

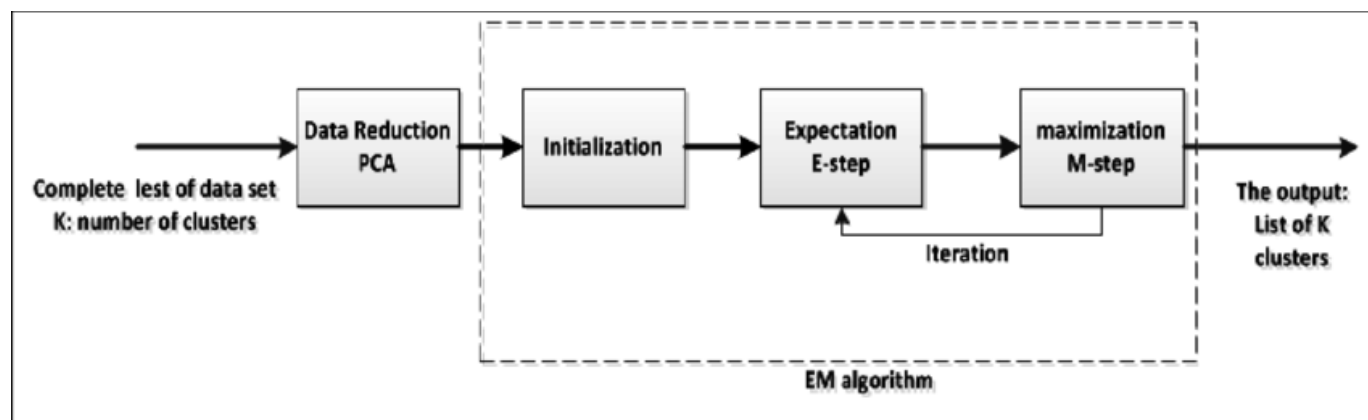
CSE472 (Machine Learning Sessional)

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

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Section : A2



Instructions to run the code

Run the following cells in the 1905048.ipynb file:

Principal Component Analysis(PCA) Task

```
# PCA
perform_pca("pca_data.txt")
plot_umap_tsne("pca_data.txt")
```

[7]

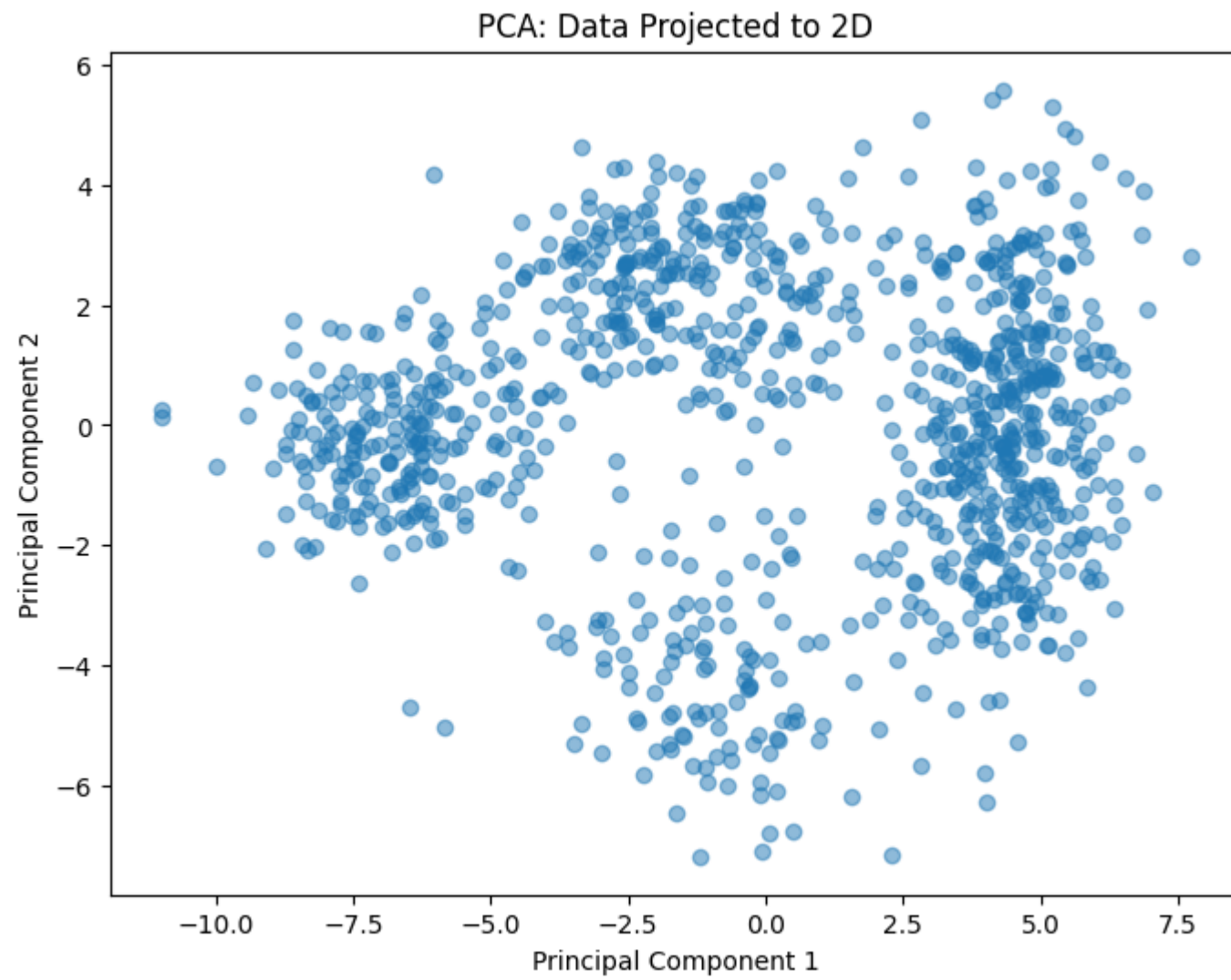
Expectation-Minimization Algorithm(EM) Task

```
# EM Algorithm
em_algorithm("em_data.txt")
```

