Hierarchical Clustering and k-means Worksheet

1. Here are some of the grades on the first midterm. Cluster the grades using the k-means algorithm (k = 3). Use the following initial clusters (95, 85, 75).  
     
   86, 90, 72, 100, 62, 75, 99, 85, 70, 80, 89, 82, 95, 92, 95, 66, 71, 71, 96, 88, 70, 85  
     
   **Answer:**  
   The resulting centroids are 96.17, 85.63, and 69.63  
     
   The clusters are:  
   100, 99, 95, 92, 95, 96  
   86, 90, 85, 80, 89, 82, 88, 85  
   72, 62, 75, 70, 66, 71, 71, 70
2. Using the grades from the previous problem, create a hierarchical cluster tree (dendrogram). Use the average linkage distance (also known as unweighted average distance (UPGMA)). Show the calculations and the resulting dendrogram.  
     
   **Answer:**  
   