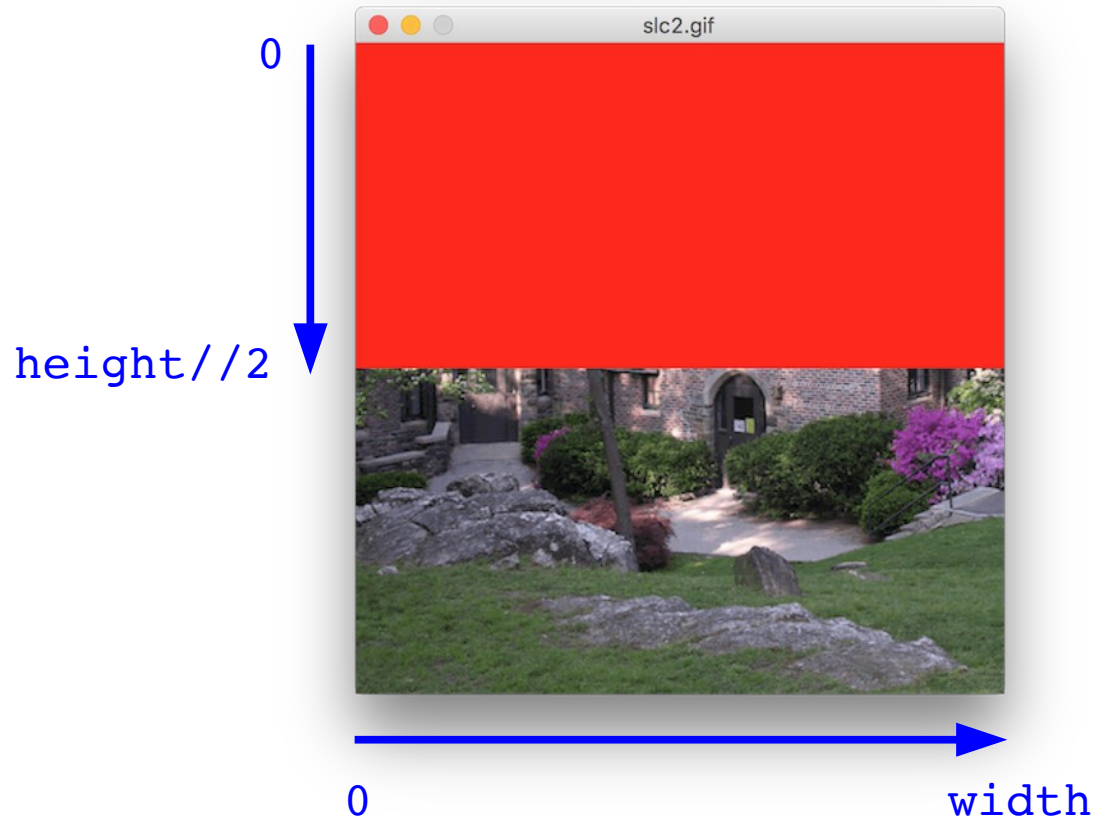
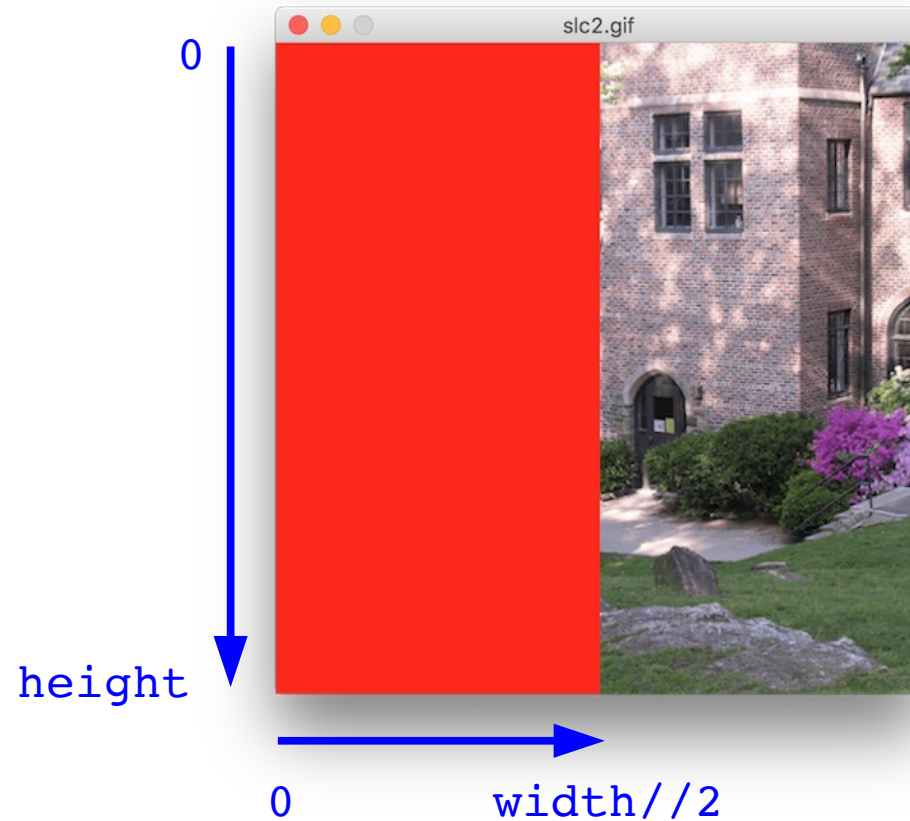


