**Key for PCA**

library("factoextra")

my\_data <- read.csv(file.choose())

res.pca <- prcomp(my\_data, scale = TRUE)

fviz\_eig(res.pca)

to calculate the individual PCA for treatment/ genotype/variety

fviz\_pca\_ind(res.pca,

col.ind = "cos2", # Color by the quality of representation

gradient.cols = c("#00AFBB", "#E7B800", "#FC4E07"),

repel = TRUE # Avoid text overlapping

)

to calculate the PCA of parameter

fviz\_pca\_var(res.pca,

col.var = "contrib", # Color by contributions to the PC

gradient.cols = c("#00AFBB", "#E7B800", "#FC4E07"),

repel = TRUE # Avoid text overlapping

)

**Correlation keys**

library(corrplot)

## corrplot 0.90 loaded

M = cor(Core.xlsx)

1. corrplot(M, method = 'number') # colorful number
2. corrplot(M, order = 'AOE') # after 'AOE' reorder

Link of R studio

<https://www.rstudio.com/products/rstudio/download/#download>

R Link

<https://cran.r-project.org/bin/windows/base/>

https://getintopc.com/softwares/3d-cad/originpro-2021-free-download/

**“install.packages(“gplots”)”**

Type **“library(gplots)”** and then press the **Enter/Return** key.

1. ggplot2

install.packages("ggplot2")

library(ggplot2)

1. data.table

install.packages("data.table")

library(data.table)

1. dplyr

install.packages("tidyverse")

install.packages("dplyr")

library(dplyr)

1. tidyr

install.packages("tidyr")

library(tidyr)

install.packages(corrplot)

Run Libarries before working

#First Code is For PCA Correlation.

library(factoextra)

my\_data<- read.csv(file.choose())

res.pca<- prcomp(my\_data,scale=TRUE)

fviz\_eig (res.pca)

#to calculate the individual PCA fro treatment/genotype/variety

fviz\_pca\_ind(res.pca,

col.ind="cos2", #color by quality

gradient.cols=c("#00AFBB", "#E7B800", "#FC4E07"),

repel= TRUE #avoid overlapping

)

#to calculate PCA of PARAMETER

fviz\_pca\_var(res.pca,

col.var = "contrib", #color by contribution

gradient.cols = c("#00AFBB", "#E7B800", "#FC4E07"),

repel = TRUE

)

#co-relation plot 1

#Method “circle”, “square”, “ellipse”, “number”, “shade”, “color”, “pie”

library(corrplot)

M=cor(DATAX)

corrplot(M,method = "pie")

library(corrplot)

M=cor(DATAX)

corrplot(M, method = 'pie', order = 'AOE', addCoef.col = 'black', tl.pos = 'd',

cl.pos = 'n', col = COL2('BrBG'))

--------------------------------------------------------------

#co-relation plot 2

#order 'AOE', 'FPC', 'hclust', 'alphabet'

library(corrplot)

M=cor(DATAX)

corrplot(M,order="AOE")

library(corrplot)

M=cor(DATAX)

corrplot(M, method = 'pie', order = 'alphabet')

## bottom color legend, diagonal text legend, rotate text label

library(corrplot)

M=cor(DATAX)

corrplot(M, order = 'AOE', cl.pos = 'b', tl.pos = 'd',

col = COL2('PRGn'), diag = FALSE)

library(corrplot)

M=cor(DATAX)

corrplot(M, order = 'AOE', addCoef.col = 'black', tl.pos = 'd',

cl.pos = 'n', col = COL2('PiYG'))

## remove color legend, text legend and principal diagonal glyph

library(corrplot)

M=cor(DATAX)

corrplot(M, order = 'AOE', cl.pos = 'n', tl.pos = 'n',

col = c('white', 'black'), bg = 'gold2')

## add all p-values

library(corrplot)

M=cor(DATAX)

corrplot(M, p.mat = testRes$p, insig = 'p-value', sig.level = 1.0)

M=cor(DATAX)

corrplot(M, p.mat = testRes$p, method = 'color', diag = FALSE, type = 'upper',

sig.level = c(0.001, 0.01, 0.05), pch.cex = 0.9,

insig = 'label\_sig', pch.col = 'grey20', order = 'AOE')

------------------------------------------------------------------------

#chat.correlation

# install.packages("Performance Analytics")

install.packages("PerformanceAnalytics")

library(PerformanceAnalytics)

chart.Correlation(Filename, histogram = TRUE, method = "pearson")

#psych relation

install.packages("psych")

library(psych)

pairs.panels(DATAX,

smooth = TRUE, # If TRUE, draws loess smooths

scale = FALSE, # If TRUE, scales the correlation text font

density = TRUE, # If TRUE, adds density plots and histograms

ellipses = TRUE, # If TRUE, draws ellipses

method = "pearson", # Correlation method (also "spearman" or "kendall")

pch = 21, # pch symbol

lm = FALSE, # If TRUE, plots linear fit rather than the LOESS (smoothed) fit

cor = TRUE, # If TRUE, reports correlations

jiggle = FALSE, # If TRUE, data points are jittered

factor = 2, # Jittering factor

hist.col = 4, # Histograms color

stars = TRUE, # If TRUE, adds significance level with stars

ci = TRUE) # If TRUE, adds confidence intervals