SMAA - StudEmo dataset

Methods for prediction of emotion - presentation

Group 2
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AGENDA

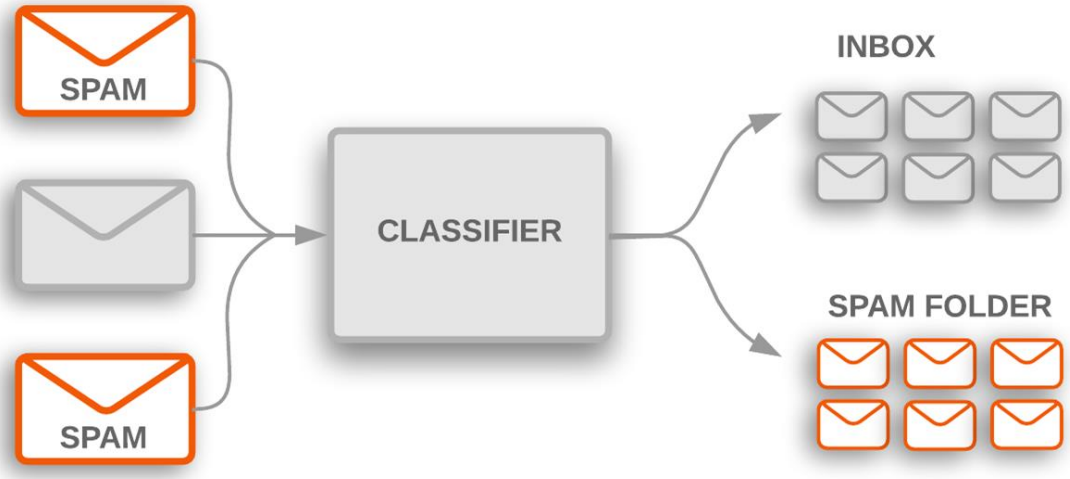
1. What is classification?
2. Dataset - StudEmo
3. Chosen methods:
    a. Decision tree
    b. Support Vector Machine (SVM)
    c. Neural Network

Source: https://thenounproject.com/icon/agenda-700063/

Source: https://machinelearningmastery.com/classification-accuracy-is-not-enough-more-performance-measures-you-can-use/

WHAT IS CLASSIFICATION?

Classification is a data science task of predicting the value of a categorical variable (target or class) by building a model based on one or more numerical and/or categorical variables (predictors or attributes).[1] In statistics, classification is the problem of identifying which of a set of categories (sub-populations) an observation, (or observations) belongs to.[2]



source:
https://developers.google.com/machine-learning/guides/text-classification/images/TextClassificationExample.png

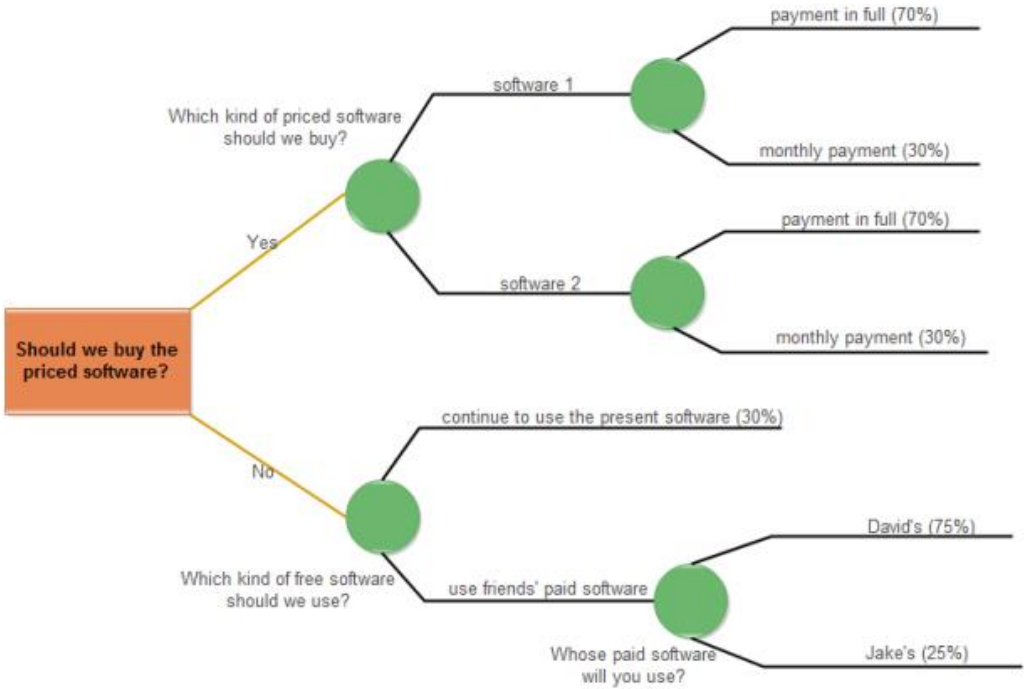
[1] Classification definition, Dr. Saed Sayad, 2021, source: saedsayad.com/classification.htm
[2] Statistical classification, source: en.wikipedia.org/wiki/Statistical_classification

