

## CS116 – Activity 4

In Activity3 we had code which draws a horizontal line by looping through all the pixels and testing which pixels fall on the line, changing just those pixels. It is rather wasteful to loop through all the pixels when we are changing just a few. Take a look at the following code which draws a horizontal line between the starting and ending x values but only loops through the pixels we want to change.

```
def draw(picture, startX, endX, y):
    for x in range(startX, endX):
        p = getPixel(picture,x,y)
        setColor(p,makeColor(0,0,0))
```

Try this function and make sure you understand how it is working.

Now, modify this function so that it takes more parameters and draws a box. To accomplish this you should add another loop to the code above so that you are drawing the horizontal line a bunch of times for different y locations:

```
def draw(picture, startX, endX, startY, endY):
    # modify the previous code
```

You should now be able to make a minor modification so that you draw a striped box by drawing a line at every other y location.

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Suppose we want to crop a picture so that we return only a rectangular region of the picture. The region can be specified by providing the coordinate of the upper left corner and the width and height of the rectangle. We will set the colors of the resulting picture to the colors within the region of the given picture. The problem is the coordinates of the region are not the same as the coordinates of the picture we are copying into. The upper left corner of the region is (x,y) but the upper left corner of the resulting picture is (0,0).

Complete the code for crop and try it out.

```
def crop(picture, x, y, w, h):
    result = makeEmptyPicture(w,h)
    for i in range(0,w):
        for j in range(0,h):
            p1 = getPixel(picture,x+i,y+j)
            # complete the code to get the correct pixel p2 from result
            setColor(p2,getColor(p1))
    return result
```