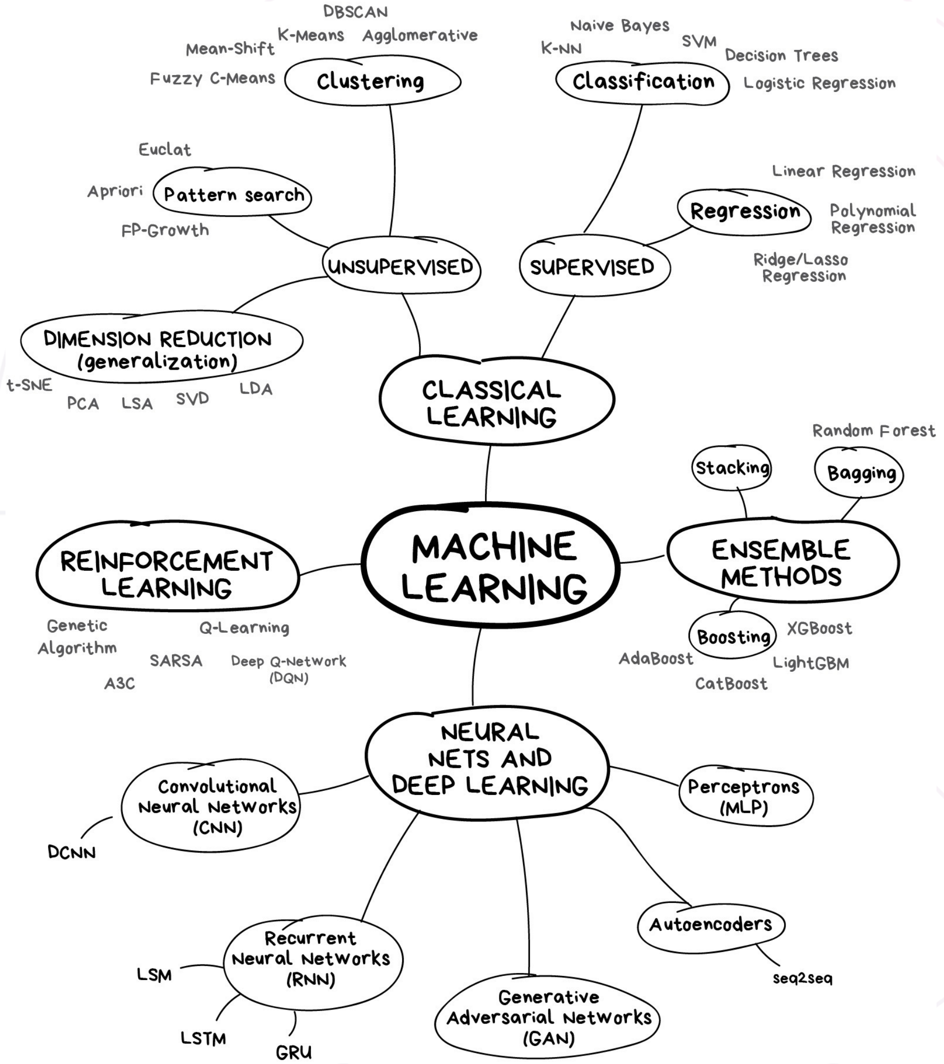
6 AI Algorithms

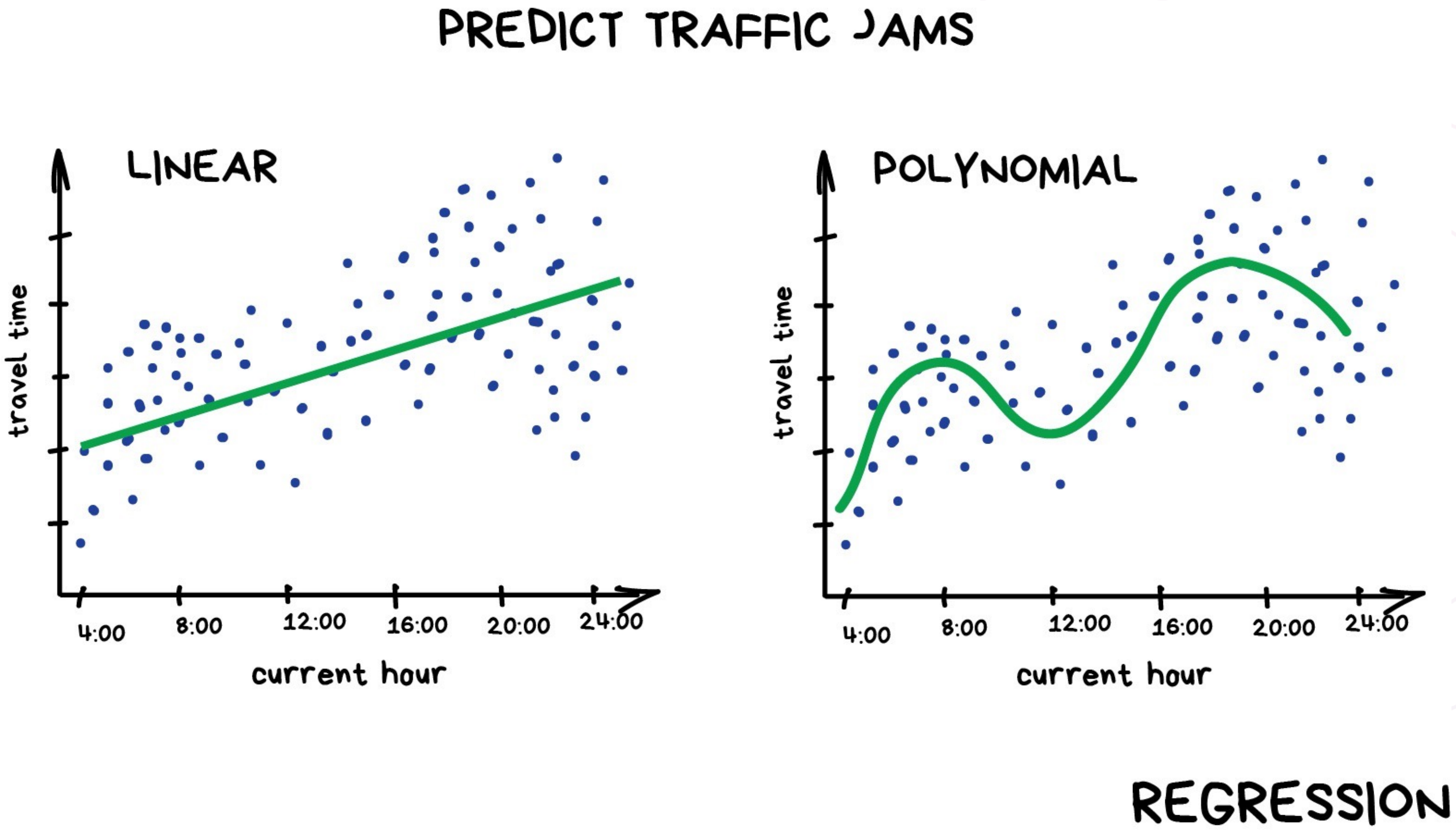
Overview of algorithms

vas3k – Machine Learning

