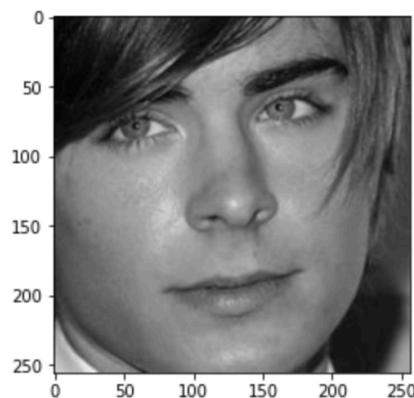

Assignment-3

Prafullitt Jain - 3 April 2020

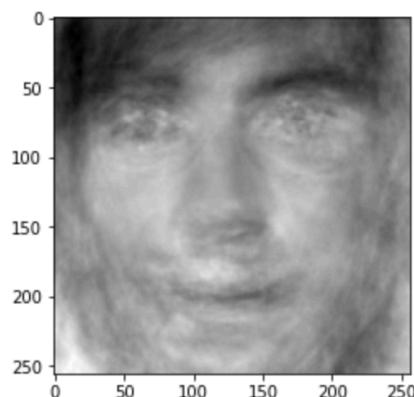
Question-1

Reconstruction of image using Principal Component Analysis

```
In [10]: imgplot = plt.imshow(images[100], cmap='gray')
plt.show()
```

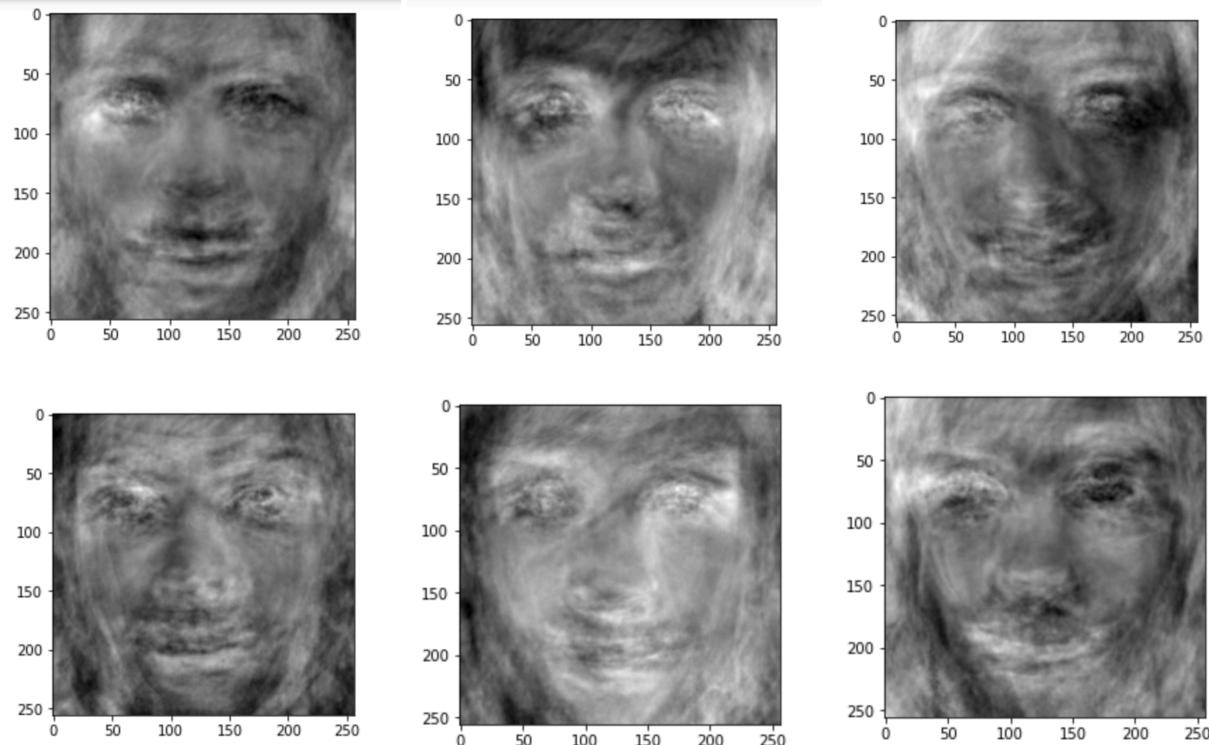
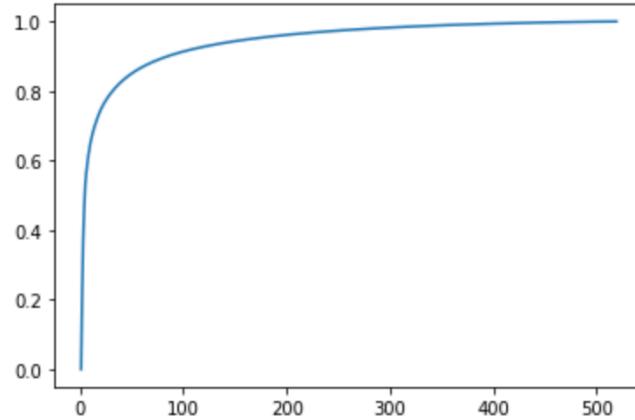