DATASET

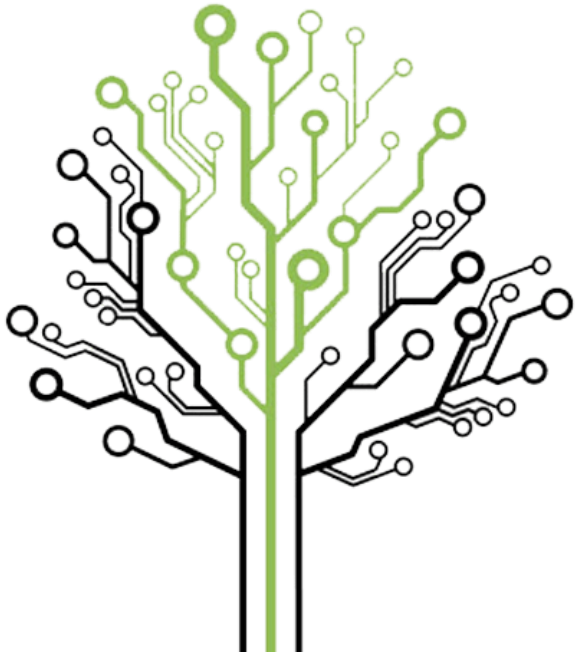
source:
https://styles.redditmedia.com/t5_2r97t/styles/communityIcon_ri05w19k4zh01.png

