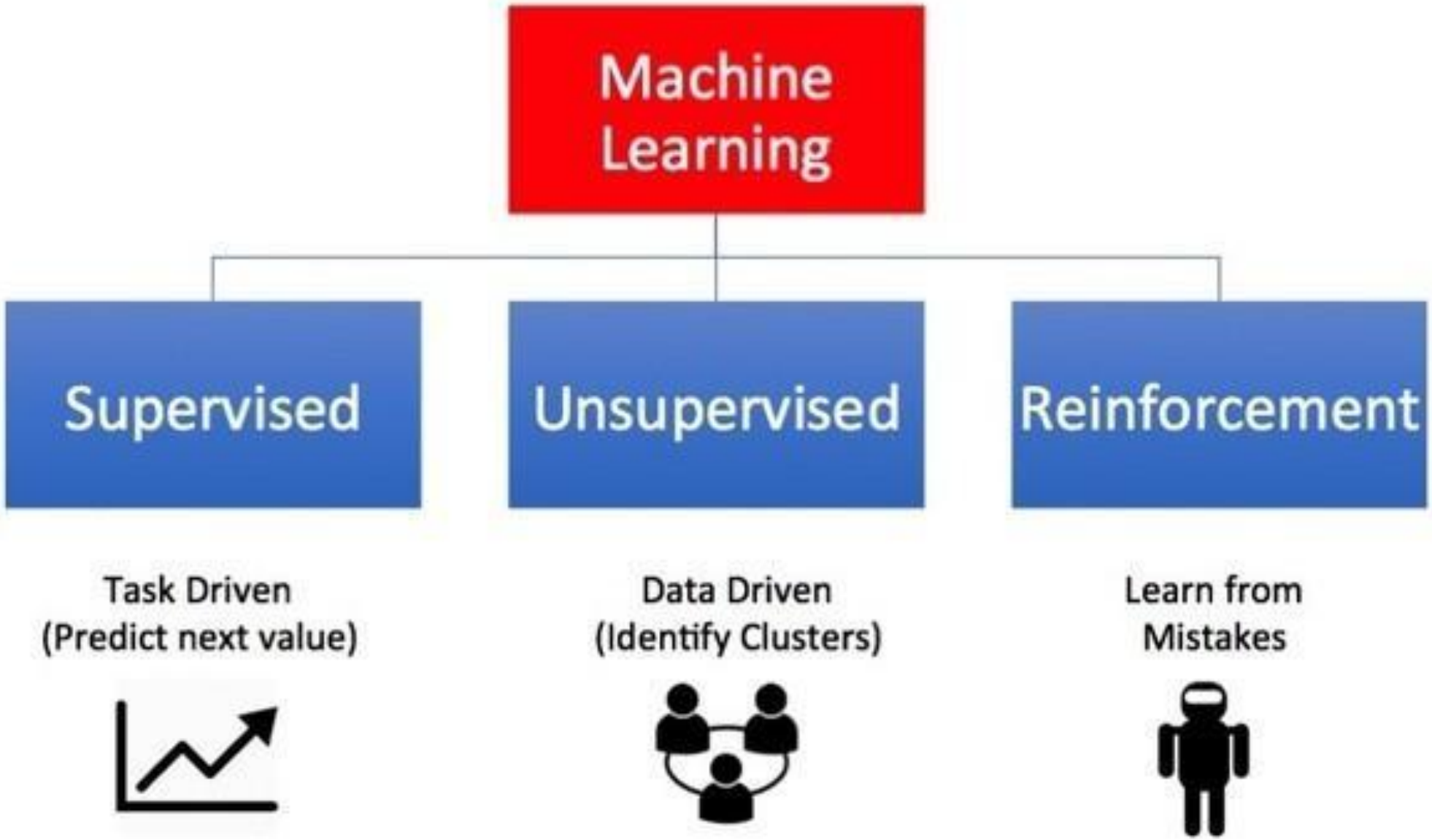