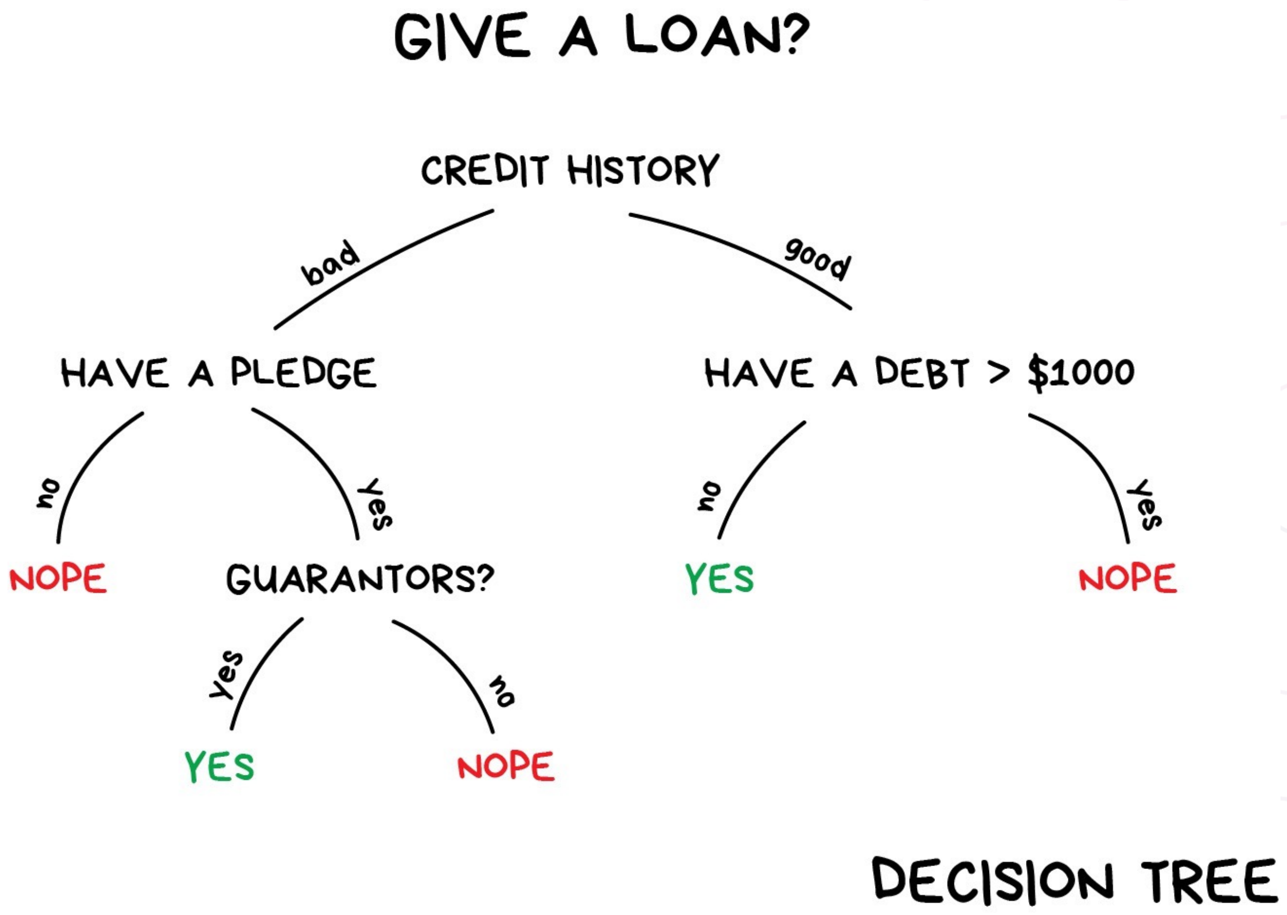
- Very interesting introductory blog on AI algorithms
- Pictures in this section taken from this blog (credits to vas3k)


