

Machine Learning with Python

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Introduction

What is Machine Learning :

Designing computational Algorithms to let computers learn from data

Spam Filters and Recommendation systems are the traditional usage of Machine learning

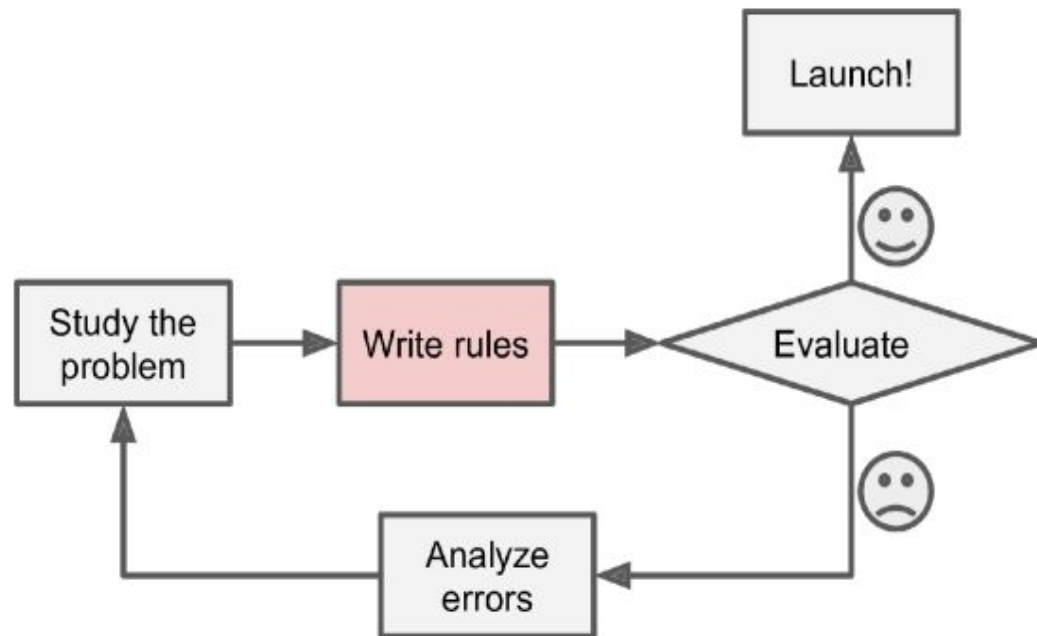


Figure 1-1. The traditional approach

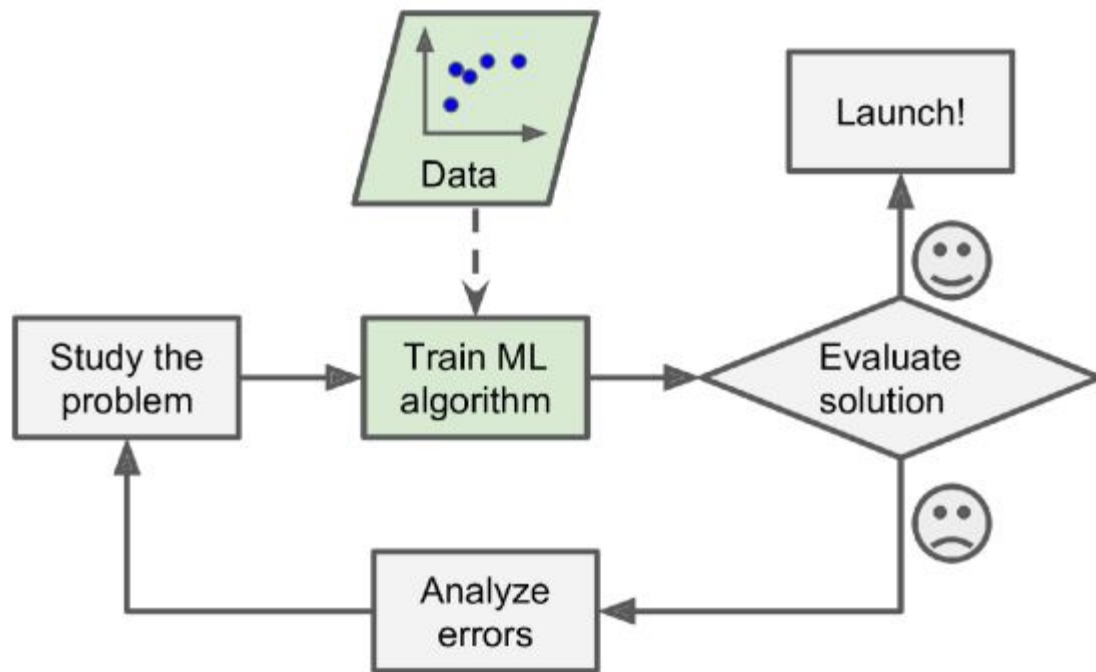


