

CompSci 6

Programming Design and Analysis



January 28, 2010

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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

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

Example – 2 ifs

```
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");  
}
```

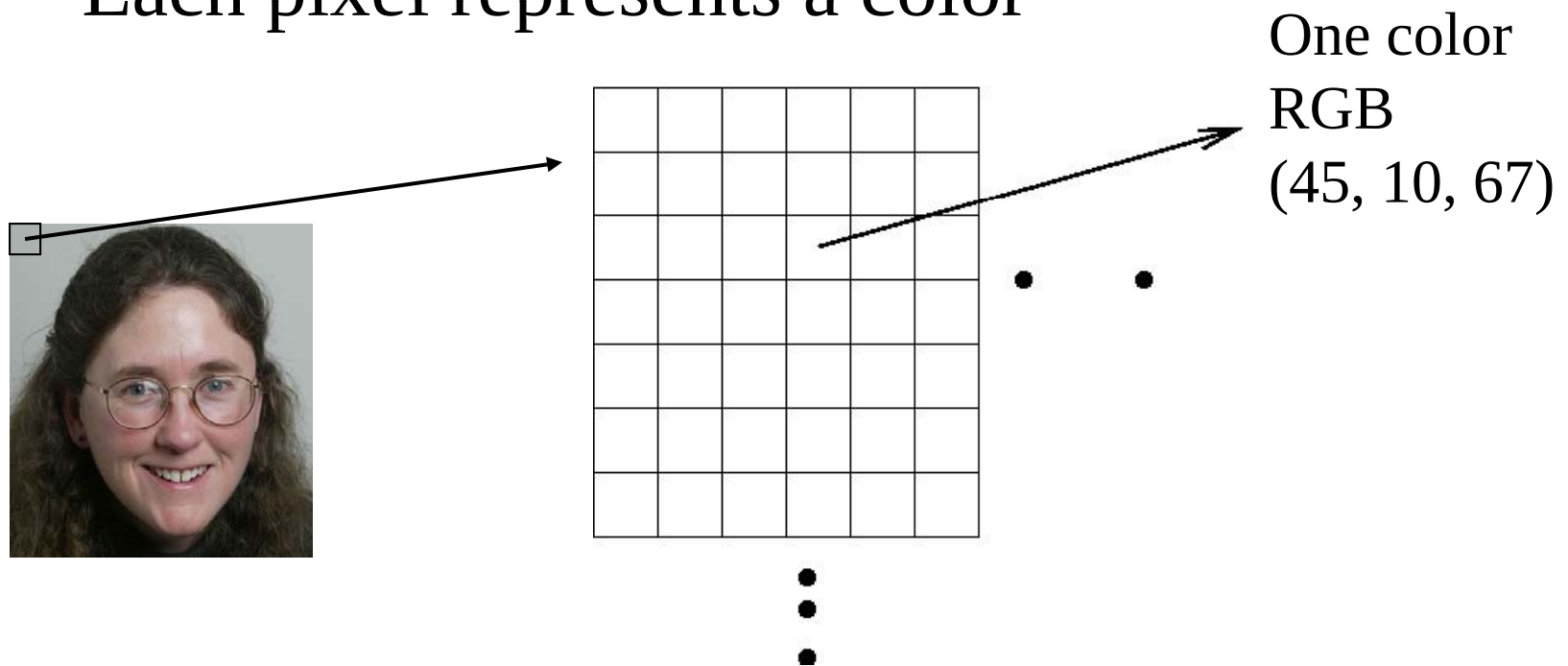
Null and Objects

```
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



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



Darken



- Brighten



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)