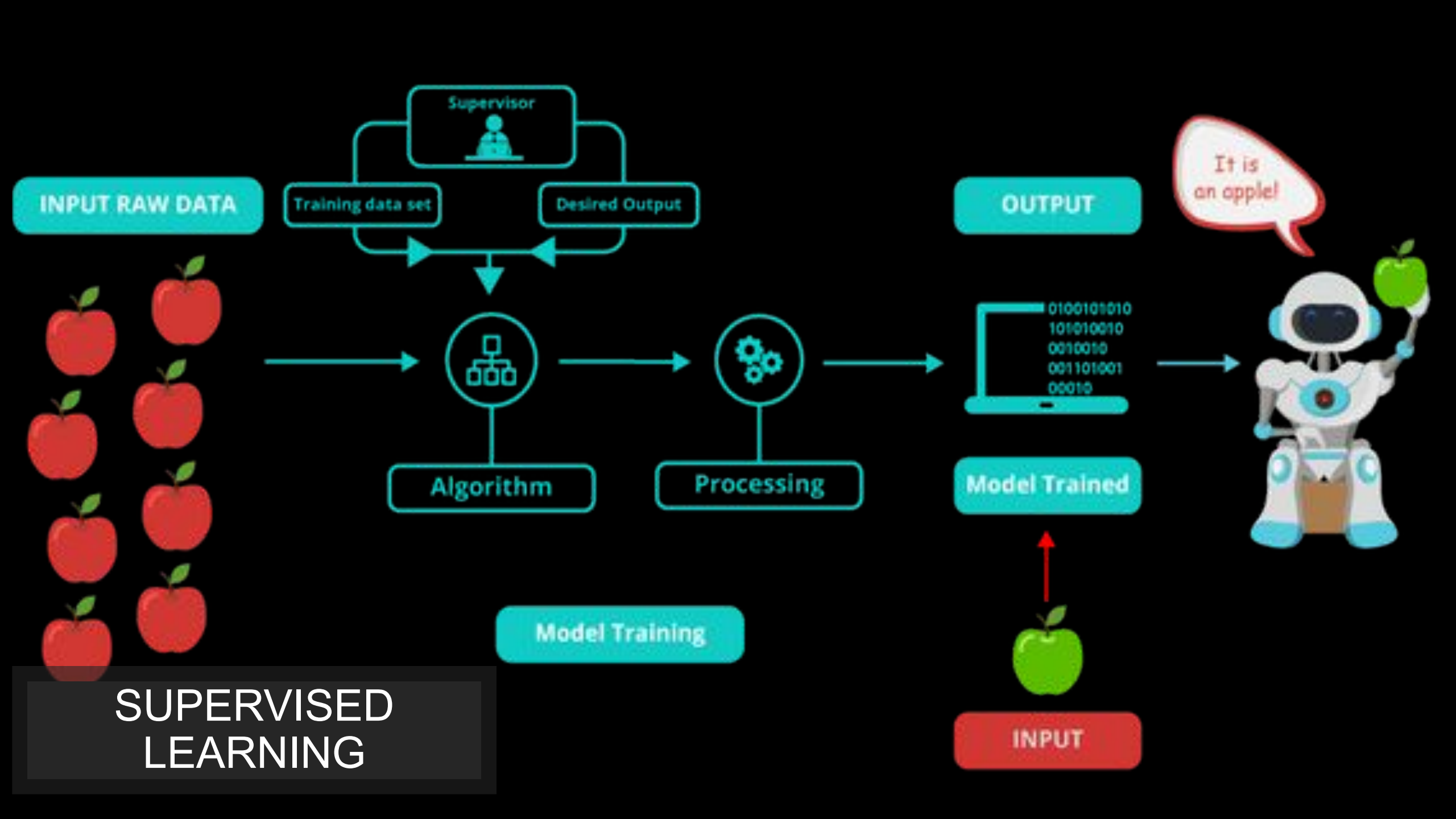
Types of Machine Learning