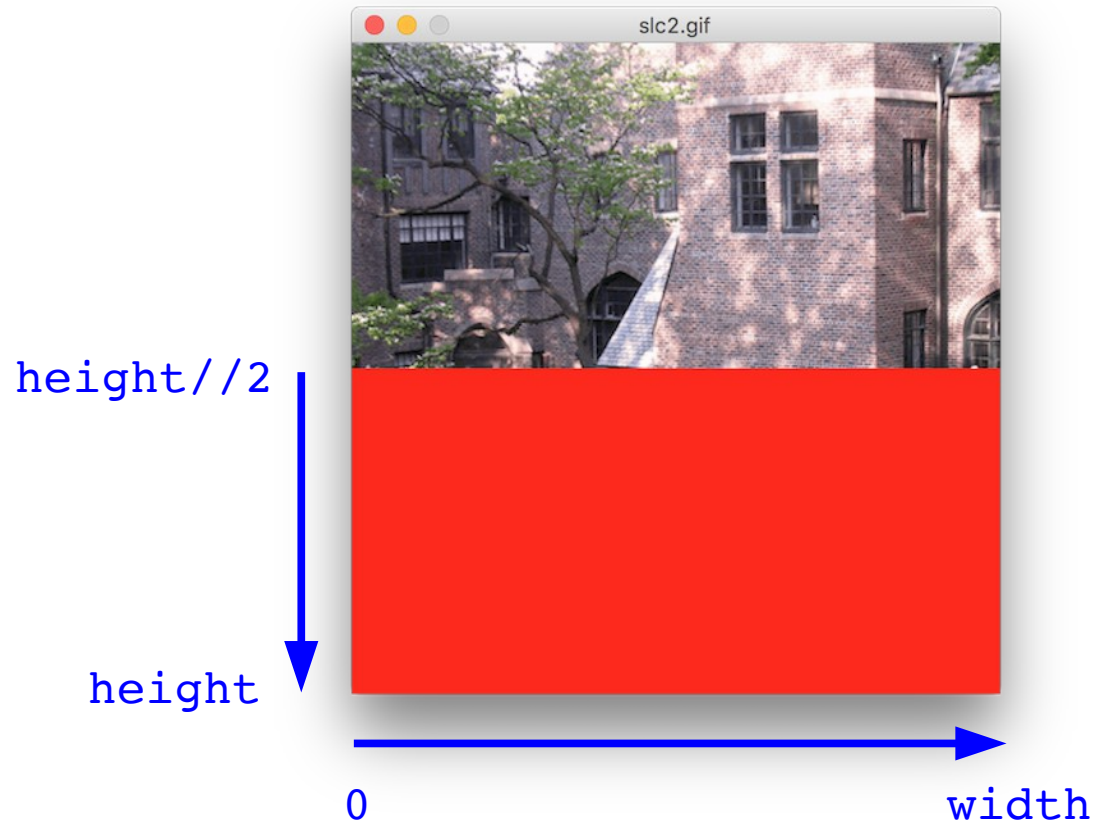
```
def red(img):  
    width = img.getWidth()  
    height = img.getHeight()  
    for y in range(0, height):  
        for x in range(0, width):  
            img.setPixel(x, y, [255,0,0])  
        if y % 10 == 0:  
            img.update()
```



