"

v. Press **F8** to step to the next line and inspect the halved value



```java
public class NewClass {
    public static void main(String[] args) {
        String value = JOptionPane.showInputDialog("Enter something:");
        double halfValue = Double.parseDouble(value) / 2;
        System.out.printf("Halve the value: %.2f\n", halfValue);
    }
}
```

vi. You can press **Shift-F5** to finish debugging mode.

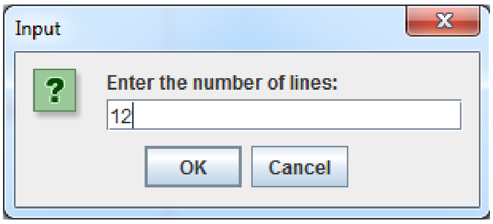
2. Design a Java method (function) to print letters from A to Z using a for-loop. (Hints: You can manipulate a character as a number. Try to figure out the numerical difference between A and B.)

3. Given an array of integers, a triple is a value appearing 3 times in a row in the array. Write a static method *hasTriples( )* that returns true if the array contains any triples, or false if it doesn't. You should write a few test cases in your main method to test if the method *hasTriples()* works properly.

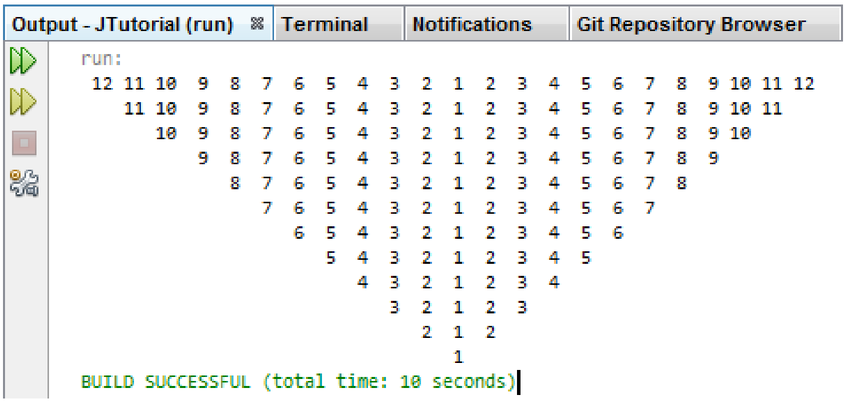
```
boolean hasTriples(int[] nums)
```

Input	Expected Output
{1, 1, 2, 2, 1}	false
{1, 1, 2, 2, 2, 1}	true
{1, 1, 1, 2, 2, 2, 1}	true

4. Write a class *PrintPyramid* that prompts a user to enter an integer between 1 to 15 and displays a digit-pyramid. For example, if the input integer is 12, the output is shown below.



Enter the number of lines: 12



```
run:
 12 11 10  9  8  7  6  5  4  3  2  1  2  3  4  5  6  7  8  9 10 11 12
    11 10  9  8  7  6  5  4  3  2  1  2  3  4  5  6  7  8  9 10 11
       10  9  8  7  6  5  4  3  2  1  2  3  4  5  6  7  8  9 10
           9  8  7  6  5  4  3  2  1  2  3  4  5  6  7  8  9
              8  7  6  5  4  3  2  1  2  3  4  5  6  7  8
                 7  6  5  4  3  2  1  2  3  4  5  6  7
                    6  5  4  3  2  1  2  3  4  5  6
                       5  4  3  2  1  2  3  4  5
                          4  3  2  1  2  3  4
                             3  2  1  2  3
                                2  1  2
                                   1
BUILD SUCCESSFUL (total time: 10 seconds)
```

- END -