Figure 1-2. The Machine Learning approach

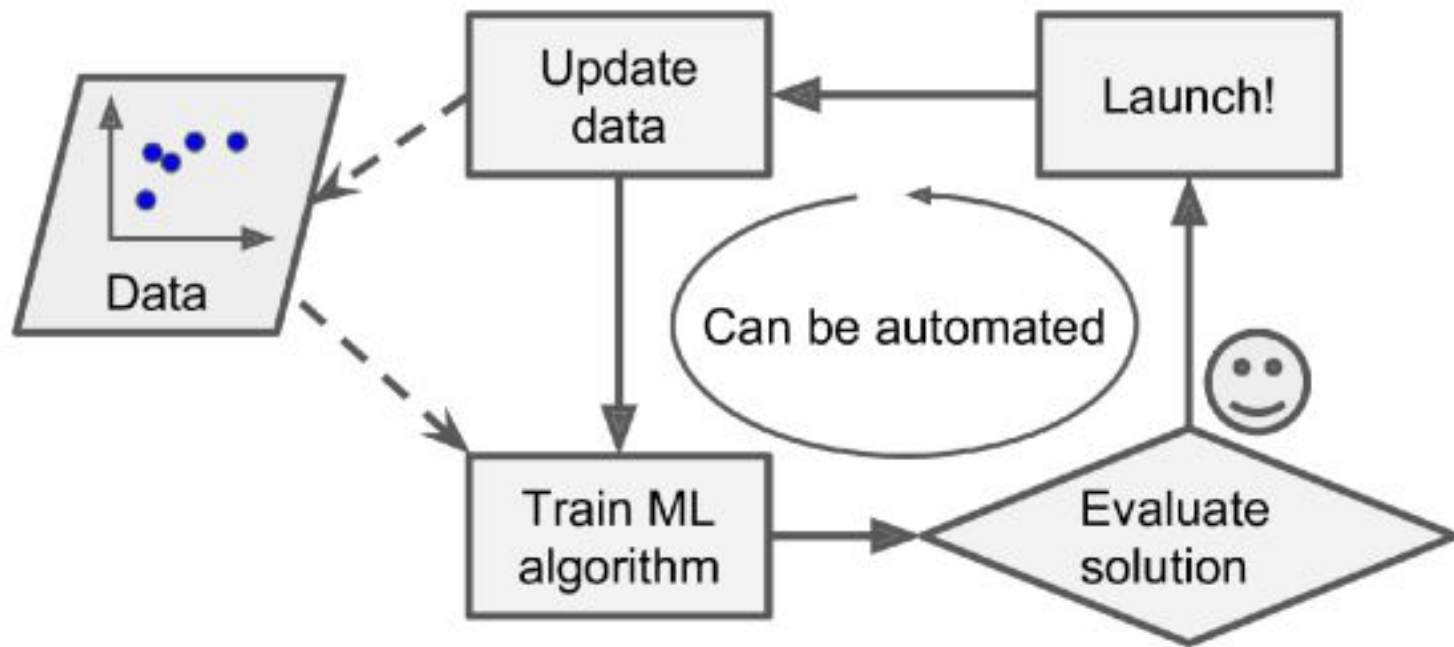


Figure 1-3. Automatically adapting to change

ML Approaches

ML Approaches :

Supervised Learning

Unsupervised Learning

Semi supervised learning

Reinforcement Learning

Supervised Learning

In supervised learning, the training set you feed to the algorithm includes the desired solutions, called labels.