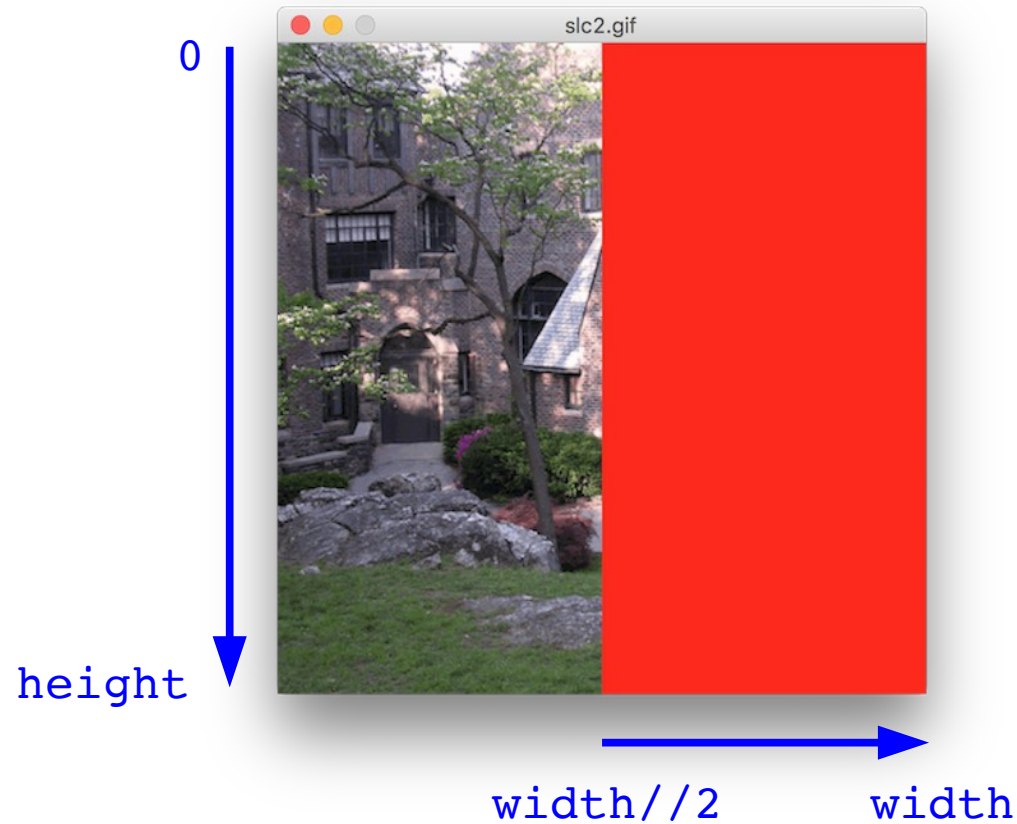
```
def redTopHalf(img):  
    width = img.getWidth()  
    height = img.getHeight()  
    for y in range(0, height//2):  
        for x in range(0, width):  
            img.setPixel(x, y, [255,0,0])  
        if y % 10 == 0:  
            img.update()
```