Supervisor
INPUT RAW DATA
Training data set
Desired Output
OUTPUT
It is an apple!
0100101010
101010010
0010010
001101001
00010
Algorithm
Processing
Model Trained
Model Training
INPUT
SUPERVISED LEARNING

SUPERVISED LEARNING

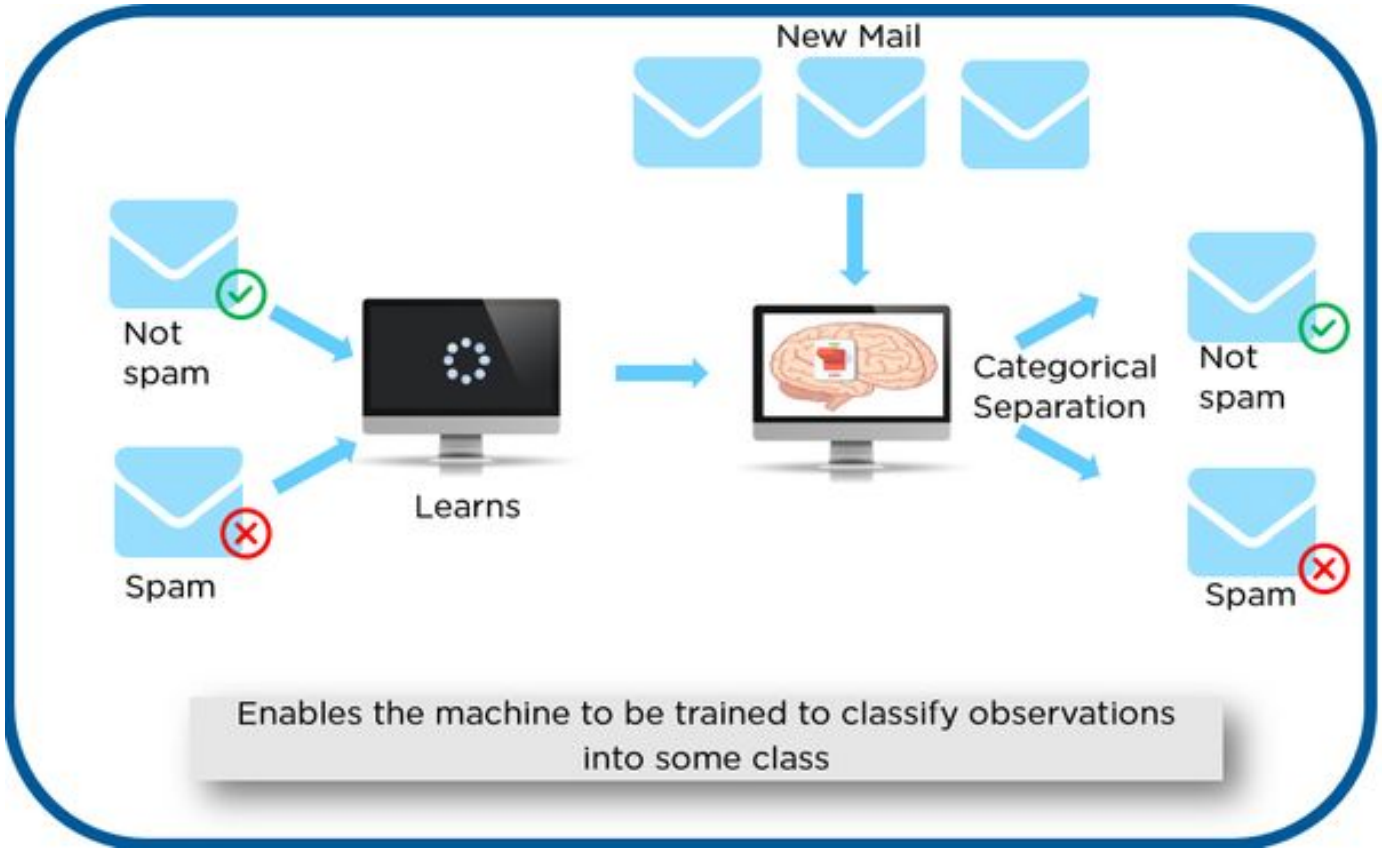
It is the easiest to understand and the simplest to implement. It is very similar to teaching a child with the use of flash cards.