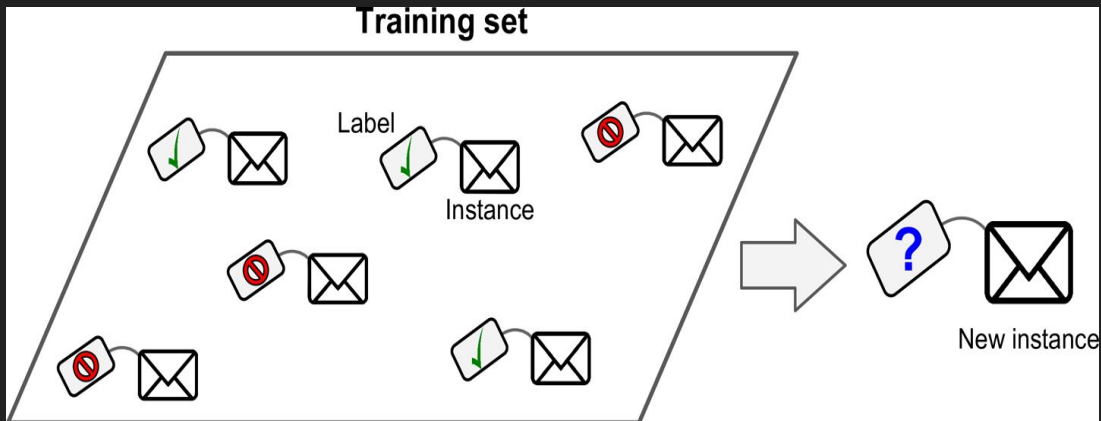
KNN

Linear Regression

Logistic Regression

Support Vector Machines (SVMs)

Decision Trees and Random Forests



Unsupervised Learning

In unsupervised learning, as you might guess, the training data is unlabeled.

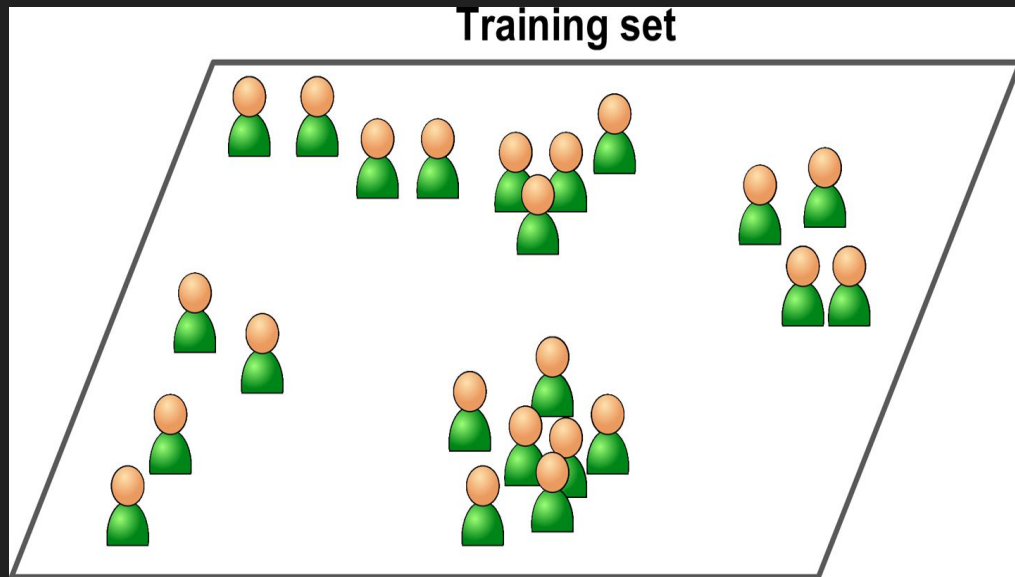
We use distance metrics to Train the ML models

