AI and ML

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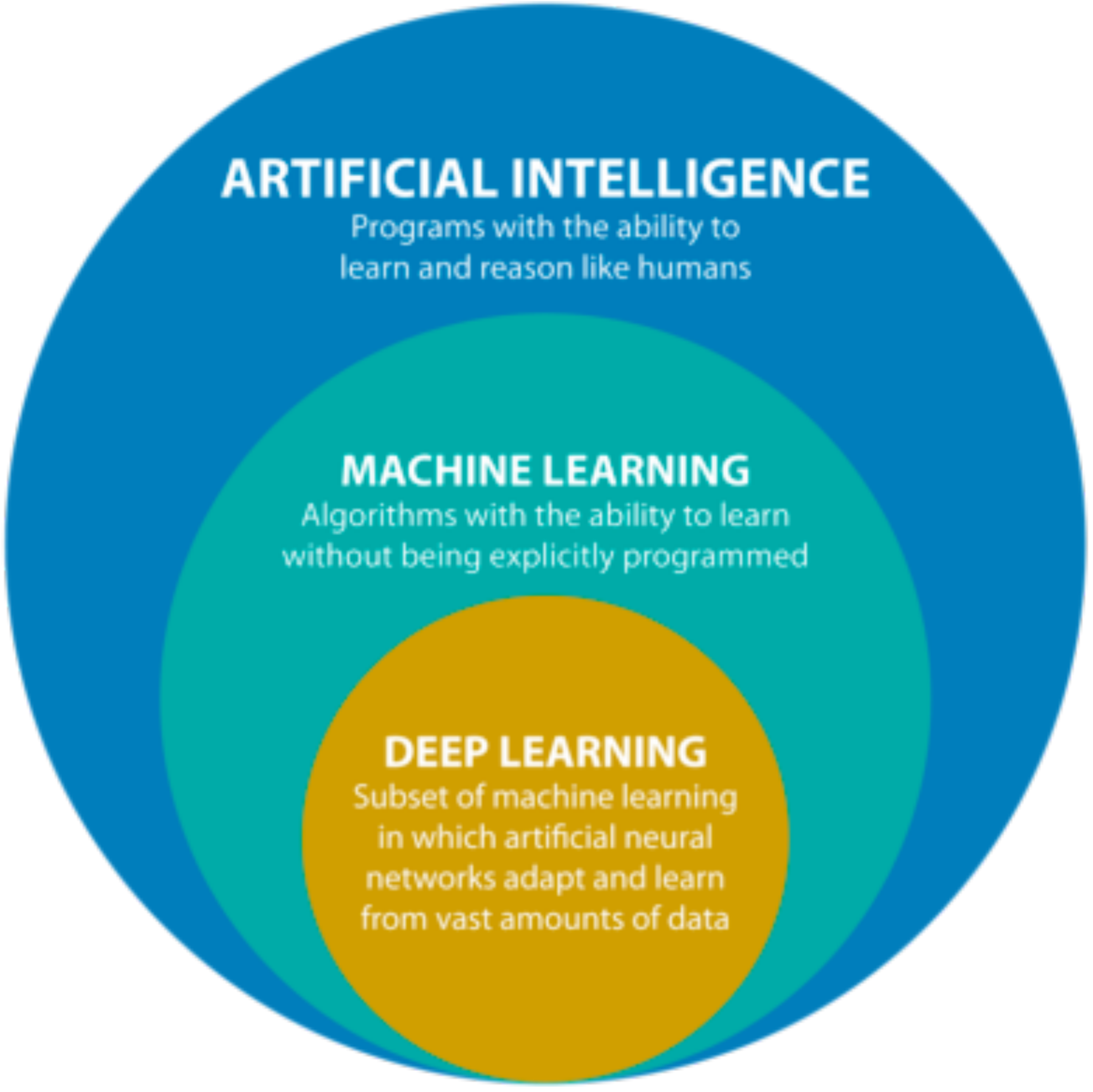
What is AI and ML?

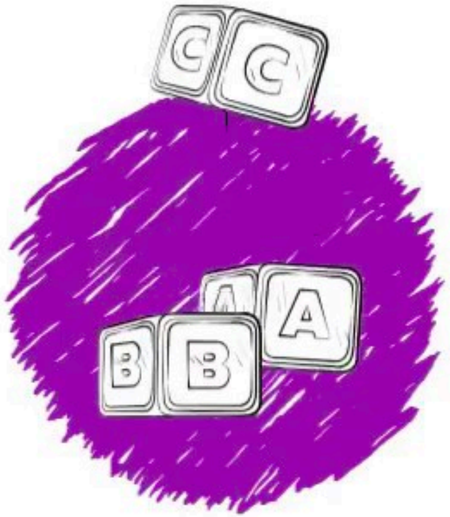

ARTIFICIAL INTELLIGENCE
Programs with the ability to
learn and reason like humans
MACHINE LEARNING
Algorithms with the ability to learn
without being explicitly programmed
DEEP LEARNING
Subset of machine learning
in which artificial neural
networks adapt and learn
from vast amounts of data

So basically ML is a type of AI!

