Assignment 3

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1. Problem Statement:

   Corner detection and matching in two similar images.

2. Proposed Solution:

   For each image:
   Use Harris Corner Detection Algorithm.
   Find the exact position of the corners by localizing the corner.
   Find the feature descriptors for the top corners in the image.

   Find the matching corners by comparing the feature descriptors of the images

3. Implementation details:

   Instruction to run the program:
   Python A3.py Imagepath window-size k-value threshold

   There were not much design issues.

   One problem I faced is, for the corner localization we need to take all the points (Pi) from the window where the corner is detected. I was not able to figure out how to get these points. Please let me know in the feedback for this homework. Because of this I could not complete the homework according the requirements specified and do matching using feature descriptors.

4. Results and discussion:

Original images:

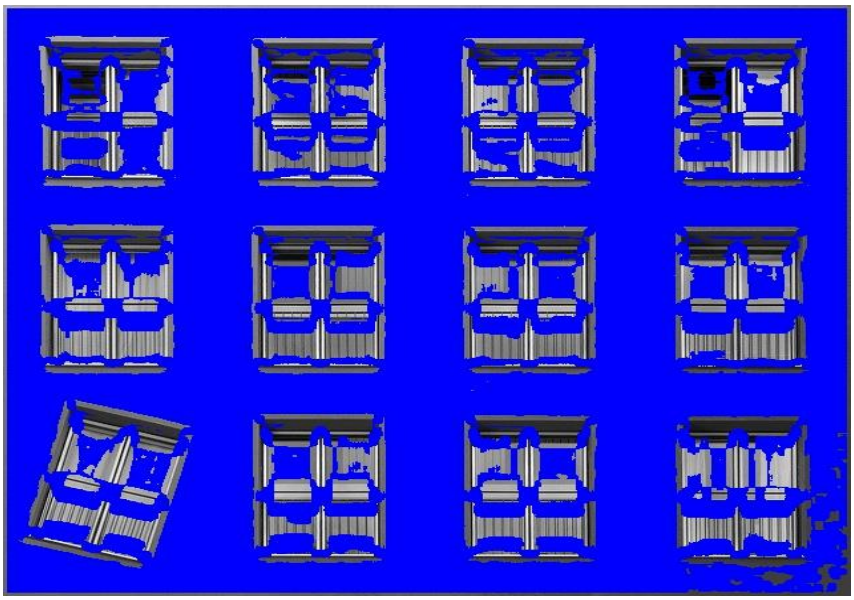
Results of Corner detection:

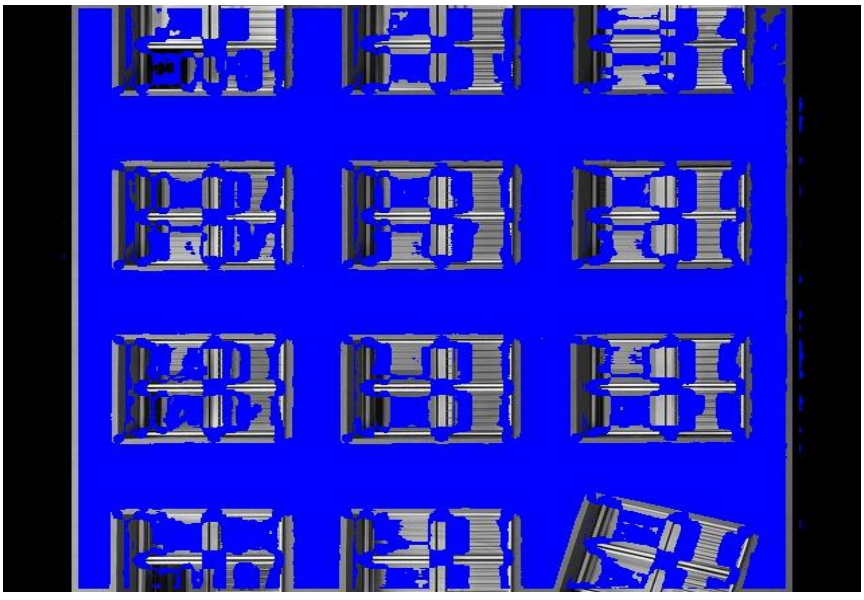
I wanted to see the effect of the parameters on the algorithm. So I picked this image (where we can clearly see the corners) and made another image by rotating it, so that I can visual the results of matching.

I set window size to 5 and k to 0.04 as I knew these are typical values used.

