Part 23- Support Vector Machines Motivation

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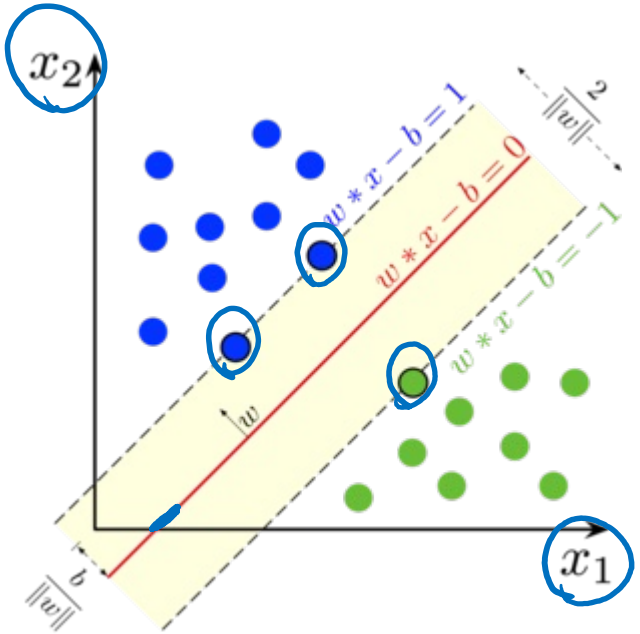
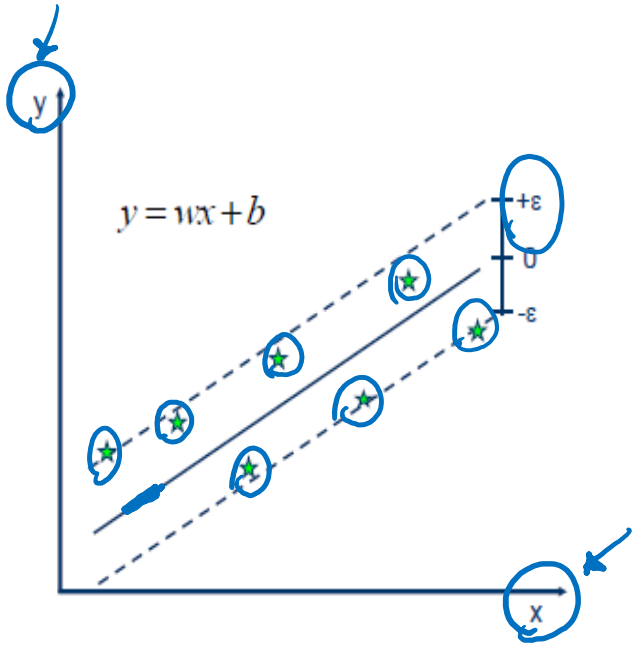
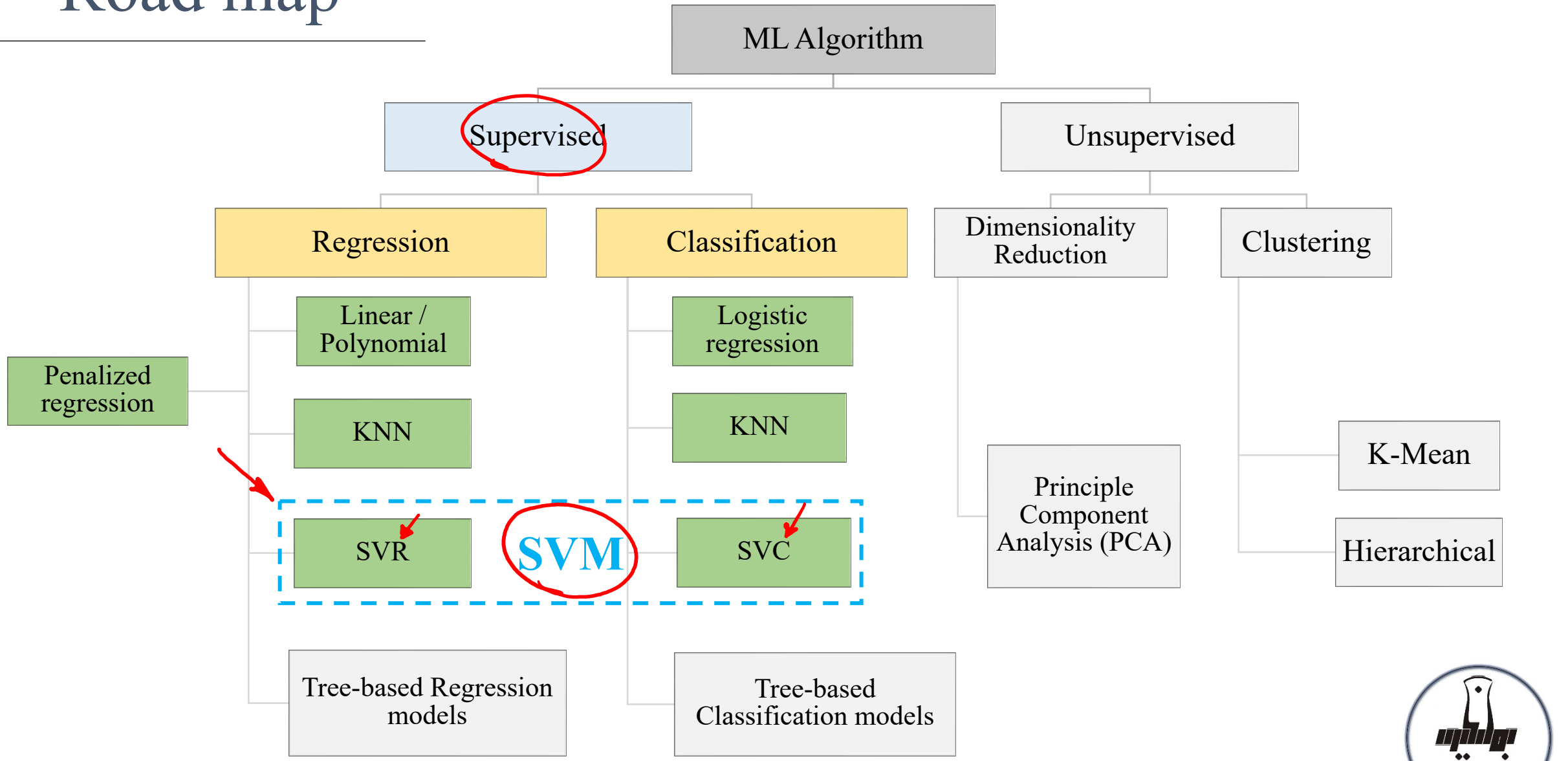