DBSCAN
K-Means
Agglomerative
Mean-Shift
Fuzzy C-Means
Clustering
Naive Bayes
K-NN
SVM
Decision Trees
Classification
Logistic Regression
Euclat
Apriori
Pattern search
FP-Growth
Linear Regression
Regression
Polynomial Regression
Ridge/Lasso Regression
UNSUPERVISED
SUPERVISED
DIMENSION REDUCTION (generalization)
t-SNE
PCA
LSA
SVD
LDA
CLASSICAL LEARNING
Random Forest
Stacking
Bagging
REINFORCEMENT LEARNING
MACHINE LEARNING
ENSEMBLE METHODS
Genetic Algorithm
Q-Learning
SARSA
Deep Q-Network (DQN)
A3C
Boosting
XGBoost
AdaBoost
LightGBM
CatBoost
NEURAL NETS AND DEEP LEARNING
Convolutional Neural Networks (CNN)
DCNN
Perceptrons (MLP)
Autoencoders
seq2seq
Recurrent Neural Networks (RNN)
LSM
LSTM
GRU
Generative Adversarial Networks (GAN)

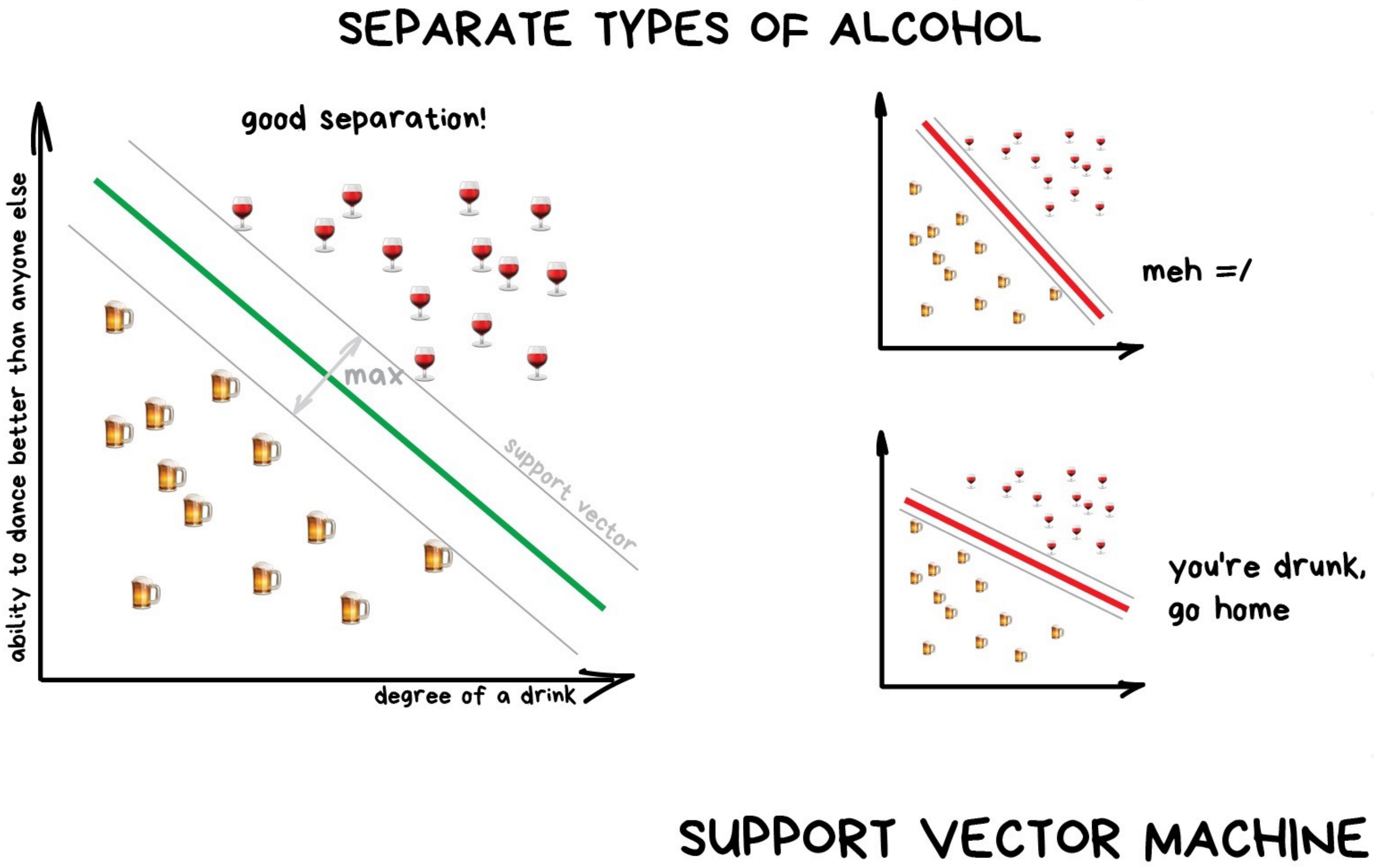
Linear or polynomial regression



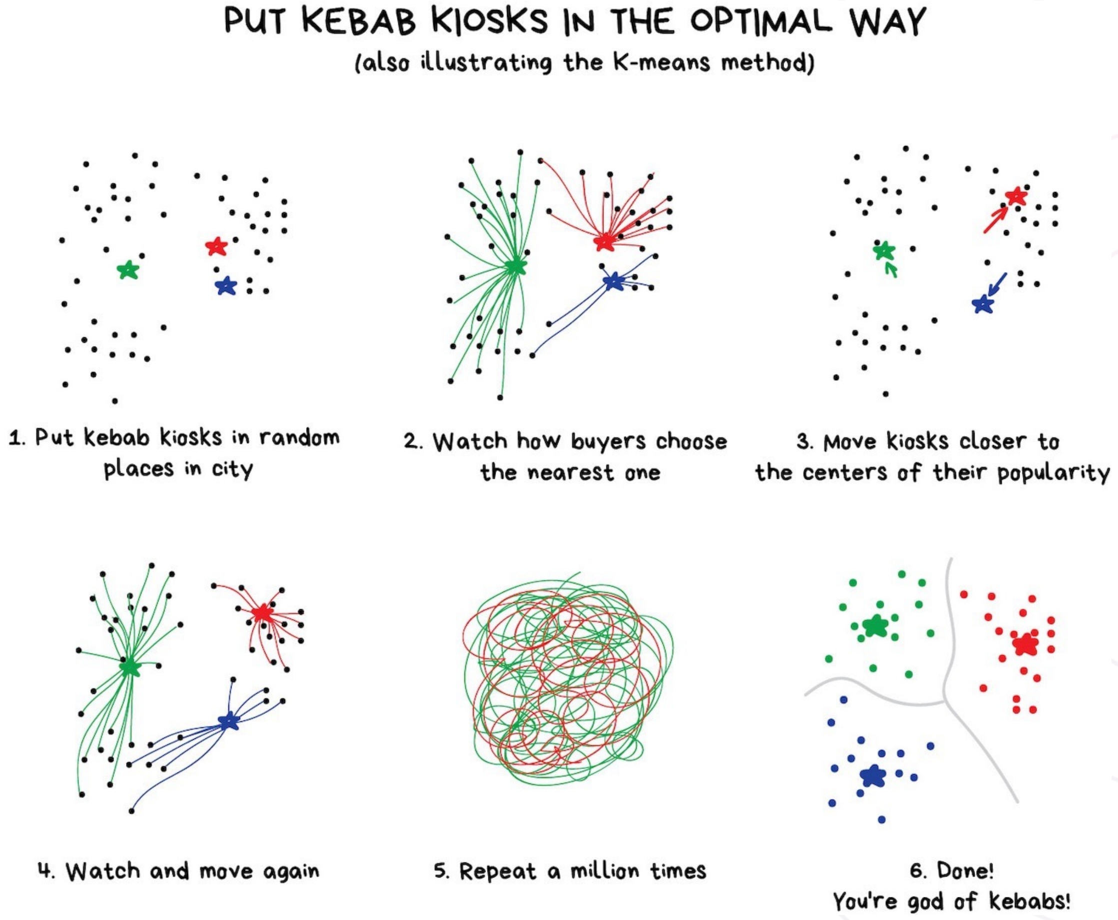
Decision tree


GIVE A LOAN?
CREDIT HISTORY
bad
good
HAVE A PLEDGE
HAVE A DEBT > $1000
no
yes
no
yes
NOPE
GUARANTORS?
YES
NOPE
yes
no
YES
NOPE
DECISION TREE