source:
https://miro.medium.com/max/661/1*3K9GIOVLNu0cRvQap_KaRg.png

DECISION TREE - CLASSIFICATION

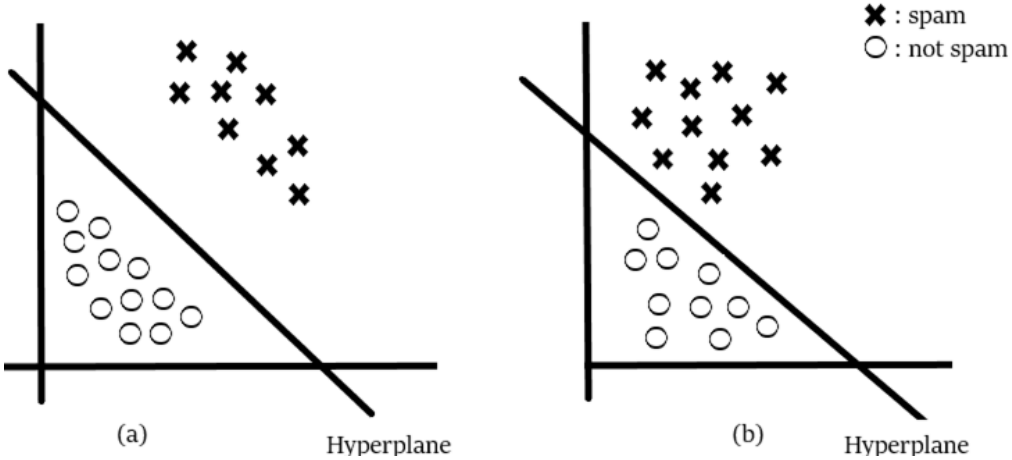


Source: https://www.edrawmax.com/decision-tree/

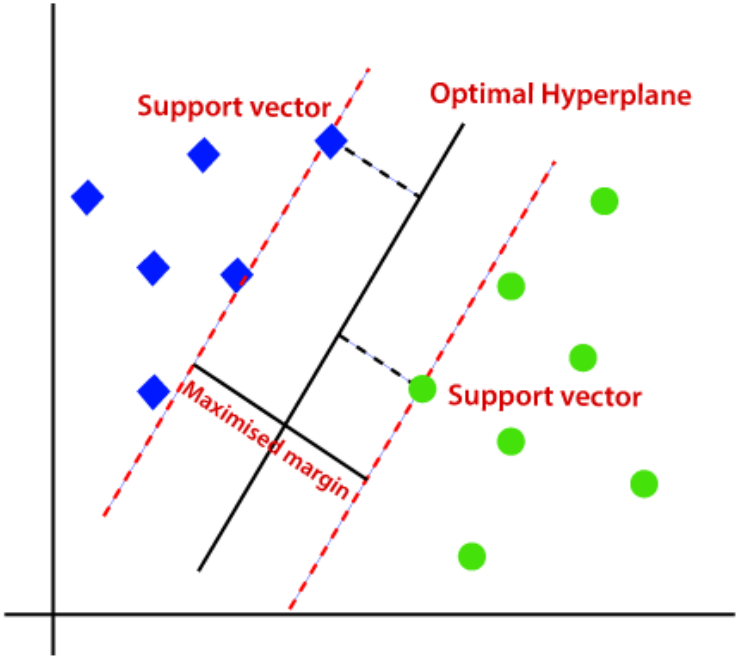


Source: https://code.4noobz.net/decision-tree-simple-example/

SUPPORT VECTOR MACHINE - SVM

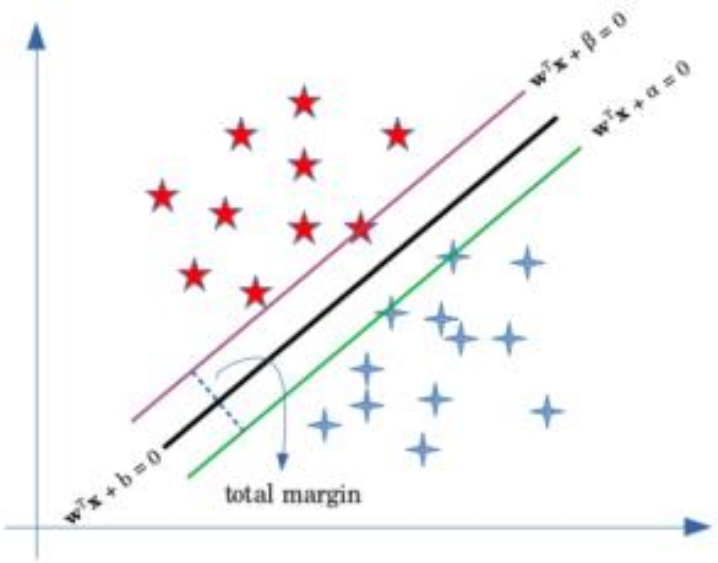


Source: https://towardsdatascience.com/support-vector-machines-svm-c9ef22815589

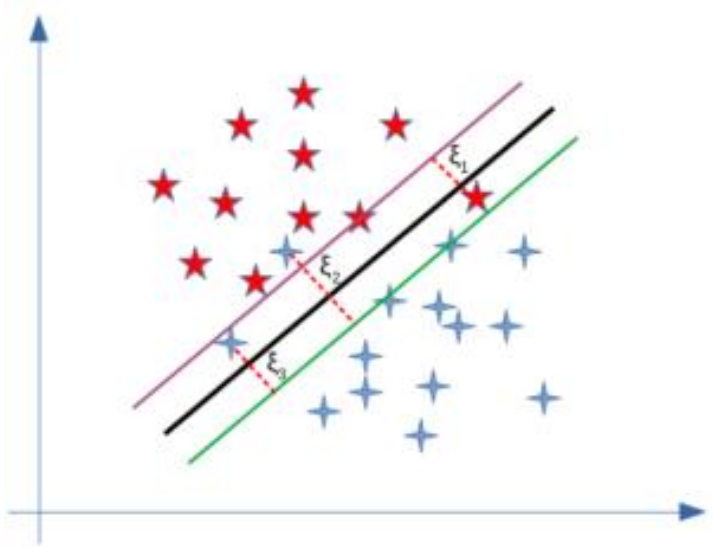


Source: https://www.javatpoint.com/machine-learning-support-vector-machine-algorithm

