Télécom Saint-Étienne
FISE2 2017-2018
Java INFO 4.1
Lab #8 - 3h00

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Goals of the session:

Create your Graphic User Interface using Swing
In this session you will learn :
- To use the Swing framework, especially component and their layout.
- To implement event listeners

Rules

You must read carefully this document. Your time is valuable, as is the time of your teacher. Every question to the teacher whose answer is to be found in this document will lead to a lock of the resource teacher for 10 minutes. This means that nobody in the group will be able to any question to the teacher.

In this lab, we will be using another IDE than Eclipse for building our Graphic User Interfaces (henceforth GUI). The IDE of choice is Netbeans (https://netbeans.org/downloads/).

We will first discover Netbeans GUI capabilities by reading the Oracle documentation on the topic (Exercise 1). Then, exercise 2 will offer you the opportunity to implement a simple GUI that requires to create components, place them in the window (using layouts), and implement event (mouse) and action (keyboard) listeners.

1 Exercise 1 : Netbeans

Question 1.1 Download and install Netbeans in your virtual machine.

Question 1.2 Lookaround netbeans GUI capabilities by reading this presentation of the different areas usefull to build GUi in Netbeans : https://docs.oracle.com/javase/tutorial/uiswing/learn/netbeansbasics.html.

Question 1.3 Implement the CelsiusConverter GUI by following this tutorial https://docs.oracle.com/javase/tutorial/uiswing/learn/creatinggui.html.

Question 1.4 We will here discover the main classes of the Swing framework, that is the native framework in Java to create GUI.

First, read carefully :
- about Swing components : https://docs.oracle.com/javase/tutorial/uiswing/components/index.html. (You may skip "Text Component Features")
- about Swing layouts : https://docs.oracle.com/javase/tutorial/uiswing/layout/index.html.

– about Event listeners : https://docs.oracle.com/javase/tutorial/uiswing/events/intro.html.

Now, we can answer the following questions :

1. What is a `JFrame` ?
2. What is the `ContentPane` and what is its type ?
3. How to add a `JButton` to the `ContentPane` ?
4. What is a layout manager ?
5. How to add a new `BoxLayout` to the `ContentPane` ?
6. How to implement a `MouseListener` and how to bind it to a `JButton` in the ContentPane ?
7. WHat is a `KeyListener` and how to use it ? (e.g. how to display "Hello" to the standard output when the key Enter is pressed in the GUI ?)

2 Exercise 2 : Calculator

Question 2.1 We will now create a new Swing application. This Swing application is calculator, like the infamous Windows one.

Your calculator will have the following features :

– Implement the following operations : add, sub, mult, div and modulo.
– Provides button for those operations, along button for numbers 0-9, a Enter button to perform the result, and a clear button to clear the result being displayed (set the text field to the value 0)
– The result will be displayed at the top of the calculator in a `JTextField`. This value can be reused for further operations.

Optionally if time allows :

– You will provide a button to switch to the scientific mode. In this mode, you show a new `JPanel` that was until then hidden. This panel provides advanced computations: sin, cos, tan, and factorial.
– The calculator will allow complex expression using parenthesis (beware: this is a more difficult functionality to add).

In order to do this, we recommend that you first draw your GUI and materialize the different `JPanel`, `JComponent` and `Layout` that you will need to then create in the Netbeans GUI editor.