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# SMAI Mini project1

## Report- PCA

With increase in number of sorted eigen vectors used for image reconstruction, the accuracy of reconstruction increases.(mean square error decreases).

This is calculated by taking difference between oldx(reconstructed one) ;

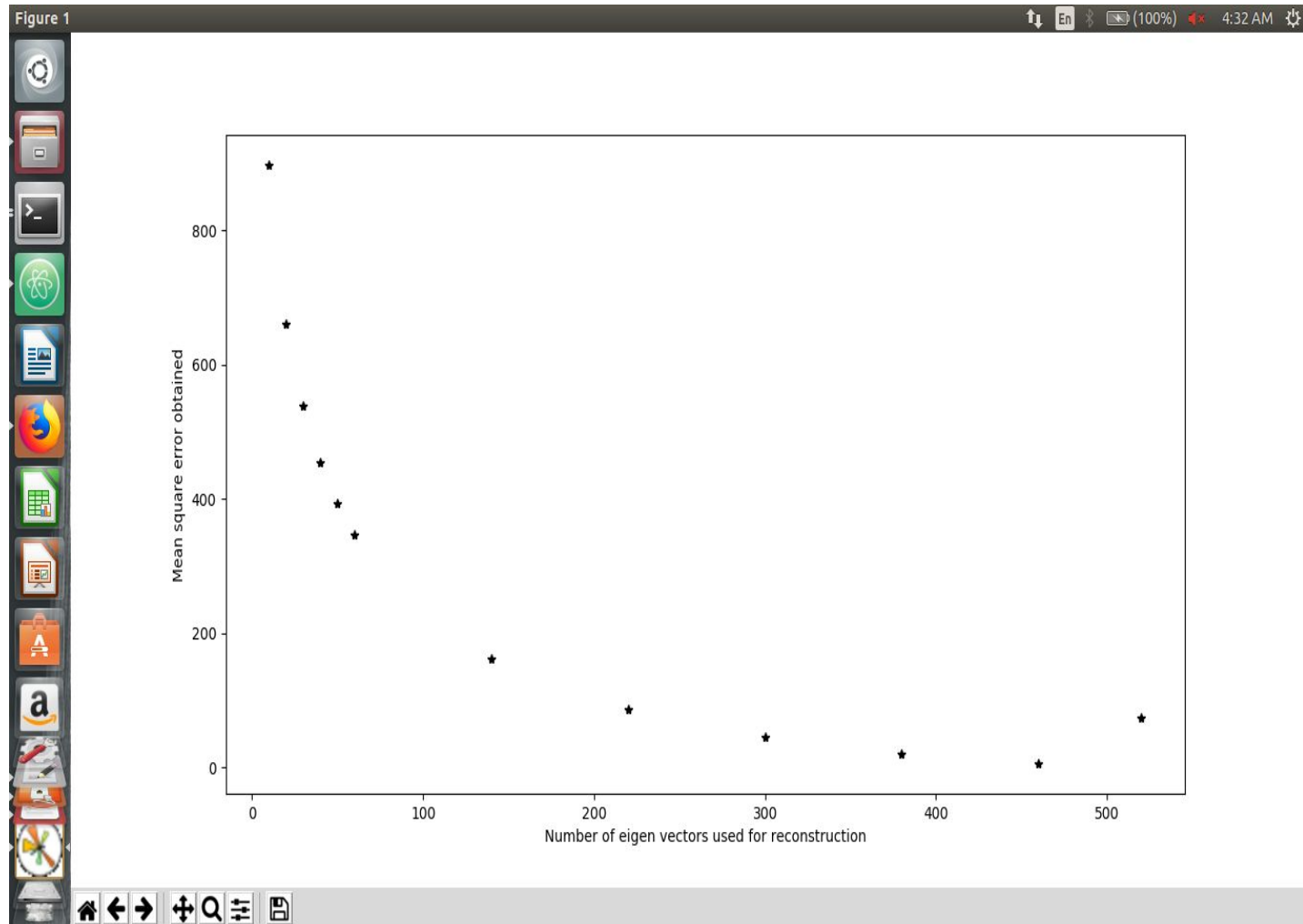
```
newx = np.matmul(X, normeig) #nd dk
```

```
oldx = np.matmul(newx, np.transpose(normeig)) #nk kd
```

