REPORT
CV ASSIGNMENT 3

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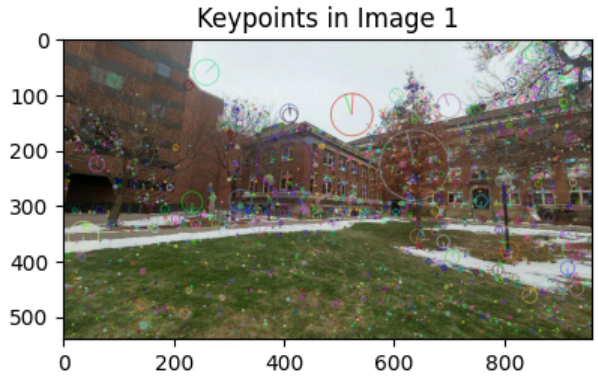
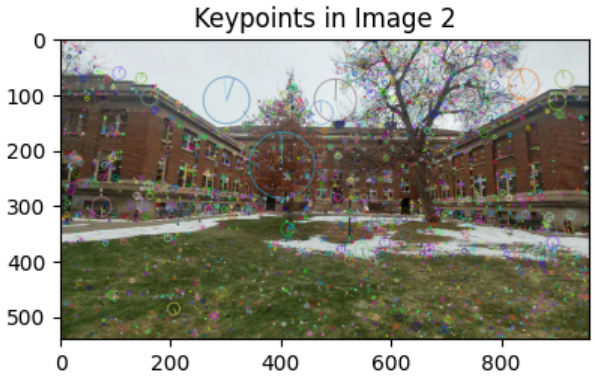
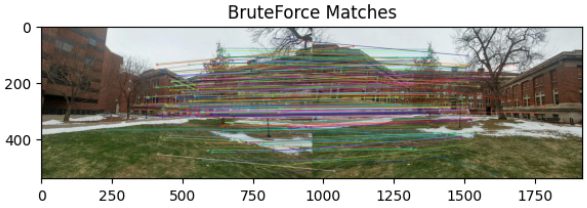
2. Panorama Generation

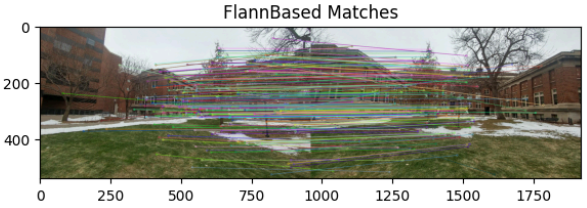
1. We are given 8 images in a drive folder. In the first question. We have to stitch all the images into a panorama
   To do so, the first step is finding all keypoints and descriptors in images. Keypoints are local descriptors of each image.





   As seen in image, keypoints can be chimneys, or edge between roof and sky. These are used to identify unique features that later can be used to merge images.
2. We are matching extracted features in 2 pictures with the help of 2 algorithms: Brute Force Algorithm and Flann Based Algorithms.

