CVIP- Project 1

Optical Character recognition:

Objective: the goal is to implement an optical character recognition system by implementing three parts- Enrollment, Detection and Recognition.

Enrollment:

- We process an initial set of target characters from the specified directory and generate characteristics for each that are sufficient for recognition.
- We used SIFT library from open cv to extract features from our character set.
- We dumb this feature as a Map of feature label and value as array of arrays descriptors ('features2.json').
- We also added some padding to the images so that we can detect corner edges more.

Detection:

- We converted our image pixel matrix into binary matrix by setting a threshold of 180.
- After that we label every pixel and its connected components, whose value is 1's using different labels. For this we use breadth first search algorithm.
- From this we are visiting each node and checking if it is already visited and finding the minX, minY, maxX and maxY values which in turns gives the bounding box and store it in a new map along with labels. (componentMap)

Feature Recognition:

- In this we pass our test image and the map created from the detection phase.
- For each feature, we try to find the rmse of that feature and features extracted from masking the bounding boxes from our componentMap
- Then we store the minimum rmse value in a new dictionary (newDict)
- We then use this value as threshold while iterating through each key in the componentMap. And select the features if the rmse calculated < 2* (minimum value from newDict corresponding to label)
- F-Score was calculated as 0.508