Intro to ML

ML Bootcamp
Session 1

eceusc.ucsd.edu/projects/ml-bootcamp-1

ML Bootcamp Breakdown

Topics:

1. Linear Regression
2. Classification & Logistic Reg
3. Natural Language Processing
4. Decision Tree/Random Forest
5. KNN (K-Nearest Neighbors)
6. Computer Vision
7. Recommender System (K-Means)
8. Reinforcement Learning
9. Deep Learning/Neural Networks
10. Support Vector Machine

Projects:

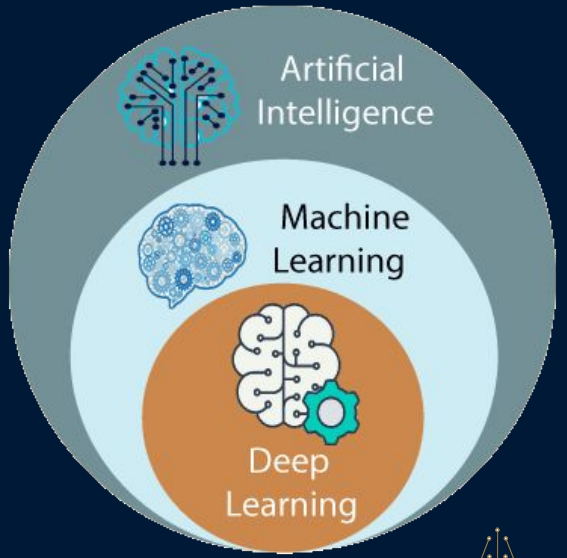
- Student Performance Prediction
- Clean vs Dirty Room
- Spam Email Filter
- Titanic Survival Challenge
- Digit handwriting Classification
- Snapchat Filter/Facial Recognition/Harry Potter Invisible Cloak
- Anime Recommendations
- Flappy Bird AI
- Music Generation/Neural Style Transfer

What is AI, ML, and DL?

AI : Human intelligence exhibited by machines

ML : Teaching a machine to learn from past experiences

DL : ML technique that loosely mimic the human brain



https://blogs.nvidia.com/blog/2016/07/29/whats-difference-artificial-intelligence-machine-learning-deep-learning-ai/

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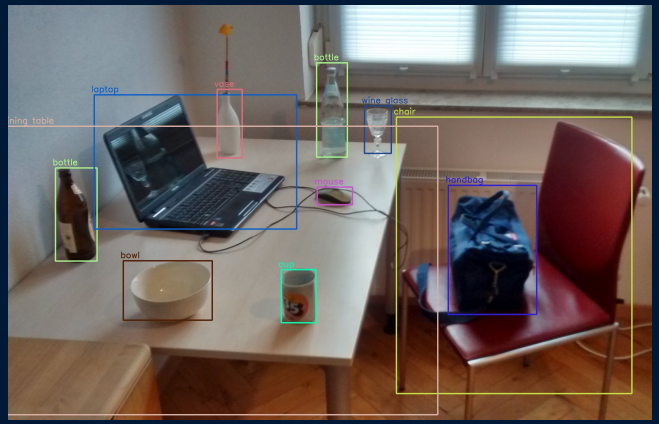
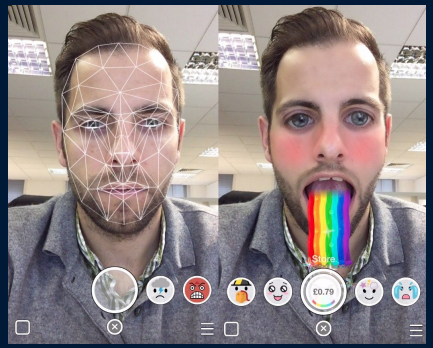
Some AI Application





