Exercises

1. Conduct PCA using the data set, *attitude* {datasets}.
(1) Report the determinant of correlation matrix, p-value from the Bartlett's chi-square test, and the KMO value. Is this dataset suitable for PCA?
(2) How many principal components have eigenvalues ≥1.0? Use scree plot.
(3) What are the principal component equations to generate the scores?
(4) Plot a diagram of the principal components to reveal graphically its component structure. Look up the usage for the *fa.diagram()* function and utilize it.

2. Conduct PCA using the data set, *USArrests* {datasets}.
(1) What are the principal component equations to generate the scores?
(2) Plot the first two principal components for the USArrests by using *biplot*.
Interpret the results: Among the crime-related variables, which variables are correlated and which variables appear as uncorrelated? What can we tell about California? How is it different to Mississipi or North Dakota?