**CMSC 117: Introduction to Computing: Interactive Systems**
# Software Mirror
Due by Class April 17, 2014

The next assignment asks you to create a series of effects for images, similar to Apple's Photobooth application. This "software mirror" sketch should load an image from the web cam (see last page), and then based on the user's input, the image should be transformed by at least three effects. You should start with the code we used in class (see last page) and trigger your effects when the user presses the specified key. Some examples:
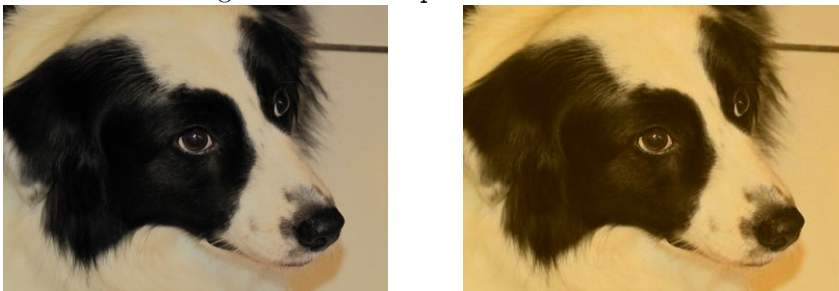
1. **mirror** – 'm' – the image should be mirrored about the y-axis.
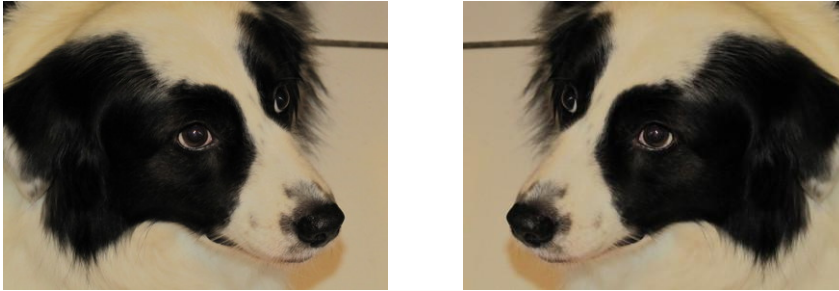
2. **flip** – 'v' – the image should be flipped about the x-axis.
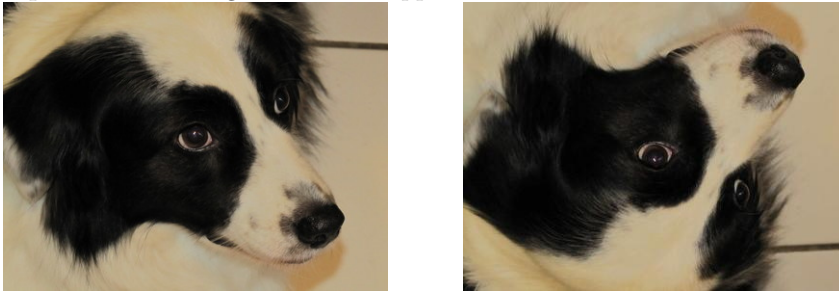
3. **sepia** – 's' – applies a sepia effect, which raises the red and green channels, and lowers the blue. In particular it adds 2 * `sepiaAmount` to the red, adds `sepiaAmount` to green, and subtracts `sepiaAmount` from blue. 20 is a good value for `sepiaAmount`.

4. **fairey** – 'f' – applies an effect similar to Shepard Fairey's iconic Obama "HOPE" poster. Each pixel is colored one of four colors depending upon the sum of RGB values. It assigns roughly equal intervals for each of the four colors.

Saturation	Color
0 – 181	darkBlue (0, 51, 76)
182 – 363	red (217, 26, 33)
364 – 545	lightBlue (112, 150, 158)
545 – 765	yellow (252, 227, 166)
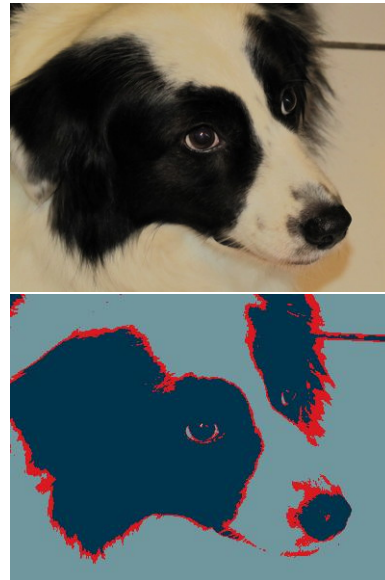
5. **Your Effect** – 'y' – an image effect of your choice.

Learning Objectives

- Use for loops.

- Analyze images at the pixel level.

- Work with image coordinate systems.

Deliverable

Submit an electronic copy of your sketch via moodle. This project will not work on sketch pad. Please upload a zip file of your entire sketch folder.

```
import processing.video.*;

Capture video;

void setup()
{
  size(640, 480);
  video = new Capture(this, width, height);
  // video.start(); //necessary with Processing 2.0
}

void draw()
{
  if (video.available())
  {
    video.read();

    for (int i = 0; i < width; i = i + 1)
    {
      for (int j = 0; j < height; j = j + 1)
      {
        color px  = video.get(i, j);
        float r = red(px);
        float g = green(px);
        float b = blue(px);
        if (key == 'i')
        {
          // invert image
          color c = color(255-r, 255-g, 255-b);
          set(i, j, c);
        }
        else if (key == 'r')
        {
          // make image all red
          color c = color(r, 0, 0);
          set(i, j, c);
        }
        else
        {
          set(i, j, px);
        }
      }
    }
  }
}
```