

# Programmierpraktikum

Exercise Sheet #12

WS, 2012/2013

## Introduction to the GUI

Similar as in the examples from the lecture, for instance:

<http://itp.uni-frankfurt.de/~gros/Vorlesungen/ProgPrak/Java-GUI.html#%28%29>,

write a program that:

- Generates a window in the graphical interface (by instantiating a **JFrame**).
- Add elements to the window: generate a “pocket calculator” (it does not have to function, just look like a pocket calculator). For this, use buttons, labels, fonts, background colors, and any other element that you may need (check the documentation). To get a proper layout, check the documentation for a *layout manager*, e.g. **BorderLayout** or **GridLayout**.  
<http://docs.oracle.com/javase/7/docs/api/java/awt/LayoutManager.html>
- [Optional] Make the calculator actually work (you need to implement actions, as in the next point).

## Actions

Design a class extending **JFrame**, which will be the main window of your program. Design a second class to manage events. Using explicitly this separated design, make a program that presents a window with buttons:

- When pressing one button (print button), a string should be printed to the standard output (the console):
- With the other button (close button), the window should close and the program should end cleanly.
- The window contains a third button, which changes its label when pressed.

The program should finish properly when closing the window.

*Hint:* The **ActionListener** part needs to get the **JFrame** part as an argument (so you can identify the object originating the actions and act on it, for instance changing its label) and both classes will have to implement **ActionListener**, although the one from **JFrame** is to be ignored (only the listener from your listener class is to be used).