**Intro to Unsupervised Learning**

Types of unsupervised learning

Challenges in unsupervised learning

Pre-processing and Scaling

Kinds of pre-processing

Applying Data transformations

**Dimensionality Reduction I**

Principal Component Analysis

Variance, Covariance and Covariance Matrices

Eigenvectors and Eigenvalues

**Dimensionality Reduction II**

Non-Negative Matrix Factorization

Manifold learning with t-SNE

**Association Analysis**

Apriori principle

Finding frequent itemsets

Mining association rules

CASESTUDY: Finding similar features

**Clustering I**

K-Means Clustering

Local optima

Applying clustering for Image quantization

Using clustering for Feature Generation

**Clustering II**

Agglomerative Clustering

DBSCAN