Teachable Machine
https://teachablemachine.withgoogle.com/

Quick, Draw
https://quickdraw.withgoogle.com/

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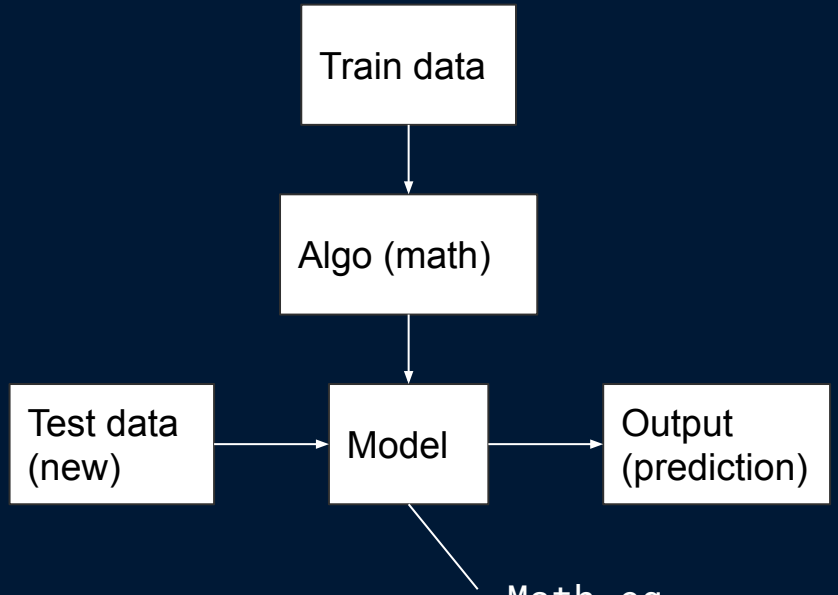
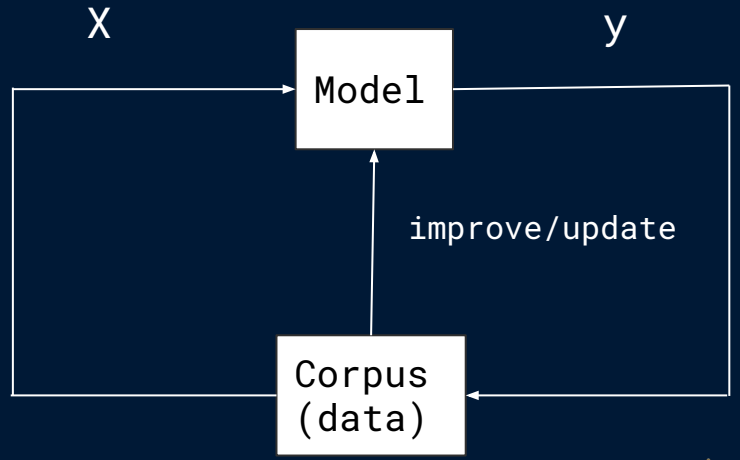
What is Machine Learning?





