

## CSE472 (Machine Learning Sessional)

### Assignment 4: Principal component analysis (PCA) and expectation-maximization (EM) algorithm

#### 1. Instructions to run the code:

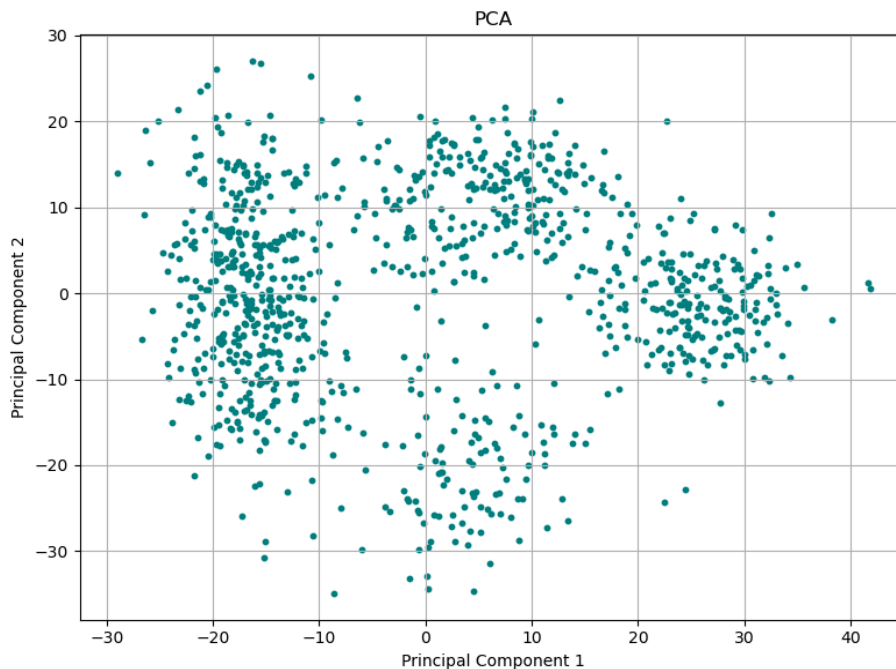
```
data = np.loadtxt('pca_data.txt', delimiter=' ')
data.shape
```

