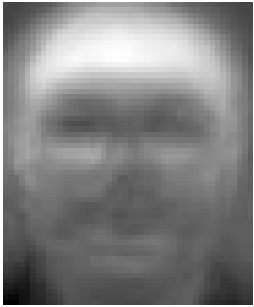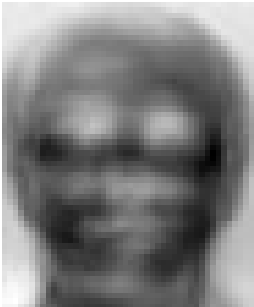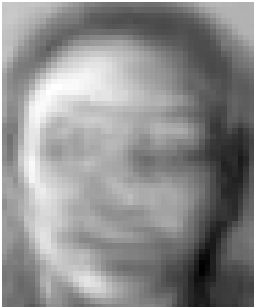# Deep Learning for Computer Vision (2021 Fall) HW0
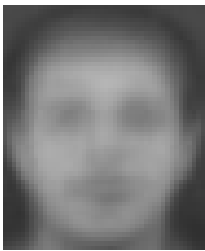
R10942152 Ken Yu(游家權)

Question 1

Mean Face	1st Eigenface	2nd Eigenface	3rd Eigenface	4th Eigenface

Question 2,3

	n=3	n=50	n=170	n=240	n=345
Reconstructed Image					
MSE	1566.35	134.03	39.85	21.48	3.04

* MSE is rounded to second decimal place.

Question 4

	Fold 1	Fold 2	Fold 3	Average Precision
N=3, k=1	0.7083	0.6417	0.7000	0.6833
N=3, k=3	0.6000	0.5583	0.5583	0.5722
N=3, k=5	0.5583	0.4750	0.4667	0.5000
N=50, k=1	0.8667	0.8417	0.8750	**0.8611**
N=50, k=3	0.8333	0.7833	0.7750	0.7972
N=50, k=5	0.8083	0.7000	0.7167	0.7417
N=170, k=1	0.5250	0.5917	0.6917	0.6028
N=170, k=3	0.2833	0.3333	0.3250	0.3139
N=170, k=5	0.2000	0.2667	0.2250	0.2306

Question 5

N = 50, k =1 is the best hyperparameter set in Question 4.

The Recognition rate on testing set using this hyperparameter is **1.0**, which means NN neighborhood is able to classify all the testing data correctly.