Model Building Process

1. Define model

   ```
   my_model = Model()
   ```

2. Fit (train) model

   ```
   my_model.fit(features, target)
   ```

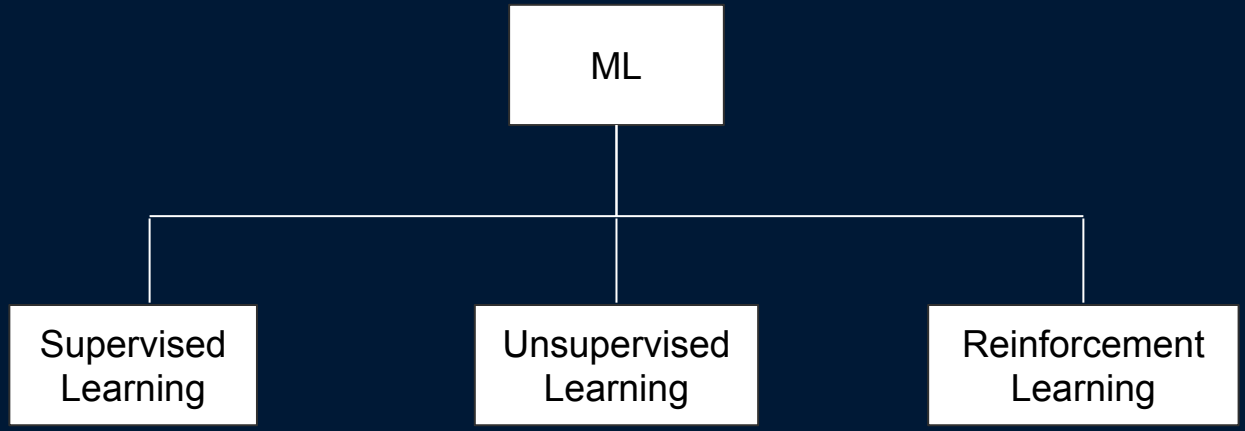
3. Make predictions

   ```
   my_model.predict(data)
   ```

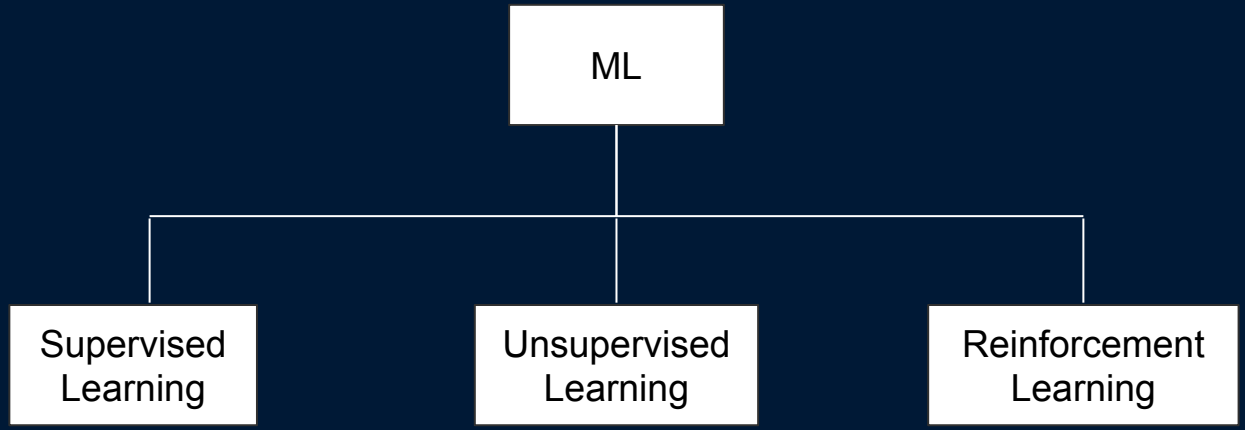
4. Evaluate

   ```
   my_model.score(prediction, target)
   ```

Machine Learning Techniques



Machine Learning Techniques



Given X & y
- Regression
- Classification

Ex: spam filter, image classification, score prediction

Only given X
- Clustering

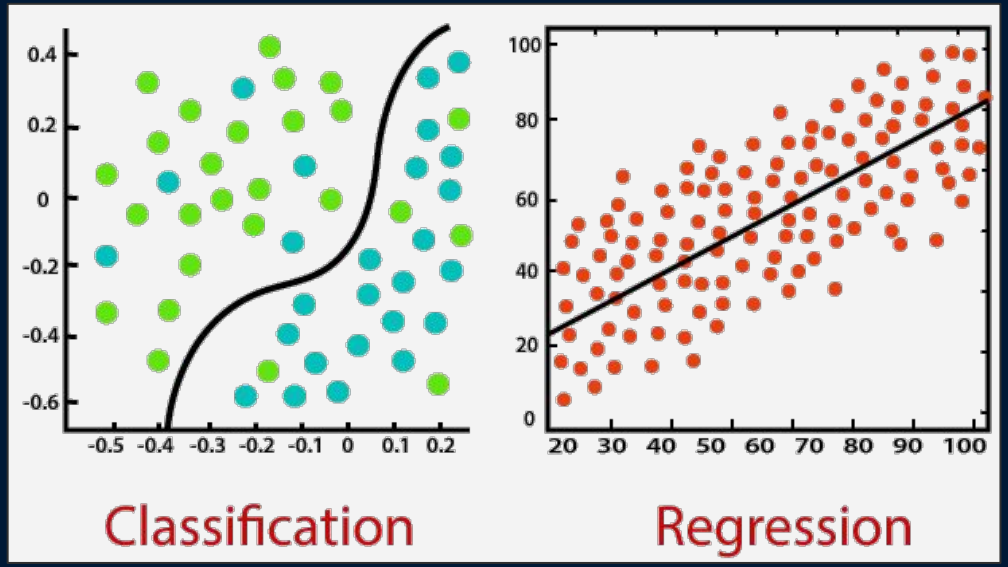
Ex: Similar product recommendation

Reward based learning

Ex: Game AI

