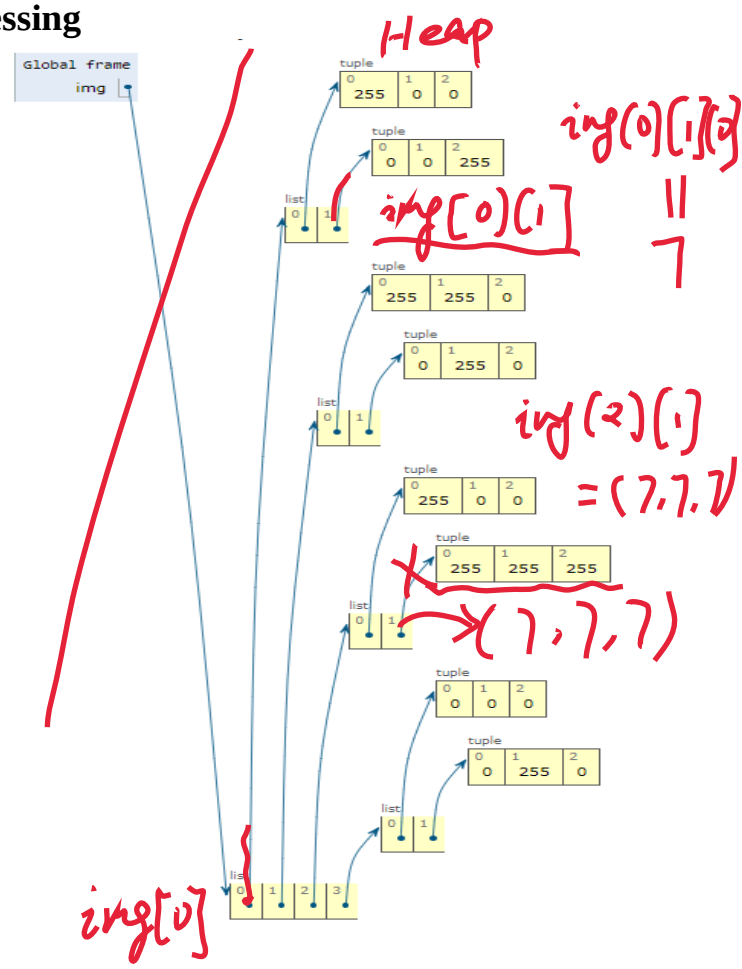
Pictures Processing

```
img =
[
  [(255, 0, 0), (0, 0, 255)],
  [(255, 255, 0), (0, 255,0)],
  [(255, 0, 0), (255, 255, 255)],
  [(0, 0, 0), (0, 255, 0)]
]
```



1. Image as 2D list of tuples

To change an image, you can use the CSE8AImage library

Steps

1. load_img or create_img
2. Get the image(s)'s dimensions
3. Use nested for loop on the correct range
   i. (r, g, b) = img[i][j]
   ii. img[i][j] = new tuple

CSE8AImage library functions

`load_img(filename), save_img(img, filename), create_img(height, width, color), height(img), width(img), summarize(img), img_str_to_file(img, filename)`

Coding Exercises

Write a function that takes in an image and remove all the red components in the pixels (i.e. set red to be 0).

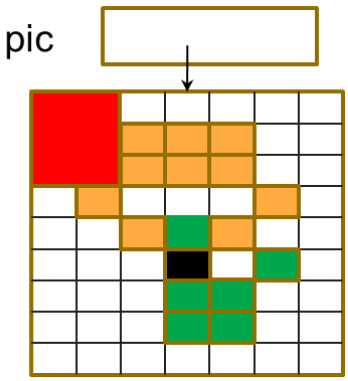
```
def red_filter(img):
    # write code here
```

Some notes on Image Transformations

- Start with something very small!
- Make sure your code works for small images (i.e., small 2d list of tuples)
- Test your code to work with real images (i.e., much larger 2d list of tuples)
- Check what happens with edge cases/boundary conditions (e.g., out of bounds)
- Handle edge cases in a special way

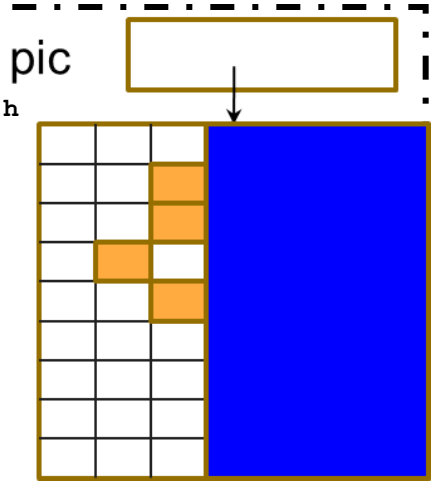
How about the corner area to be all red?

```
#assume we know the width and height of the image as w and h
for i in range(_____3_____):
  for j in range(_____2_____):
      pic[i][j] = ____(255, 0, 0)____
```



How about the corner area to be all red?

```
#assume we know the width and height of the image as w and h
for i in range(____1_____):
  for j in range(_____2_____):
      pic[i][j] = _____3_____
```



Answer for blank 1
A. h B.w C. h/2, h D.w/2, w E. None of the answers

Answer for blank 2
A. h B.w C. h/2, h D.w/2, w E. None of the answers w//2, w

Answer for blank 3
A. (0, 0, b) B. (0, 0, 255) C. (r, g, b) D.(r//2, g//2, b//2) E. None of the answers

Coding exercises
Write a nested loop to make the top half darker by a threshold

```
def change (img, threshold):
  #write code here
```