
Machine Learning:

*the main goal,
some examples and facts*



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Generalizing is the main idea of ML

MAGIC

Available data



(machine learning algorithm)

Prediction
for new data

Automatically learning is advisable!



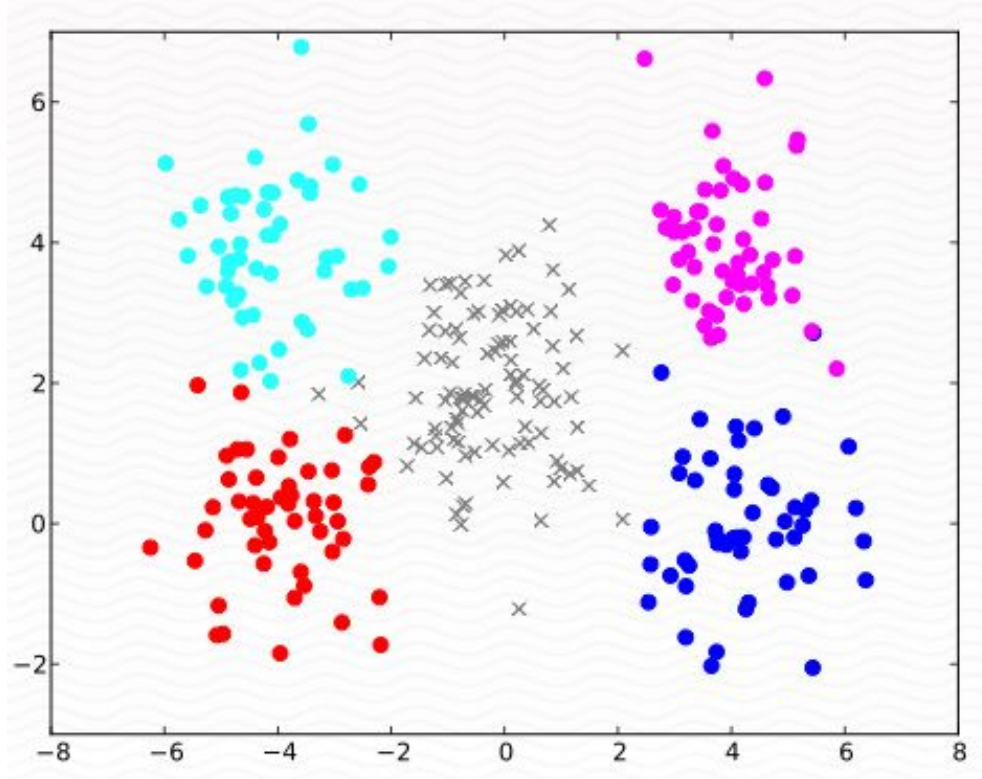
Machine learning is everywhere!!!