Clustering

K-Means

DBSCAN

Hierarchical Cluster Anal



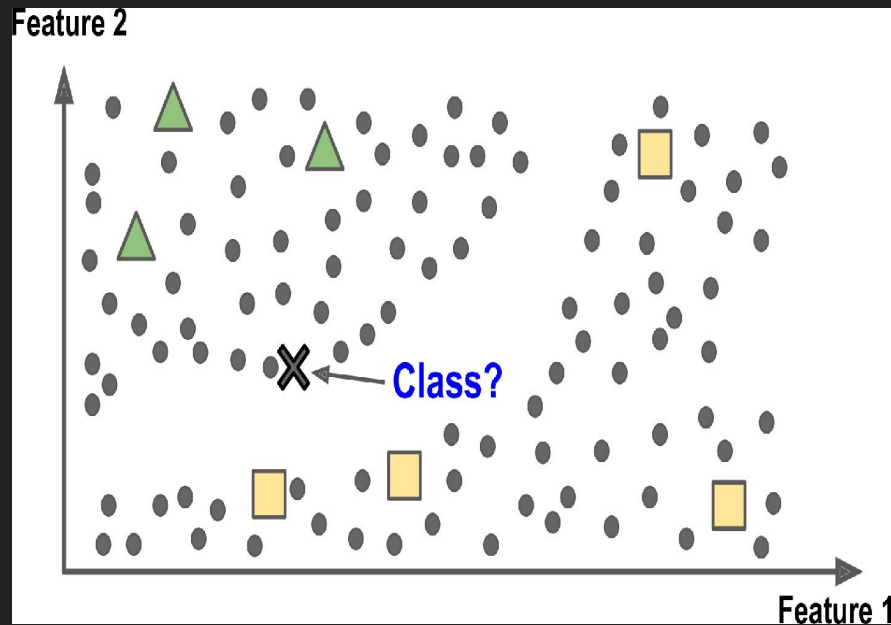
Semi Supervised Learning

Since labeling data is usually time-consuming and costly, you will often

have plenty of unlabeled instances, and few labeled instances. Some

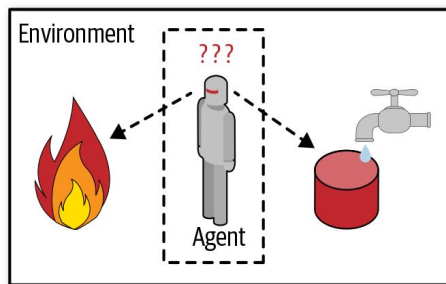
algorithms can deal with data that's partially labeled. This is called semi-supervised learning

Similarity metrics are the main functions in training this ML models



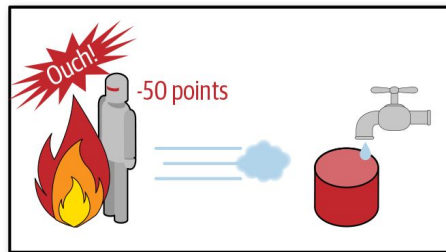
Reinforcement Learning

Training optimum policies to provide self learning Tasks.



