Problem set 6
Hierarchical clustering

Excercise 1

Given the following set of 2-dimnesional points $X_1 = (2, 10), X_2 = (2, 5), X_3 = (8, 4), X_4 = (5, 8), X_5 = (7, 5), X_6 = (6, 4), X_7 = (1, 2), X_8 = (4, 9)$ apply single-linkage agglomerative clustering using Euclidean distance. Draw a dendrogram representing the resulting hierarchy of clusters.

Excercise 2

The dataset consists of four objects with pairwise distances given by the following distance matrix

$$\begin{pmatrix} 0 & 1 & 4 & 5 & 7 \\ 1 & 0 & 2 & 6 & 2.5 \\ 4 & 2 & 0 & 3 & 8 \\ 5 & 6 & 3 & 0 & 4 \\ 7 & 2.5 & 8 & 4 & 0 \end{pmatrix}.$$

1. Cluster dataset using single-linkage agglomerative clustering. Draw the corresponding dendrogram.
2. Cluster dataset using complete-linkage agglomerative clustering. Draw the corresponding dendrogram.