Supervised Learning

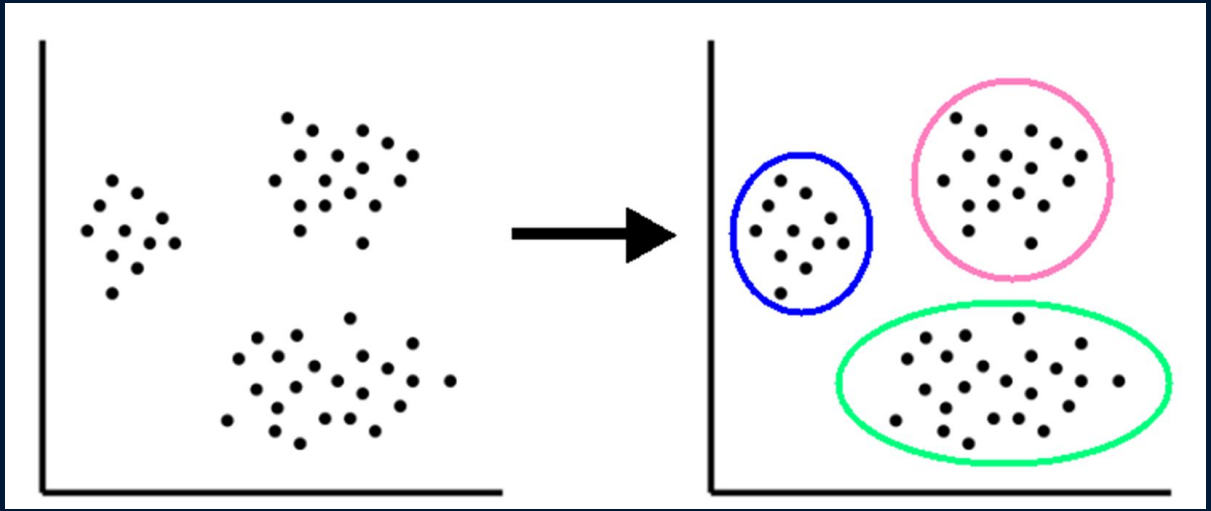
- Given both X and y
  - Algorithm learns on a labeled dataset (learn by example)



Animal Prediction

Unsupervised Learning

- Given only X
  - Algorithm learns on unlabelled data (learn by pattern recognition)



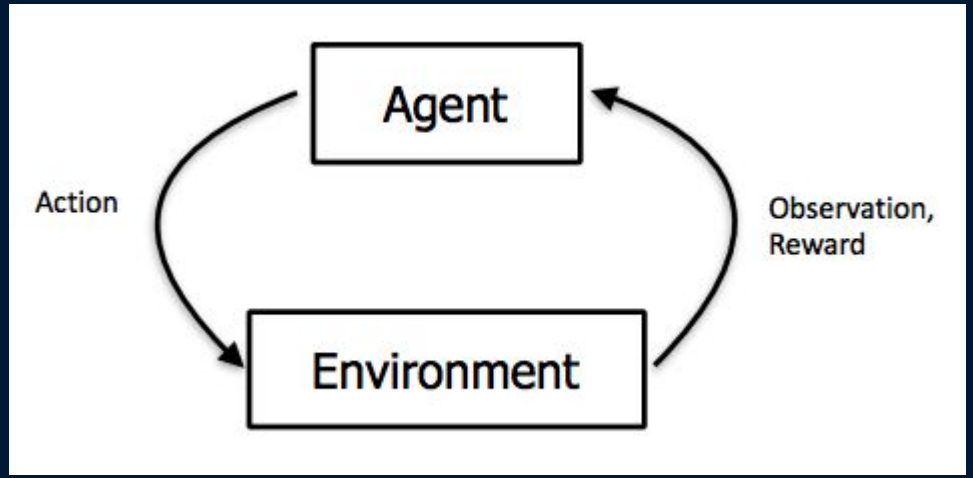
Unsupervised Learning




Pizza Shop Problem

Reinforcement Learning

- Learning based on a system of rewards through trial and error



Next Time:

Theory:

- Linear Regression

Project:

- House Price Prediction
- Salary Prediction

Practice:

- Student Performance Prediction

Check Your Understanding + Feedback

https://forms.gle/jixUKRUXLeu6qhHS7