

### Question 1

For this exercise we will be using the ***cities*** data that is found in the *psych* package in R.

Run the following lines of code to obtain the dissimilarity matrix that we will work with.

```
library(psych)
```

```
data(cities)
```

```
cities
```

- a) Using the first 4 (four) cities, ATL, BOS, ORD and DCA. Perform the classical scaling algorithm *by first principals* to obtain the principals coordinates. Plot the principal coordinates in 2 dimensions. You can use R to create matrices and perform the Eigen value decomposition.
- b) Use the function *cmdscale* in R to check check your answer in part (a).
- c) Perform the classical scaling algorithm to the entire dissimilarity matrix and obtain the principal coordinates. Plot the resulting coordinates in 2 dimensions.