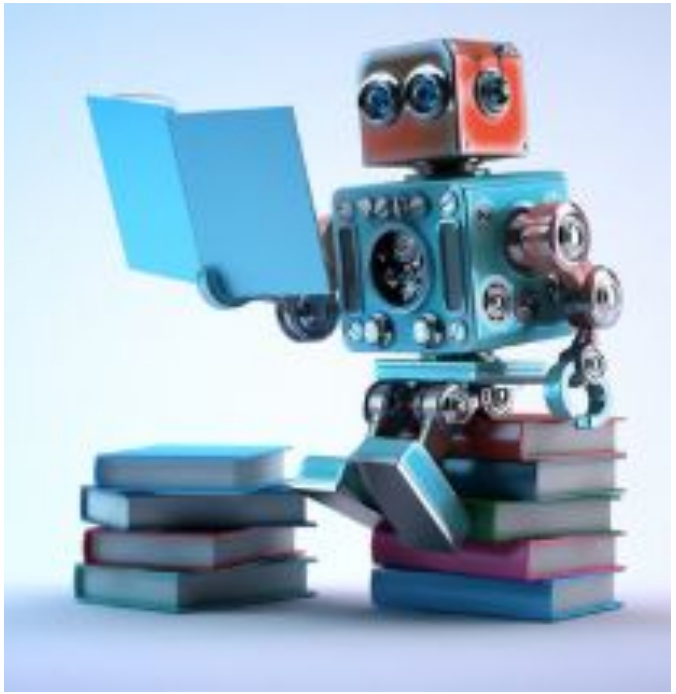


Introduction to Machine Learning

APSSDC

Artificial Intelligence

Machine Learning

Machine Learning is a subtopic of Artificial Intelligence(AI) that the Machine have an ability to learn from the data and improve from experience.

Arthur Lee Samuel

Types of Machine Learning

Supervised Learning

- Makes machine Learn explicitly
- Data with clearly defined output is given
- Direct feedback is given
- Predicts outcome/future
- Resolves classification and regression problems

