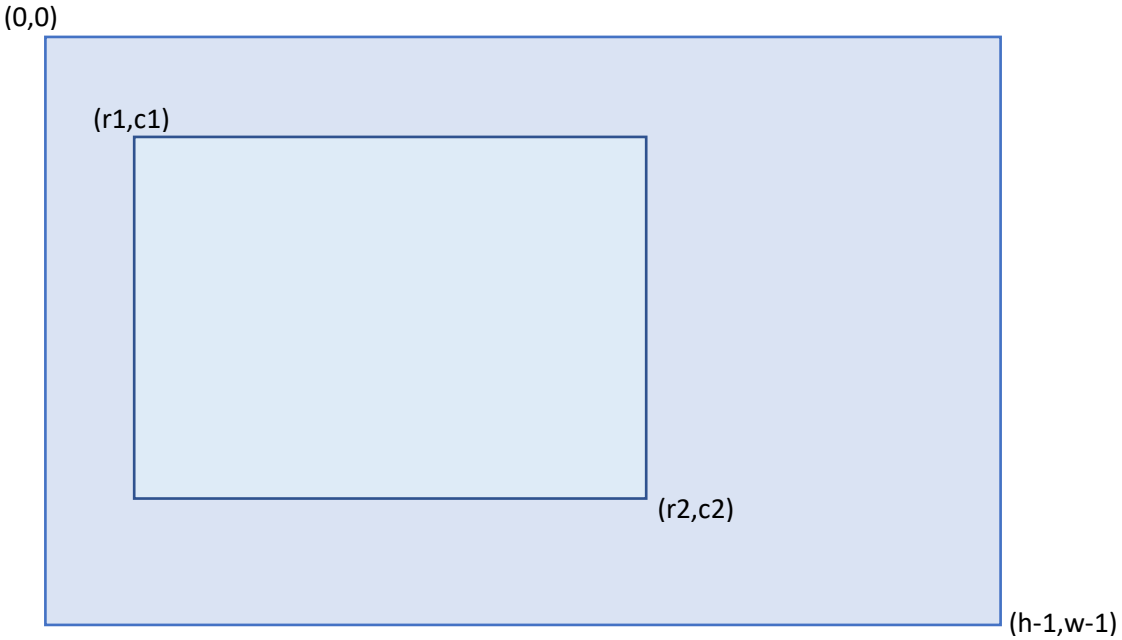
CS 450 Computer Vision and Machine Learning (Spring 2025)

Homework Assignment 3

Use Jupyter Notebook for the next few exercises and upload your notebook with the outputs. You can use Google and the Python documentation for help.

1. Write a function that takes **a color image and an integer 'n'** as input and returns a **numpy array of size nx4 (n rows and 4 columns)**. This array should contain corner coordinates of n randomly generated boxes defined on the image in the order **[r1, c1, r2, c2]**. One such box is shown in the figure. Values r and c represent row and column numbers. Also**, h>r2>r1**, **w>c2>c1** where h and w are the height and width of the image. **Demonstrate the function on an image.** The purpose of this exercise is to make sure you feel comfortable handling images, so write the code yourself, don't use a library function to do this whole work even if you find one. **[15]**



2. Write a function that takes a color image and four integers in the order r1, c1, r2, c2 and returns the image with a red rectangle drawn over it between these coordinates (Hint: setting the red pixel component to 255 and green and blue to 0 turns the pixel red). The thickness of the lines forming the rectangle is up to you but just one pixel thick would be enough. **Demonstrate the function on an image.** The purpose of this exercise is to make sure you feel comfortable handling images, so write the code yourself, don't use a library function to do this whole work even if you find one. **[15]**