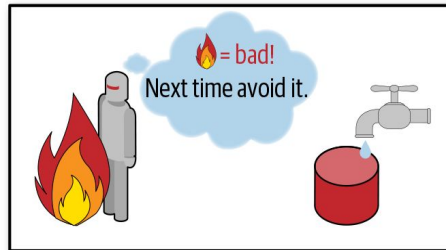
1 Observe

2 Select action using policy



3 Action!

4 Get reward or penalty

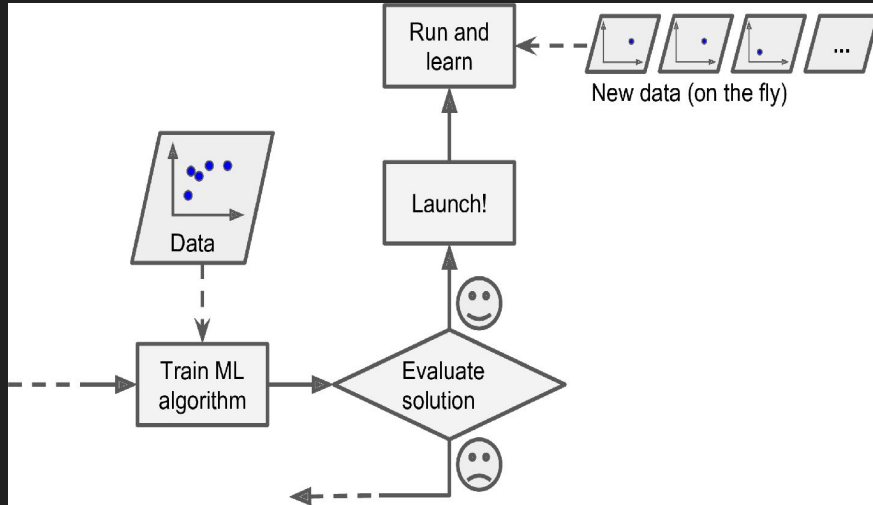


5 Update policy (learning step)

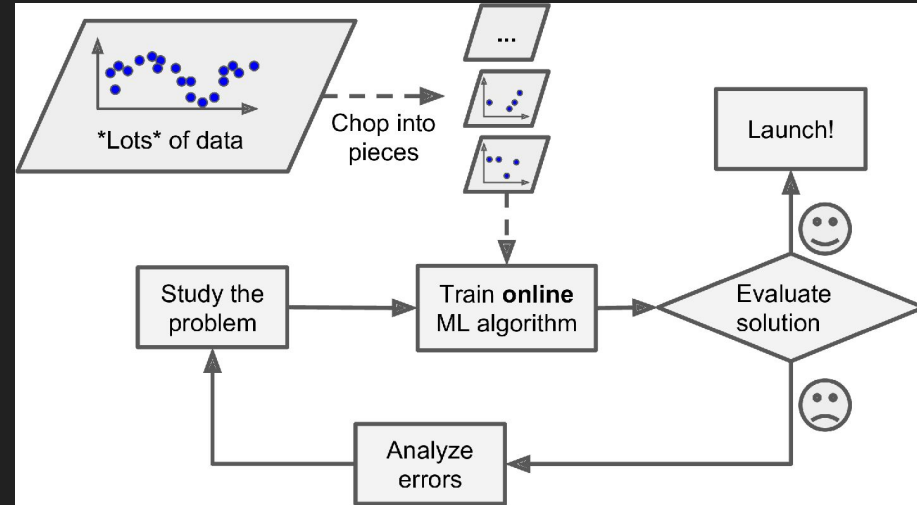
6 Iterate until an optimal policy is found

Learning approaches based on Data

Online Learning



Batch Learning

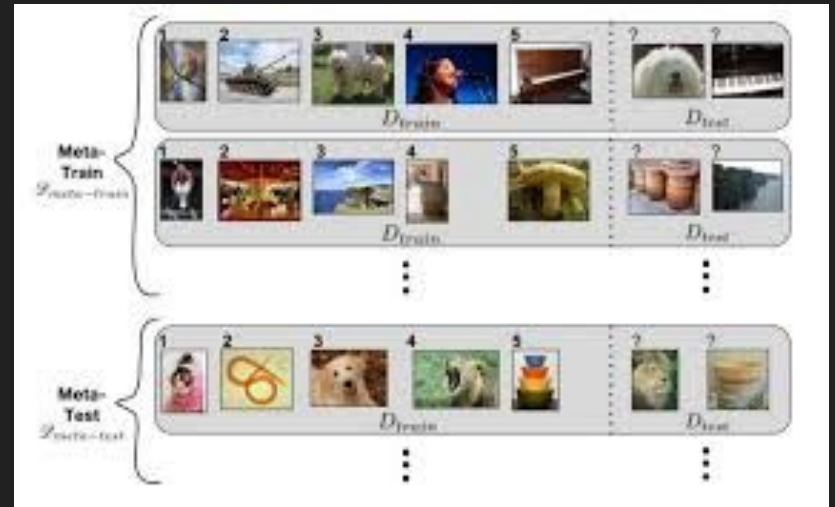


This novel approaches usually being used in Deep learning

Transfer Learning



Meta Learning



Essential Frameworks

Python

Numpy

Pandas

Scikit-learn

Matplotlib

Pyspark

anaconda