Real life examples of supervised learning

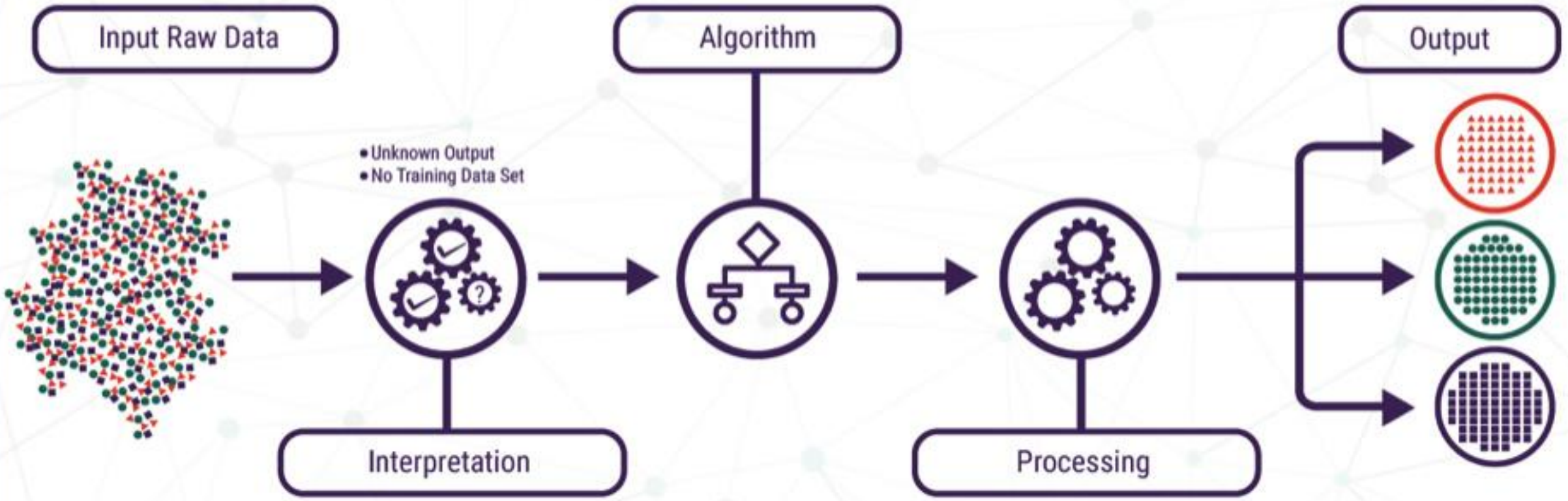
That spam filter is a supervised learning system.

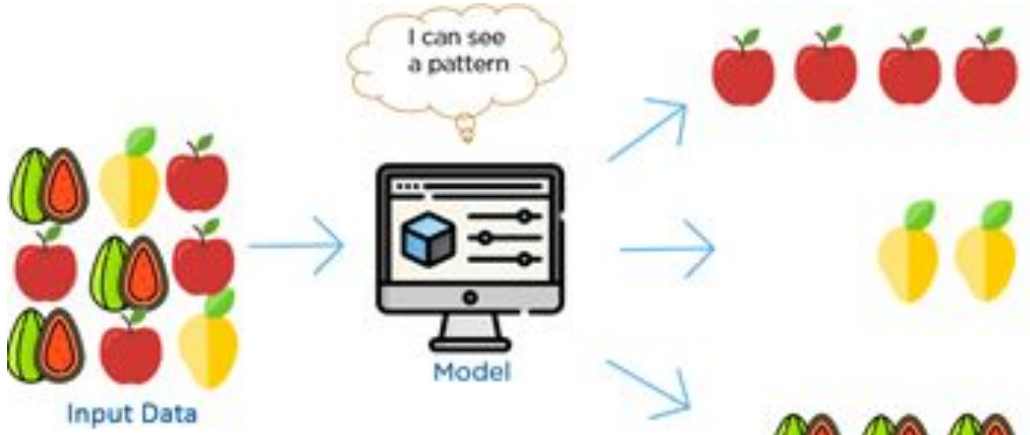
Fed email examples and labels (spam/not spam), these systems learn how to preemptively filter out malicious emails so that their user is not harassed by them.

