Exercises

1. The toothpaste data is from a meta-analysis of studies comparing two different toothpastes.

```
##Exercise 1
data(toothpaste, package="HSAUR3")
toothpaste
```

Study	nA	meanA	sdA	nB	meanB	sdB
1	134	5.96	4.24	113	4.72	4.72
2	175	4.74	4.64	151	5.07	5.38
3	137	2.04	2.59	140	2.51	3.22
4	184	2.70	2.32	179	3.20	2.46
5	174	6.09	4.86	169	5.81	5.14
6	754	4.72	5.33	736	4.76	5.29
7	209	10.10	8.10	209	10.90	7.90
8	1151	2.82	3.05	1122	3.01	3.32
9	679	3.88	4.85	673	4.37	5.37

(a) Perform kmeans clustering and plot the result. Do not scale the data for this exercise.
(b) Draw a silhouette plot using the clusters obtained from kmeans analysis.

2. The “ProteinEurope” data set shows nutrition data for different types of protein in European countries around 1970.

Data source: http://www.math.umd.edu/~petersd/666/html/proteinex.html

(a) Perform **kmeans** clustering and plot the result. Assume 2 clusters. Do not scale the data for this exercise.
(b) Draw a **silhouette plot** using the clusters obtained from **kmeans analysis**.
(c) What are the significant differences among the clusters?
(d) Plot a cluster dendrogram.