CompSci 6
Programming Design and Analysis

January 28, 2010
Prof. Rodger
Announcements

• Next time loops, arrays and Strings
• Read Chapter 6.1-6.2, Chap7.1-7.4
• Reading Quiz
• Assignment 3 out
• Today
  – Review if (making decisions)
  – Pixmap (manipulating images)
if statement

• Condition – must be in ()’s
• Body of if/else
  – 1 statement OR multiple stmts in { }’s
• Relational operators:
  ==  <  >  >=  <=  !=
• Logic operators:
  && - means AND
  || - means OR
  !  - means NOT

```java
int x=6;
int y = 9;
if ((x<5) || (y >= 6)) {
    x = 3;
    y= 2;
} else {
    x = 5;
}
```
Example – 2 ifs

```java
int y = 3, x = 6;
if (x > 2)
{
    System.out.println("A");
}
if ((y == 3) && !(x < 3))
{
    System.out.println("B");
}
```
Example 2 - if, else if, else

// Try different values of x and y: 5,3  3,3  2,2

if (x > 4)
{
    System.out.println("A");
}
else if ((y == 3) && !(x < 3))
{
    System.out.println("B");
}
else
{
    System.out.println("C");
}
Null and Objects

Chicken bird = null;  // no memory assigned
// bird = new Chicken(“Pia”, 5.2, 4.2);
if (bird != null)       // for safety
    bird.eat(2.3);

Don’t reference null objects!
What is an image?

• Lots of pixels
• Each pixel represents a color

One color
RGB
(45, 10, 67)
Color

- See API page
- In RGB, each color is made up of 3 int values representing red, blue and green
- Each int range is 0-255
- Example of four Color variables
  - Color red = new Color (255, 0, 0);
  - Color black = new Color(0,0,0);
  - Color white = new Color(255, 255, 255);
  - Color lightSalmon = new Color(255,160,122);
Color Methods – see API page

- `getRed()` - gets red integer value
- `getBlue()` - gets blue integer value
- `getGreen()` – gets green integer value

- To modify the color of a pixel, get the old color and then create a new color that is slightly different.
Example: Change red color a little

public Color transformColor (Color current)
{
    int red = current.getRed();
    int blue = current.getBlue();
    int green = current.getGreen();
    return new Color(red + 50, green, blue);
}

CAREFUL! This could cause an error!
Classwork today - Images

• Read in an image.
• Modify `transformColor` method
  – Given a Color, create and return a new Color
  – See API for Color class
  – “Magically” transformation is applied to all pixels in the image
  – Image is transformed to new image
  – Darken darkens the image
Examples

- Image
  - Brighten

- Darken

- Negative
Examples

- Image
- Posterize
Examples

- Avg Greyscale
- Weighted Greyscale
Setup

• Main.java - run from here, DO NOT MODIFY
• Modify transformColor method in these classes
  – Brighten.java
  – Darken.java
  – Negative.java
  – Posterize.java
  – GreyScale.java
  – WeightedGreyScale.java
• READ classwork handout for details!
Method transformColor

• This method will describe how to change one color in the image. (this is what you focus on)

• The program will then automatically apply your method to all the pixels in the image (this has been done already for you)