Day 4: Android Studio Morning

Class Hierarchy, Image Manipulation
ChangeBrightness

Given a percent, shift the brightness of each RGB value

```c
int shift = (int)(percent * value);
int newValue = value + shift;
if (newValue < 0)
{
    newValue = 0;
}
if (newValue > 255)
{
    newValue = 255;
}
```

Where do you put this code?
How do you use it for all three values?
Brightness Variety
create ChangeBrightness Objects with various percents

```
public class ChangeBrightness
    extends InPlaceImageTransform
{
    private double percent;

    public ChangeBrightness(String name, double percent)
    {
        super(name);
        this.percent = percent;
    }
```
Create an Invert class that inverts the red, green a blue values. For example:

- if the red value is 200, change it to 55
- if the blue value is 20, change it to 235
- if the green value is 150, change it to 155
Sepia-Toned Pictures

• Have a yellowish tint, used to make things look old and western
Create a Sepia class based on the following formulas:

```java
p.setRed(Math.min(255, (int)(0.393 * red + 0.769 * green + 0.189 * blue)));
p.setGreen(Math.min(255, (int)(0.349 * red + 0.686 * green + 0.168 * blue)));
p.setBlue(Math.min(255, (int)(0.272 * red + 0.534 * green + 0.131 * blue)));
```
Multicolored!

• Create a new Transform Class called MultiColor
• How can we apply different operations to different pixels?
Processing every pixel

```java
for (int x = 0; x < picture.getWidth(); x++)
{
    for (int y = 0; y < picture.getHeight(); y++)
    {
        //process pixel (x,y)
    }
}
```
Multicolored!

- How do we know when to setGreen vs. setBlue vs setRed?

```java
for (int x = 0; x < picture.getWidth(); x++)
{
    for (int y = 0; y < picture.getHeight(); y++)
    {
        //??
    }
}
```
Activities

• Call multiple transforms on the same input image
• Create new transform classes based on RGB values
• Make an image rainbowed