

Exercise1

Use pca method, svm

```
X = face_profile_data
y = face_profile_name_index

X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.25, random_state=42)
```

random select data from the sample

Loading Database:

```
0      65 images are loaded from: ../face_profiles/yaleB33
1      65 images are loaded from: ../face_profiles/yaleB34
2      65 images are loaded from: ../face_profiles/yaleB02
3      65 images are loaded from: ../face_profiles/yaleB05
4      65 images are loaded from: ../face_profiles/yaleB04
5      65 images are loaded from: ../face_profiles/yaleB03
6      65 images are loaded from: ../face_profiles/yaleB35
7      65 images are loaded from: ../face_profiles/yaleB32
8      65 images are loaded from: ../face_profiles/yaleB10
9      64 images are loaded from: ../face_profiles/yaleB17
10     65 images are loaded from: ../face_profiles/yaleB28
11     65 images are loaded from: ../face_profiles/yaleB21
12     65 images are loaded from: ../face_profiles/yaleB26
13     65 images are loaded from: ../face_profiles/yaleB19
14     65 images are loaded from: ../face_profiles/yaleB27
15     64 images are loaded from: ../face_profiles/yaleB18
16     65 images are loaded from: ../face_profiles/yaleB20
17     63 images are loaded from: ../face_profiles/yaleB16
18     65 images are loaded from: ../face_profiles/yaleB29
19     61 images are loaded from: ../face_profiles/yaleB11
20     65 images are loaded from: ../face_profiles/yaleB08
21     65 images are loaded from: ../face_profiles/yaleB37
22     65 images are loaded from: ../face_profiles/yaleB30
23     65 images are loaded from: ../face_profiles/yaleB39
24     65 images are loaded from: ../face_profiles/yaleB06
25     65 images are loaded from: ../face_profiles/yaleB01
26     65 images are loaded from: ../face_profiles/yaleB38
27     65 images are loaded from: ../face_profiles/yaleB07
28     65 images are loaded from: ../face_profiles/yaleB31
29     65 images are loaded from: ../face_profiles/yaleB09
30     65 images are loaded from: ../face_profiles/yaleB36
31     61 images are loaded from: ../face_profiles/yaleB13
32     65 images are loaded from: ../face_profiles/yaleB25
33     65 images are loaded from: ../face_profiles/yaleB22
34     65 images are loaded from: ../face_profiles/yaleB23
35     65 images are loaded from: ../face_profiles/yaleB24
36     60 images are loaded from: ../face_profiles/yaleB12
37     64 images are loaded from: ../face_profiles/yaleB15
```

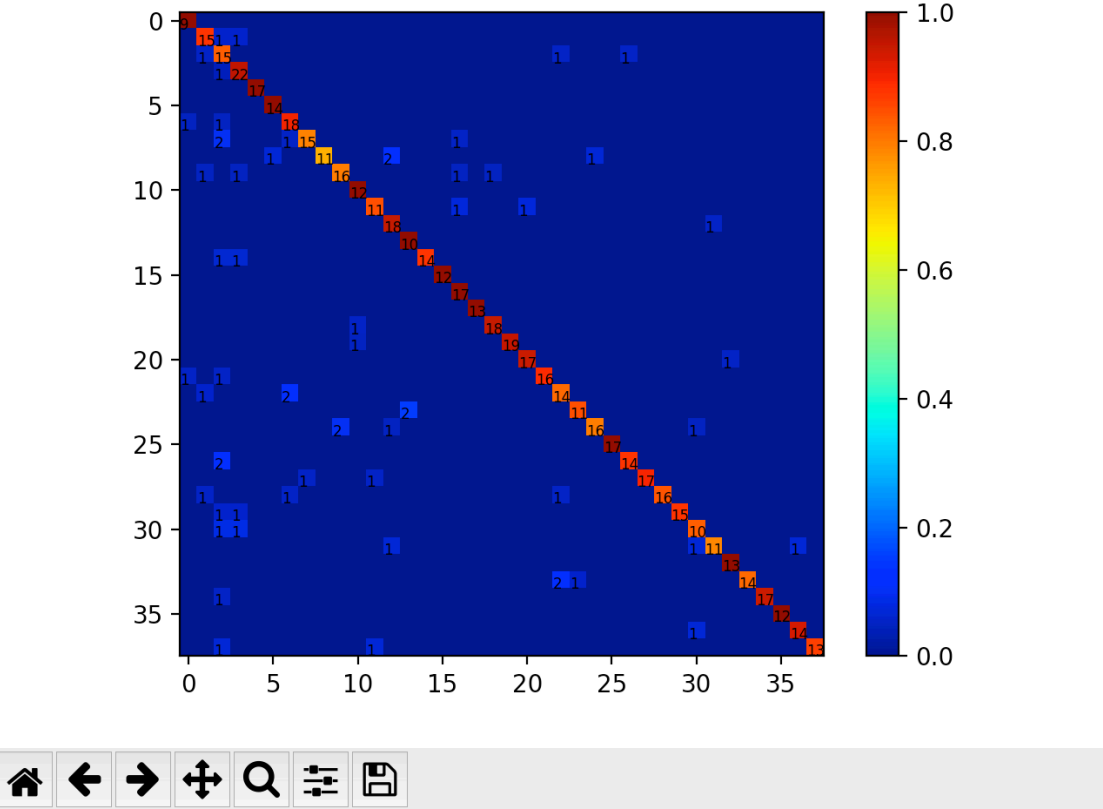
2452 samples from 38 people are loaded

```
Extracting the top 150 eigenfaces from 1839 faces
Projecting the input data on the eigenfaces orthonormal basis
Fitting the classifier to the training set
Predicting people's names on the test set
Prediction took 0.00026580 second per sample on average

Test Error Rate: 8.8091 %
Test Recognition Rate: 91.1909 %
```

```
confusion matrix=
[[ 9  0  0 ...  0  0  0]
 [ 0 15  1 ...  0  0  0]
 [ 0  1 15 ...  0  0  0]
 ...
 [ 0  0  0 ... 12  0  0]
 [ 0  0  0 ...  0 14  0]
 [ 0  0  1 ...  0  0 13]]
```

Figure 2



confusion_matrix

predicted: yaleB25
true: yaleB25



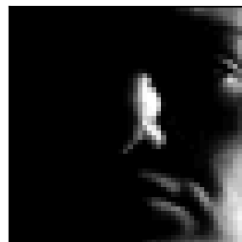
predicted: yaleB28
true: yaleB28



predicted: yaleB16
true: yaleB16



predicted: yaleB15
true: yaleB15



predicted: yaleB01
true: yaleB01



predicted: yaleB04
true: yaleB04



predicted: yaleB11
true: yaleB11



predicted: yaleB28
true: yaleB32



predicted: yaleB32
true: yaleB32



predicted: yaleB17
true: yaleB17



predicted: yaleB05
true: yaleB05



predicted: yaleB06
true: yaleB06