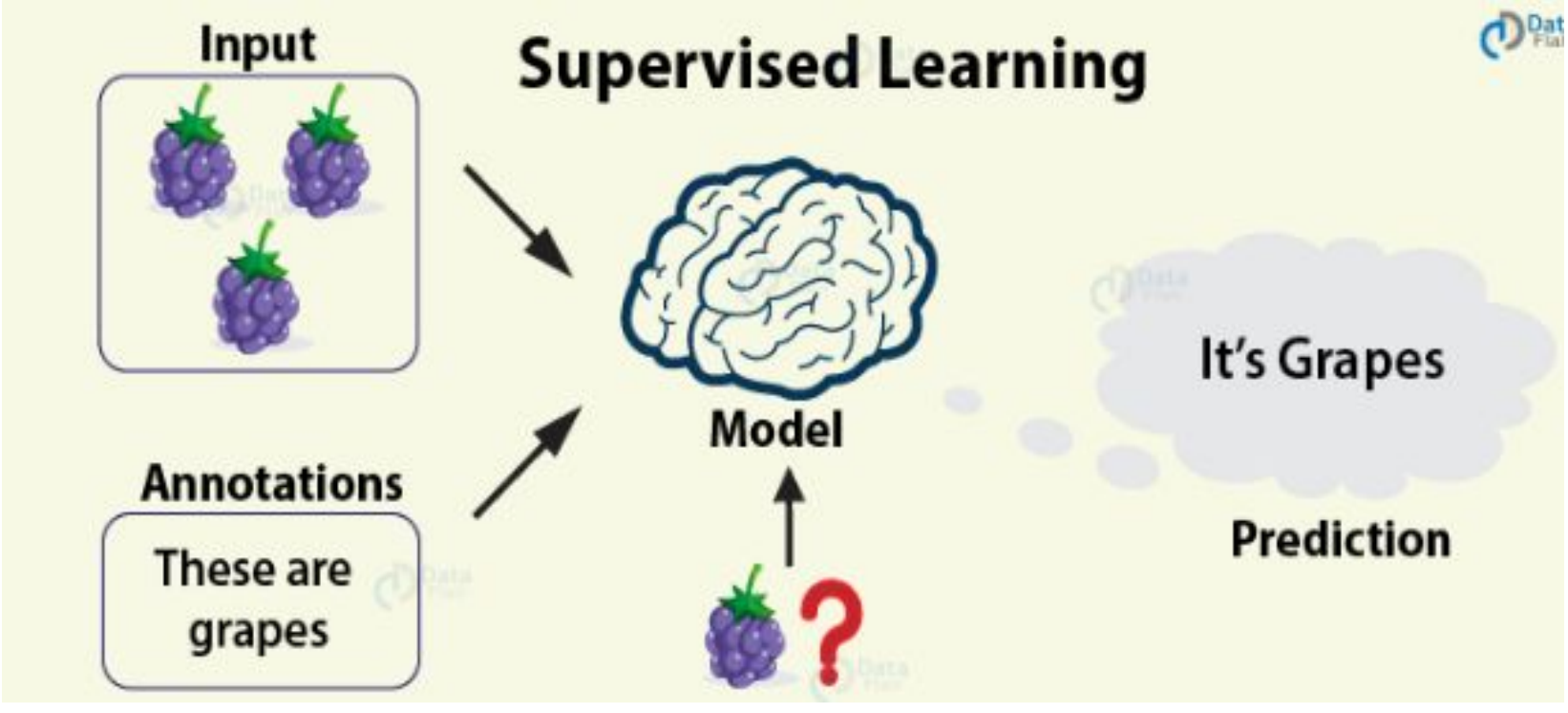
Unsupervised Learning

- Machine understands the data (Identifies patterns/structures)
- Evaluation is qualitative or indirect
- Does not predict/find anything specific

