Problem 1: Kapok trees

In the remote wilderness of the Amazon Rainforest, there is a region known as the *Jungle Sanctuary* that has witnessed a long history of natural disturbances, including massive wildfires. The file `kapok.txt` contains information on 294 ancient Kapok trees, specifically recording their heights (in meters) and trunk diameters (in meters).

a) Conduct a cluster analysis of the Kapok trees using a hierarchical clustering method (Euclidean distance and Ward linkage). Report the number of clusters you deem appropriate to represent the data, the centroids of the clusters, and their size. Additionally, provide a possible interpretation regarding the possible number of historical wildfires that affected the growth of the *Jungle Sanctuary*.

b) Calculate Bonferroni intervals at a global significance level of 90% for both the mean and variances of the trunk diameters within each of the clusters identified in (a). Introduce and verify the appropriate assumptions.