HARD MARGIN AND SOFT MARGIN - SVM

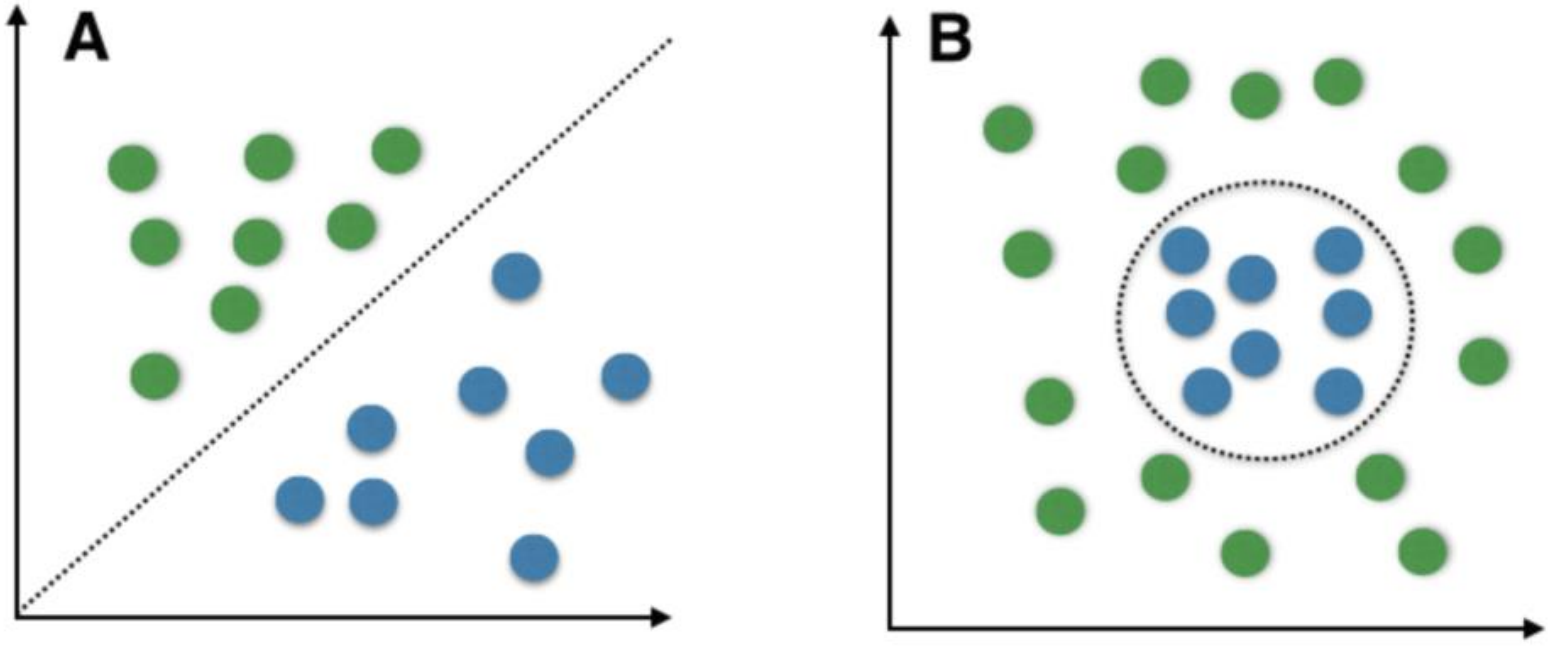


Source: https://www.baeldung.com/cs/svm-hard-margin-vs-soft-margin



Source: https://www.baeldung.com/cs/svm-hard-margin-vs-soft-margin

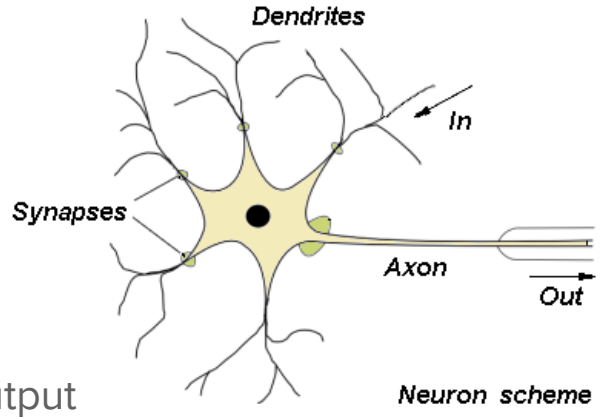
NON-LINEAR SVM - KERNEL TRICKS



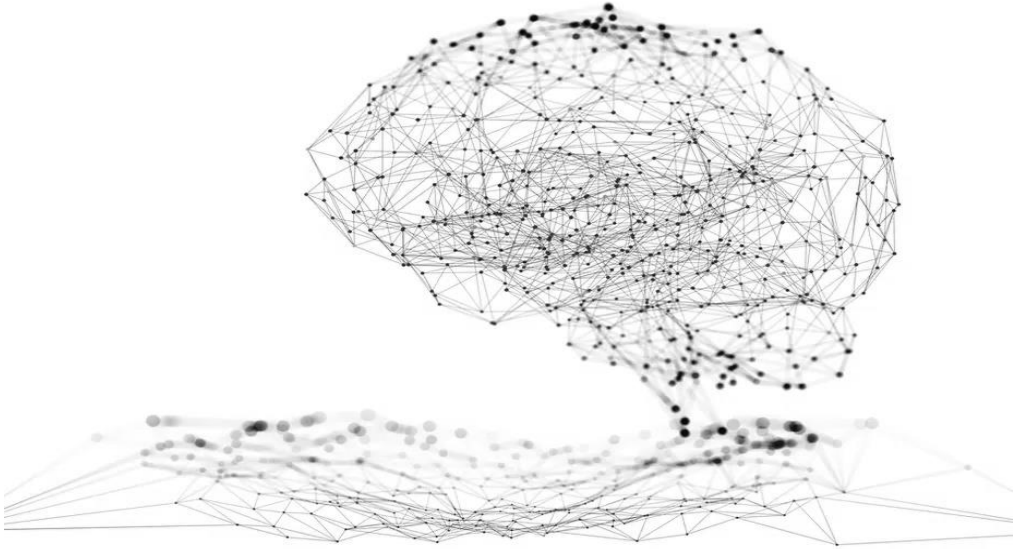
Source: https://www.geeksforgeeks.org/introduction-to-support-vector-machines-svm/

NEURAL NETWORK - BASICS