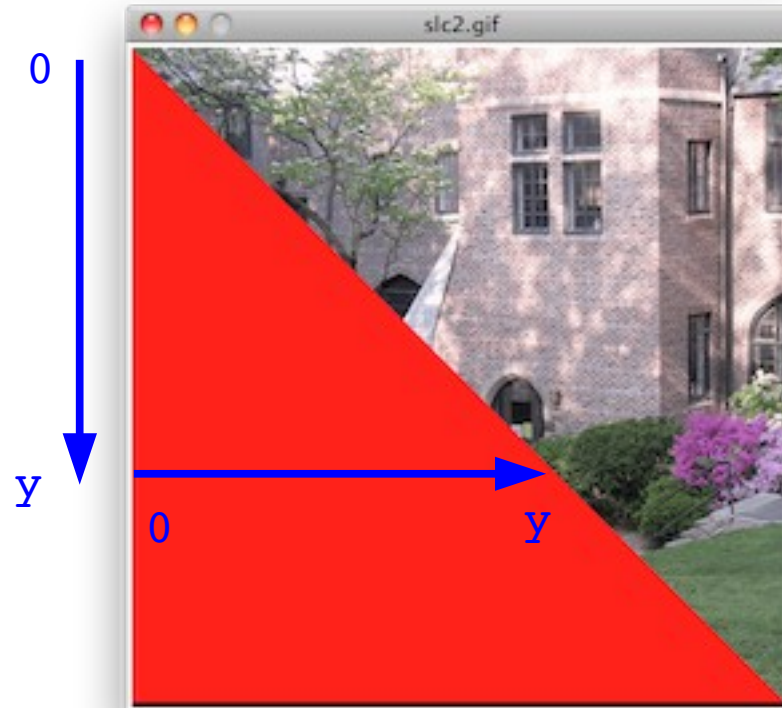
```
def redLeftHalf(img):  
    width = img.getWidth()  
    height = img.getHeight()  
    for y in range(0, height):  
        for x in range(0, width//2):  
            img.setPixel(x, y, [255,0,0])  
        if y % 10 == 0:  
            img.update()
```



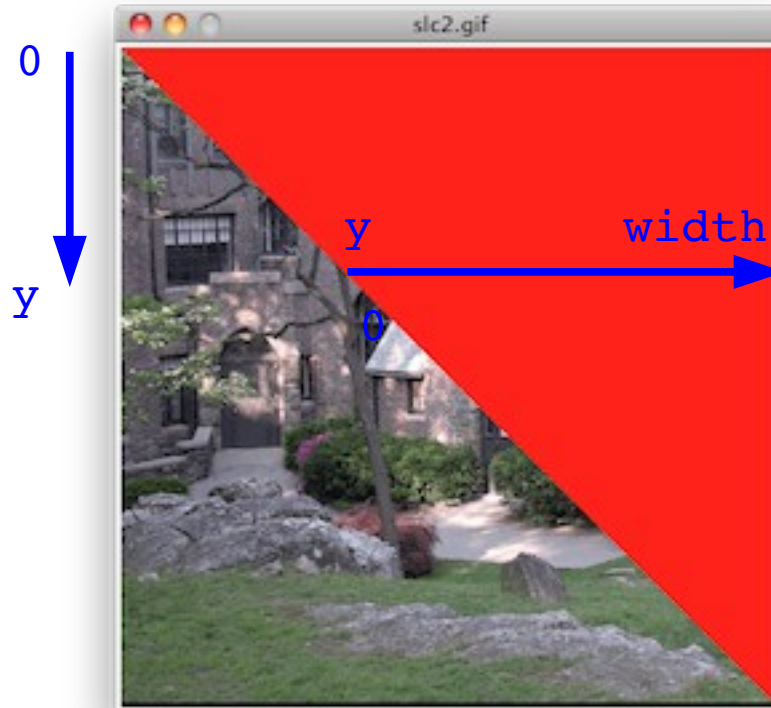
```
def redBottomHalf(img):  
    width = img.getWidth()  
    height = img.getHeight()  
    for y in range(height//2, height):  
        for x in range(0, width):  
            img.setPixel(x, y, [255,0,0])  
        if y % 10 == 0:  
            img.update()
```