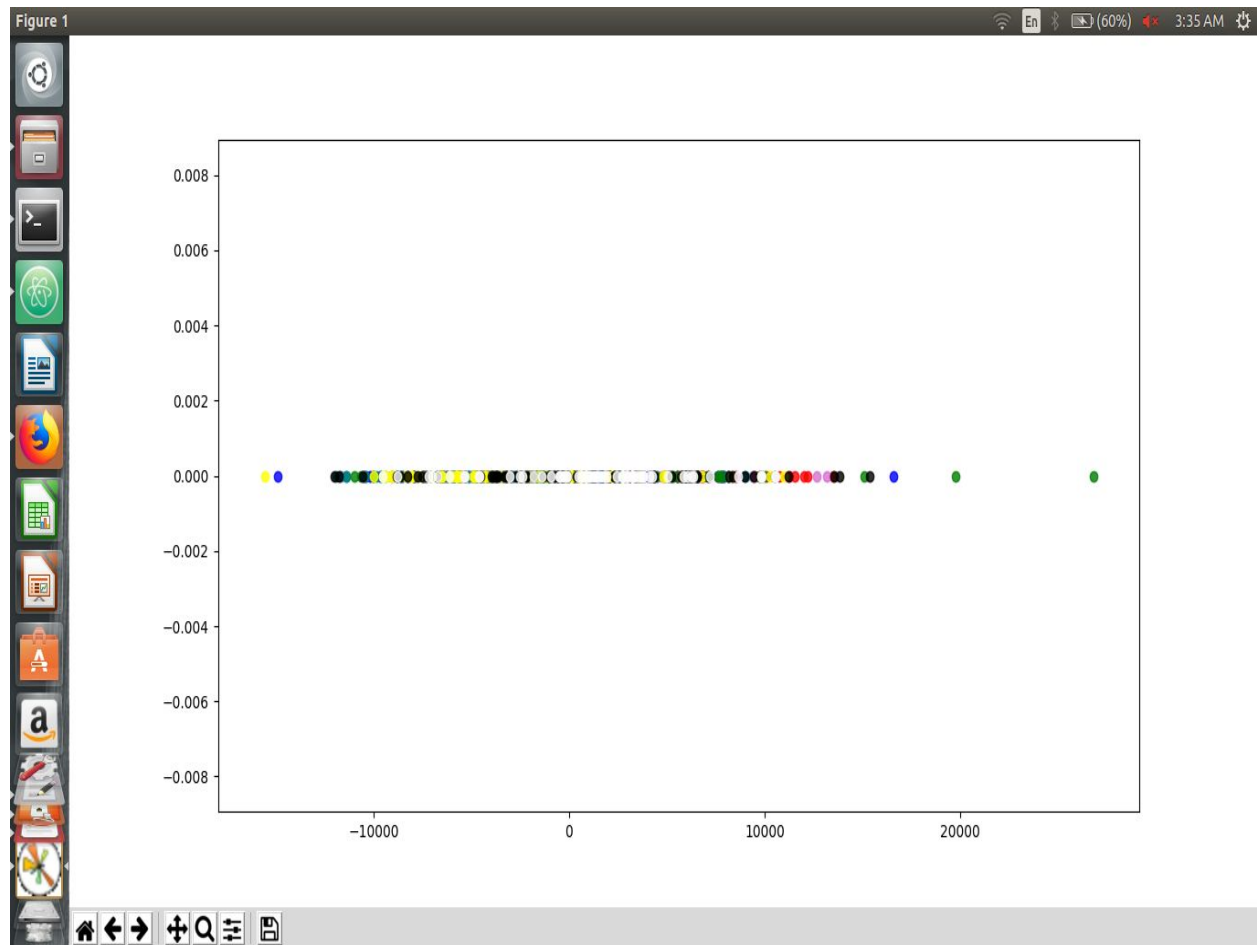
Where X is feature space .

