# Ch2

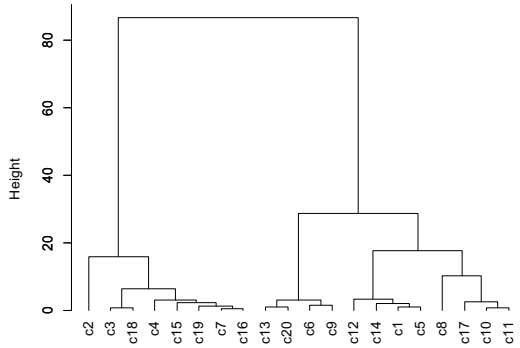
**Hierarchical clustering**

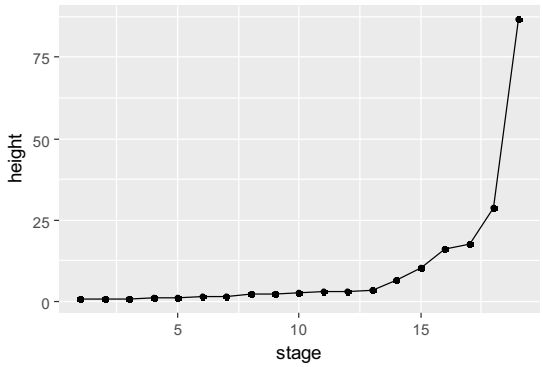
scale(x) – standardization (col by col)

d<-dist(x, method = "euclidean")^2 – distance

fit.hc<-hclust(d, method = "complete"/"ward.D2"/"single"/"ward.D"/"average"/"centroid")

# dendrogram or distance plot

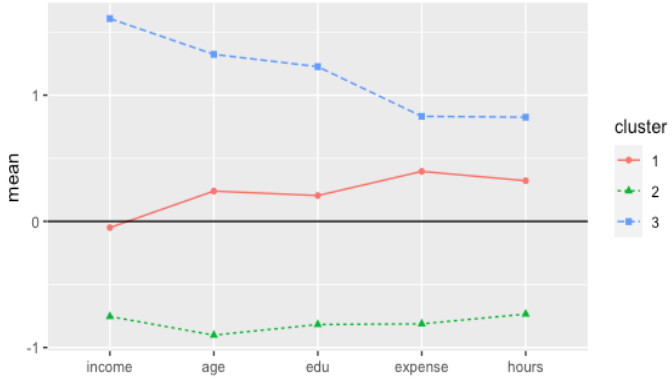



cluster<-cutree(fit.hc, k)

centers<-aggregate(x = data, by = list(cluster = cluster), FUN = mean)

# profile plot




**K-means**

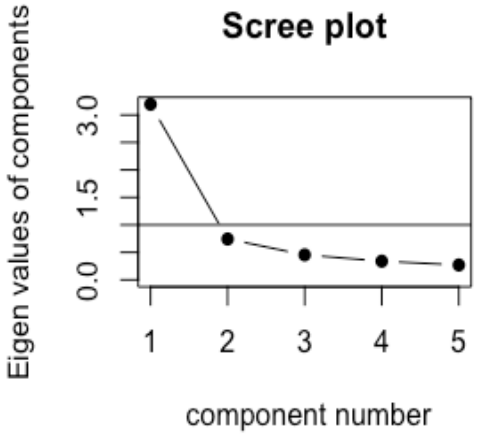
fit.km<-kmeans(x = data, centers = num/centers, algorithm = "Hartigan-Wong"/"Lloyd"/"Forgy"/"MacQueen") (set.seed(123) if num)

# Ch3

**Principal component method**

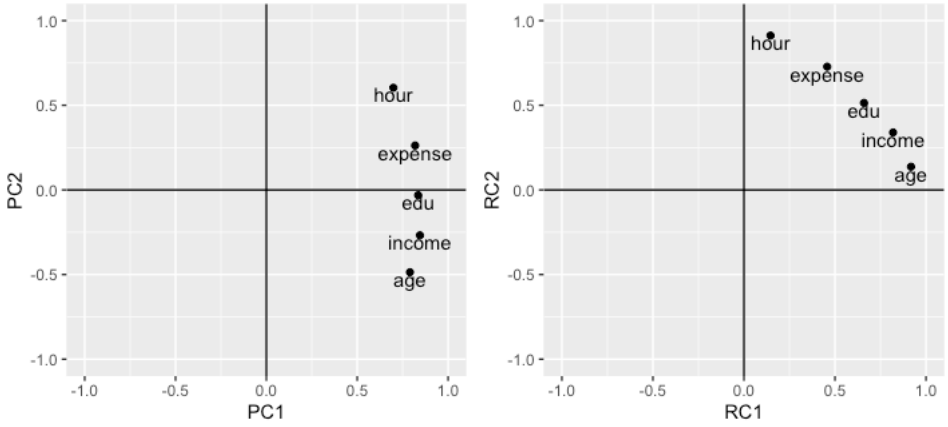
(fit.pc.full<-principal(data, nfactors = num, rotate = "none"))

scree(data, factor = F) (correlation matrix)