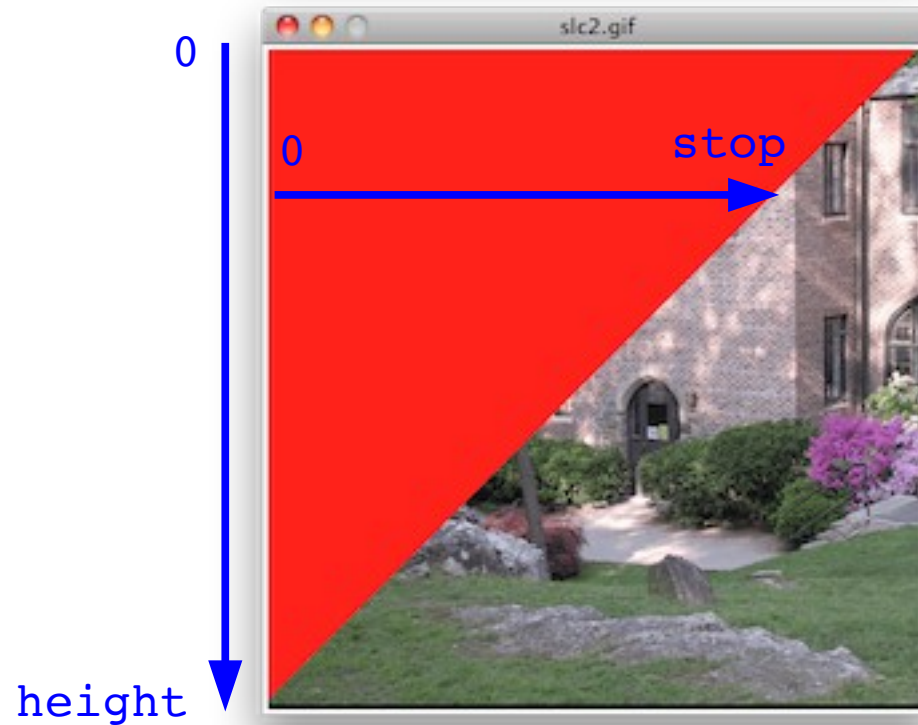
```
def redRightHalf(img):  
    width = img.getWidth()  
    height = img.getHeight()  
    for y in range(0, height):  
        for x in range(width//2, width):  
            img.setPixel(x, y, [255,0,0])  
        if y % 10 == 0:  
            img.update()
```



```
def redSW(img):  
    width = img.getWidth()  
    height = img.getHeight()  
    for y in range(0, height):  
        for x in range(0, y):  
            img.setPixel(x, y, [255,0,0])  
        if y % 10 == 0:  
            img.update()
```

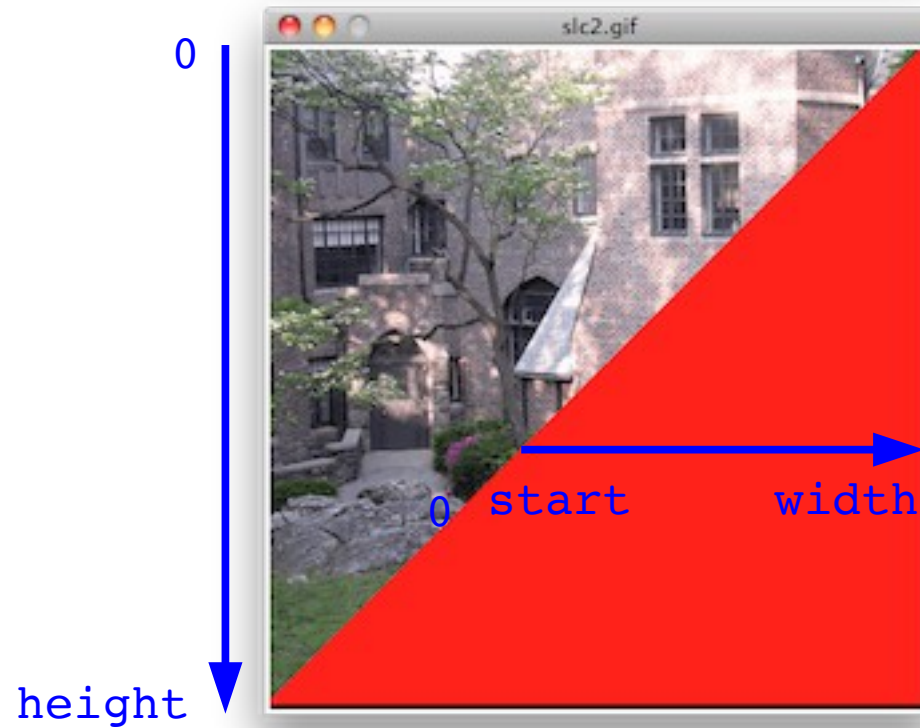


```
def redNE(img):  
    width = img.getWidth()  
    height = img.getHeight()  
    for y in range(0, height):  
        for x in range(y, width):  
            img.setPixel(x, y, [255,0,0])  
        if y % 10 == 0:  
            img.update()
```



```
def redNW(img):  
    width = img.getWidth()  
    height = img.getHeight()  
    stop = width  
    for y in range(0, height):  
        for x in range(0, stop):  
            img.setPixel(x, y, [255,0,0])  
            stop = stop - 1  
        if y % 10 == 0:  
            img.update()
```