1 → THE 3 TYPES OF ML

#1

Supervised learning



#2

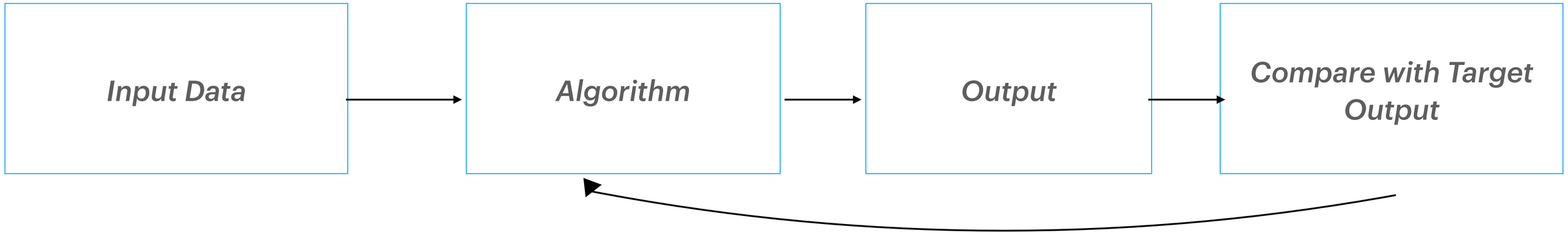
Unsupervised learning

#3

Reinforcement Learning

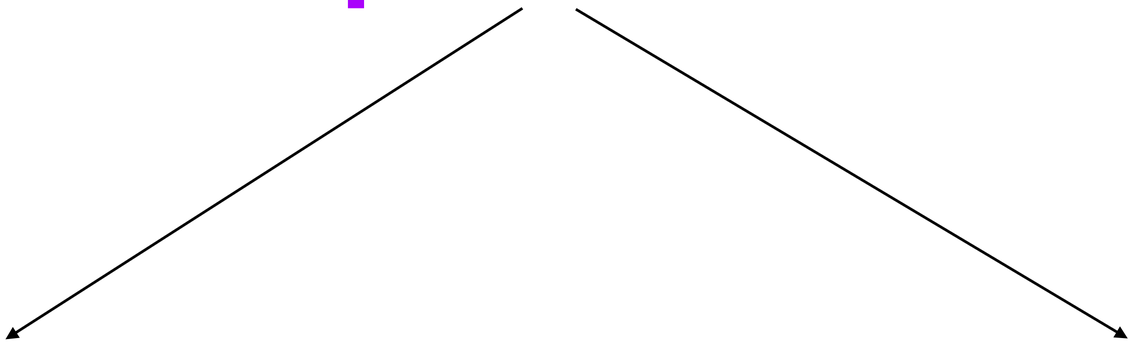
Supervised Learning

What is Supervised Learning?



Try to minimize the difference between target and our output

Types of Supervised Learning



Regression

We predict a real value of some quantity on the basis of certain attributes.
Eg: Price of a house

Classification

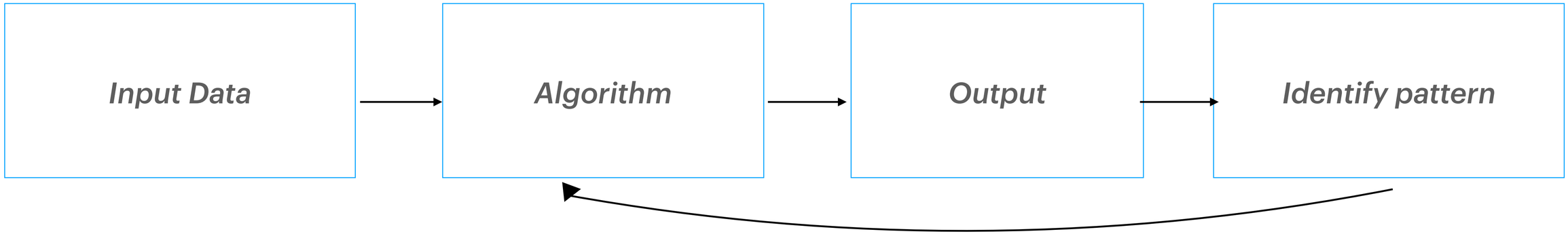
We categorize the data into certain categories based on certain attributes
Eg. Identifying if the animal in photo is cat or dog

Some Supervised Learning Algorithms

1. **Regression:**
    - Linear Regression
    - Polynomial Regression
2. **Classification:**
    - Naïve Bayes Classifier
    - K-Nearest Neighbours Classifier (KNN)
    - Decision Tree Classifier
    - Support Vector Machine Classifier (SVM)
    - Perceptron Learning

Unsupervised Learning

What is Unsupervised Learning?



