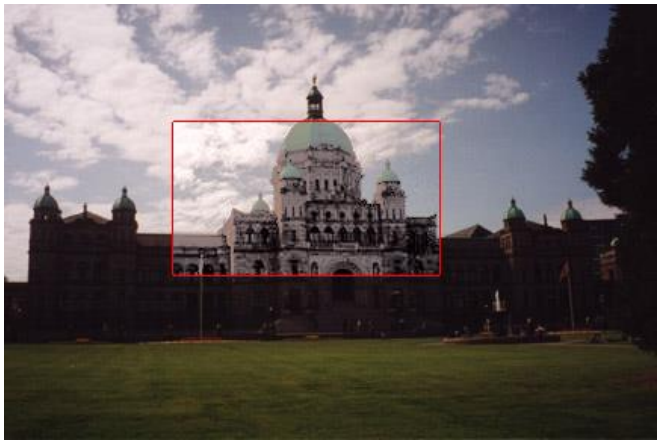
# Homework 1

1. Read and display an image $I$. (10pts)
2. On this image, track the user's mouse positions, to support picking a rectangle Region of Interest (ROI). (30pts)
    a. The "MousePosition.py" is an example program for you to see how a mouse position can be obtained using OpenCV.
    b. Modify "MousePosition.py" to a new program, named "PickRectROI.py", in which you can select and draw a rectangular ROI (using the left mouse button to pick the top-left corner, then drag and release the button to select the bottom-right corner)
3. Use codes you just developed to select an ROI; press "**C**" to copy this ROI into a new variable $J$. (15pts)
4. Press "H" to apply histogram equalization on $J$, and get an enhanced patch $J'$. (15pts)
    a. The image is likely to have color, remember to split the channels, apply equalization, then merge them again.
5. Replace this ROI region to the new enhanced patch. (30 pts)
6. * (Extra 15 pts): You may notice a "false-color" issue after histogram equalization enhancement. Convert RGB to YCbCr, and only enhance the Y channel. It will solve this problem. (15pts)



**Your codes and result images are due: Feb. 27 (11:59pm).**

Submit your homework on Moodle.

If you are late for $k$ $(k < 7)$ days, your score will be calculated as:

Final homework score = (The score based on your codes) $\times 0.95^k$