Many of these also behave in such a way that a user can provide new labels to the system and it can learn user preference.



UNSUPERVISED LEARNING

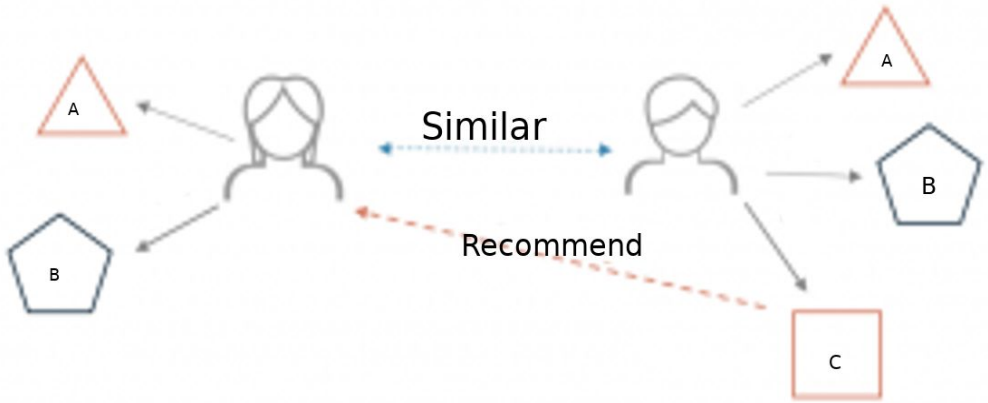




Un-Supervised Learning

- Unsupervised learning is very much the opposite of supervised learning.
- It features no labels.
- Our algorithm would be fed a lot of data and from there, it can learn to group, cluster, and/or organize the data in a way such that a human (or other intelligent algorithm) can come in and make sense of the newly organized data.

