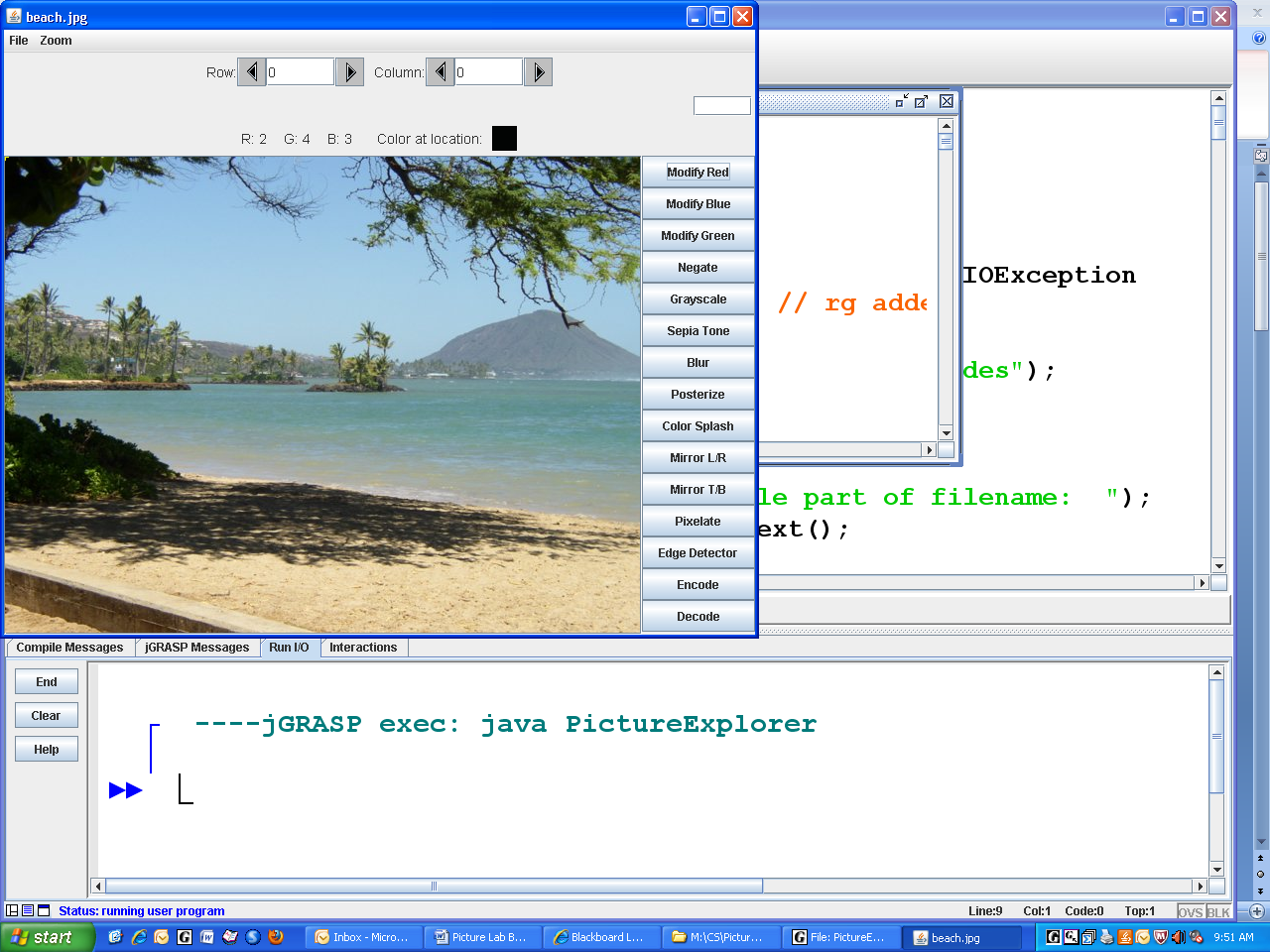
**FauxtoShop Buttons**



*Modify Red*

Click on the button, enter a % change (0-200) in the textfield, then press Enter. This method reduces or increases the red value for every pixel by the specified percentage.

*Modify Blue*

See above. Reduces or increases the blue value for every pixel by the specified percentage.

*Modify Green*

See above. Reduces or increases the green value for every pixel by the specified percentage.

