

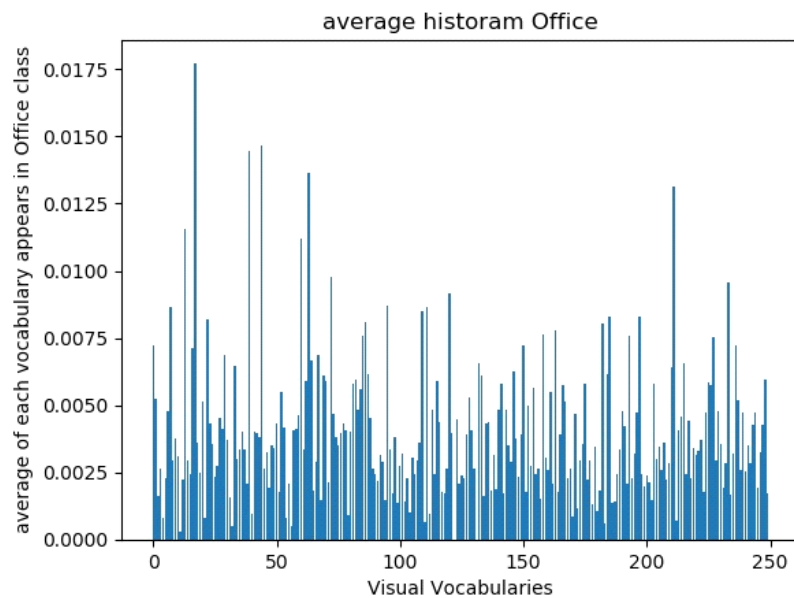
Name: Shahriar Shayesteh

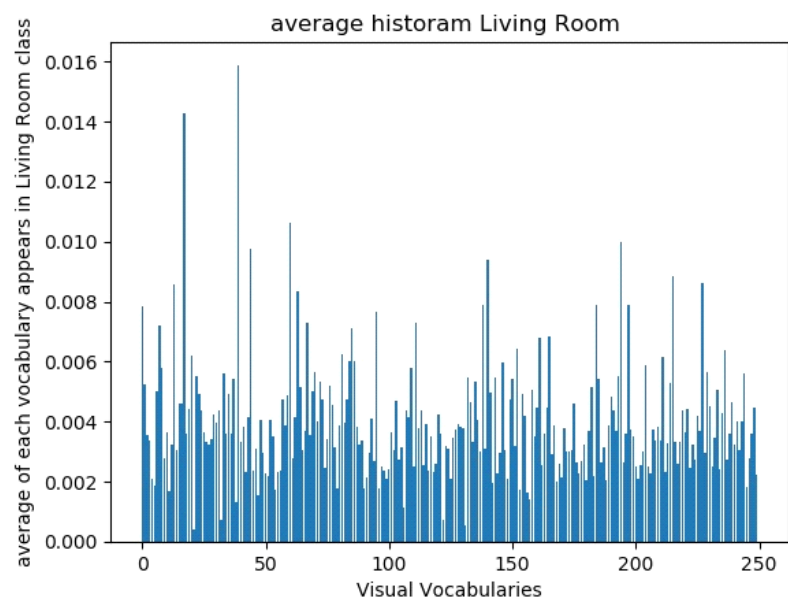
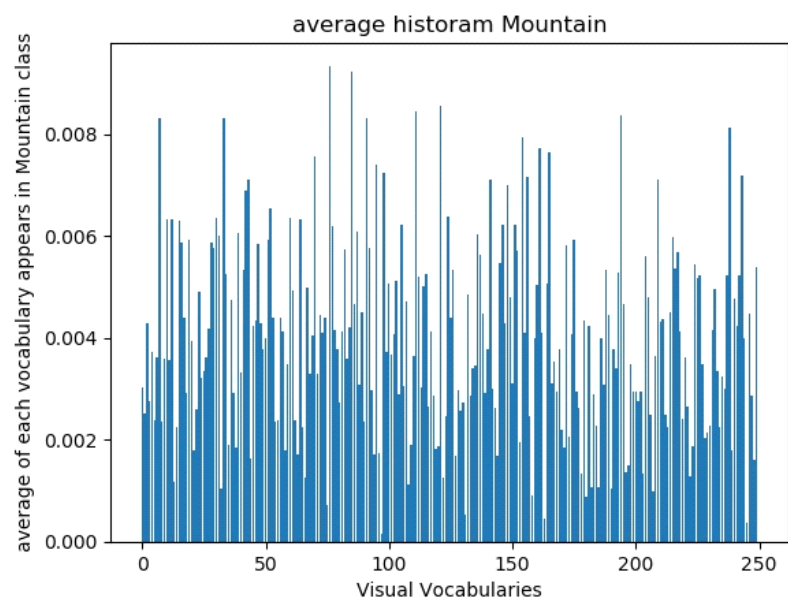
Student ID = 494945575

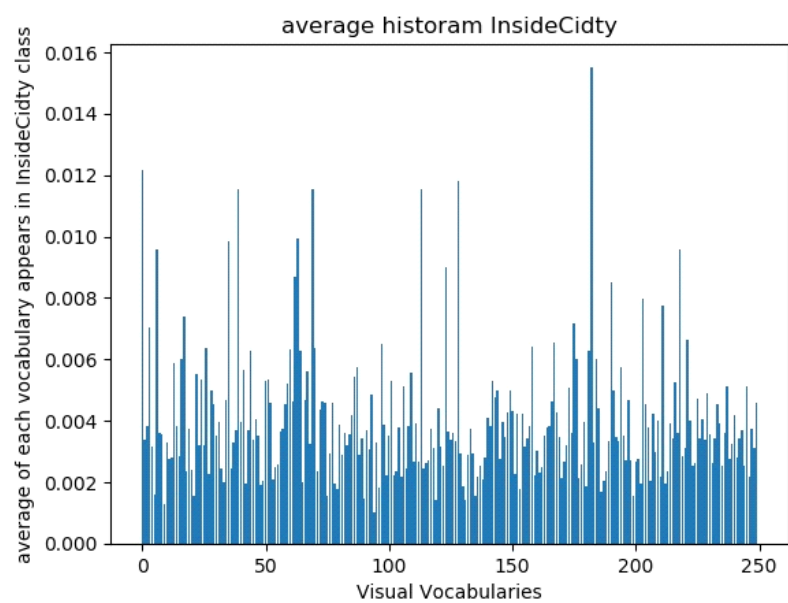
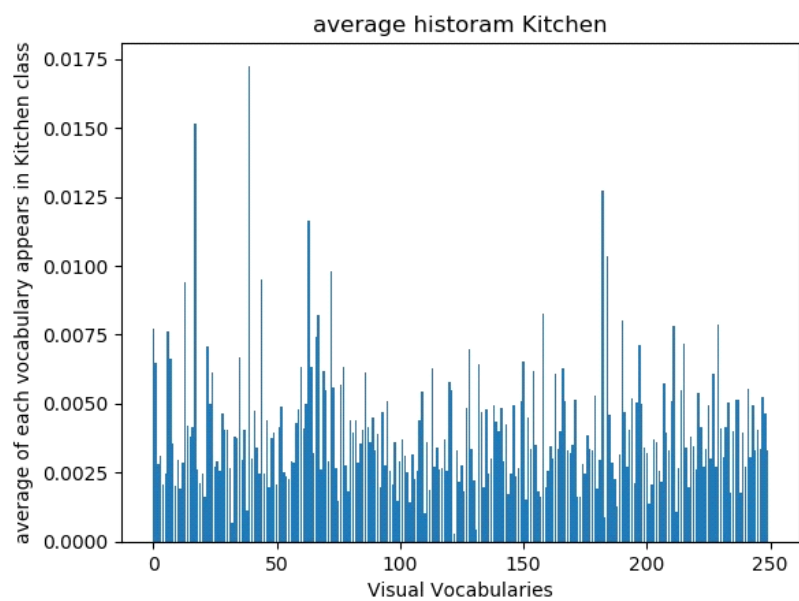
## Assignment 4

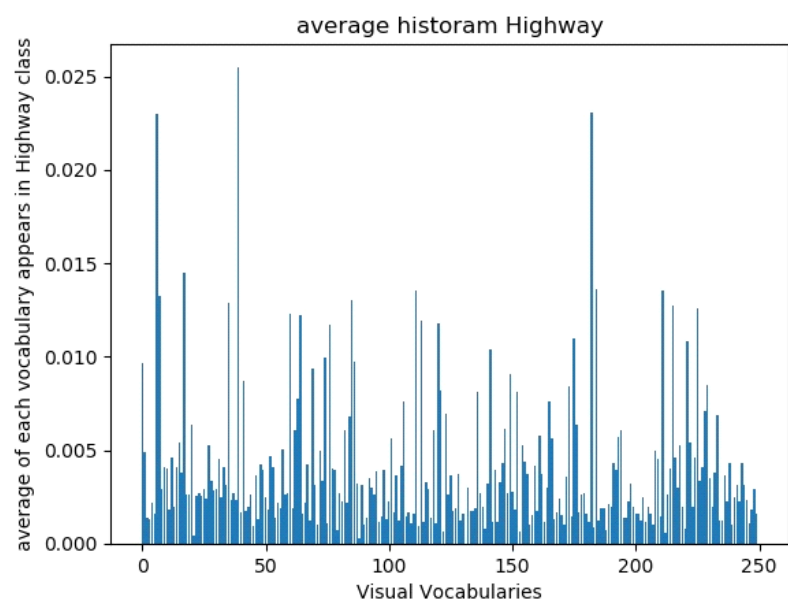
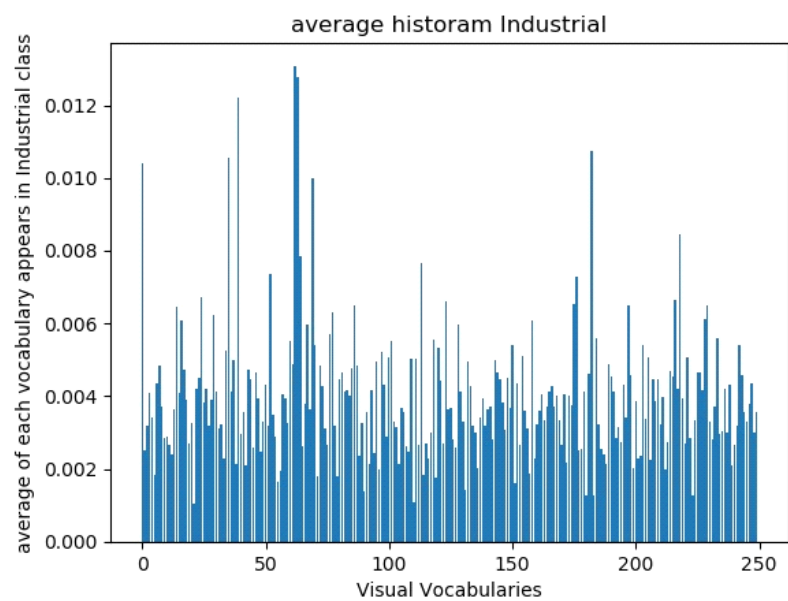
### Question 4

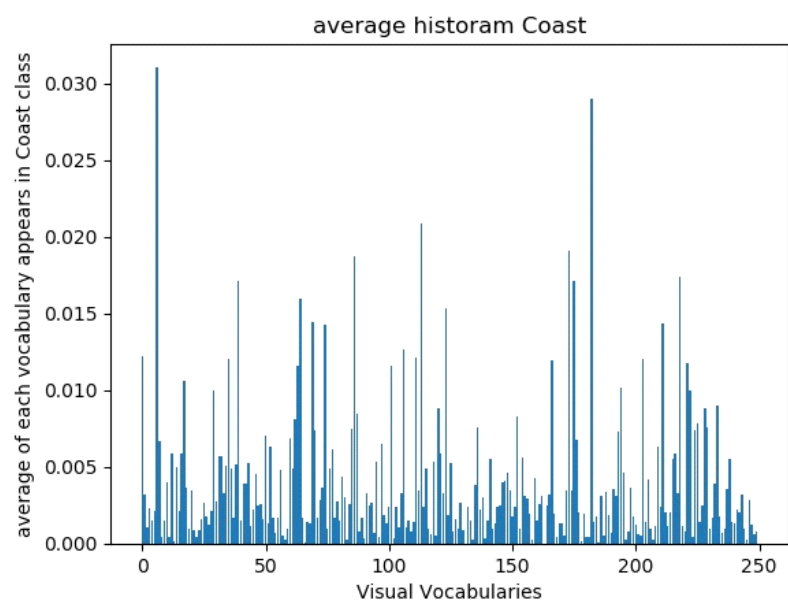
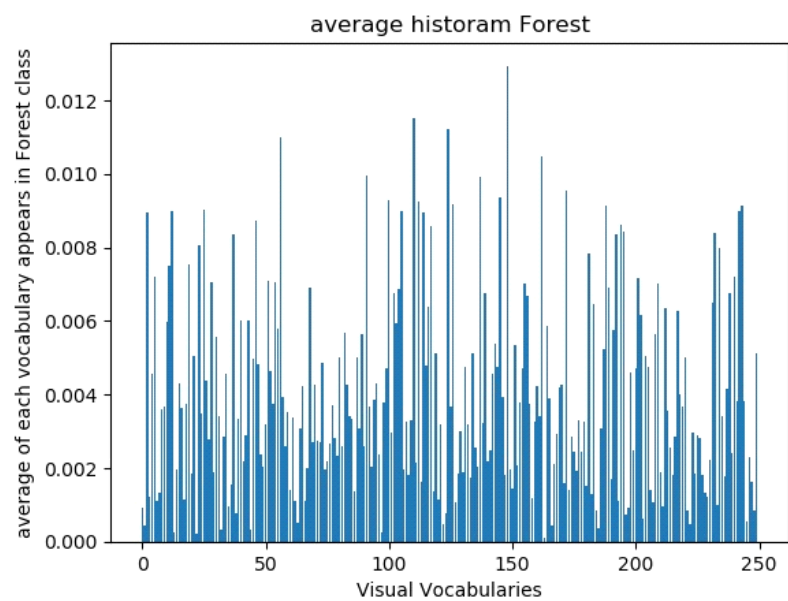
Our code book consists of number of visual vocabulary(250) and for each class visual words appears in different frequencies. In this problem we looped over all training data and averaged their vocabulary occurance over training data in each class. So each word in avrage appears in each class with different frequency and those classes whose average frequencies for their vocabularies are all in the same range and there is no distinctive visual vocabularies are hard to separate.

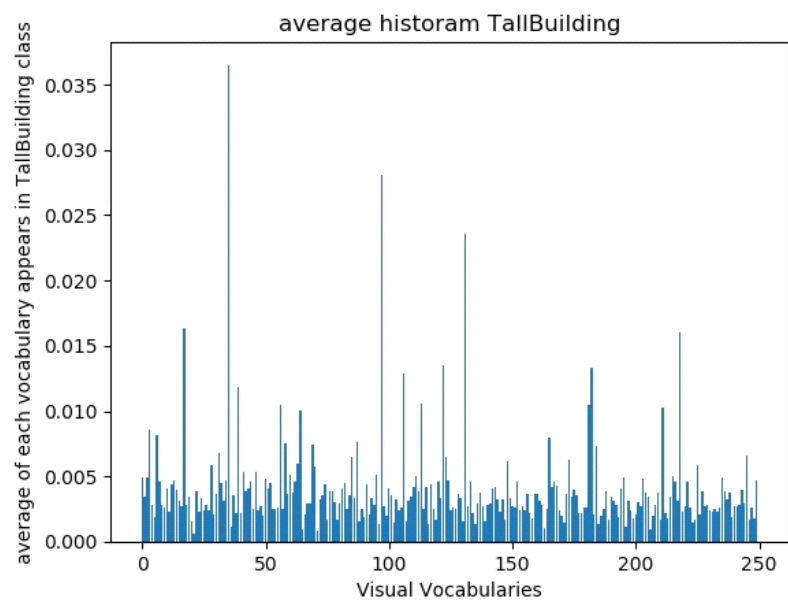
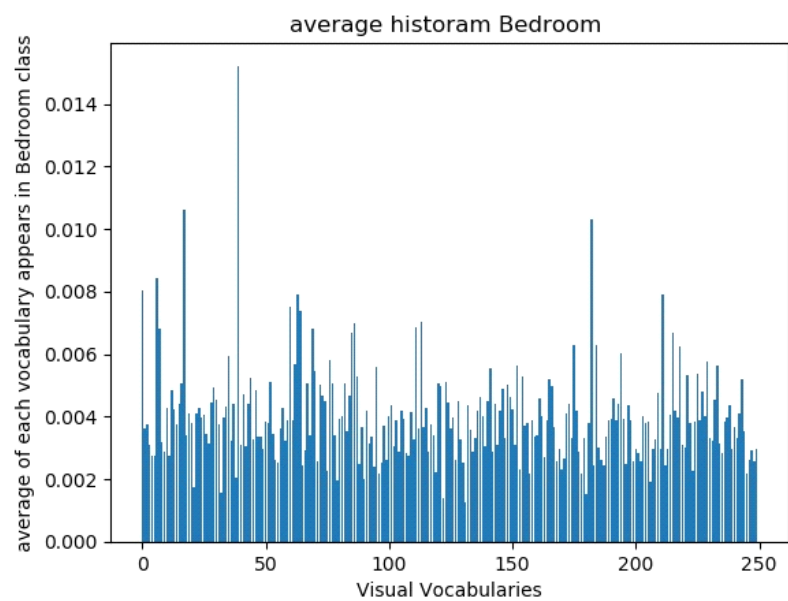


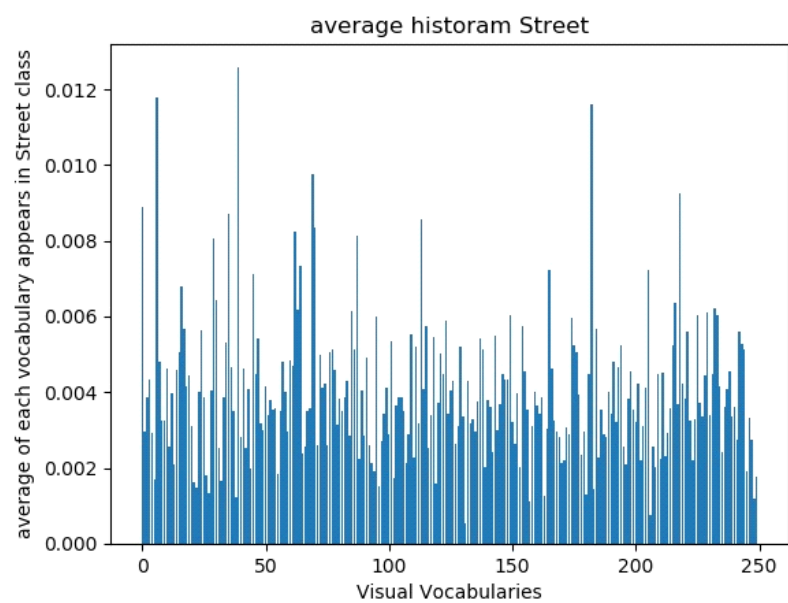
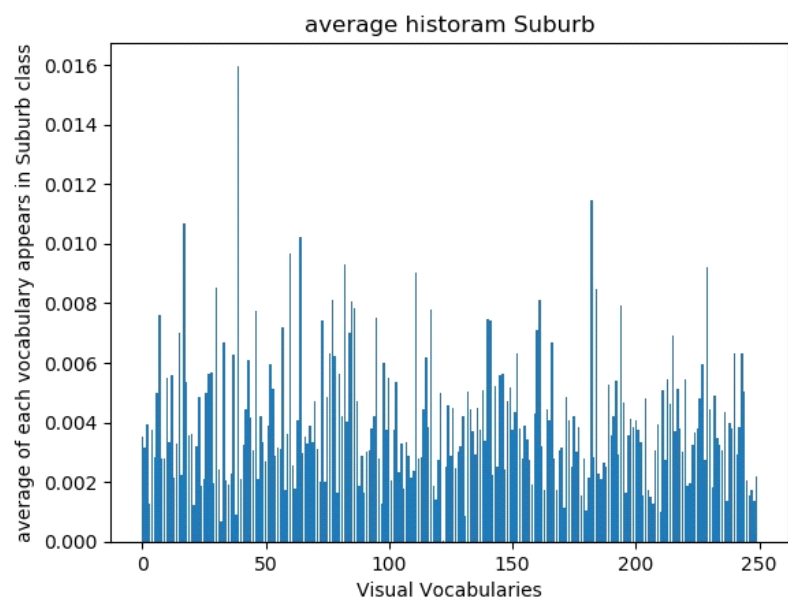


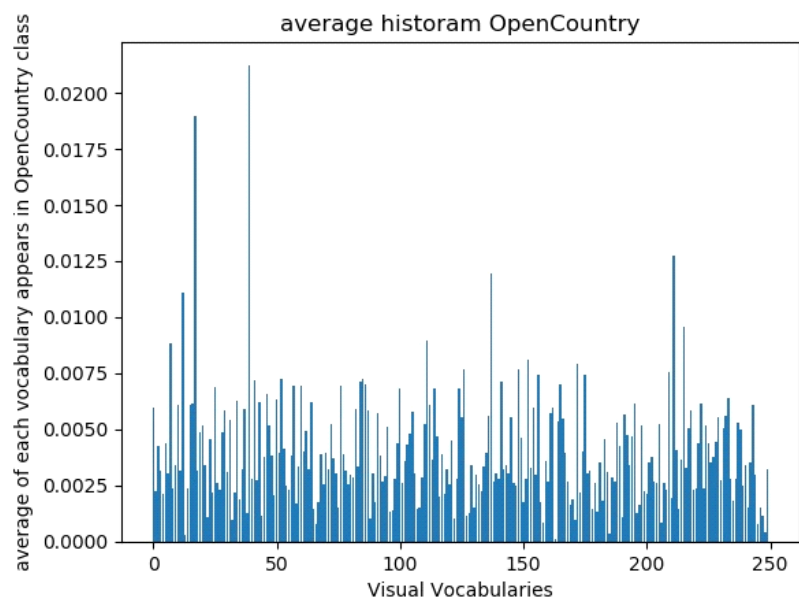
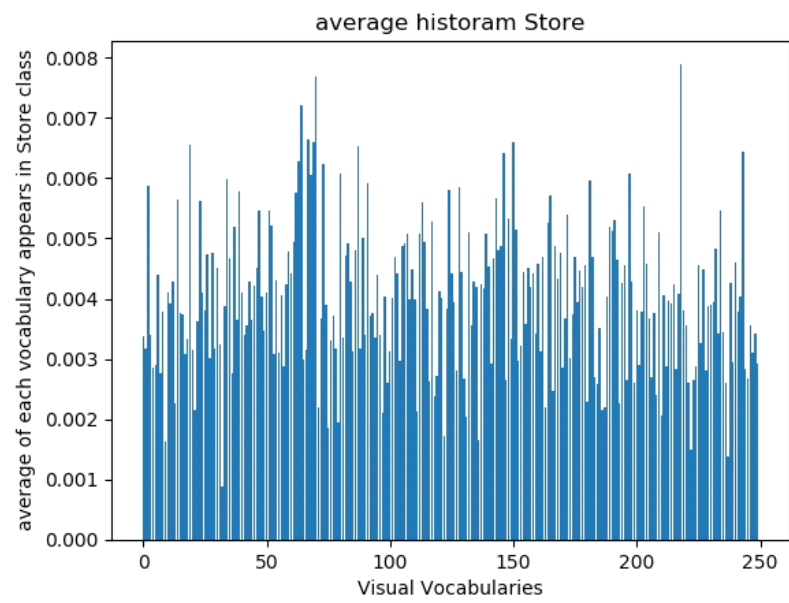






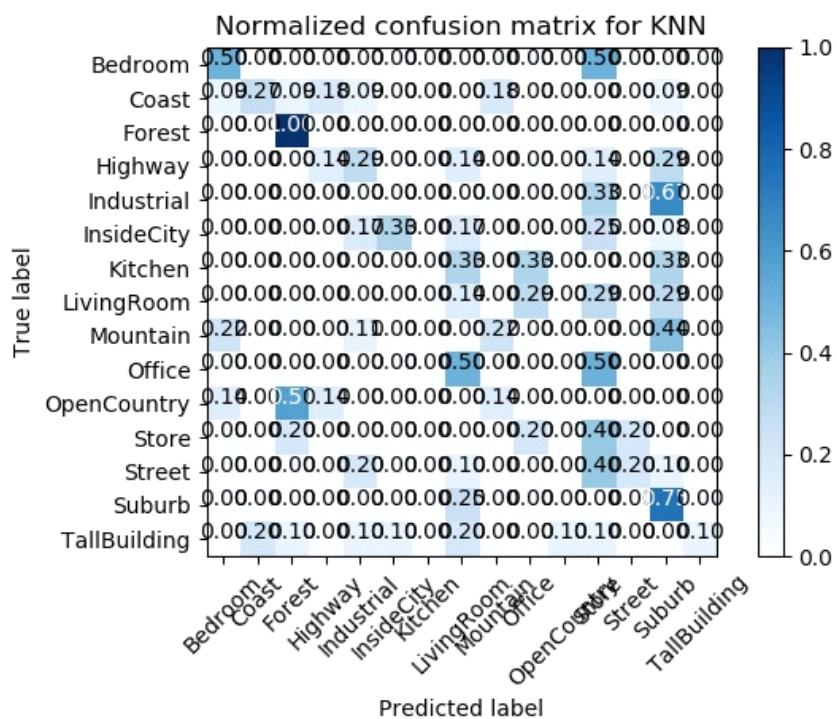
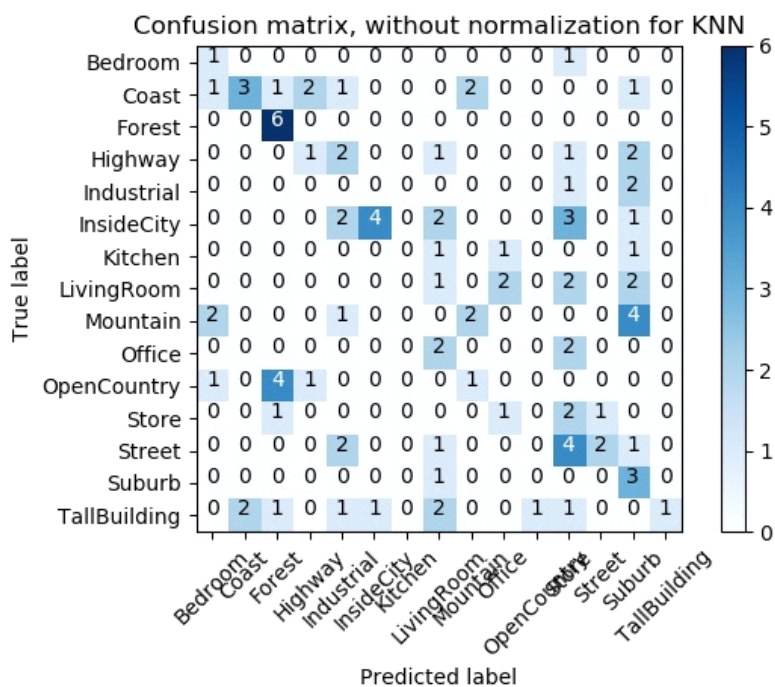






Question 5

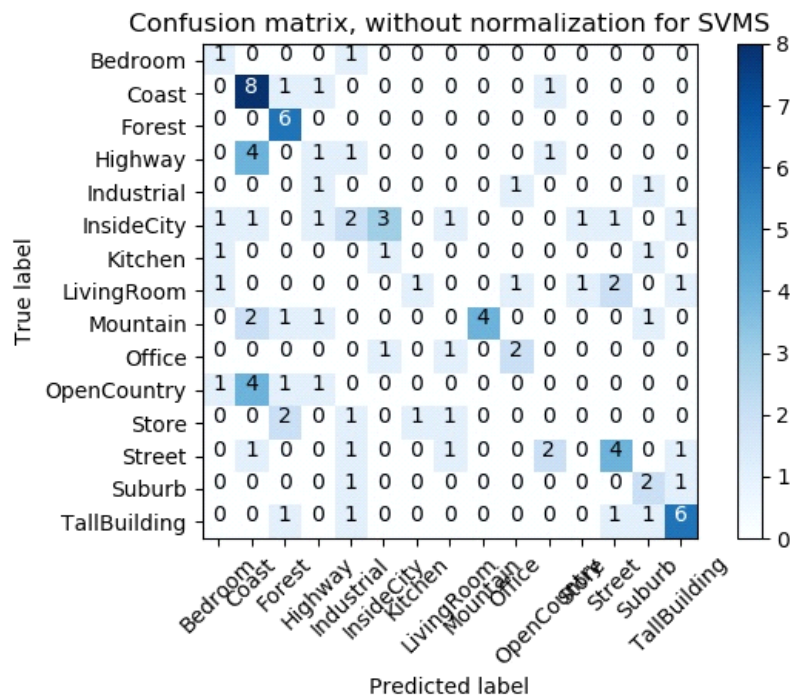


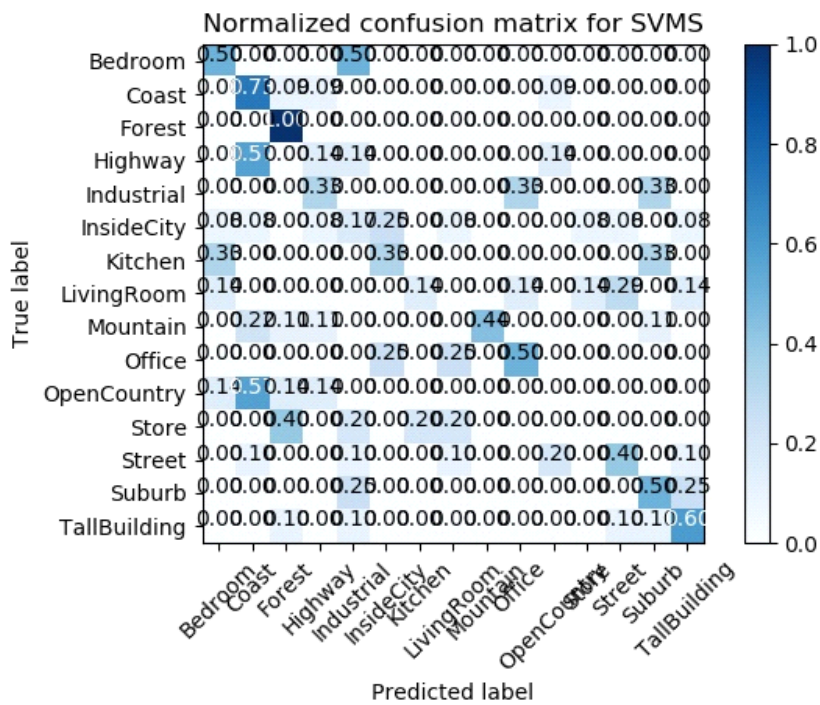


Final Accuracy = 0.32(n\_neighbors=8),0.325((n\_neighbors=9)

The best choice of k depends upon the data; generally, larger values of k reduces effect of the noise on the classification, but make boundaries between classes less distinct. A good k can be selected by various techniques and should be a trade-off between reducing the amount of noise and have a distinct boundry between classes. In this problem, I experienced k = 1, 3, 5, 7, 9, 11, 15 and and accuracy started from 0.31 and peaked at 0.355 (k= 7, 9) decreased again to 0.31 (k=15). So for our problem, K should be between 7 and 9.(all the experiment for different K conducted on a fixed data)

## Question 6





Final Accuracy for linear svm= 0.42(C=0.9), 0.45(C=1)

In this problem, I experienced  $c = 0.1, 0.3, 0.5, 0.7, 0.9, 1.1, 1.5$  and accuracy started from 0.28 and peaked at 0.355 ( $C = 0.7, 0.9$ ) decreased to 0.31 ( $k=15$ ). So for our problem,  $C$  should be between 0.7 and 0.9.(all the experiment for different  $K$  conducted on a fixed data)

Final Accuracy= 0.43( $C=0.9$ , kernel='rbf', degree=5, gamma=0.9), 0.49( $C=1$ , kernel='rbf', degree=5, gamma=0.9)