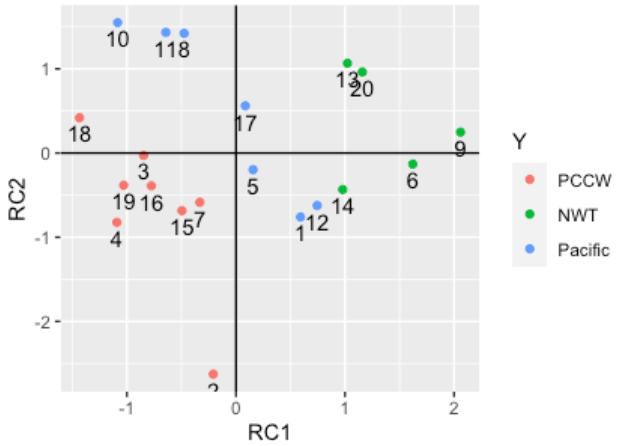



fit.pc.rot<−principal(data, nfactors = 2, rotate = "varimax"/"quartimax"/"promax") (correlation matrix or covar = T) (regression by default)

# loading plots before and after factor rotations




# factor score plot



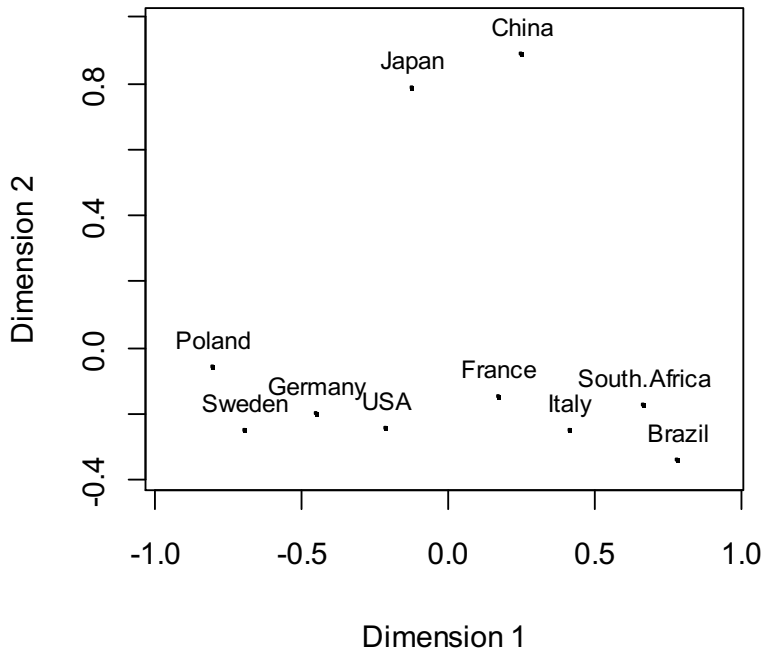
**Maximum likelihood method**

fit.pc.ml<-fa(data, nfactors = 2, rotate = "none"/"varimax"/"quartimax", fm = "ml") (correlation matrix or covar = T) (regression by default)

## Ch4

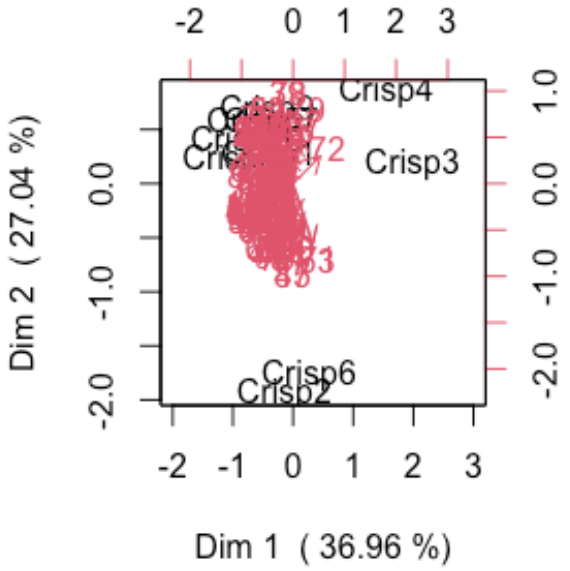
**Dissimilarity (distance) matrix**

fit.dc<-mds(delta, ndim=2, type="interval"/"ratio"/"ordinal")
(ordinal=nonmetric MDS, compare the stress)
# perceptual map




**Preference matrix**

fit.pr<-cmdpref(pref, ndim = 2, monotone = T/F) (Rows as objects and columns as subjects. Small value for less preferable and large value for more preferable.)
# joint plot for object coordinates and subject ideal vectors




**Disimilarity matrices provided by several individuals (INDSCAL model)**

fit.in<−indscal(delta, ndim=2, type="interval"/"ratio"/"ordinal")

(ordinal=nonmetric MDS, compare the stress)

# perceptual map for objects and weighting plot for subjects