

CS 111 - Intro to Computing, Fall 20123

Lab 8

Posterization

Posterization is a technique that reduces the number of colors used in a picture. During lecture we did examples of posterizing a picture to 2 colors, to 4 colors and to 8 colors.

The code to posterize is often a modification of the black & white (grayScale) code. Once the "grayAmount" has been determined for a pixel, we use that value in if statement(s) to determine which of the posterized colors that pixel will be set. The following shows that code for posterizing into 2 colors: black and white.

- If the grayAmount is in the range from 0 to 127, the color of the pixel becomes black.
- If the gray Amount is in the range from 128 to 255, the color of the pixel becomes white.

```
// determine the grayAmount from the color at the pixel
int grayAmount = (int) (red * 0.299 + green * 0.587 + blue * 0.114);

// determine the final color value of the pixel
if ( grayAmount < 128 )
{
    // set the pixel to black
    red = 0;
    green = 0;
    blue = 0;
}
else
{
    // set the pixel to white
    red = 255;
    green = 255;
    blue = 255;
}
```

To posterize to more colors we just need to use nested if statements (often called "else-if" clauses). The following posterizes to 4 colors (black, blue, cyan and white). In this one the ranges for the grayAmount are:

- 0 - 63 for black,
- 64 - 127 for blue,
- 128 - 191 for cyan, and
- 192 - 255 for white.

```
// determine the grayAmount from the color at the pixel
int grayAmount = (int) (red * 0.299 + green * 0.587 + blue * 0.114);

// determine the final color value of the pixel
if ( grayAmount < 64 )
{
```

```

// set the pixel to black
red = 0;
green = 0;
blue = 0;
}
else if ( grayAmount < 128 )
{
// set the pixel to blue
red = 0;
green = 0;
blue = 255;
}
else if ( grayAmount < 192 )
{
// set the pixel to cyan
red = 0;
green = 255;
blue = 255;
}
else
{
// set the pixel to white
red = 255;
green = 255;
blue = 255;
}
}

```

Lab Assignment

Due: Tuesday 10/22/2013 by 11:59 pm

For this lab assignment, you are to posterize a picture into 5 colors. We will use the "grayAmount" that was used when creating a black and white (grayscale) picture to determine which of the five color values will be used.

Since our range for the "grayAmount" can vary from 0 to 255, we need to divide that range into 5 parts to distribute the five colors evenly throughout the picture.

We will use the following shades of orange for our 5 colors. The names come from the web page at: <http://www.tayloredmktg.com/rgb/>.

gray Amount Range	0 - 51	52 - 102	103 - 153	154 - 204	205 - 255
Color Value	Chocolate r = 210 g = 105 b = 30	Dark Orange r = 255 g = 140 b = 0	Orange r = 255 g = 165 b = 0	Sandy Brown r = 244 g = 164 b = 96	Light Salmon r = 255 g = 160 b = 120

For this lab assignment, you are to write a java program that will complete the following:

1. Prompt the user for a picture and open that picture.
2. Call a method that will posterize the picture as described above. The picture opened in step 1 is to be sent as a parameter to this method.
3. Display the posterized picture.
4. Prompt the user to enter a filename to Save the picture.
5. You must write your programs using good programming style which includes:
 - o Good variable names
 - o in-line commenting
 - o header block commenting for the program and each method written
 - Be sure to include the following with the header block comment for the program.
 - your name
 - day and time of your CS 111 lab section (i.e. Friday at 9:00)
 - A description of the project.
 - o proper indentation of program statements
 - o use of blank lines to separate blocks of code.

Submission of the Lab

The lab must be submitted electronically to the Assignment Link for Lab 8 inside of [Blackboard](#). You will only need to submit the java source code file (the ".java" file). Please only submit source code file (the **.java** file, not the **.class**)