FactorC2 <- read.csv("SHOESC.csv") #Imports data

summary(FactorC2) #Gives summary of data

correl = cor(FactorC2) #Gives correlation matrix

correl

# for factor analysis

install.packages("psych") #installs required package #R packages are extensions to the R statistical programming language. R packages contain functions, code, data, and documentation in a standardised collection format that can be installed by users of R, typically via a centralised software repository such as CRAN(Comprehensive R Archive Network: cran.r-project.org)

library(psych) #After installing the package it activates the library

#detach("package:psych", unload = T)

# Bartlett's test of spherecity ("psych")

cortest.bartlett(correl, n = nrow(FactorC2)) # n is the sample size of the dataset, correl is the correlation matrix

#cortest.bartlett(correl, n = 30)

#cortest.bartlett(correl, n = nrow(FactorC2[, -c(2,4)])) #we can keep removing the redundant variable one by one and check the improvement in the output/result

#D

# KMO (Kaiser-Meyer-Olkin) test for sampling adequacy

KMO(correl)

#MSA is measure of sampling adequacy

#PCA

?pca

pca1 = pca(correl, nfactors = 20,method = "regression", rotate = "none") #Gives factors/components/ segments

pca1

pca2 = pca(correl, nfactors = 7, method = "regression", rotate = "none") #Gives relevant factors/components/ segments

pca2

pca3 = pca(correl, nfactors = 7, method = "regression", rotate = "varimax") #Gives IMPROVED relevant factors/components/ segments

pca3

# RC1,...(rotated component matrix)

#pca3$values

#pca3$communality

print(pca3$loadings, digits = 2, cutoff = .5) #It gives factor loading with minimum 0.5 value

# Finally check for factor loadings. cross loadings,communality, cummulative variance (and threshold values of Bartlet's, KMO & Eigenvalue are met)

pca3$r.scores