Real life examples of un-supervised learning

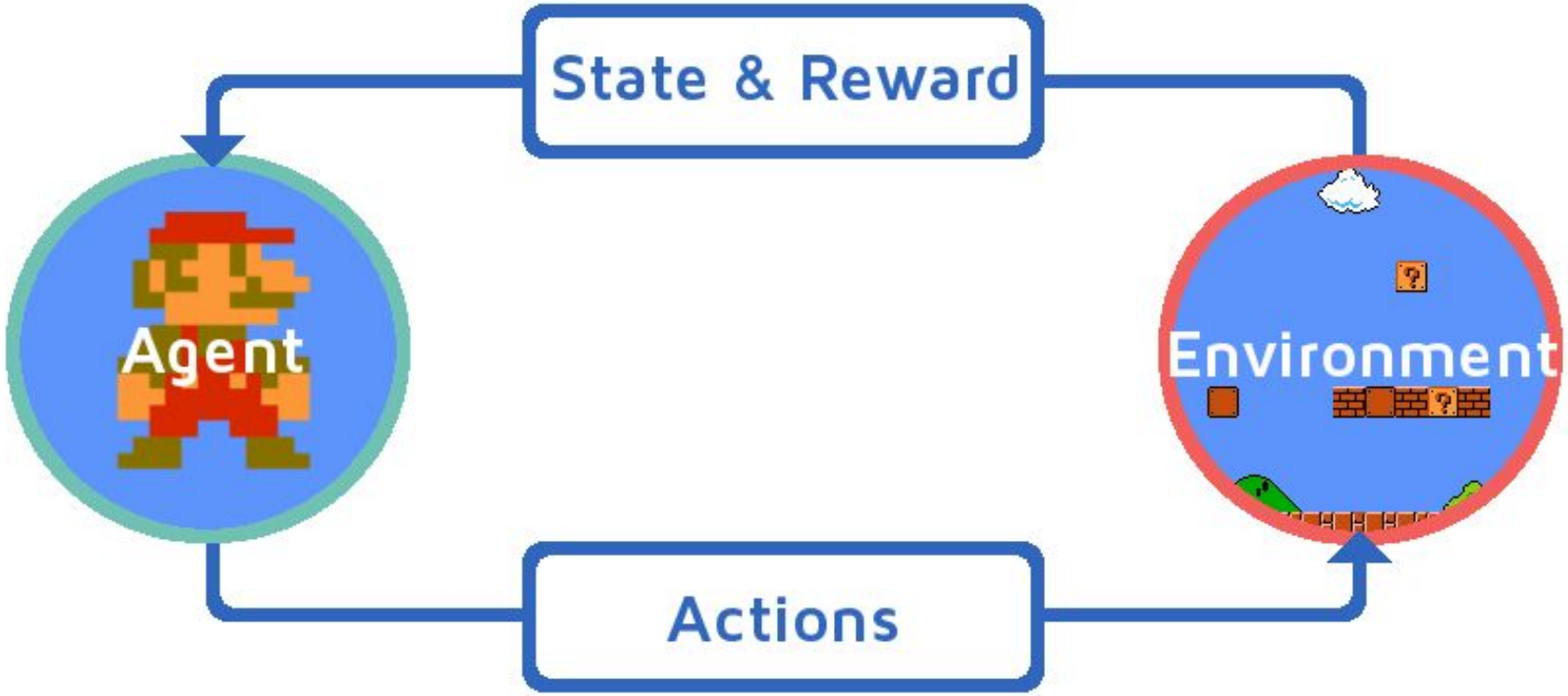


Recommender Systems

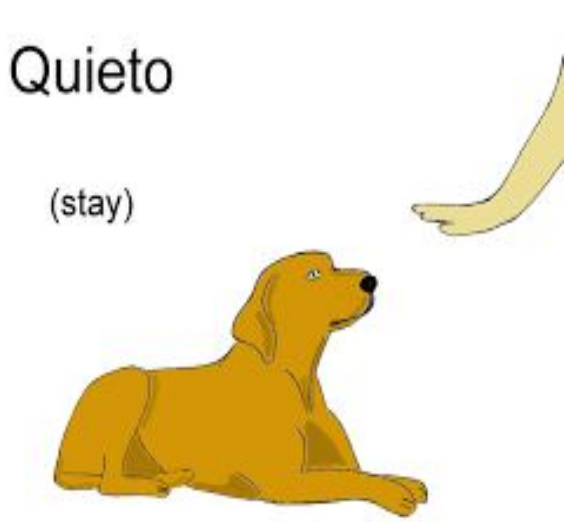
- If you've ever used YouTube or Netflix, you've most likely encountered a video recommendation system.
- Taking into account users that have watched similar videos as you and then enjoyed other videos that you have yet to see, a recommender system can see this relationship in the data and prompt you with such a suggestion.