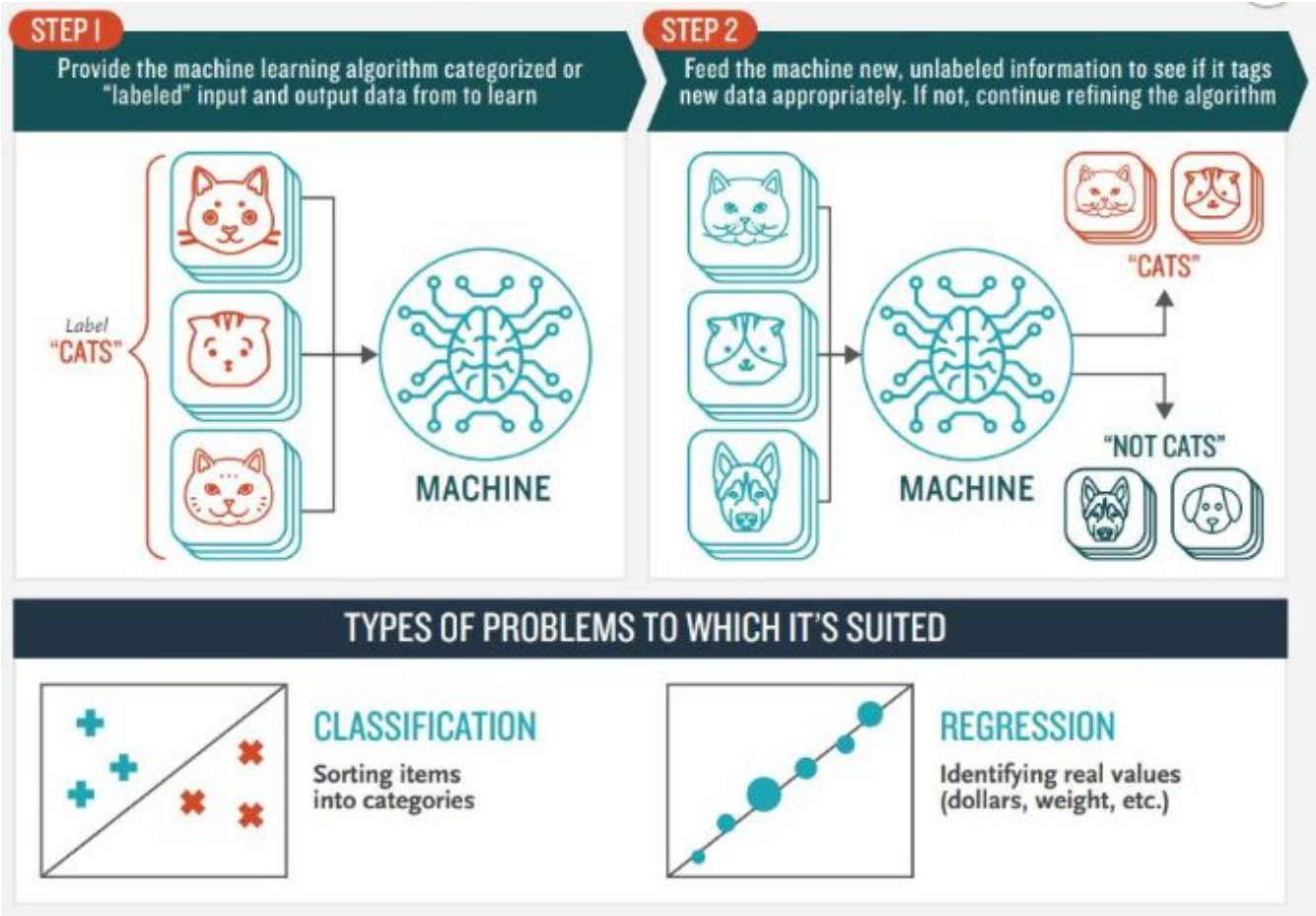
Reinforcement Learning

- An approach to AI
- Reward based learning
- Learning form +ve & +ve reinforcement
- Machine Learns how to act in a certain environment
- To maximize rewards