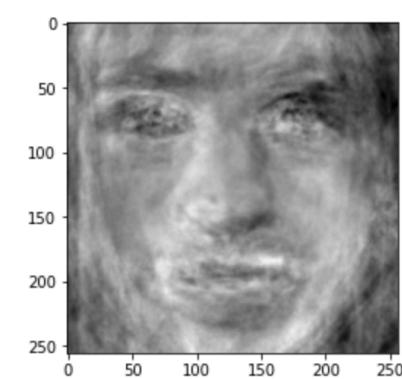
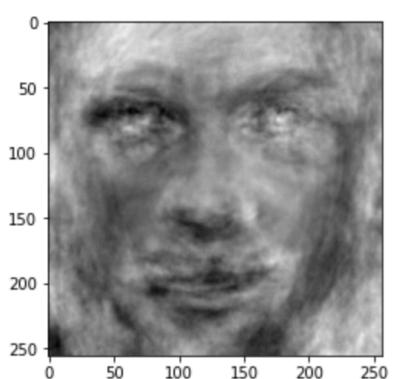
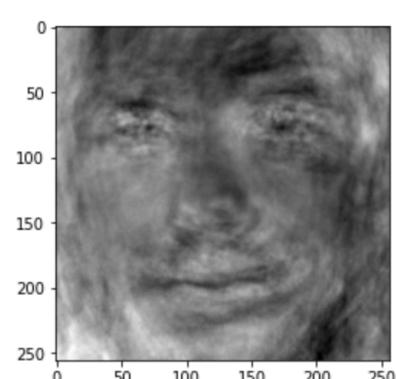
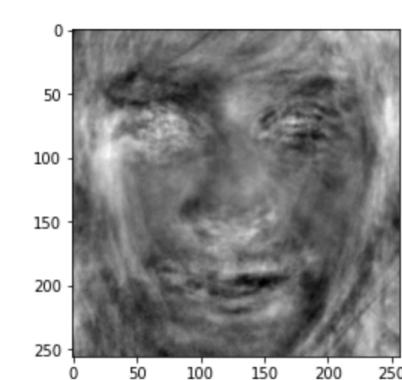
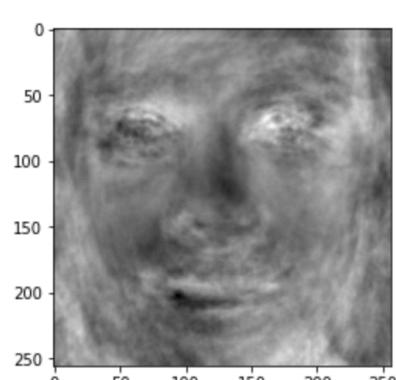
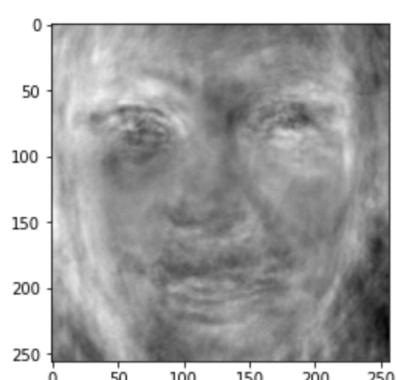
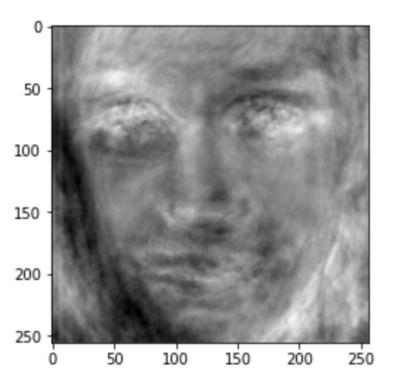
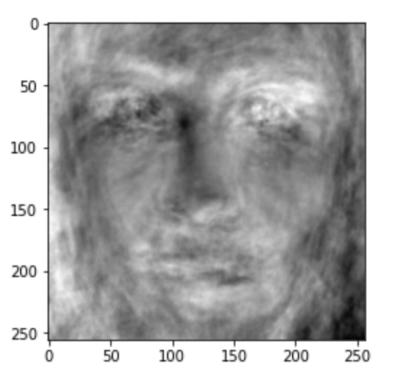
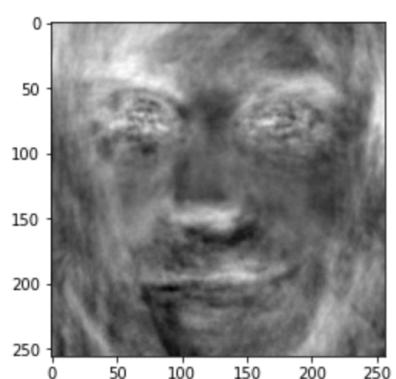