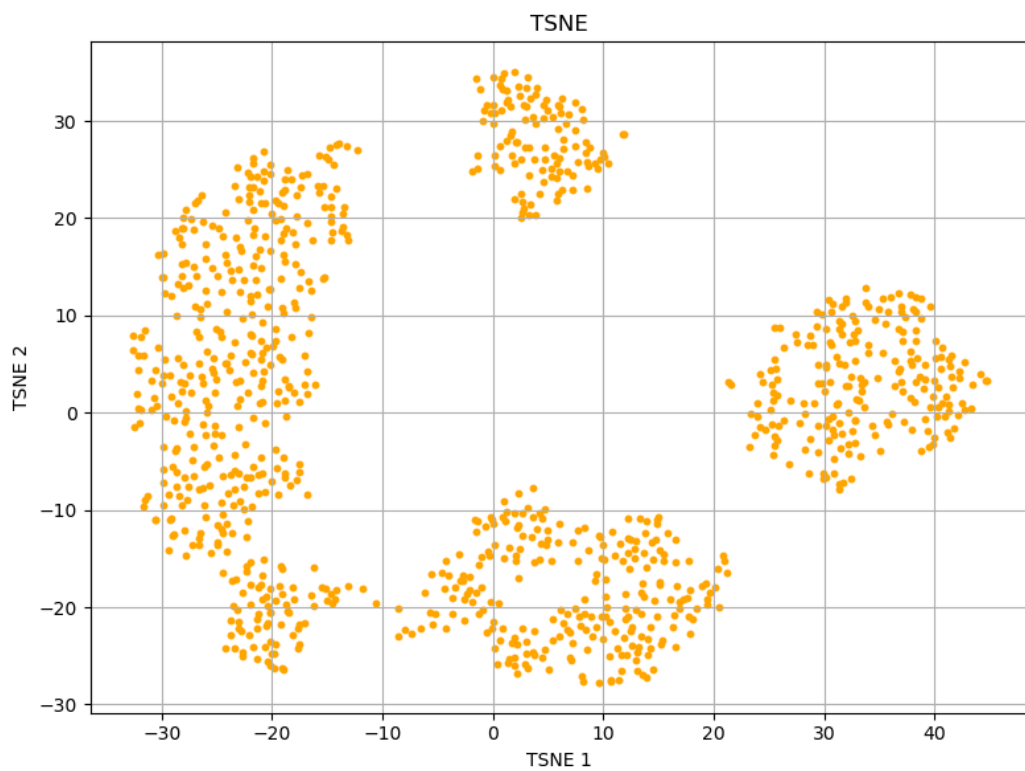
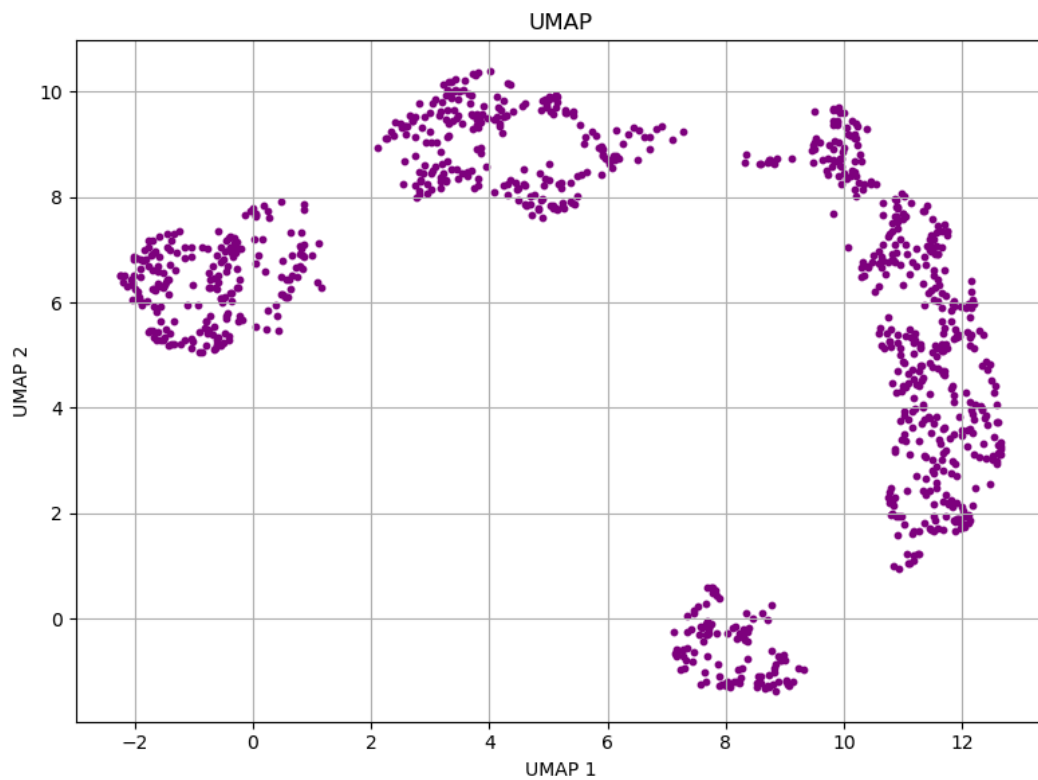
Changing the test file here & clicking 'run all' will show pca of the data points, along with umap & t-sne.

```
data = np.loadtxt("em_data.txt")
K = 2
lambda_f, pi_f = em_algorithm(data, K)
```

Similarly, Changing the test file here & clicking 'run all' will show the results of the em-algorithm.

#### 2. PCA, UMAP & t-SNE Plots:





### 3. EM Statistics:

Converged at iteration 114

Mean number of children in families without family planning: 1.7831

Mean number of children in families with family planning: 4.9113

Proportion of families without family planning: 0.3562

Proportion of families with family planning: 0.6438