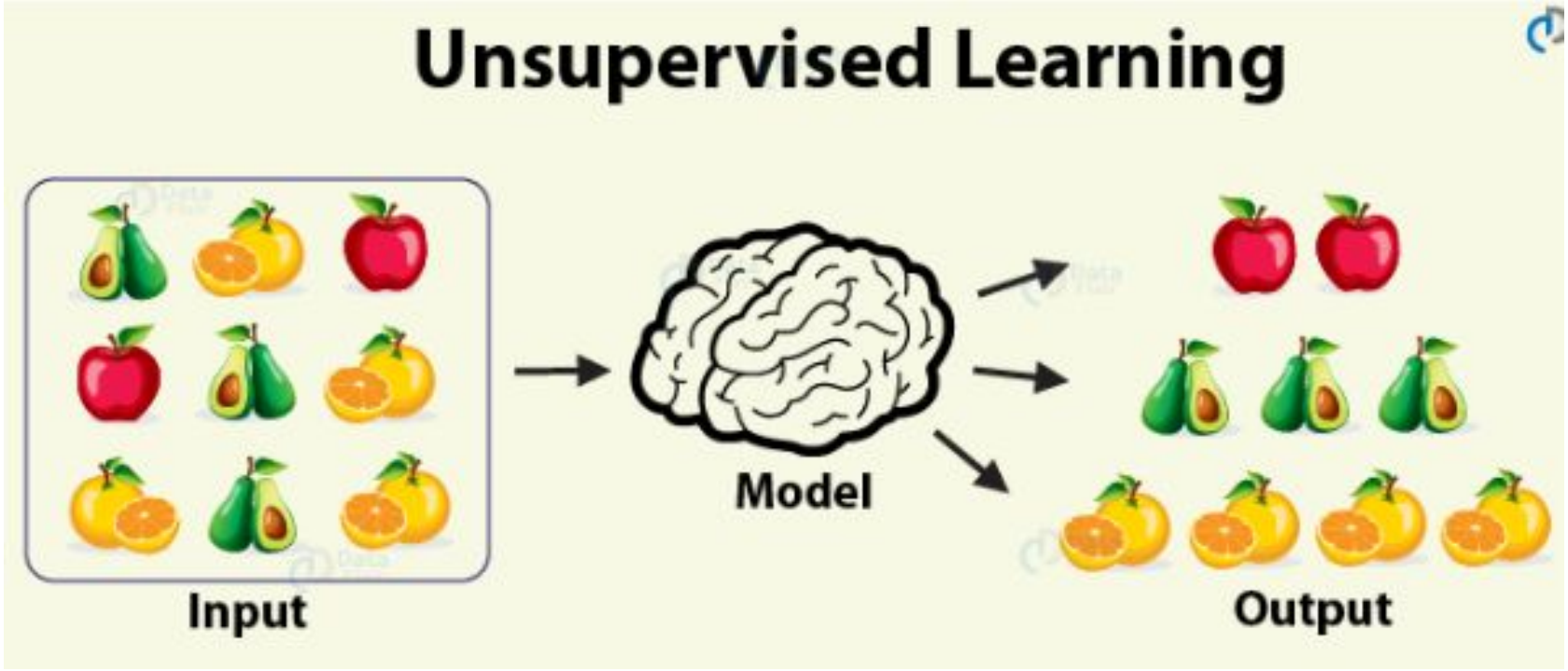
#1
Supervised
learning



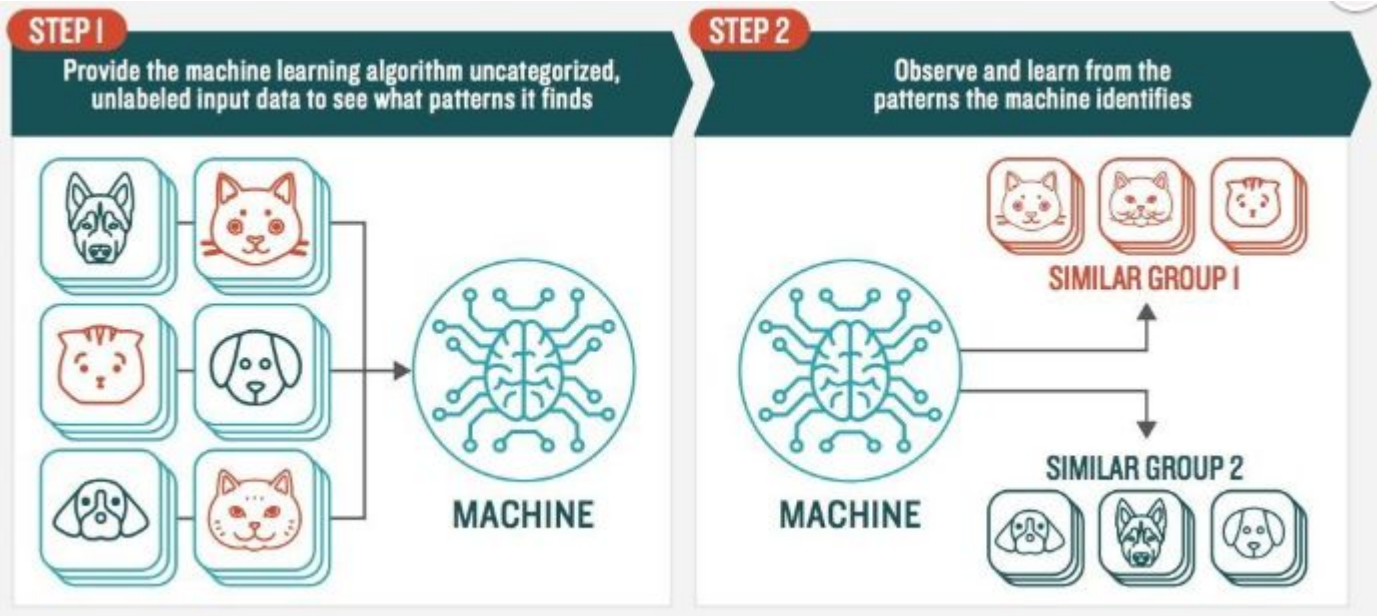
How Supervised Machine Learning Works

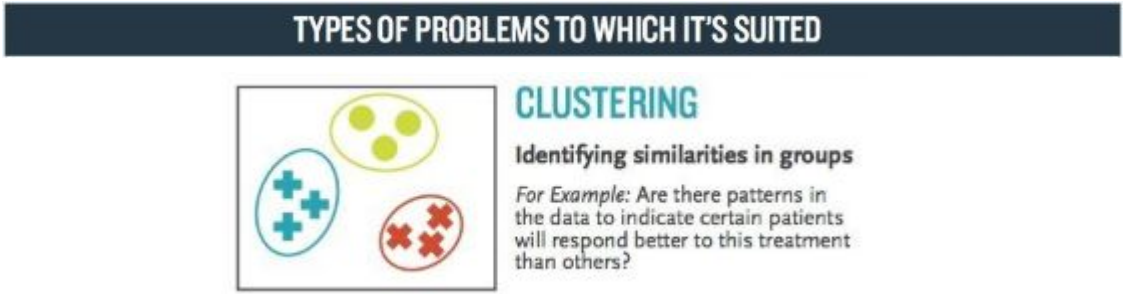


#2
Unsupervised learning



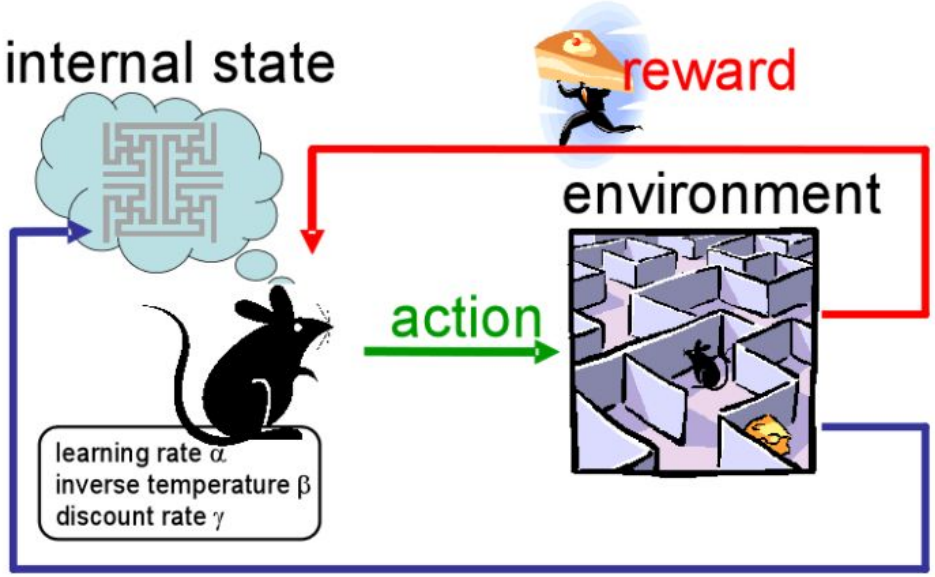
How Unsupervised Machine Learning Works

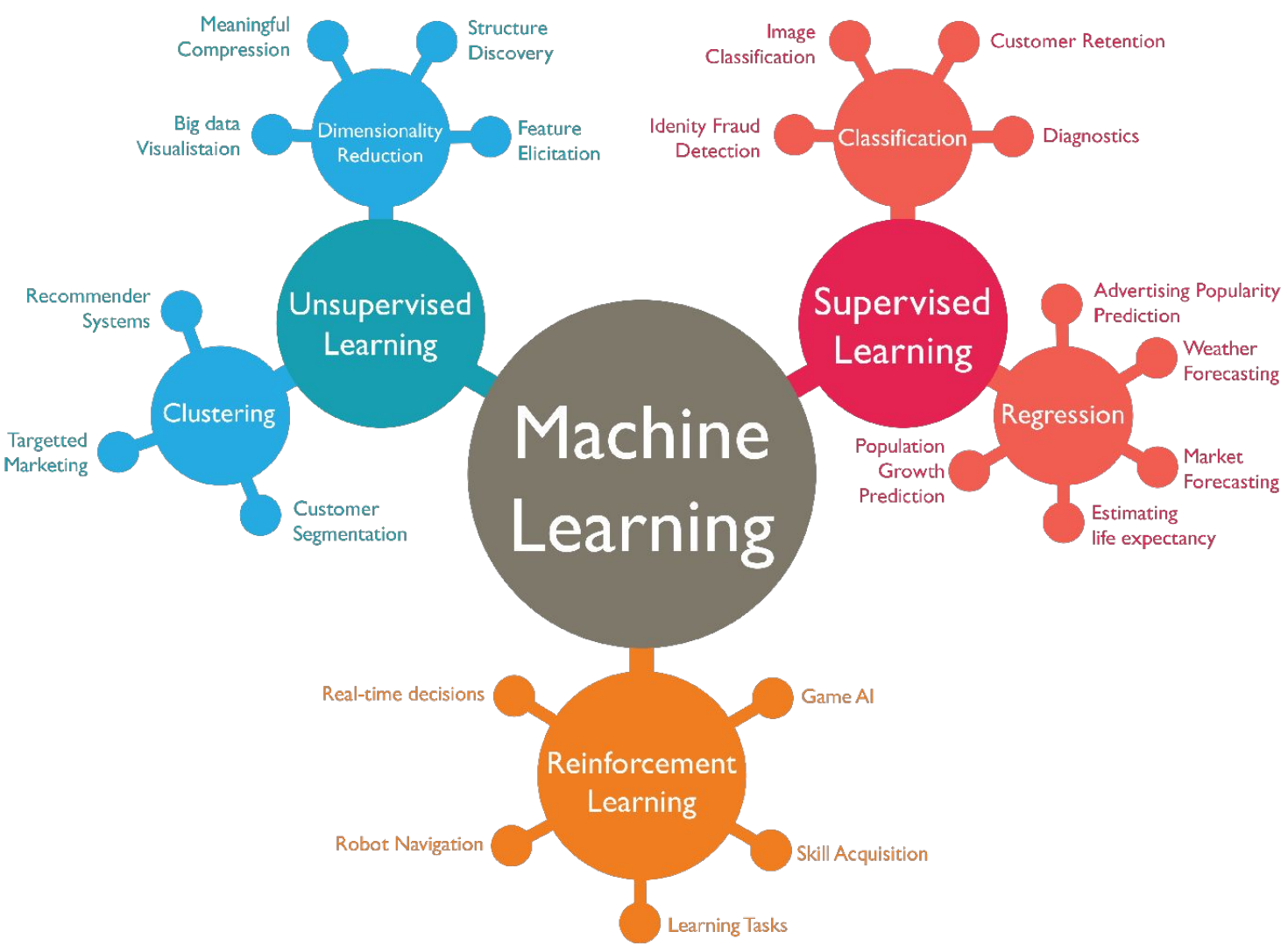