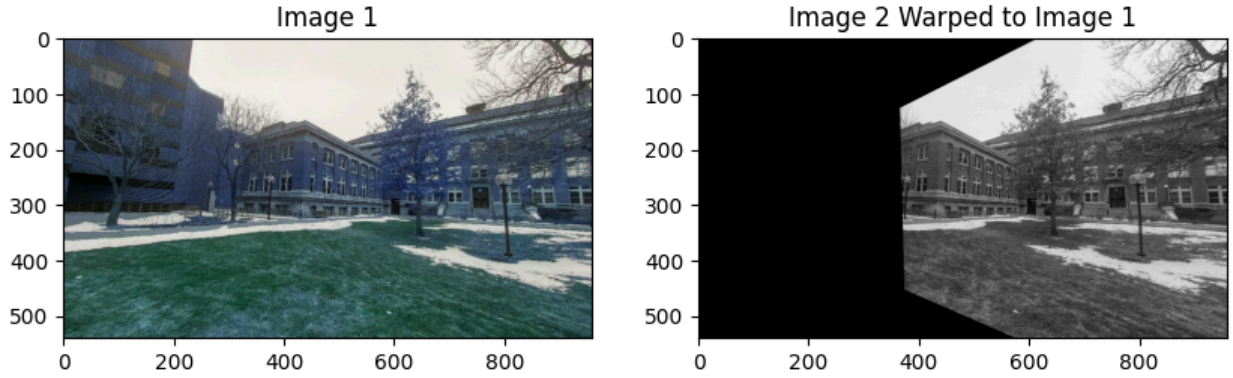




   As we can see the matches in the 2 algorithms are fairly similar. We can see the Brute force algorithm matches more key points than the FlannBased Algorithm. The FlannBased Algorithm is computationally much better than BruteForce and can be used in practical day to day life while Brute force Algo cannot be.

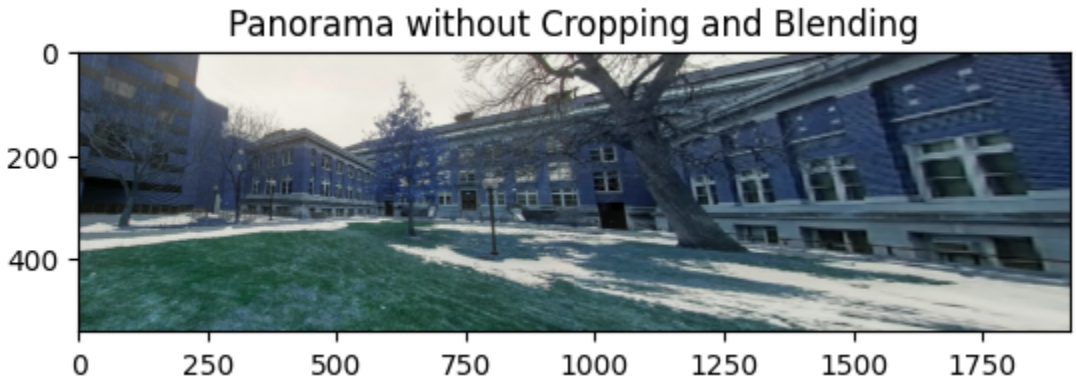
3. The Homography matrix computed after RANSAC Algorithm
   H=
   [[-1.94326988e-02 -1.22683143e-02 3.64798834e+02]
    [-3.08402159e-01 5.71087434e-01 1.27232436e+02]
    [-1.02717729e-03 -7.34533168e-05 1.00000000e+00]]

4. Warping Image 2 w.r.t 1 based on the Homography matrix computed for the first and second images



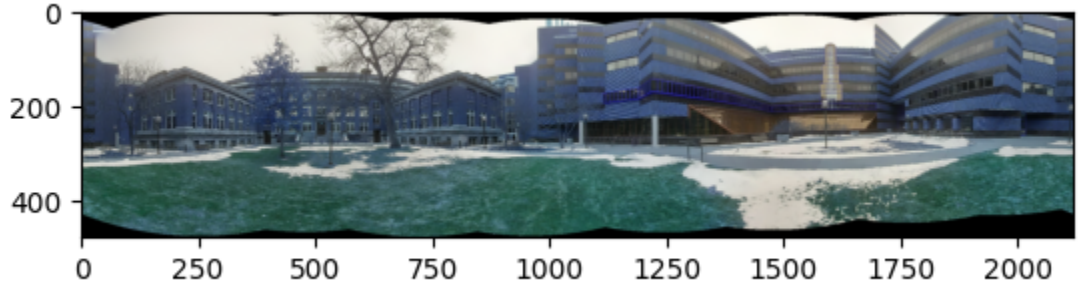
We can see that the second image has been warped on the first image, the plane of projective geometry has been made the same for image 2 as image 1.

5. Stitching the 2 images image 1 and image 2 warped about image 1. For that I have made the width of second image warped as 2 times the width of first image and then added the first half of the panorama as the first image
The results are as follows:



After that have blended and cropped the image to make the panorama

6. Stitching all 8 images using the inbuilt cv2.Stitcher function The function cv2.Stitcher wraps the function inbuilt before stitching them together



Stitching the first 4 warped images: