CPSC 425 Assignment 5 （due November 14, 2018）

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4 Implemented in def build_vocabulary(image_paths, vocab_size) and def get_bags_of_sifts(image_paths, kmeans) in util.py

5 Implemented in def nearest_neighbor_classify(train_image_feats, train_labels, test_image_feats) and def svm_classify(train_image_feats, train_labels, test_image_feats) in classifiers.py

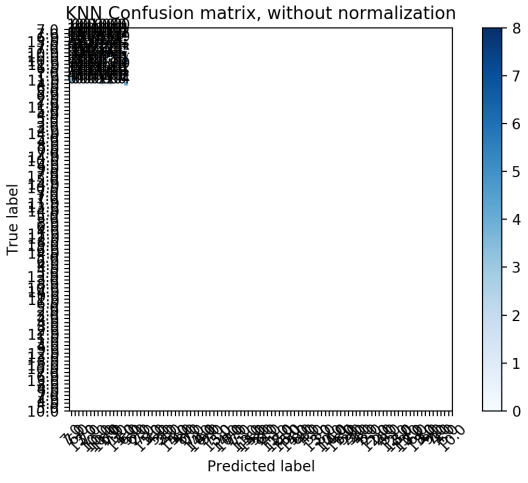
```
Using nearest neighbor classifier to predict test set categories

[ 1. 14. 14. 14. 10.  7. 10. 10. 10.  7.  8. 10. 14. 10.  5.  6. 14.  9.
 14. 14.  0.  8.  8.  1.  0. 12. 14. 14.  5.  3. 14.  6. 14. 14. 10.  5.
 14. 10.  0.  9.  8. 10.  8. 14.  3. 10.  9. 14. 14. 14. 14. 14.  3. 11.
  5. 14. 14. 14. 14. 14.  6.  2. 10.  3.  0.  7. 14. 10. 10.  0. 14. 10.
 14.  2.  8.  0.  2. 14. 14.  2.  0. 10.  5.  5. 14.  0. 14.  0. 10. 10.
  4. 13. 14.  8.  2.  7.  0. 10.  2. 10.]
Using support vector machine to predict test set categories

[ 1.  2.  6. 10. 10.  6. 10. 10. 10. 10.  6. 10.  6. 10.  6.  6.  6.  6.
  1. 10. 11.  6.  6. 12.  6.  6.  3. 10.  6.  4.  6. 10. 10.  0. 10.  4.
 10. 10.  0. 12.  6. 10.  6. 10.  1.  6.  4.  0. 12.  6.  6.  6.  6. 10.
 10.  6. 10.  6. 10. 12.  6.  4. 10.  3.  6.  6. 14. 10. 10.  0. 10.  2.
 12.  6.  6. 12.  6.  6.  3. 12. 10.  2.  2. 12. 10. 10. 10.  0. 10.  3.
  1. 10.  6.  6.  2.  0.  6.  6. 10. 10.]
---Evaluation---

('KNN Accurracy =', 0.0022)
('SVM Accurracy =', 0.0023)
```

figure 5

The best KNN Accuracy I get is 0.0023 and the best SVM Accuracy I get 0.0023, not very successful.

Confusion matrix:

```
Confusion matrix, without normalization
[[1 0 0 0 0 0 1 0 0 0 0 0 0 0 0]
 [1 0 0 0 0 0 0 0 0 0 0 0 0 0 1]
 [0 0 1 0 0 0 0 0 0 0 1 0 0 0 2]
 [1 0 0 1 0 0 0 1 1 0 0 0 1 0 0]
 [2 0 2 2 0 3 0 0 2 0 2 0 0 0 1]
 [0 1 1 0 0 1 0 0 1 1 0 0 0 0 5]
 [0 0 0 0 1 0 2 0 1 1 1 0 0 0 3]
 [0 1 0 1 0 0 0 2 1 0 4 0 0 0 4]
 [0 0 0 0 0 0 0 0 0 0 0 0 0 0 7]
 [0 0 1 0 0 1 0 0 0 0 0 0 0 0 1]
 [0 0 0 0 0 0 0 0 0 0 8 0 0 0 0]
 [1 0 0 0 0 0 0 1 0 0 2 1 0 0 1]
 [0 0 1 0 0 1 0 0 0 0 0 0 0 0 1]
 [4 0 0 0 0 0 0 0 0 1 0 0 0 1 2]
 [0 0 0 0 0 0 0 0 1 0 1 0 0 0 4]]
```



```
Normalized confusion matrix
[[0.5  0.   0.   0.   0.   0.5  0.   0.   0.   0.   0.   0.   0.
  0.  ]
 [0.5  0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.
  0.5 ]
 [0.   0.   0.25 0.   0.   0.   0.   0.   0.   0.   0.25 0.   0.
  0.5 ]
 [0.2  0.   0.   0.2  0.   0.   0.   0.2  0.2  0.   0.   0.   0.2  0.
  0.  ]
 [0.14 0.   0.14 0.14 0.   0.21 0.   0.   0.14 0.   0.14 0.   0.   0.
  0.07]
 [0.   0.1  0.1  0.   0.   0.1  0.   0.   0.1  0.1  0.   0.   0.   0.
  0.5 ]
 [0.   0.   0.   0.   0.11 0.   0.22 0.   0.11 0.11 0.11 0.   0.   0.
  0.33]
 [0.   0.08 0.   0.08 0.   0.   0.   0.15 0.08 0.   0.31 0.   0.   0.
  0.31]
 [0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.
  1.  ]
 [0.   0.   0.33 0.   0.   0.33 0.   0.   0.   0.   0.   0.   0.   0.
  0.33]
 [0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   1.   0.   0.   0.
  0.  ]
 [0.17 0.   0.   0.   0.   0.   0.   0.17 0.   0.   0.33 0.17 0.   0.
  0.17]
 [0.   0.   0.33 0.   0.   0.33 0.   0.   0.   0.   0.   0.   0.   0.
  0.33]
 [0.5  0.   0.   0.   0.   0.   0.   0.   0.   0.12 0.   0.   0.   0.12
  0.25]
 [0.   0.   0.   0.   0.   0.   0.   0.   0.17 0.   0.17 0.   0.   0.
  0.67]]
```