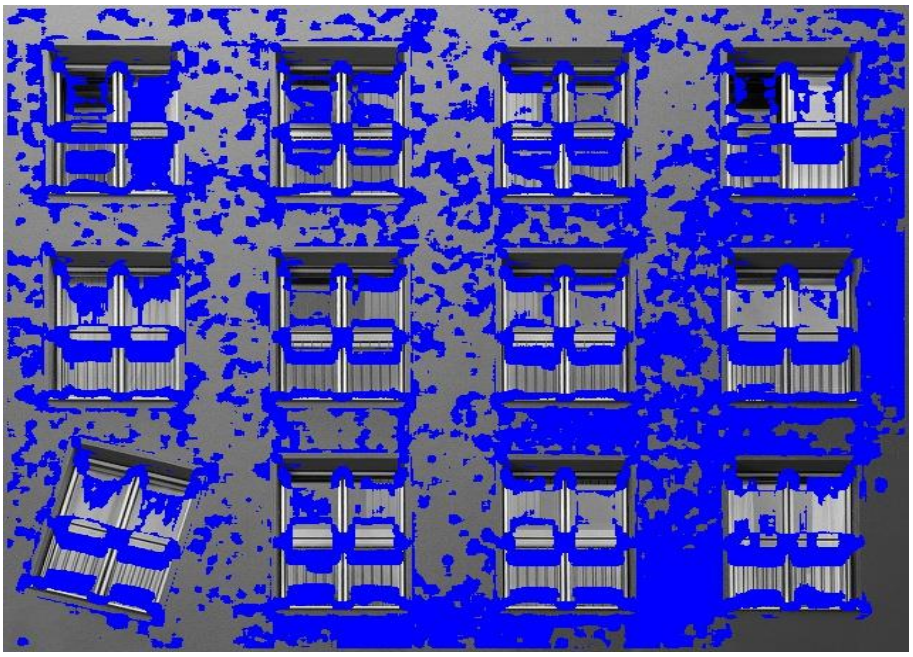
As I was not sure of the threshold value to use, I tried different numbers and found interesting results which pointed out the importance of the threshold value in the algorithm.

