# FEATURE EXTRACTİON METHODS

Principle Components Analysis (PCA)
Independent Component Analysis (ICA)
Linear Discriminant Analysis (LDA)

# PRİNCİPLE COMPONENTS ANALYSİS (PCA)

PCA is a statistical process that turns a set of potentially correlated observations into a set of values for linearly uncorrelated variables known as principle components.

(The most gentle introduction to Principal Component Analysis, 2022)

U

Unsupervised

L

Linear dimensionality reduction technique

C

Compress Information

D

input data to be autoscaled

B

Usually it is done before ICA

F

Find information less mutual

# INDEPENDENT COMPONENT ANALYSİS (ICA)

The machine learning technique Independent Component Analysis (ICA) is used to distinguish independent sources from a mixed input.

F

Find information less mutual

F

Focuses on maximizing the variance of the data points

S

Seperates Information

D

İnput data to be autoscaled

# LİNEAR DİSCRİMİNANT ANALYSİS (LDA)

Before the classification procedure, linear discriminant analysis (LDA) is performed to reduce the number of features to a more manageable quantity.

U

Used for multi-class classification

M

maximum separation for samples between classes

M

Minimum separation of samples within each class

# FEATURE SELECTİON METHODS

Variance  Threshold
Pearson  Correlation
Mutual Information

# VARİANCE THRESHOLD

Variance Threshold is a feature selector that removes all the low variance features from the dataset that are of no great use in modeling. It looks only at the features (x), not the desired outputs (y).

U

**Unsupervised**

S

**Shortening the huge dataset**

E

**Ordinal Encoder**

D

**Dropping Low Variance Columns**

# PEARSON CORRELATİON

Pearson’s Correlation method is used for finding the association between the continuous features and the class feature. Correlation coefficient is ±1. If the features are  uncorrelated, the correlation coefficient is 0.

F

**Filtering Method**

S

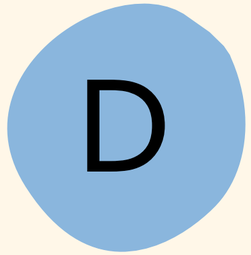
**Dependent vs Independent**

D

**Dropping Highly Correlated Columns**

# MUTUAL INFORMATION

Mutual information estimates mutual information for a discrete target variable. Mutual information between two random variables is a non-negative value, which measures the dependency  between the variables.




**Discrete Target Variable**

**Non-Negative Values**

**Rely on Non-Parametic Method**