# COEN 166 Artificial Intelligence
# Fall 2018 Lab

## Assignment #4: Face Recognition

Assigned on October 29, 2018, Due on November 27, 218

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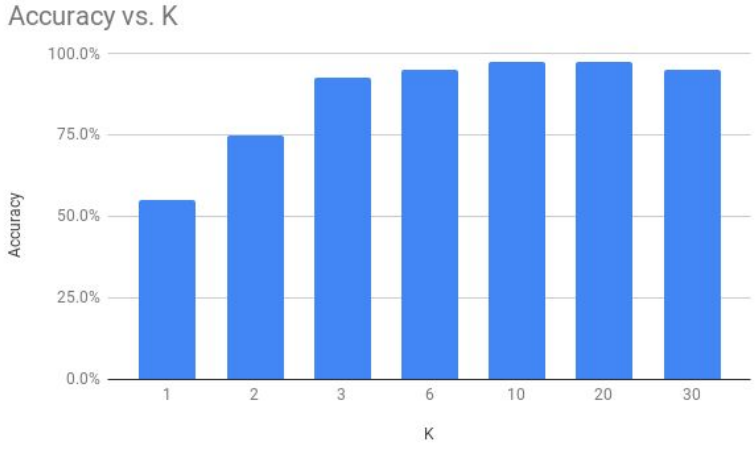
**Pseudocode**

```
//Build image matrix
Foreach image in training image set
        import image
        flatten image
        append flattened image to image matrix
//Result: 60x10304 matrix of 60 stacked images
//Build training matrix
Foreach desired k-value
        Calculate mean, eigenvectors of image matrix
        Project mean-shifted image matrix onto eigenvectors
        Train KNN object
        //Evaluate test images
        Foreach test image
                import image
                flatten image
                run KNN using KNN object
                print expected label and generated label
        Calculate accuracy for k-value
```

**Accuracy**

| K | Accuracy |
|---|---|
| 1 | 55.0% |
| 2 | 75.0% |
| 3 | 92.5% |
| 6 | 95.0% |
| 10 | 97.5% |
| 20 | 97.5% |
| 30 | 95.0% |



**Comments**

As expected, as the number of considered data points (k) rises, facial recognition becomes more accurate. The slight fall in accuracy at k=30 is likely the result of extremely low eigenvalues for data points past the first dozen, which do not provide much meaningful information.