#3

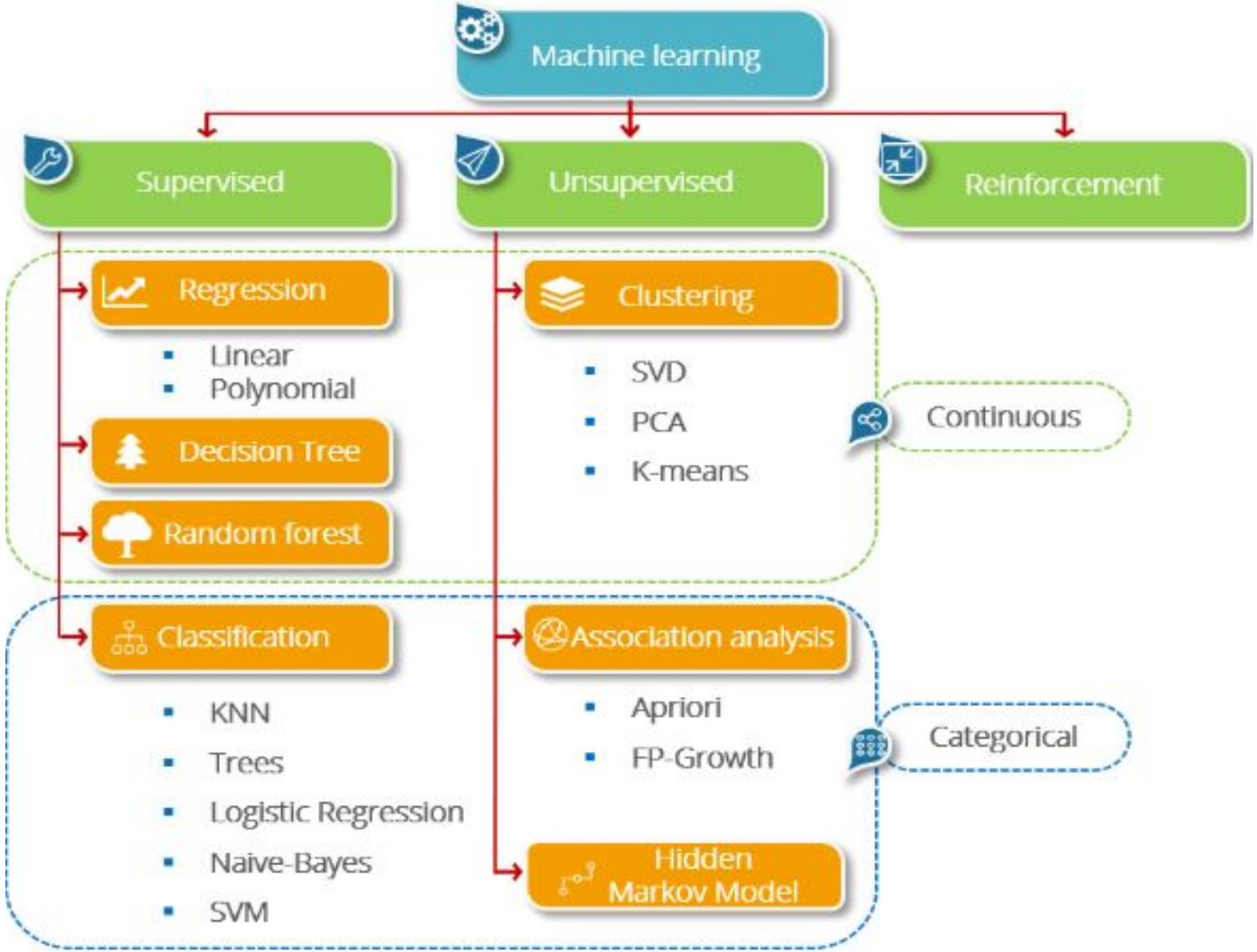
Reinforcement Learning




Machine Learning
Unsupervised Learning
Dimensionality Reduction
Meaningful Compression
Structure Discovery
Big data Visualistaion
Feature Elicitation
Clustering
Recommender Systems
Targetted Marketing
Customer Segmentation