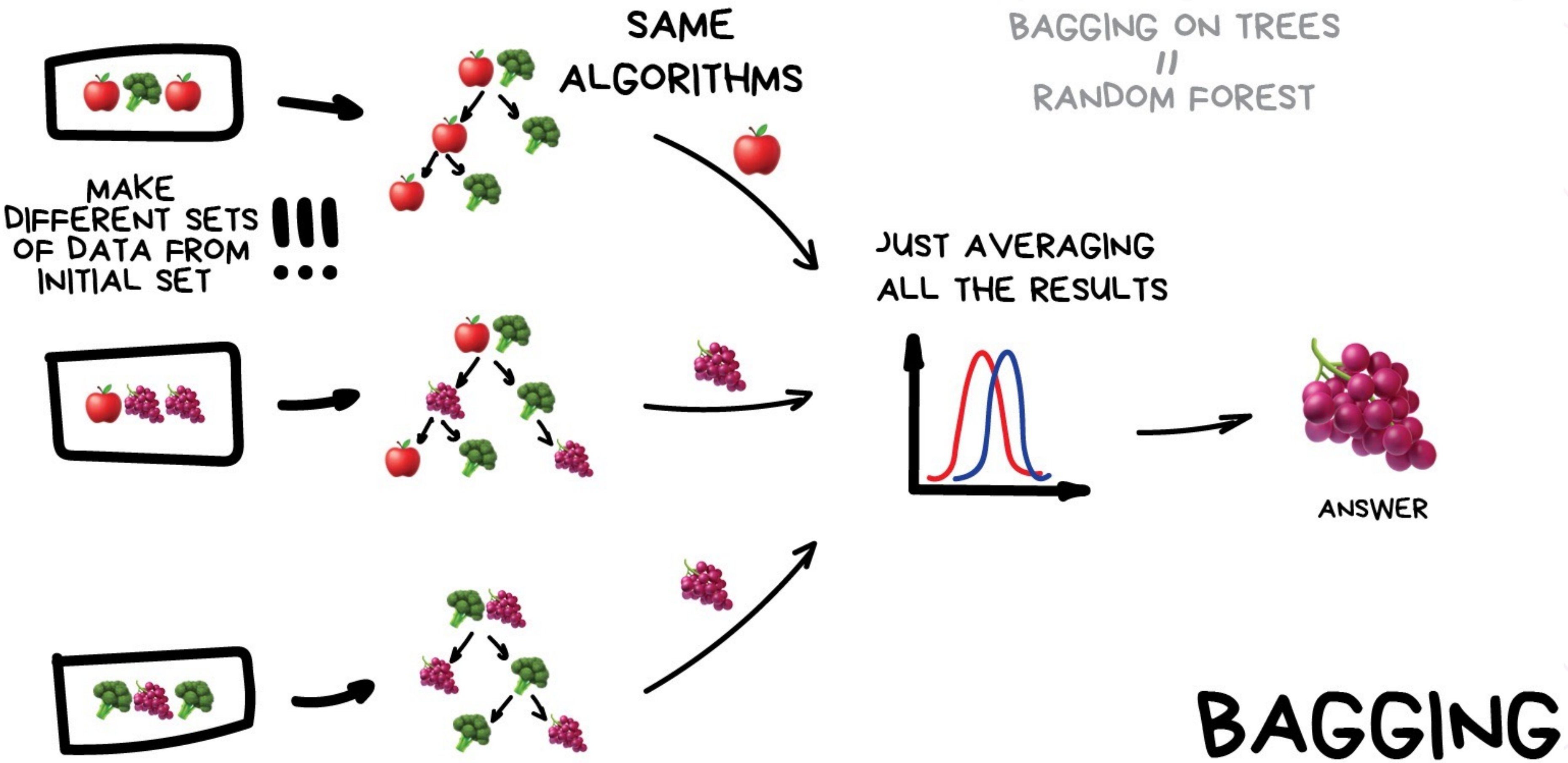
Support vector machine


SEPARATE TYPES OF ALCOHOL
good separation!
ability to dance better than anyone else
max
support vector
degree of a drink
meh =/
you're drunk,
go home
SUPPORT VECTOR MACHINE

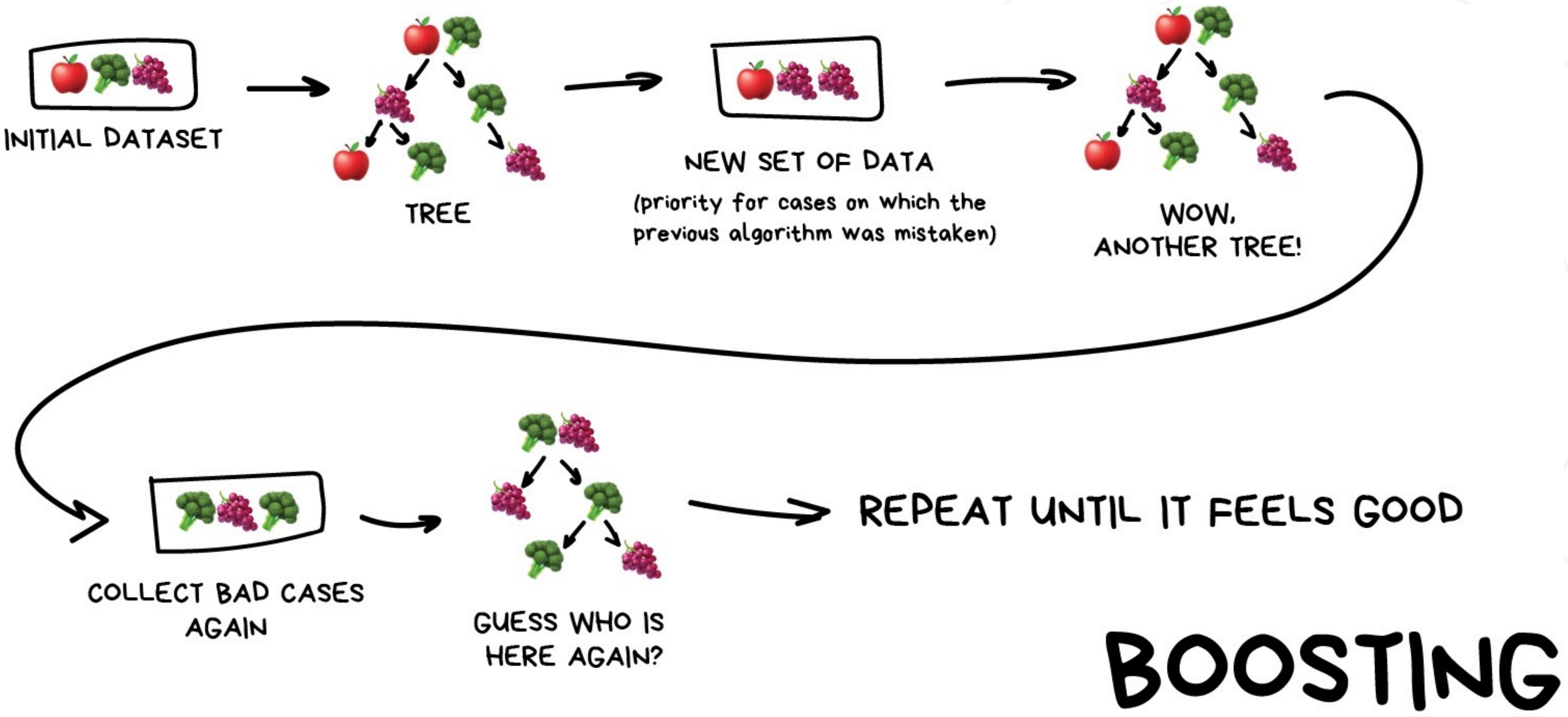
K-means clustering


PUT KEBAB KIOSKS IN THE OPTIMAL WAY
(also illustrating the K-means method)
1. Put kebab kiosks in random places in city
2. Watch how buyers choose the nearest one
3. Move kiosks closer to the centers of their popularity
4. Watch and move again
5. Repeat a million times
6. Done! You're god of kebabs!

