About the transformation - dt\_pca: Principal Component Analysis (PCA) to project data onto orthogonal components with highest variance. Allows defining the number of components.

Environment setup.

# installation   
#install.packages("daltoolbox")  
  
# loading DAL  
library(daltoolbox)

Load data and PCA idea.

# Dataset for example  
iris <- datasets::iris  
head(iris)

## Sepal.Length Sepal.Width Petal.Length Petal.Width Species  
## 1 5.1 3.5 1.4 0.2 setosa  
## 2 4.9 3.0 1.4 0.2 setosa  
## 3 4.7 3.2 1.3 0.2 setosa  
## 4 4.6 3.1 1.5 0.2 setosa  
## 5 5.0 3.6 1.4 0.2 setosa  
## 6 5.4 3.9 1.7 0.4 setosa

# PCA

PCA finds a projection capturing the largest possible variance in the data. Below, we fit PCA and transform the dataset.

# cria e ajusta PCA usando a coluna alvo para referência  
mypca <- dt\_pca("Species")  
mypca <- fit(mypca, datasets::iris)  
iris.pca <- transform(mypca, iris)

# PCA properties

print(head(iris.pca))

## PC1 PC2 Species  
## 1 2.640270 -5.204041 setosa  
## 2 2.670730 -4.666910 setosa  
## 3 2.454606 -4.773636 setosa  
## 4 2.545517 -4.648463 setosa  
## 5 2.561228 -5.258629 setosa  
## 6 2.975946 -5.707321 setosa

print(head(mypca$pca.transf))

## PC1 PC2  
## Sepal.Length 0.5210659 -0.37741762  
## Sepal.Width -0.2693474 -0.92329566  
## Petal.Length 0.5804131 -0.02449161  
## Petal.Width 0.5648565 -0.06694199

Manually set the number of components and repeat the transformation.

# Definição manual do número de componentes  
mypca <- dt\_pca("Species", 3)  
mypca <- fit(mypca, datasets::iris)  
iris.pca <- transform(mypca, iris)  
print(head(iris.pca))

## PC1 PC2 PC3 Species  
## 1 2.640270 -5.204041 2.488621 setosa  
## 2 2.670730 -4.666910 2.466898 setosa  
## 3 2.454606 -4.773636 2.288321 setosa  
## 4 2.545517 -4.648463 2.212378 setosa  
## 5 2.561228 -5.258629 2.392226 setosa  
## 6 2.975946 -5.707321 2.437245 setosa

print(head(mypca$pca.transf))

## PC1 PC2 PC3  
## Sepal.Length 0.5210659 -0.37741762 0.7195664  
## Sepal.Width -0.2693474 -0.92329566 -0.2443818  
## Petal.Length 0.5804131 -0.02449161 -0.1421264  
## Petal.Width 0.5648565 -0.06694199 -0.6342727