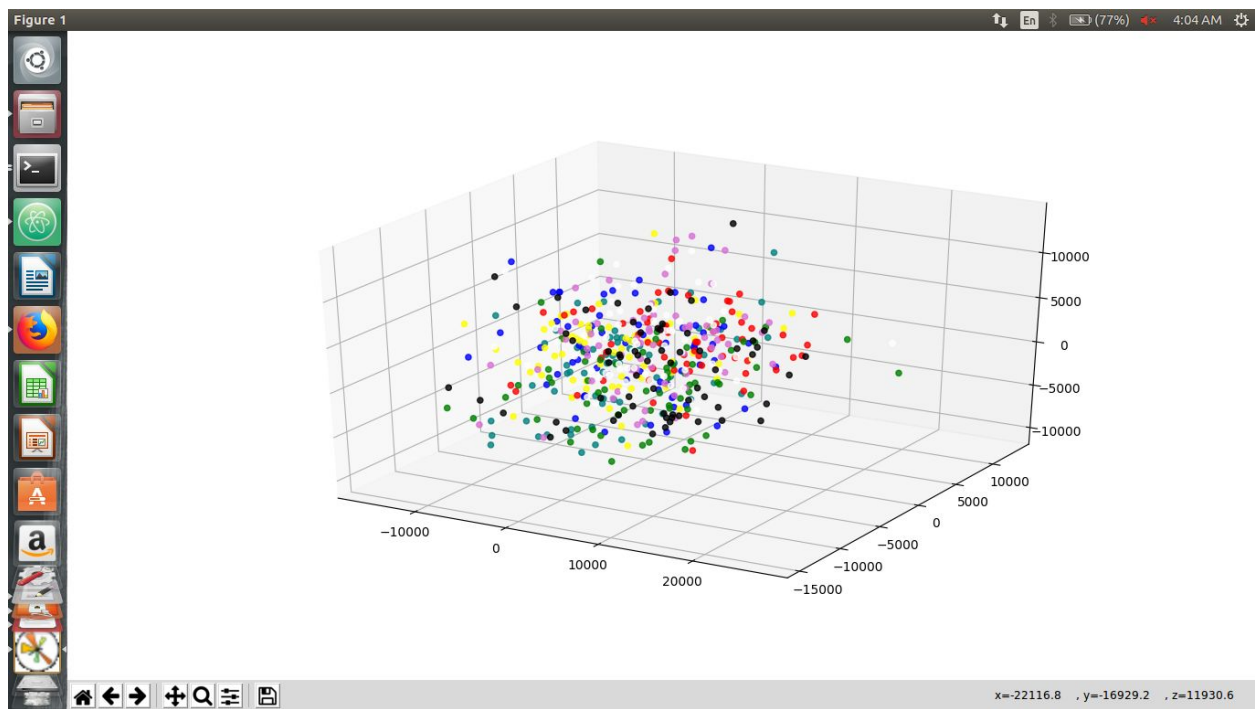
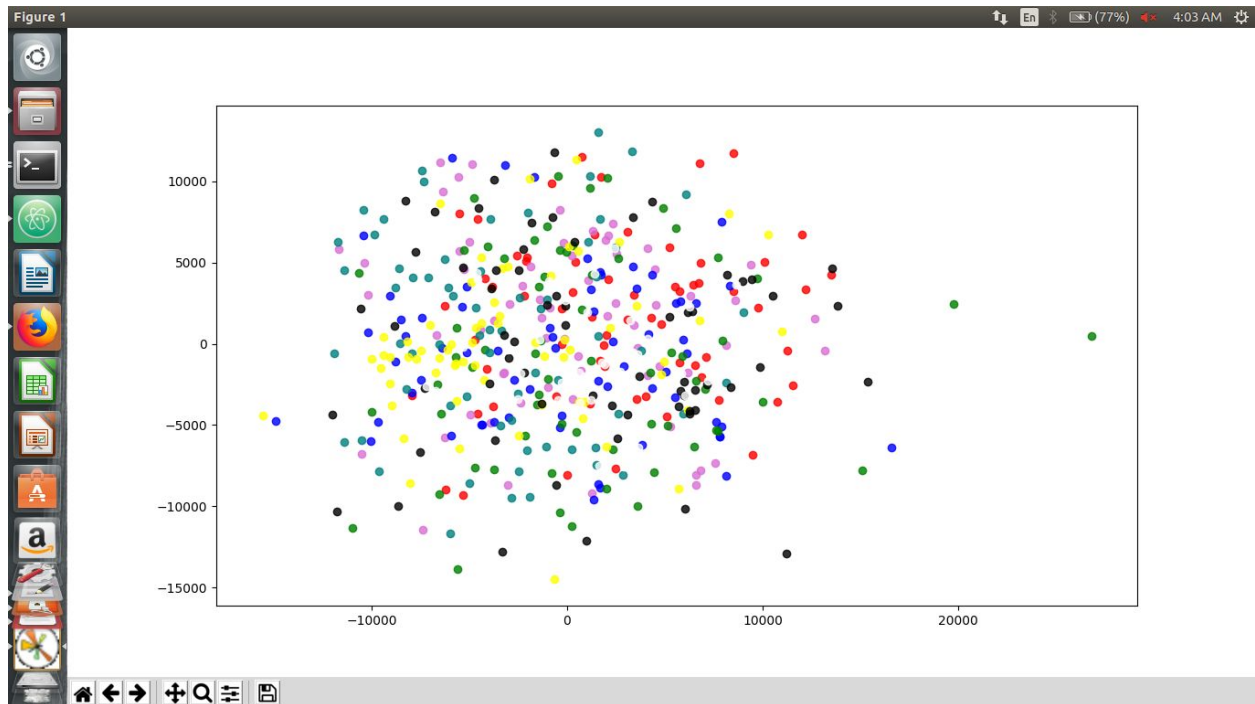
Using these commands, we construct images again and their reduced dimension representations.