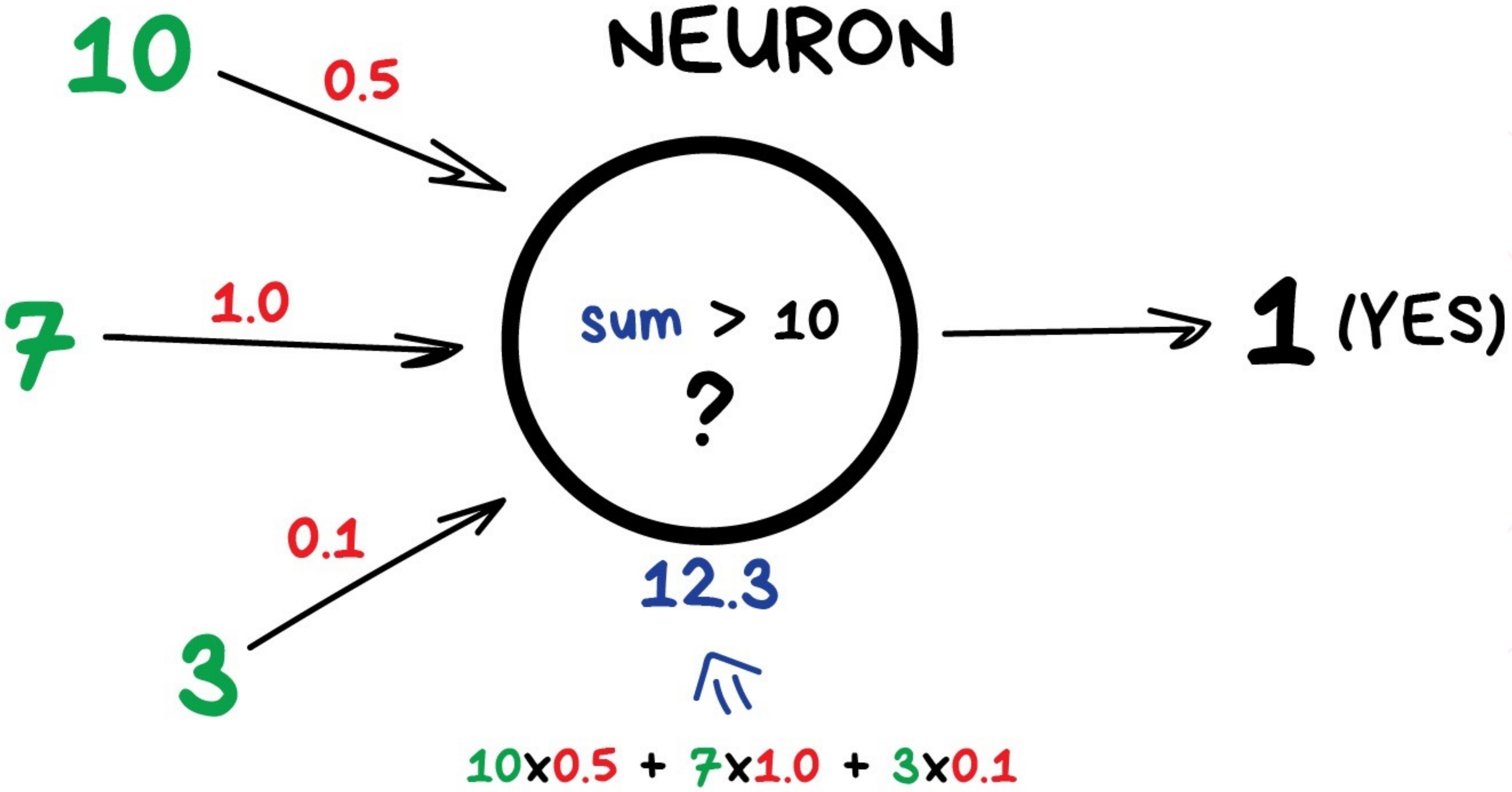
Bagged ensemble


SAME ALGORITHMS
BAGGING ON TREES
//
RANDOM FOREST
MAKE DIFFERENT SETS OF DATA FROM INITIAL SET !!!
JUST AVERAGING ALL THE RESULTS
ANSWER
BAGGING