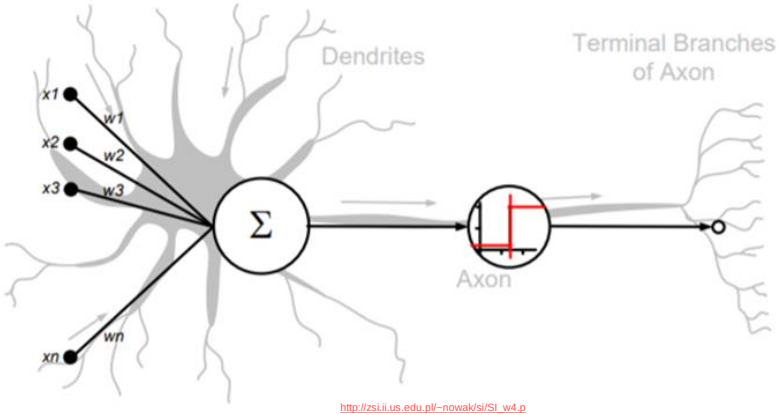
- ★ Artificial Neural network - imitation of biological one
- ★ Dendrites, Synapses, Axon
- ★ Many Inputs, Weights, Sum junction, Activation function, Output



https://home.agh.edu.pl/~vlsi/AI/intro/



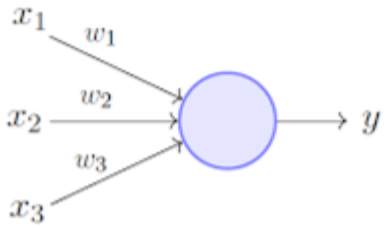
Source: https://theconversation.com/what-is-a-neural-network-a-computer-scientist-explains-151897



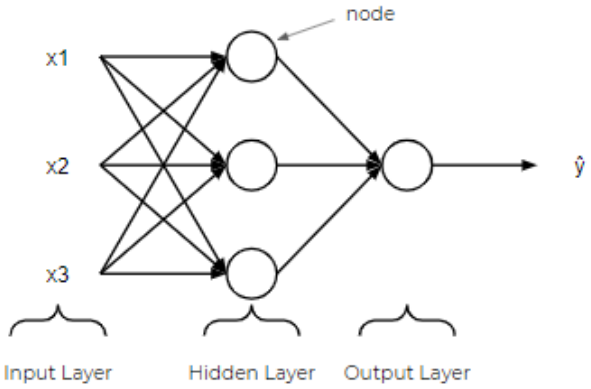
http://zsi.ii.us.edu.pl/~nowak/si/SI_w4.pdf