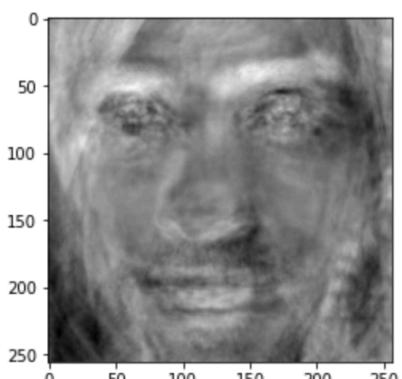
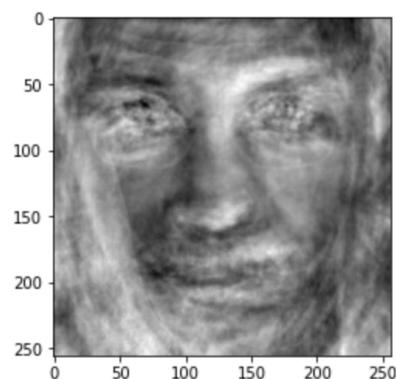
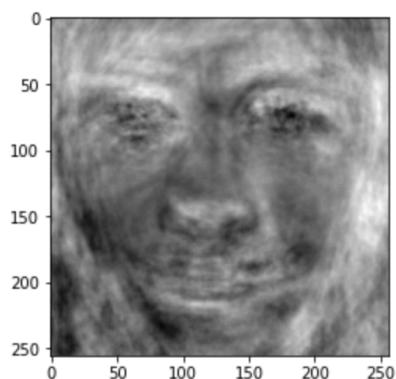
```
In [11]: imgplot = plt.imshow(rec_face[100], cmap='gray')
plt.show()
```

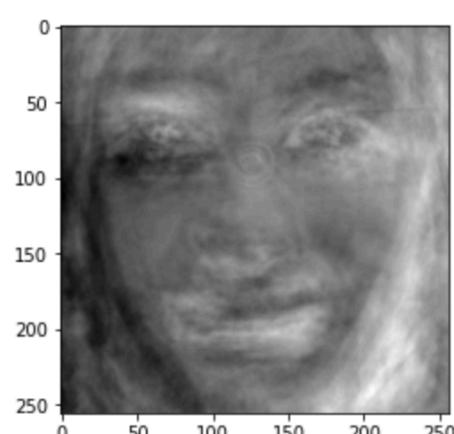
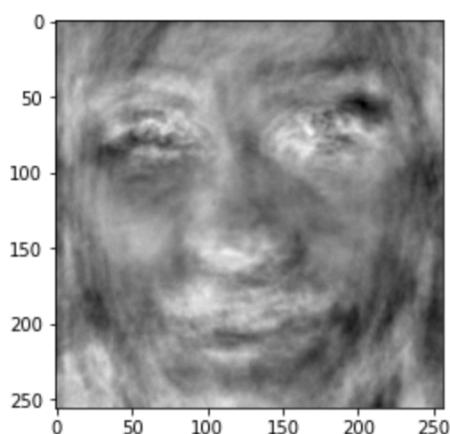
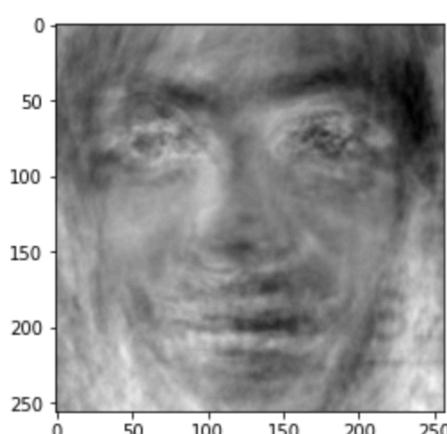
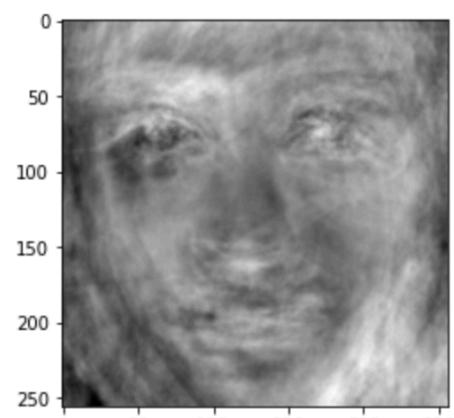