Road map


ML Algorithm
Supervised
Unsupervised
Regression
Classification
Dimensionality Reduction
Clustering
Linear / Polynomial
Logistic regression
Penalized regression
KNN
KNN
K-Mean
Principle Component Analysis (PCA)
SVR
SVM
SVC
Hierarchical
Tree-based Regression models
Tree-based Classification models

Topics

Part 23

- SVM Geometry
- SVM Motivation

Part 24

- Maximum Margin Classifier (MMC)
- Support Vector Classifiers (SVC)

Part 25

- Support Vector Machines (SVM)

Part 26

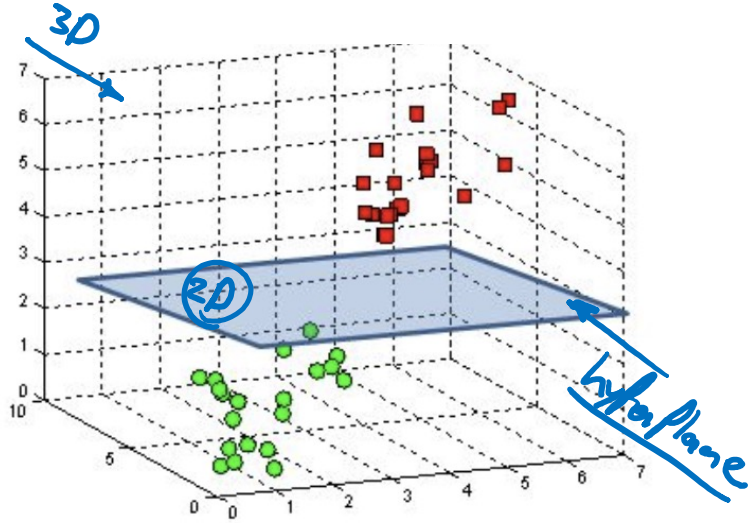
- Support Vector Regressors (SVR)