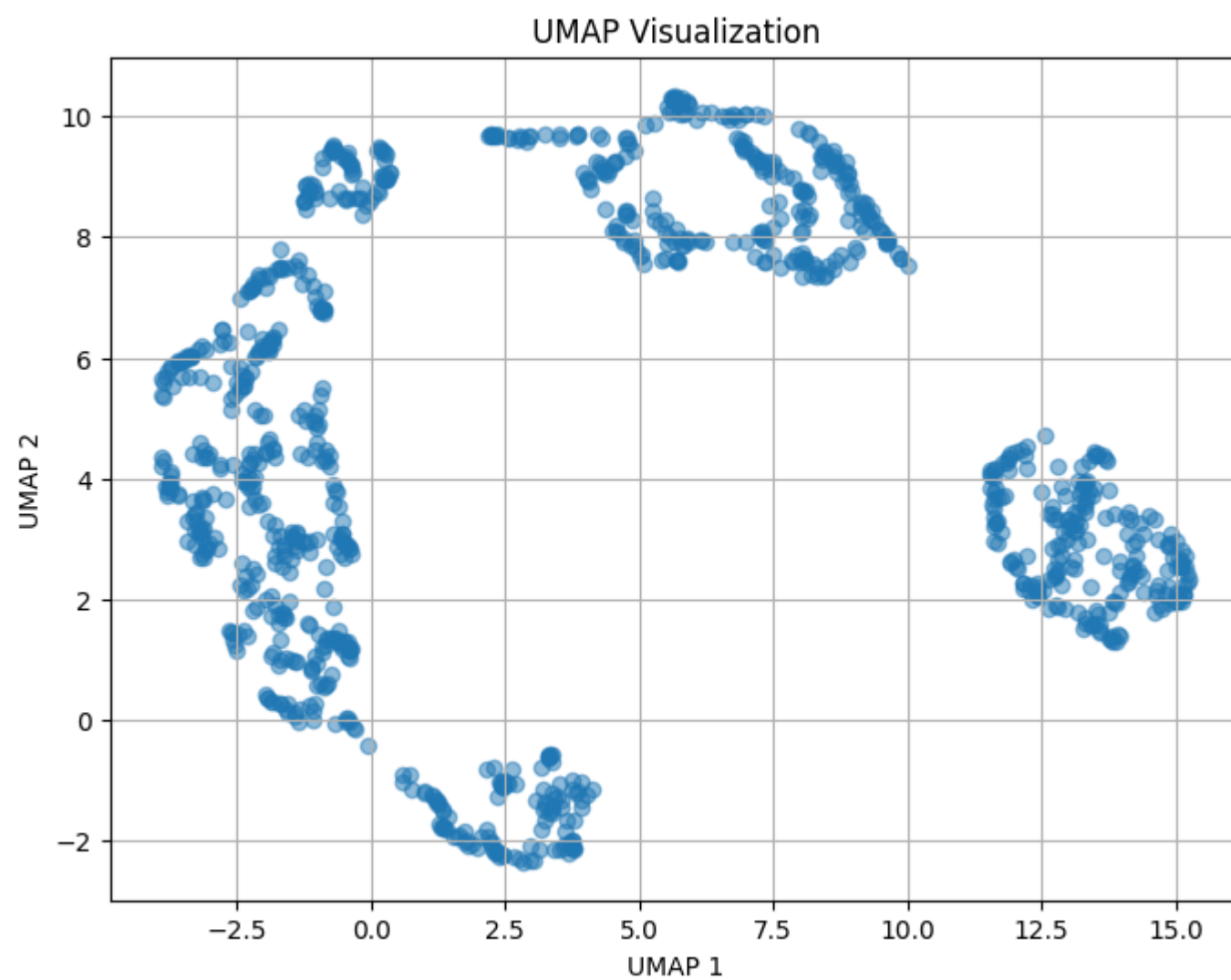
[8]

