# Supervised Vs Unsupervised

Summary

# Scenario1

- You are a kid, you see different types of animals, your father tells you that this particular animal is a dog…after him giving you tips few times, you see a new type of dog that you never saw before - you identify it as a dog and not as a cat or a monkey or a potato.

# Scenario2

- You go bag-packing to a new country, you did not know much about it - their food, culture, language etc. However from day 1, you start making sense there, learning to eat new cuisines including what not to eat, find a way to that beach etc.

# Supervised

Is like learning with a teacher

Training dataset is like a teacher

The training dataset is used to train the machine

# Supervised - Example

**Classification:** Machine is trained to classify something into some class.

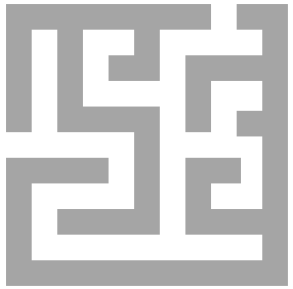
- classifying whether a patient has disease or not
- classifying whether an email is spam or not

**Regression:** Machine is trained to predict some value like price, weight or height.

- predicting house/property price
- predicting stock market price

# Unsupervised

is like learning without a teacher



the machine learns through observation & find structures in data

# Unsupervised - Example

**Clustering:** A clustering problem is where you want to discover the inherent groupings in the data

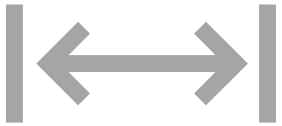
such as grouping customers by purchasing behavior

**Association:** An association rule learning problem is where you want to discover rules that describe large portions of your data

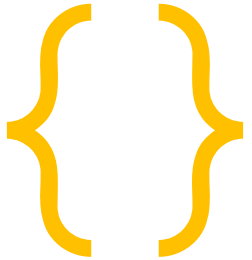
such as people that buy X also tend to buy Y

# Supervised

Supervised learning is where you have input variables (x) and an output variable (Y) and you use an algorithm to learn the mapping function from the input to the output.



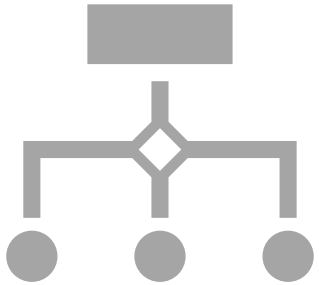
Y = f(X)



The goal is to approximate the mapping function so well that when you have new input data (x) that you can predict the output variables (Y) for that data.

# Unsupervised

Unsupervised learning is where you only have input data (X) and no corresponding output variables.



The goal for unsupervised learning is to model the underlying structure or distribution in the data in order to learn more about the data.

# Sources

https://www.quora.com/What-is-the-difference-between-supervised-and-unsupervised-learning-algorithms

https://machinelearningmastery.com/supervised-and-unsupervised-machine-learning-algorithms/