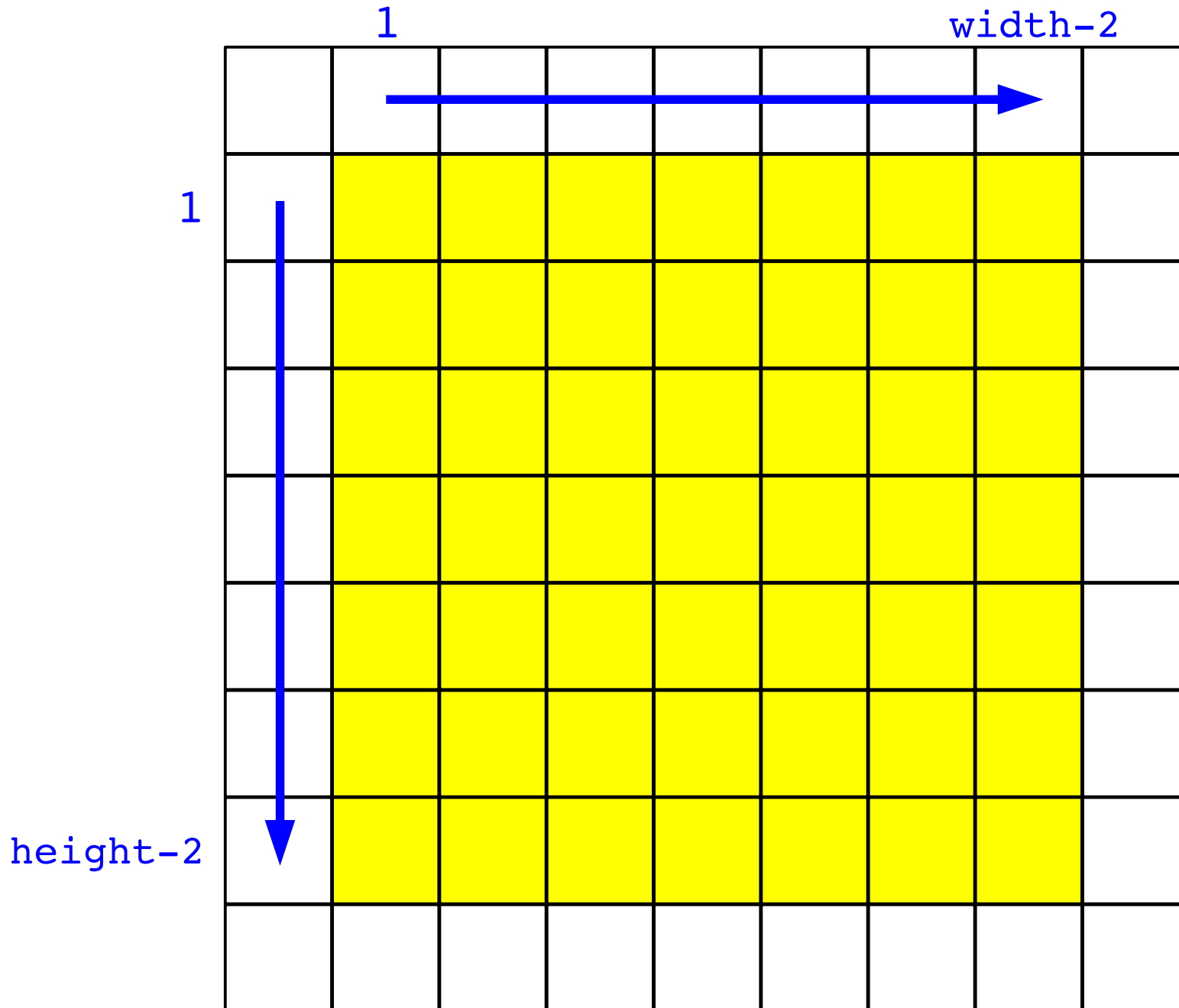


```
def redSE(img):  
    width = img.getWidth()  
    height = img.getHeight()  
    start = width  
    for y in range(0, height):  
        for x in range(start, width):  
            img.setPixel(x, y, [255,0,0])  
        start = start - 1  
        if y % 10 == 0:  
            img.update()
```



