CSE5910 : Multimedia Programming in Java

Laboratory Session Worksheet. Weeks 8 & 9, Semester 2, 2007

Individual Exercises.

This week it is time to explore some basic graphics utilities and information.

Background reading:

Read up on JPEG. How does the compression algorithm work?

Read up on Run-Length Encoding. What is it? What is it useful for? How does it work?

Programming exercises:

Cut and paste the graphics programming examples from the lecture notes into files. Compile and execute them. Do you understand what they do? Investigate the JFrame and JPanel classes. What are they for?

Write a simple 2D Cartesian point class.

Write a new class `PositionedImage` that contains both an image file and a point to be used as the position of the image in a window.

Write software to read in image file names and their x,y positions from the command line like this:

```
> java myExecutable myImageFileName1 x1 y1 myImageFileName2 x2 y2 ...
```

Or if you prefer, have your program read in a text file containing this information where you specify the name of the text file on the command line like this:

```
> java myExecutable myDataFileName.dat
```

The program should open the image file if it exists and then place the image at the location specified in the data file or on the command line. Be sure to throw and handle exceptions if there are problems reading the files or positioning the images in the window.

Parameterise the window size also or calculate the window size required based on the x,y coordinates that are entered and the sizes of the images that are loaded.

Extend your software by adding a class called `Connection` that represents a line drawn between the centre of each pair of images loaded into the software. Use vector drawing routines to automatically draw the line from one image center to the next from within a method of the class called `draw()`. Design an interface `Labelled` that stores a text label and have `Connection` implement that interface. When the `Labelled Connection` is drawn, write a text label that is a conjunction of the two image file names (e.g. if you load an image `tree.GIF` and an image `house.GIF`, make the label on the connection between them `tree-house`) to the screen also.

Save the final image of the loaded images, connections and their labels to a PNG file on the disk.