Error vs number of eigen vectors taken plot :

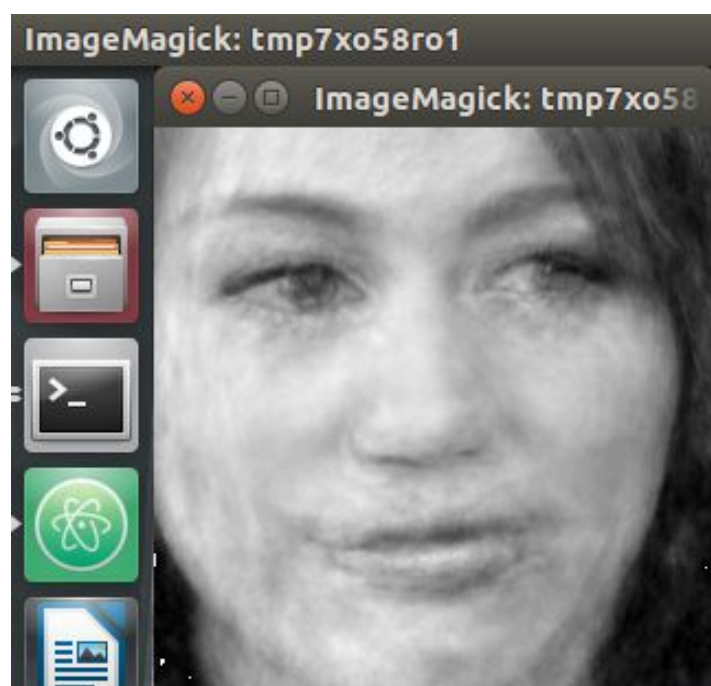


Scattered reduced dimension representations of samples ,each color represents each cluster





Faces reconstructed with increasing eigen vectors taken ;  
For 100,200,300,400,500 eigvecs taken,