Plots

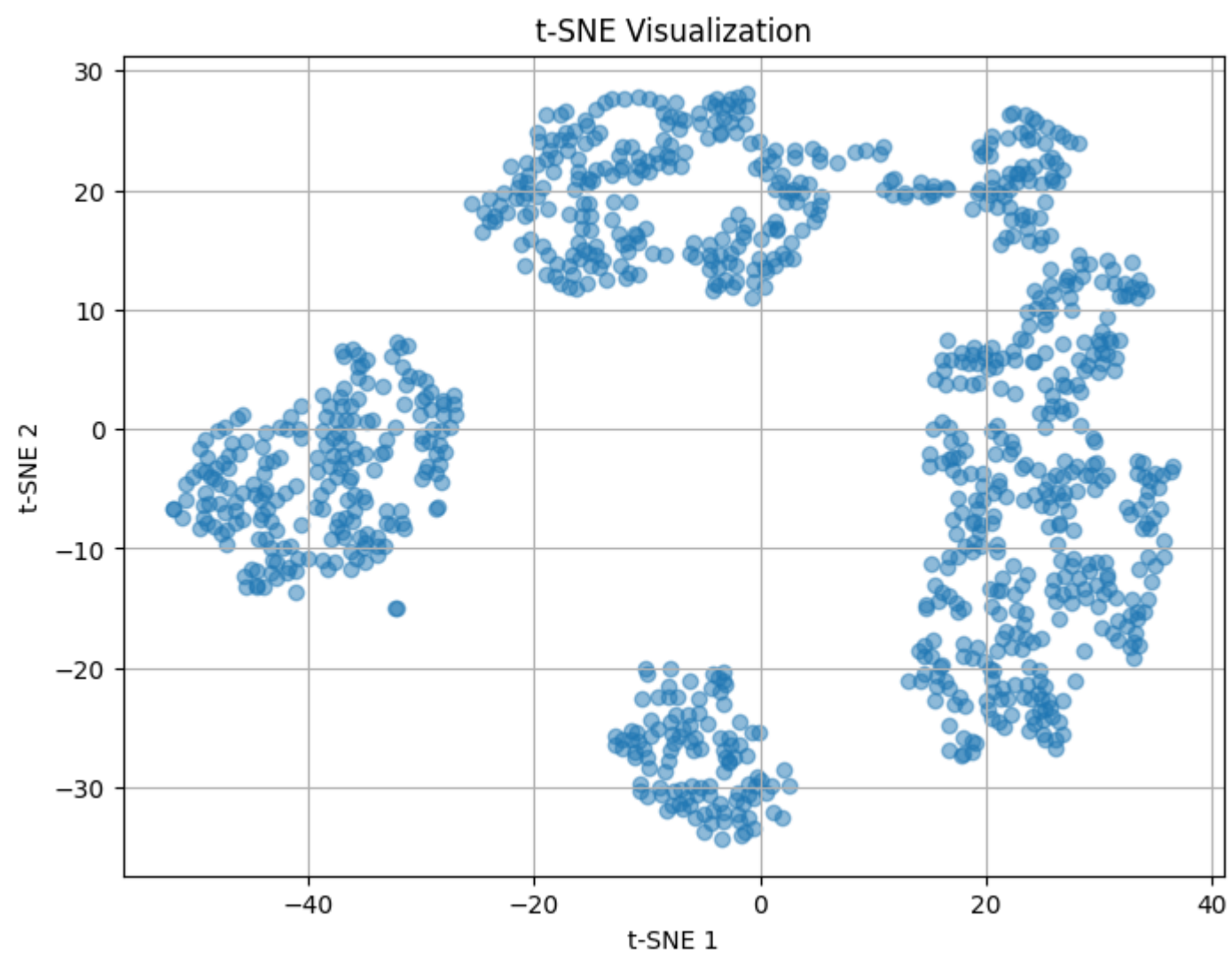
Scatter Plot of Reduced Data



UMAP Plot



t-SNE Plot



EM Algorithm Results

```
Estimated means: 1.78 (with FP), 4.91 (without FP)  
Estimated proportions: 0.36 (with FP), 0.64 (without FP)
```