*Negate*

Negates all the pixels in a picture by setting each color’s value to 255 minus the current value.

*Grayscale*

Turns picture into shades of gray by setting the red, green, and blue values of each pixel to the average of the current red, green, and blue value of the pixel. Uses getAverage.

*SepiaTone*

Sepia-toned pictures have a yellowish tint that we associate with older pictures. Microsoft’s recommended algorithm is:

* Set a pixel’s red value to the sum of .393 of its red value, .769 of its blue value, and .189 of its green value
* Set a pixel’s green value to the sum of .349 of its red value, .686 of its green value, and .168 of its blue value
* Set a pixel’s blue value to the sum of .272 of its red value, .534 of its green value, and .131 of its blue value

*Blur*

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |

Find the four pixels to the left, right, bottom, and top of the current pixel. Set the current pixel’s color to the average of the colors of the current pixel and its four neighboring pixels.

*Posterize*

A bunch of different colors gets set to just a few colors. For a range of colors, map them to a single color. For instance, if red is between 63 and 128, set red to 95. This requires a bunch of if statements.

*Color Splash*

Turn a picture into a grayscale, except for the red colors, which are made bright red.

*MirrorL/R*

Mirrors the left side of the picture onto the right side of the picture. Get a pixel from the left side of the picture and copy it onto a pixel on the right side of the picture that is on the same row and the same distance from the right end that the left pixel is from the left end.

*MirrorT/B*

Mirrors the top half of the picture onto the bottom of the picture.

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |

*Pixelate*

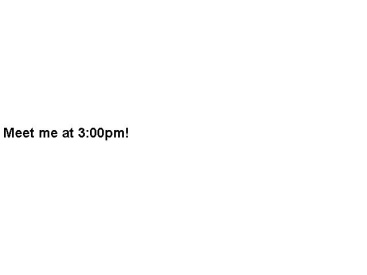
Replace a pixel’s surrounding eight neighbors with the color of the current pixel. For larger pixilation, replace the color of the pixel’s surrounding 24 neighbors.

*EdgeDetector*

Look for an edge in the picture by comparing the color at the current pixel with the pixel in the column to the right. If the colors differ by more than some specified amount (say, 10), this indicates that an edge has been detected and the current pixel color should be set to black. Otherwise, the current pixel is not part of an edge and its color should be set to white.

*Encode/Decode*

Steganography is the science of hiding information in a picture. One way to hide a black and white message inside a color picture is by first changing all the red values in the original color picture to be an even value. Then loop through both the original picture and the message picture, setting the red value of a pixel in the original picture to odd (by adding one to it) if the corresponding pixel in the message picture is close to the color black. Write an encode method that takes the black and white picture message and changes the current picture to hide the message picture inside of it. Then write a decode method that returns the picture hidden in the current picture.



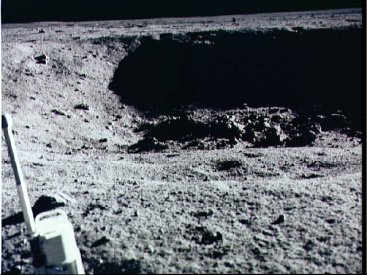
original beach message (mgs.jpg) beach with hidden message

**Challenges & Extensions**

*Sunsetize*

Decrease the green and blue values by 20%.

*Chromakey*Replaces the current pixel color with the color from another picture at the same row and column when the current pixel color is close to a specified color. In many movies, the actors are filmed in front of a green screen and then the green is replaced with a different background using a similar technique.



Dr. Guzdial moon (moon-surface.jpg) Dr. Guzdial on the moon

*RemoveRedEye*

Remove the red in the eyes of jenny-red.jpg, but don’t change the color of her shirt.

*The Undo Button*

Read up on stacks and how to use them. Instantiate a stack of Digital Pictures as a private field. Before the user makes a change to the picture, make a copy of the current picture and push it. The Undo button simply pops the previous picture and displays that. If you pop an empty stack then Java generates an error message, which is undesirable.



**Projects – Putting It All Together**

*A8: Creating a collage*

See the students’ manual for suggestions to create a collage of pictures.

*Flag Project*

The Italian flag is green, white, and red. Choose three typical pictures from Italy and color them like the flag. Or choose to do this project for another country.



*AndyWarhol*

Take an image, extract its RGB layers, and tile the resulting four pictures to make something inspired by Andy Warhol’s art.

