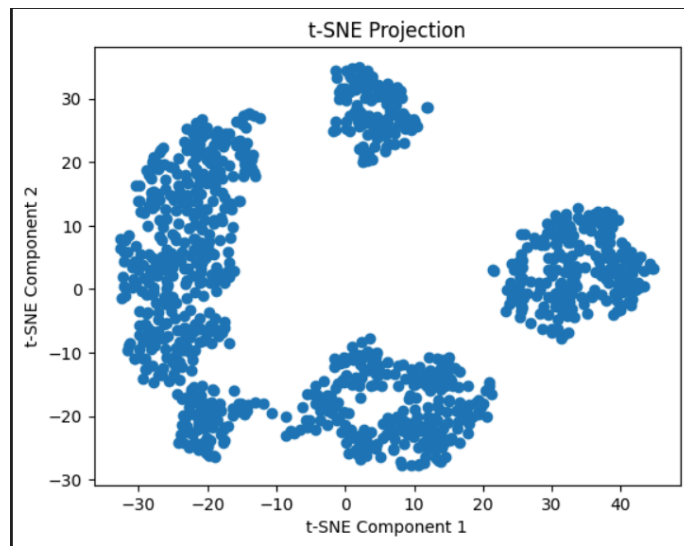
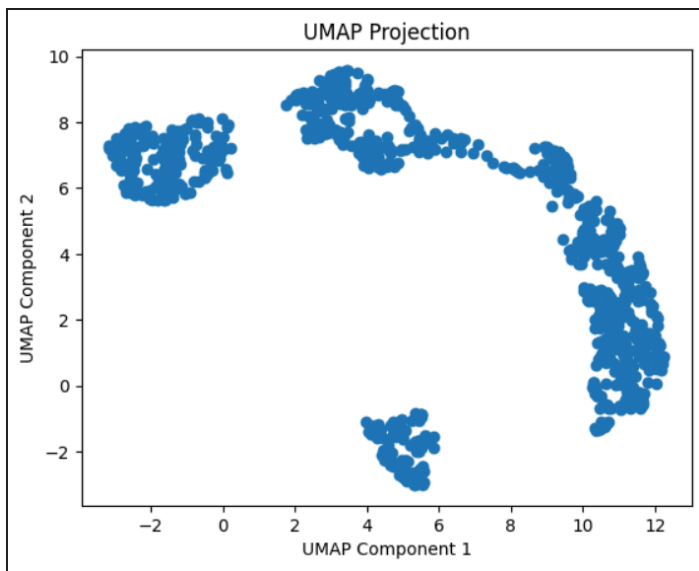
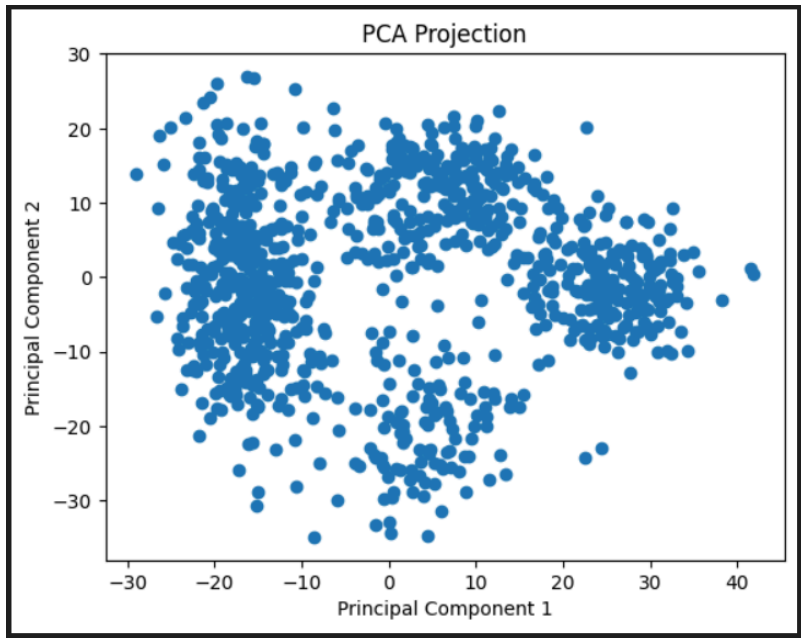


**CSE472 (Machine Learning Sessional)**  
**Assignment 4: Principal component analysis**  
**(PCA) and expectation-maximization (EM)**  
**algorithm**

**Submitted by**  
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**ID: 1905101**  
**Section: B2**

# How To Run:

- **Install necessary packages:**
  - Numpy
  - Pandas
  - Scikit-learn
  - Umap-learn
  - Matplotlib
  - Scipy-stats
- **Keep the “em\_data.txt” and “pca\_data.txt” in the same folder as “1905101.ipynb” file**
- **Click Run All**



# EM Algorithm

Mean number of children in families with family  
planning: 1.7823745486412828

Mean number of children in families without  
family planning: 4.910690671881276

Proportion of families with family planning:  
0.3560032388056196

Proportion of families without family planning:  
0.6439967611943804