IE 425

Homework 4 (due May 30, Monday @23:59)

East-West Airlines is trying to learn more about its customers. Key issues are their flying patterns, earning and use of frequent flyer rewards, and use of the airline credit card. The task is to identify customer segments via clustering. The file EastWestAirlines.xlsx contains information on 4000 passengers who belong to an ariline's frequent flier program. For each passenger the data include information on their mileage history and on different ways they accrued or spent miles in the last year. The goal is to try to identify clusters of passengers that have similar charactersitics for the purpose of targeting different segments for different types of mileage offers.

a. Apply hierarchical clustering with Euclidean distance and complete linkage. How many clusters appear to be appropriate when the silhoutte index is used?

b. Compare the cluster centroids to characterize the different clusters and try to give each cluster a label.

c. To check the stability of the clusters, remove a random 5% of the data (200 observations), and repeat the analysis. Does the same picture emerge? Use 425 as the seed.

d. Use *k*-means algorithm with different number of clusters. What is the best number of clusters using the silhoutte index?

e. Which clusters would you target for offers, and what type of offers would you target to customers in that cluster?