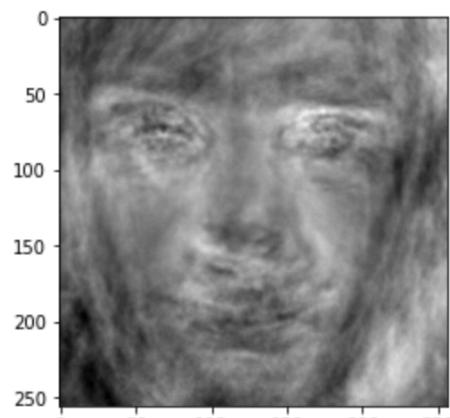
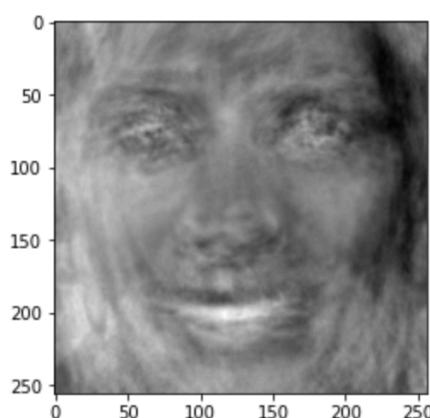
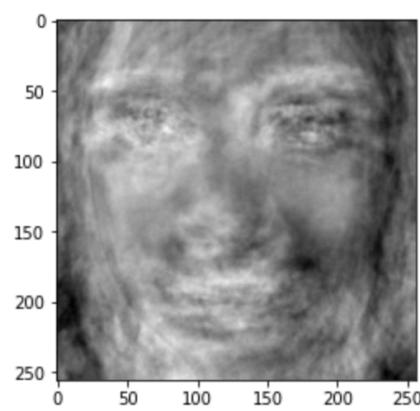
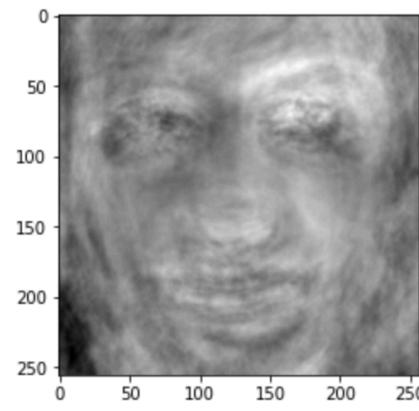
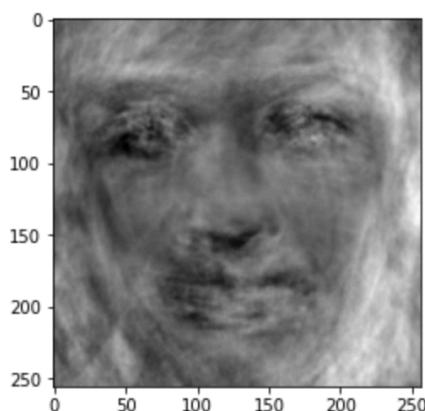
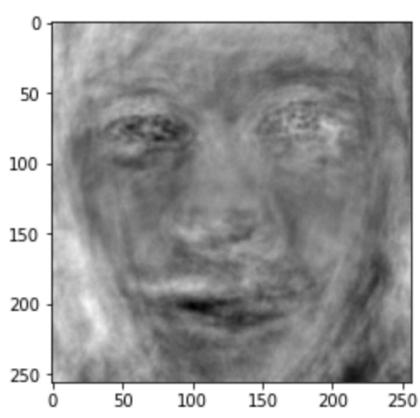
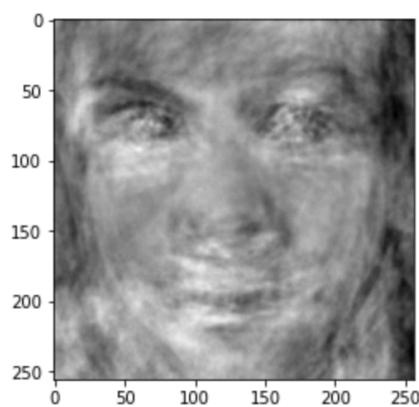
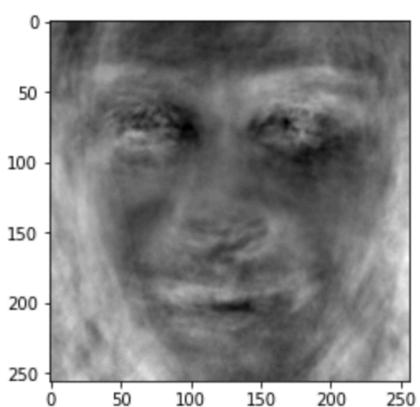


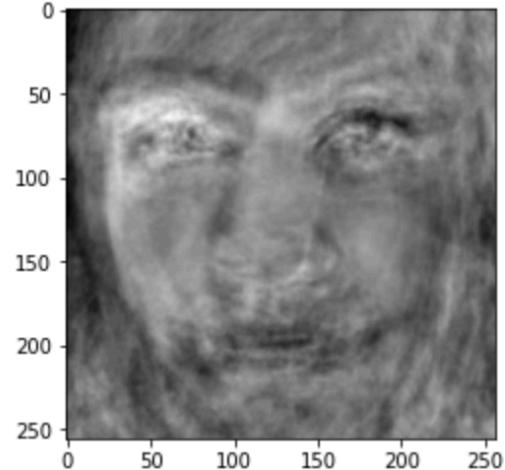
