Designing Interactive Systems II - Summer Semester 2006
Assignment 9: RAT: Really Awesome Toolkit
Due: Monday, June 26, 2006 @23:59

You will finish off your window system in this assignment by building the Really Awesome Toolkit (RAT). Your toolkit should support (at minimum) a label and button widget.

The Toolkit

There are many ways of structuring the class hierarchy of your widget toolkit. One possibility is as follows:

- RATwidget (abstract class)
    - RATlabel
        - RATbutton

A RATlabel should be able to show some text on a coloured background. A RATbutton should be able to respond to mouse events, and allow other objects to receive notifications when it is pressed. One way to do this is by using event listeners. Create an abstract class, e.g. RATmouseListener:

```
public interface RATmouseListener
{
    public void mouseClicked(parameters )
}
```

This interface is implemented by classes that need to do something when a button is pressed, and then registered with the button object. The way that you let the buttons know about relevant mouse events is left to you. It could be job of the window manager, window, or window system. Again, think about what makes for the most elegant solution.

You do not have to do any special layout managment for your widgets. It is acceptable to assume that the programmer is responsible for laying out the widgets manually in a way that they don't overlap.

HelloWorldGraphical Revisited

To demonstrate the functionality of your toolkit, rewrite the HelloWorldGraphical application from Assignment 1 using RAT.

Testing Your Understanding

Answer the following questions:

1. List all of the classes in your window system implementation, and classify them as: Graphics and Event Library; Base Window System; Window Manager; UI Toolkit; or Application.

2. Compare and contrast the use of event listeners to standard callbacks in C.

Extra Credit

Implement one of the following "extra features" for a combined bonus credit of up to 1.0:

- A basic (working) calculator program using RAT (instead of HelloWorldGraphical) (+1.0)

- A slider widget which lets one choose a value between 0.0 and 1.0 by dragging on the handle. Augment HelloWorldGraphical to use this to change the colour of the label. (+1.0)

- Implement a "nicer" looking button which has different visual feedback when the mouse cursor is over the widget (rollover state) and when the mouse button is held down over the widget (pushed state). (+0.5)
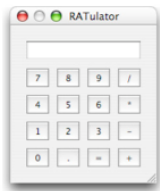
1. Calculator Program   2. Slider Widget

Be sure to document which features you implemented in your README.

Submission

Email an archive of your assignment to holman@cs.rwth-aachen.de before the due date. The subject of your email should be "DIS2 Bonn Assignment 9"; be sure to use this exact subject line as it will be used to filter assignment submissions for grading.

Your assignment archive should include your source code and everything necessary to compile and run your program. Be sure to document your source code. Include a PDF document with the name README.pdf that contains:

- names and email addresses of all group members

- instructions on how to compile and run your source code

- answers to the questions (see Testing Your Understanding)

- non-obvious things you did in your code (if any)

- anything that you think makes your design particularly optimized and/or elegant

Be prepared to discuss your solution in the next lab.

Grading

1.0 - exceptional work that clearly went above and beyond what was given on the exercise
2.0 - exercise was completed satisfactorily as per the assignment specification
3.0 - exercise was completed, but has some problems
4.0 - incomplete exercise
5.0 - little or no effort was put into the exercise

Late assignments will be graded with a penalty of 0.5 per 24 hour period after the due date.