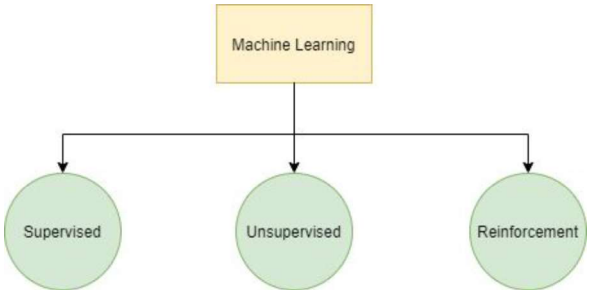
Types of Machine Learning

Homework H0.1.

Agenda

1. Overview
2. Supervised Learning
3. Unsupervised Learning
4. Reinforcement Learning

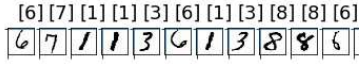
Overview



Source: own representation

Supervised Learning

- most popular
- easy and simple to implement
- data form: examples with labels
- predict label for example
- feedback if prediction is correct
- trained algorithm predicts label for example
- highly focused on singular task



Source:
https://azure.microsoft.com/de-de/services/open-datasets/catalog/mnist/

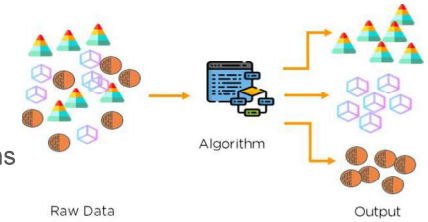
Supervised Learning

Use-Cases:

- Advertisement Popularity
  - search engine
- Spam Classification
  - e-mail
- Face Recognition
  - facebook image tag

Unsupervised Learning

- opposite of supervised learning
- no labels
- group, cluster, and/or organize the data
  - output optimized for humans
- makes suggestions and recommendations
- boost productivity



Source:
*https://miro.medium.com/max/1198/0*2EFfPMn6BlGenVWA*

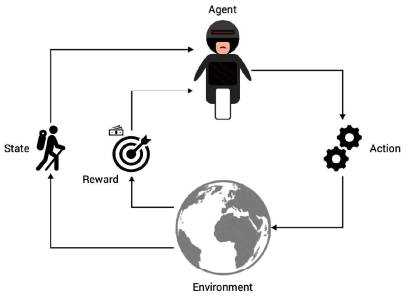
Unsupervised Learning

Use-Cases:

- Recommender Systems
  - video recommendation system
- Buying Habits
  - group customers into similar purchasing segments
- Grouping User Logs
  - group user logs and issues

Reinforcement Learning

- different than previous
- no dataset
- learning by mistakes
- lots of mistakes at beginning
- less errors over time
- signal for positive and negative behavior



Source:
https://www.inovex.de/blog/reinforcement-learning-walkthrough-introduction/

Reinforcement Learning

Use-Cases:

- Video Games
  - AlphaZero for chess and go
- Industrial Simulation
  - roboters
- Resource Management
  - data centers

Thanks for your Attention