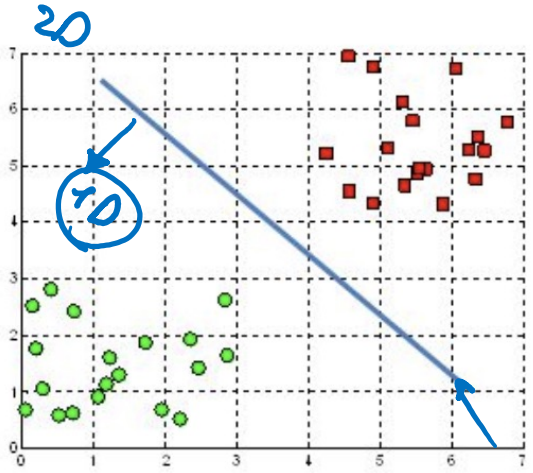
Part 27

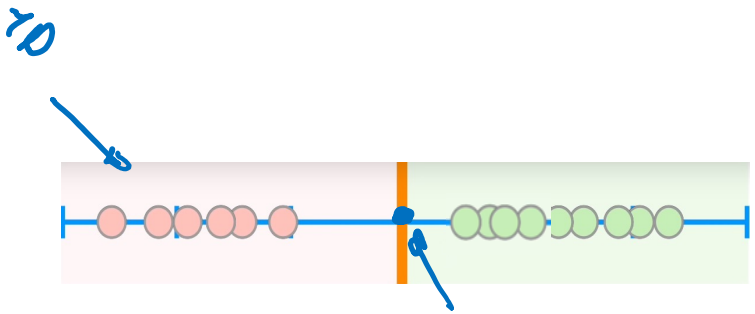
- Multiple class classification
- SVM pros and cons
- SVM applications in Finance

SVM Geometry

- In geometry, a hyperplane is a subspace whose dimension is one less than that of its ambient space. A hyperplane separates the space into two spaces.
- If a space is 3-dimensional then its hyperplanes are the 2-dimensional planes,
- If the space is 2-dimensional, its hyperplanes are the 1-dimensional lines.
- If the space is 1-dimensional, its hyperplanes are single points.

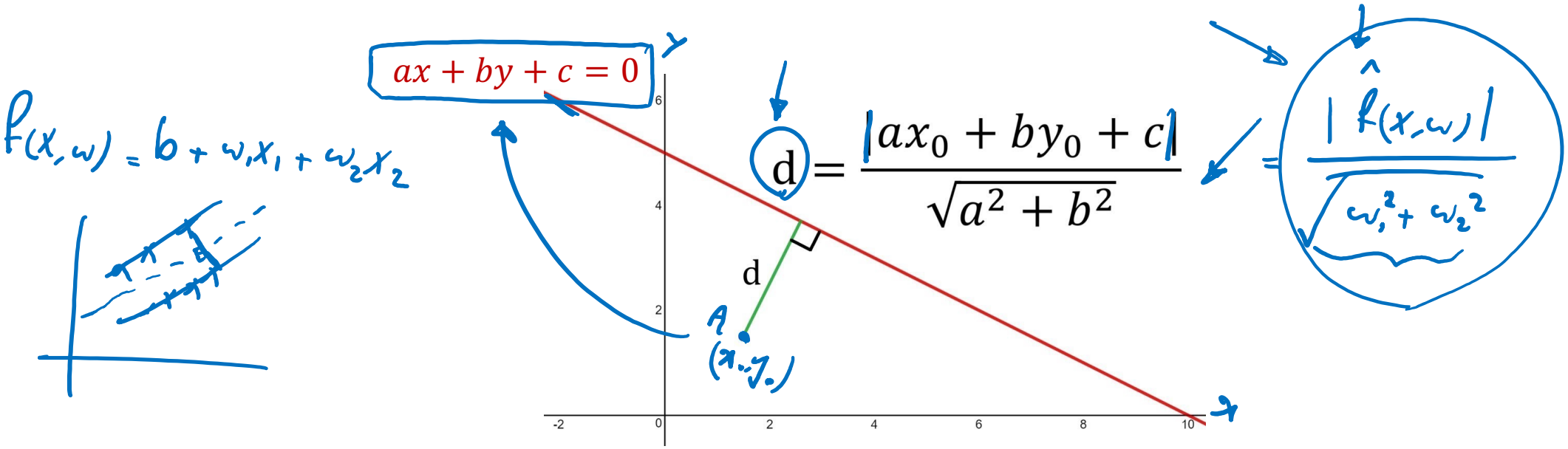






Geometry

- The perpendicular distance between two objects is the distance from one to the other, measured along a line that is perpendicular to one or both.
- The distance between a point (x_0, y_0) and a line parameterized by $ax + by + c = 0$ is equal to:



SVM Motivation

Support vector machine (SVM) is one of the most popular algorithms in machine learning. It is a powerful supervised algorithm used for classification and regression.