Types of Unsupervised Learning

Clustering

We segregate the data into clusters.
Eg: Identify if tumor is malignant/ benign when target o/p is not available

Some Unsupervised Learning Algorithms

- K-Means Clustering
- Hierarchical Clustering
- K-Mediods Clustering

Reinforcement Learning

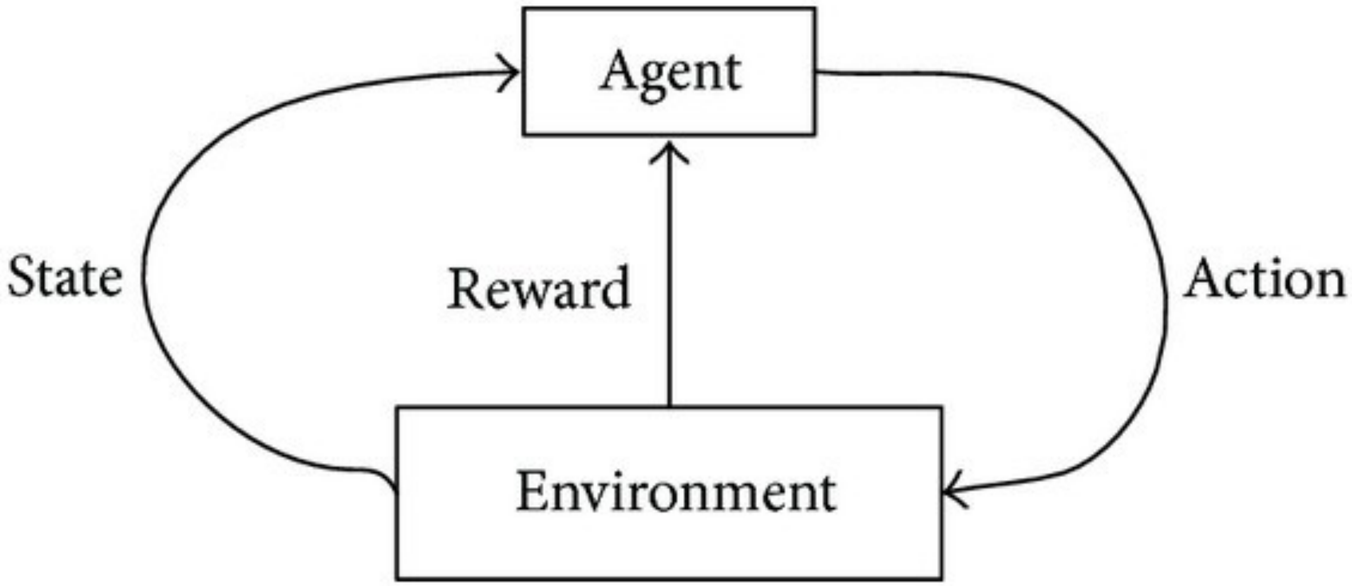
What is Reinforcement Learning?

1. Input state is observed by the agent.

2. Decision making function is used to make the agent perform an action.

3. After the action is performed, the agent receives reward or reinforcement from the environment.

4. The state-action pair information about the reward is stored.

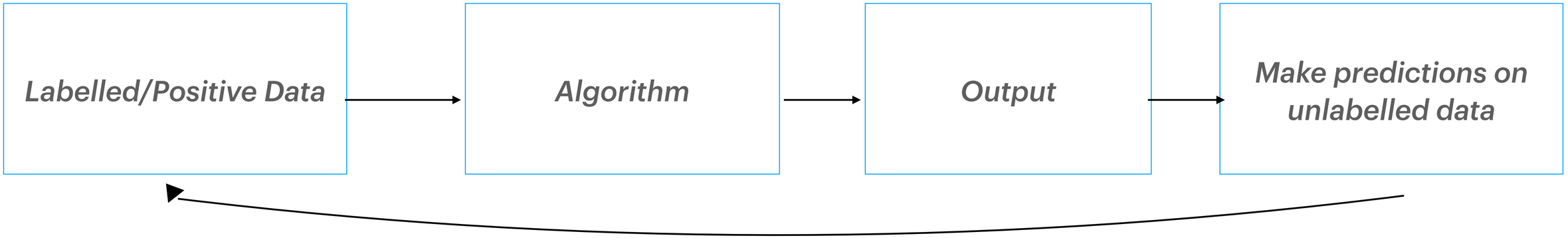


Some Reinforcement Learning Algorithms

- Q-Learning
- Policy Optimization

Other Techniques: Semi-Supervised Learning

What is Semi-Supervised Learning?