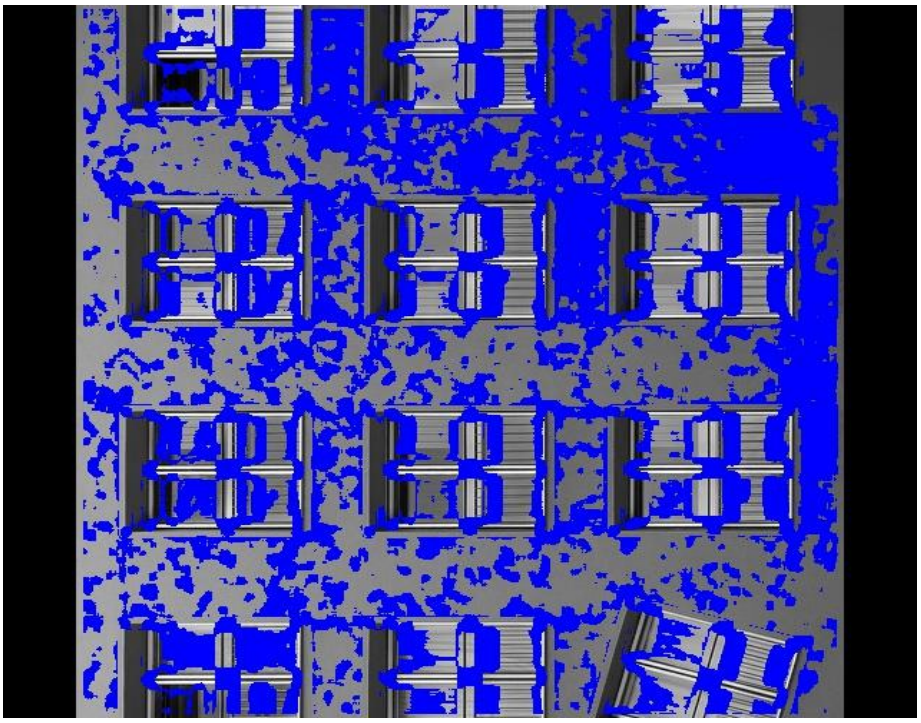
Threshold: 10000000



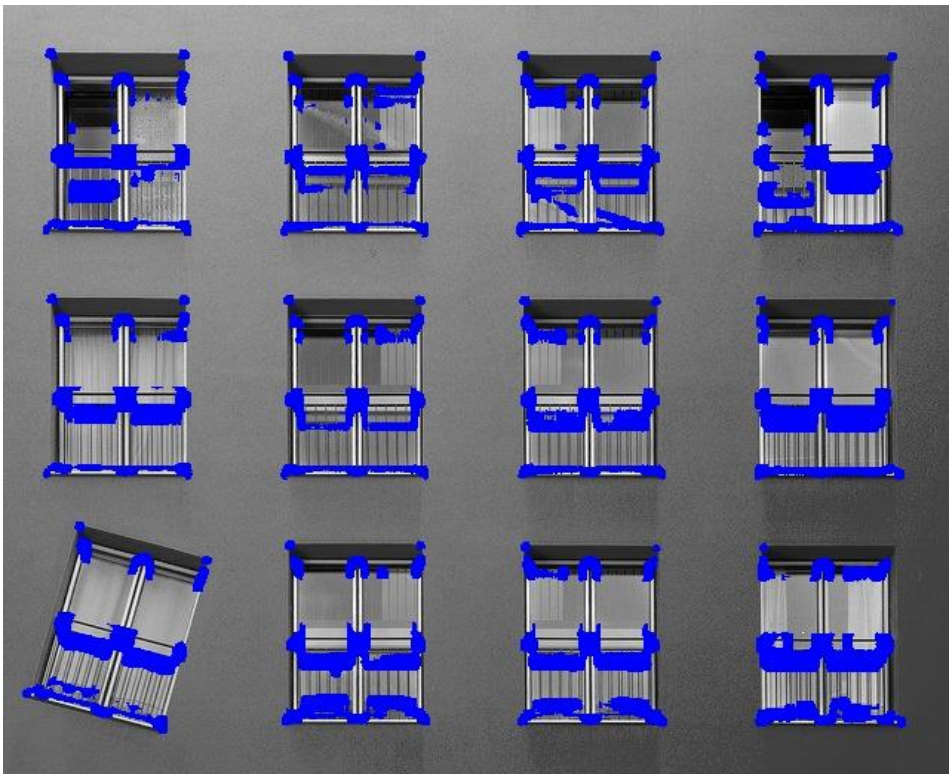


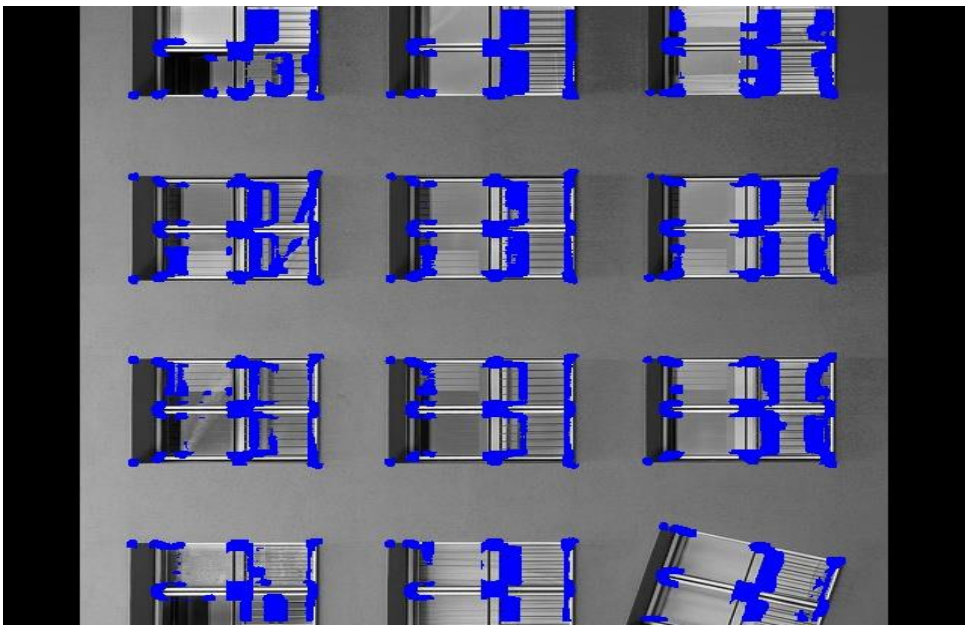
Threshold: 100000000000



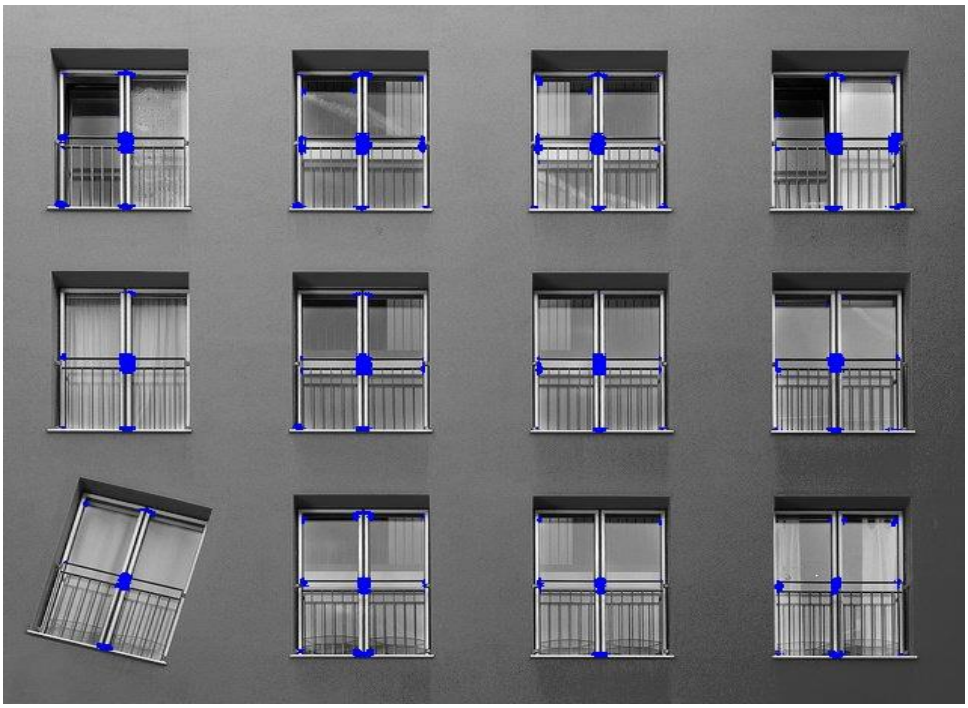


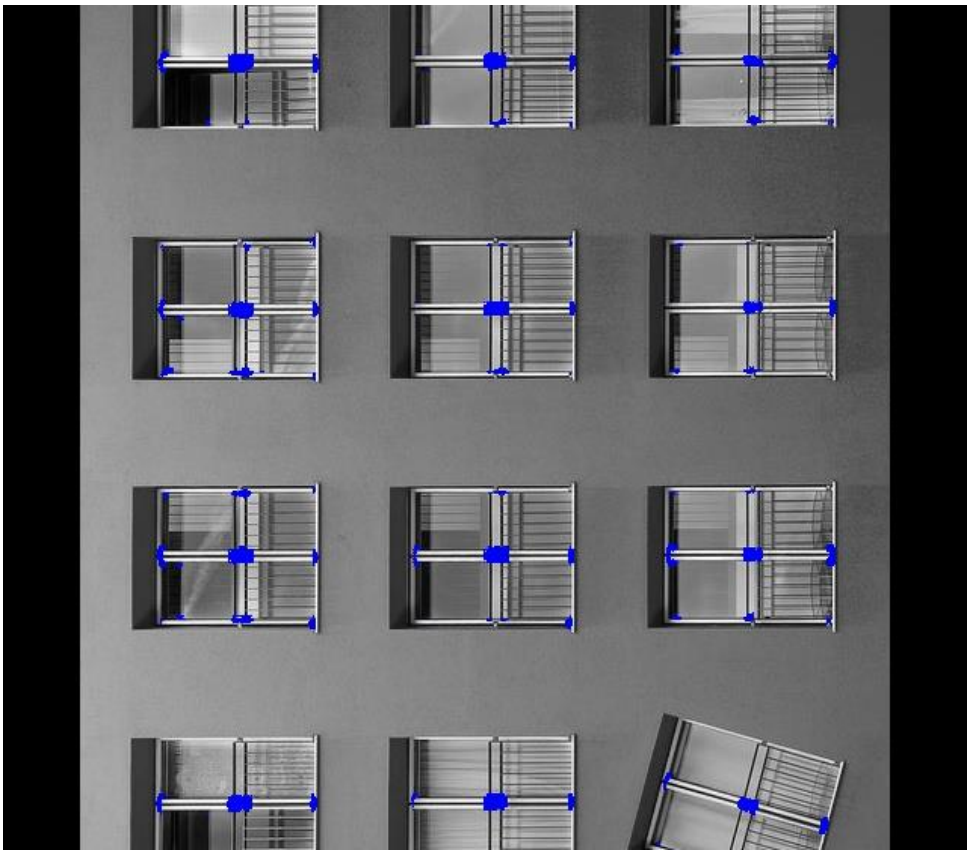
Threshold: 1000000000000000





Threshold: 100000000000000000





Threshold: 10000000000000000000

Above results summarizes the importance of the threshold in the algorithm. This is something that I learnt from the experiments. But, the question remains in my mind on what value of threshold to choose and how to determine the suitable value?

5. References:
https://docs.opencv.org/3.0-beta/doc/py_tutorials/py_tutorials.html