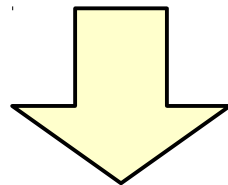
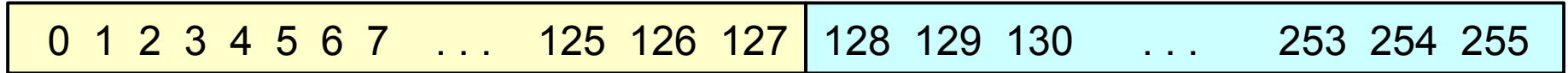
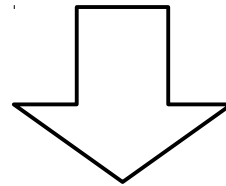


# Solution: Just Skip the Boundary Pixels

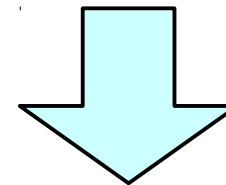


# “Charcoal” Transformation

average of R, G, B values



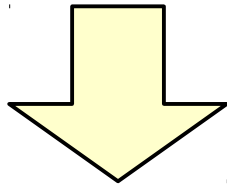
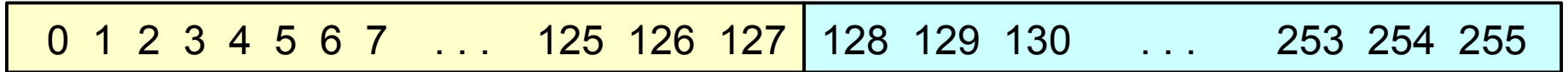
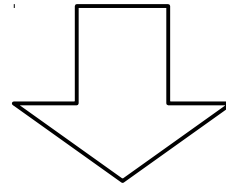
black



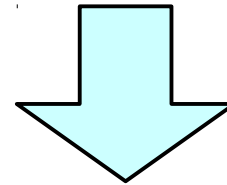
white

# “Posterize2” Transformation

n



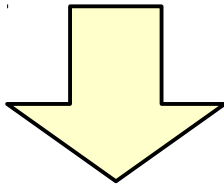
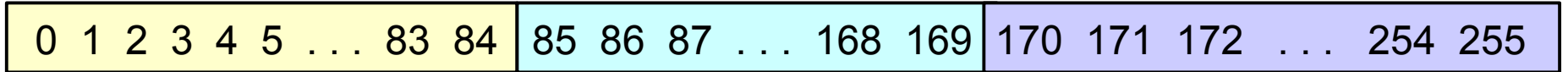
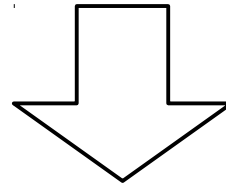
64



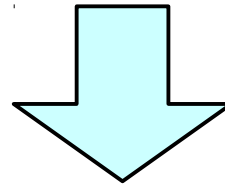
192

# “Posterize3” Transformation

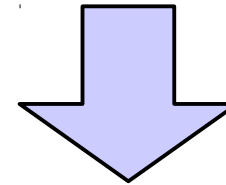
n



42



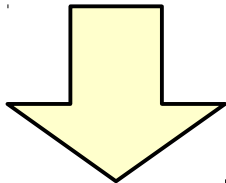
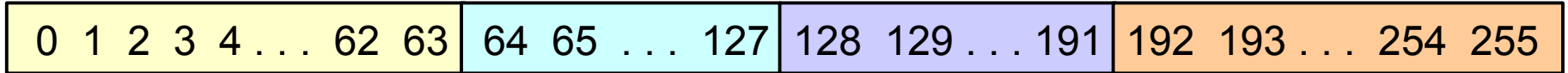
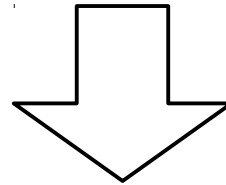
127



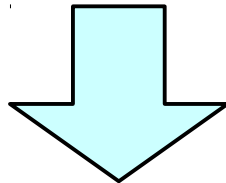
212

# “Posterize4” Transformation

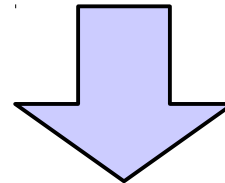
n



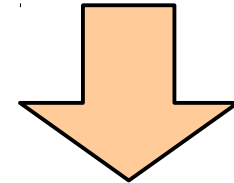
31



95



159



223