Google



RECOMMENDED

Classification is the most mature type of ML



Classification is the most mature type of ML



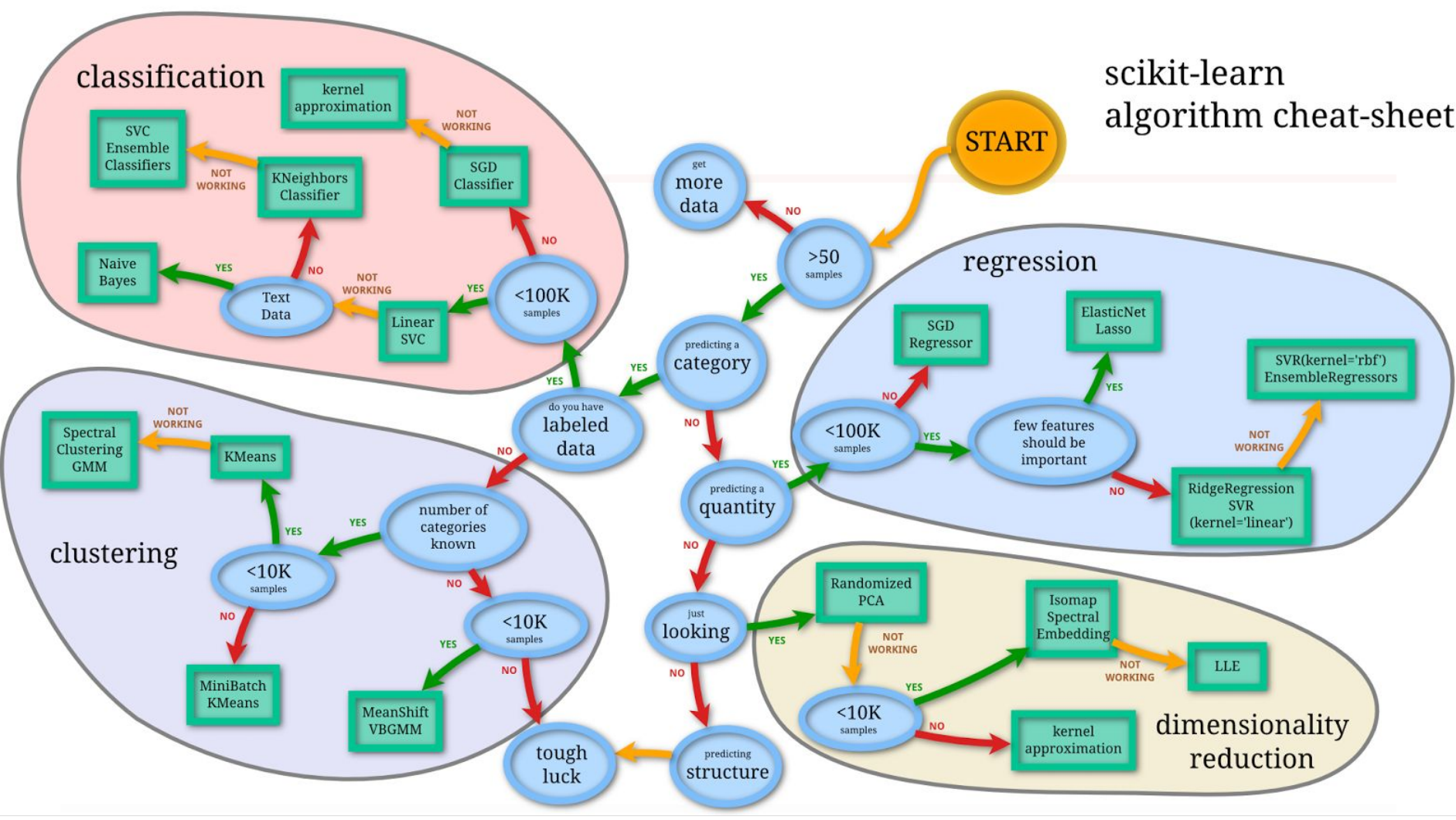
$$X_j = 1$$

*if the j -th word in the
dictionary appears in the
email*

$$X_j = 0$$

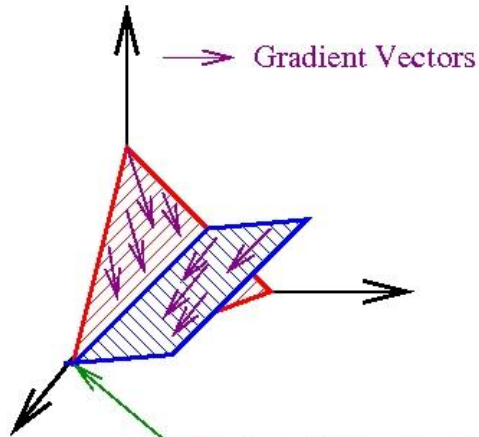
otherwise

scikit-learn algorithm cheat-sheet

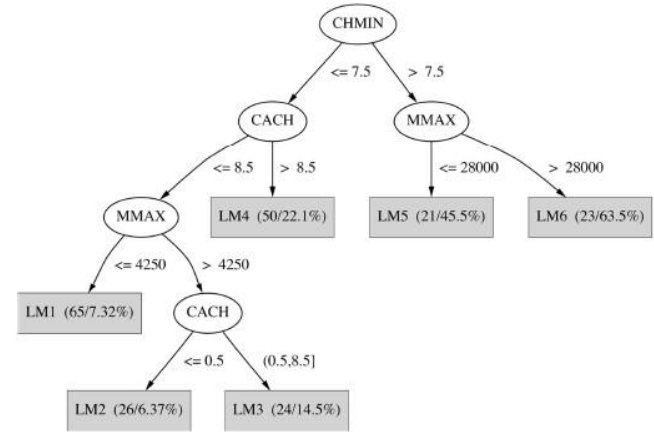


The main steps of selecting:

- Representation



- Evaluation



- Optimization

Examples of this three components

Representation	Evaluation	Optimization
Instances	Accuracy/Error rate	Combinatorial optimization
<i>K</i> -nearest neighbor	Precision and recall	Greedy search
Support vector machines	Squared error	Beam search
Hyperplanes	Likelihood	Branch-and-bound
Naive Bayes	Posterior probability	Continuous optimization
Logistic regression	Information gain	Unconstrained
Decision trees	K-L divergence	Gradient descent
Sets of rules	Cost/Utility	Conjugate gradient
Propositional rules	Margin	Quasi-Newton methods
Logic programs		Constrained
Neural networks		Linear programming
Graphical models		Quadratic programming
Bayesian networks		
Conditional random fields		

Today we have known:

- ✓ What machine learning is
- ✓ Where machine learning is used
- ✓ What the criteria for selection algorithms exist.

Thank you for your attention!