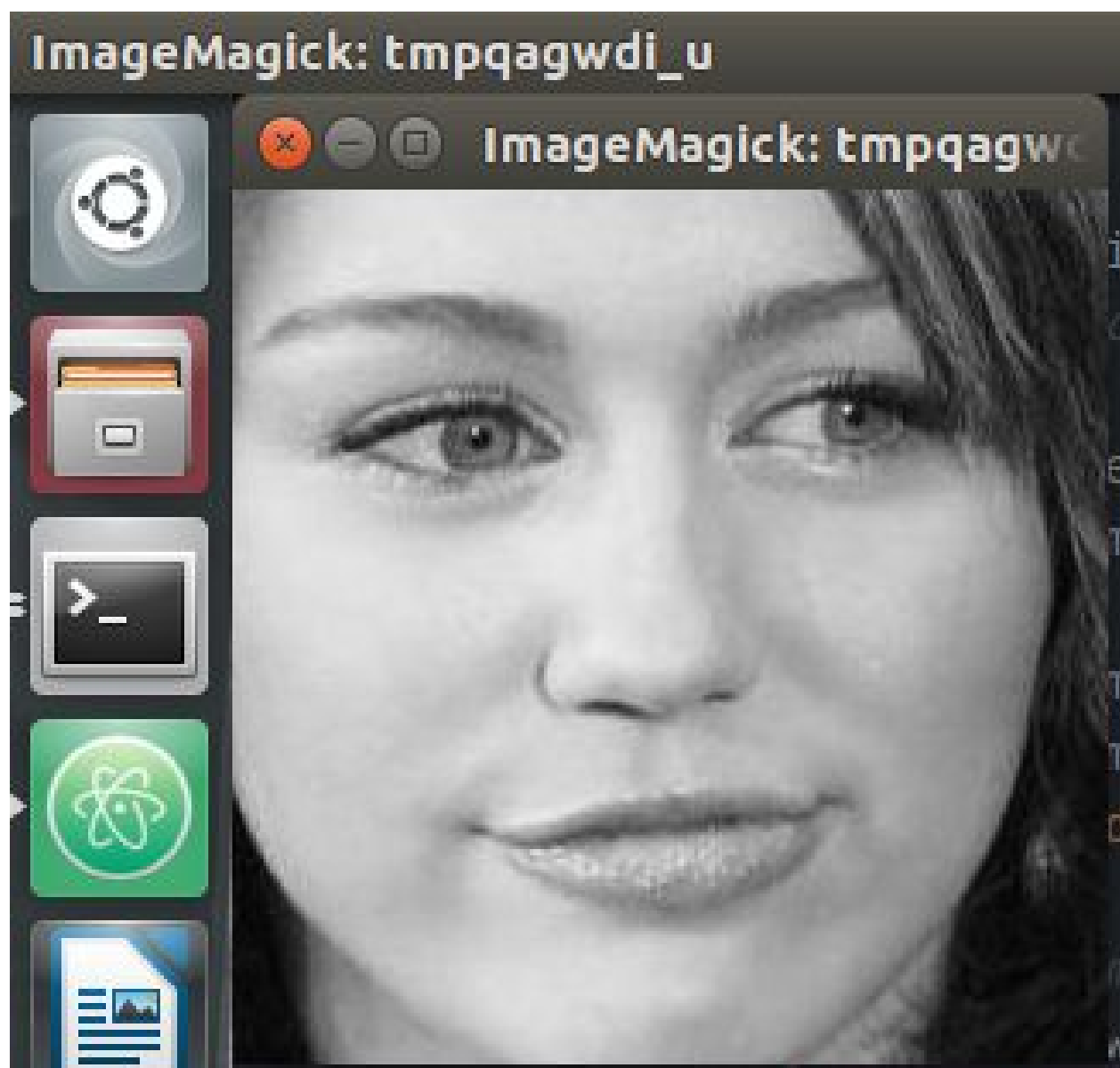


ImageMagick: tmp161tfydb



ImageMagick: tmp161tfy





ImageMagick: tmp2o040wfo



ImageMagick: tmp2o040