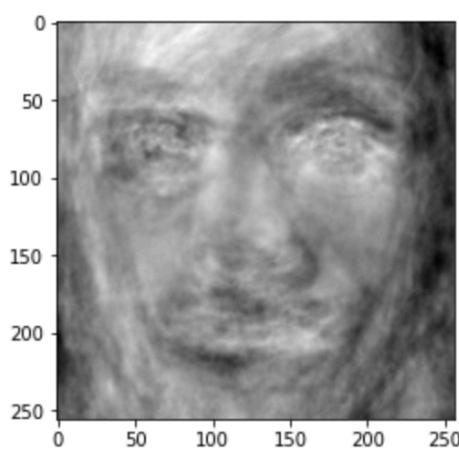
Plot showing the total mean square error over all train images vs the number of principal components used to reconstruct

```
In [13]: x = [i for i in range(1,520)]  
plt.plot(x,arr)  
Out[13]: [<matplotlib.lines.Line2D at 0x18c9b1fd0>]
```



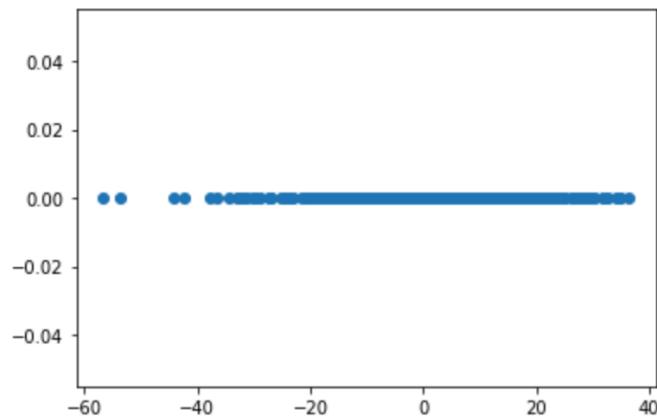






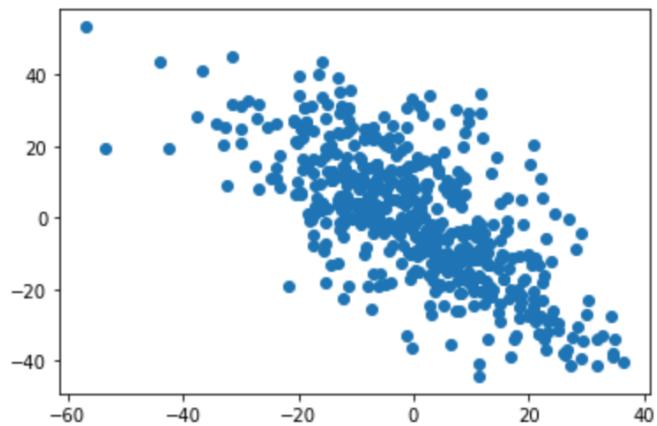
```
plt.scatter(x[:,1],y)
```

```
<matplotlib.collections.PathCollection at 0x123a11390>
```



```
plt.scatter(x[:,1],x[:,2])
```

```
<matplotlib.collections.PathCollection at 0x16549b588>
```



```
fig = plt.figure()
ax = fig.add_subplot(111, projection='3d')
ax.scatter(x[:,1],x[:,2],x[:,3])
<mpl_toolkits.mplot3d.art3d.Path3DCollection at 0x165723588>
```

