

CS116 – Lab 3
Due Date: September 19

Purpose: We have been making changes to an entire picture, but what if we want to change just a portion of it? An `if` statement, often called a *conditional*, allows us to do something if a certain condition is true. Therefore we can make changes to only the pixels that satisfy some criteria, using the conditional.

Knowledge: This lab will help you become familiar with the following content knowledge:

- How to use `if` statements to select certain pixels in a picture
- How to perform actions only if a specified condition is true

Task: Before starting this lab, you should have read Chapter 5 in your text. Follow the steps in this lab carefully and complete the assignments.

Assignment 1:

In the activity you wrote a function to draw a solid black box in a picture. Write a function `drawboxLine(picture, startx, starty, boxwidth, boxheight)` that draws only the four lines that outline the box, leaving the pixels inside the box unchanged.

Hint: You will want to use four `if` statements to specify the conditions for each of the four lines.

Criteria For Success: If you show your picture after using the function, you will see the outlines of the box in the location specified and of the size specified.

Assignment 2:

Write a function `authenticate(picture1, picture2)` which checks to see if the two pictures are identical. This function should return a new picture which is the same size as `picture1`. For each pixel position you will need to compare if the colors of the two pictures are the same. If they are the same then that pixel in the resulting picture should be white. If they are different then that pixel in the resulting picture should be the same color as the `picture1`. In that way, the resulting picture will highlight the places where the two pictures differ.

If the two pictures are not the same size, the resulting picture should contain all black pixels.

Hint: You will want an `if` to test if the pictures are the same size. You will also want an `if` to check if corresponding pixels in the two pictures contain the same color.

You can test your function on the following pictures:

barbara_jpeg_wm barbara_jpeg_manip
houses_jpeg_wm houses_jpeg_manip

Criteria For Success: When the pictures are not the same size you will get a totally black picture the size of picture1. When you use the pictures given above you will get a picture highlighting the regions where the pictures differ.

Submit your file containing all your functions. Please indicate both partner names in your submission file.