Reinforcement learning

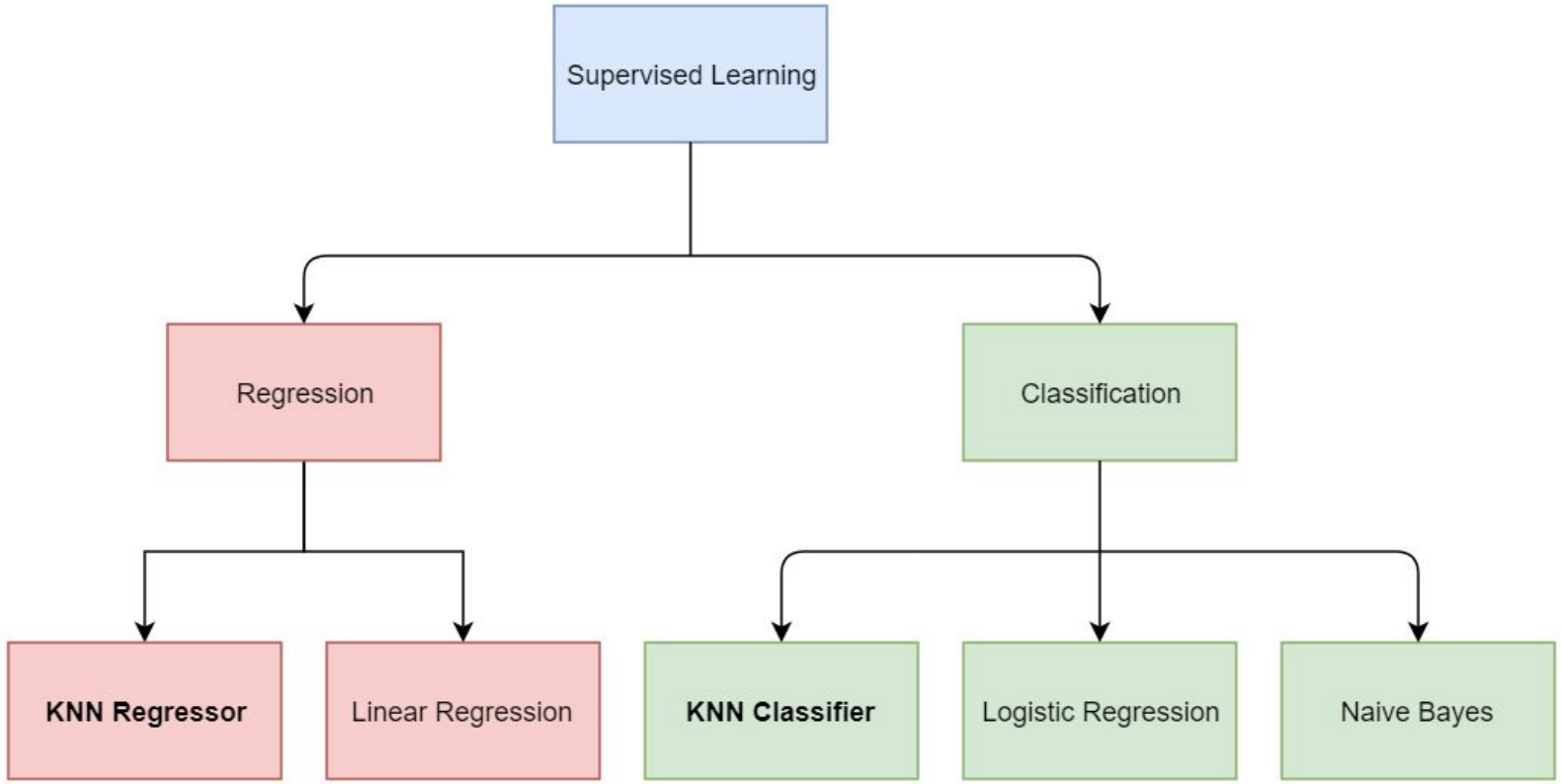
Action and reward-based learning



Reinforcement Learning



SUPERVISED LEARNING



Finding similar rows

Distance functions

Euclidean $\sqrt{\sum_{i=1}^{k}(x_i - y_i)^2}$

Manhattan $\sum_{i=1}^{k}|x_i - y_i|$

Minkowski $\left(\sum_{i=1}^{k}(|x_i - y_i|)^q\right)^{1/q}$