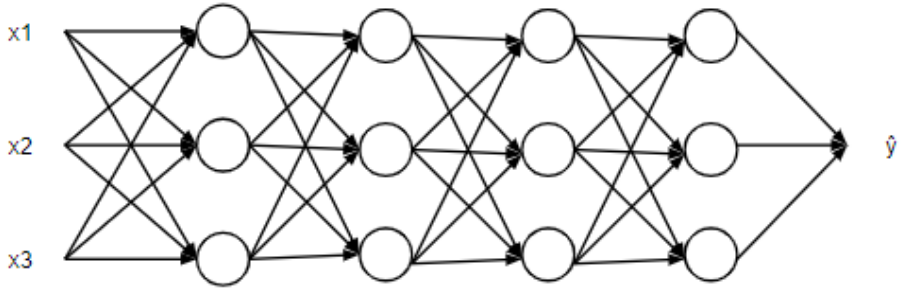
NEURAL NETWORK - BASICS

- ★ Perceptron - simple model of neuron
- ★ Most NN have Input Layer, Hidden Layer/s, Output Layer
- ★ Many Inputs, Weights, Sum junction, Activation function, Output



Perceptron - single layer
https://towardsdatascience.com/what-is-a-perceptron-210a50190c3b





https://towardsdatascience.com/a-beginner-friendly-explanation-of-how-neural-networks-work-55064db60df4

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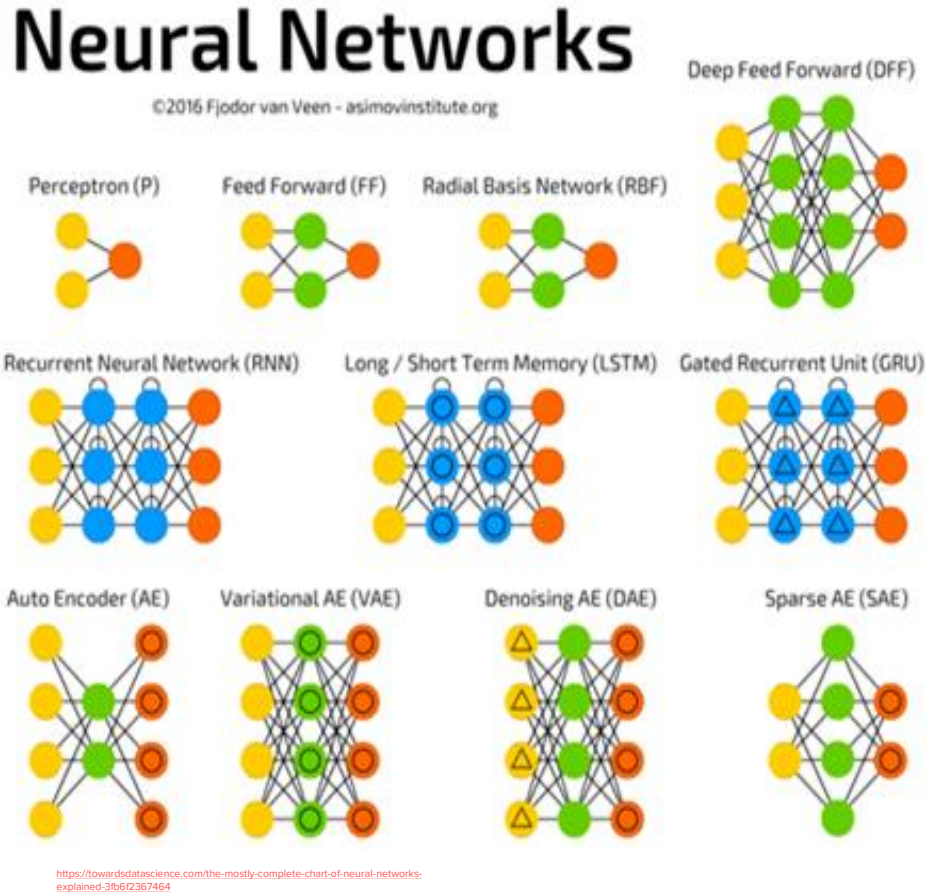
NEURAL NETWORK

- ★ Paradigm (Supervised, unsupervised)
- ★ Learning rule
- ★ Architecture (Single/Multi Layer,

  FeedForward/Competitive, ANN, RNN, CNN...)

- ★ Learning Algorithm



https://towardsdatascience.com/the-mostly-complete-chart-of-neural-networks-explained-3fb6f2367464

Advantages: computational power, non-linear modeling capabilities, multiple applications – e.g. text classification/prediction

Thank you for your attention!

Any questions?