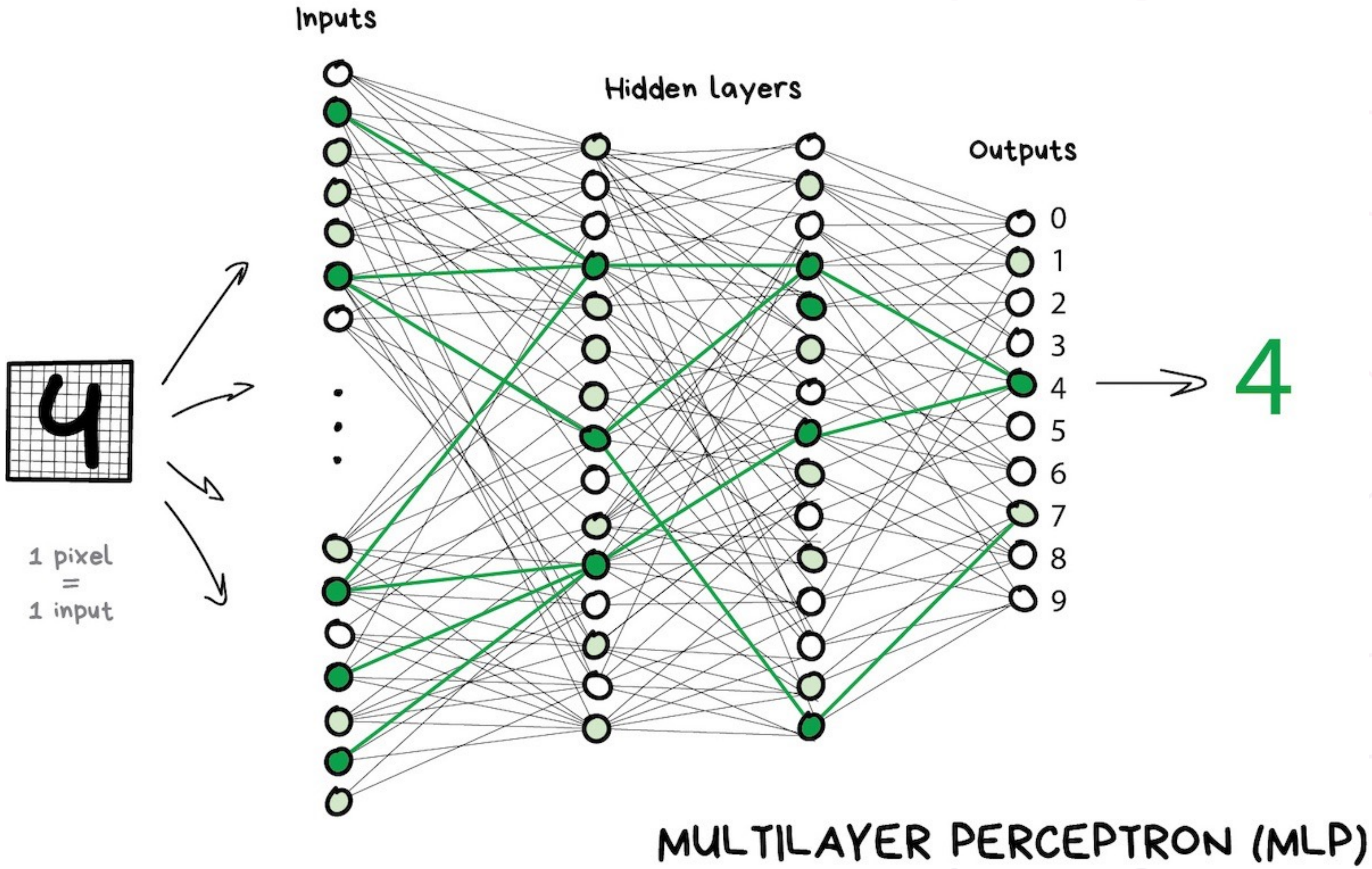
Boosted ensemble


INITIAL DATASET
TREE
NEW SET OF DATA
(priority for cases on which the previous algorithm was mistaken)
WOW, ANOTHER TREE!
COLLECT BAD CASES AGAIN
GUESS WHO IS HERE AGAIN?
REPEAT UNTIL IT FEELS GOOD
BOOSTING

Perceptron


10
0.5
NEURON
7
1.0
sum > 10
?
1 (YES)
0.1
12.3
3
10x0.5 + 7x1.0 + 3x0.1

Neural network


Inputs
Hidden layers
Outputs
0
1
2
3
4
5
6
7
8
9
4
4
1 pixel
=
1 input
MULTILAYER PERCEPTRON (MLP)