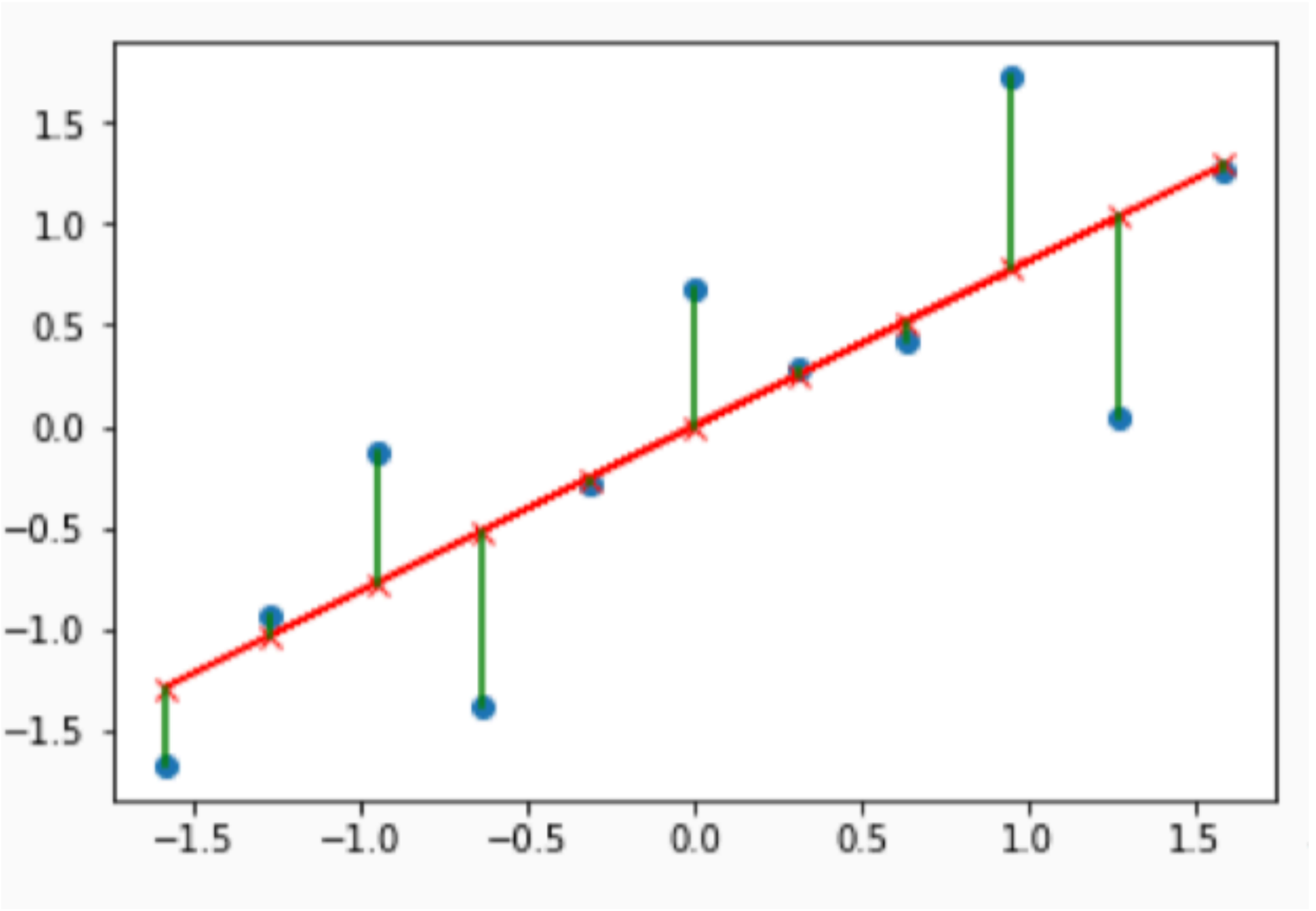


Add predicted value to labelled/positive data and repeat the process

Some Semi-Supervised Learning Algorithms

1. **Using Labelled and Unlabelled Data:**
    - Co-Training
    - Self-Training
2. **Using Positive and Unlabelled Data:**
    - Two-Step Approach
    - Direct-Approach

EG: Linear Regression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Some Reasources to get you started

- Towards Data Science - https://towardsdatascience.com/
- Colab: https://colab.research.google.com/
- Analytics Vidya - https://www.analyticsvidhya.com/
- StatQuest - https://www.youtube.com/user/joshstarmer
- Other Medium Articles
- Sky’s the Limit....

Thank you!