Supervised Learning
Classification
Image Classification
Customer Retention
Idenity Fraud Detection
Diagnostics
Regression
Advertising Popularity Prediction
Weather Forecasting
Population Growth Prediction
Market Forecasting
Estimating life expectancy
Reinforcement Learning
Real-time decisions
Game AI
Robot Navigation
Skill Acquisition
Learning Tasks

Algorithms

In Machine Learning



Classification

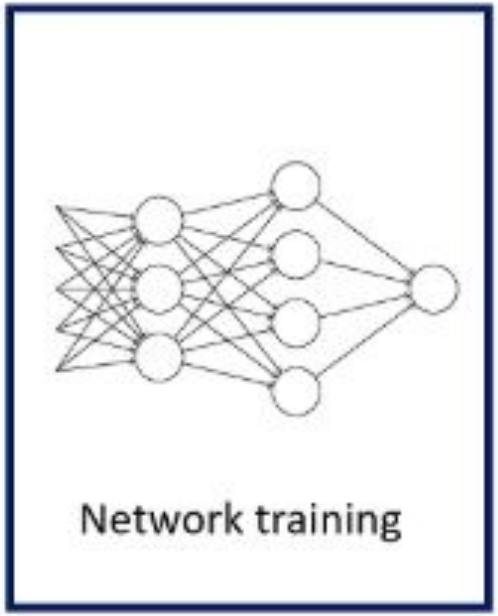
- Logistic Regression
- K Nearest Neighbours
- Trees (Random Forest)
- Naive Bayes
- SVM

#1
Supervised learning


Happy


Sad

MNIST Handwritten Digits



0
1
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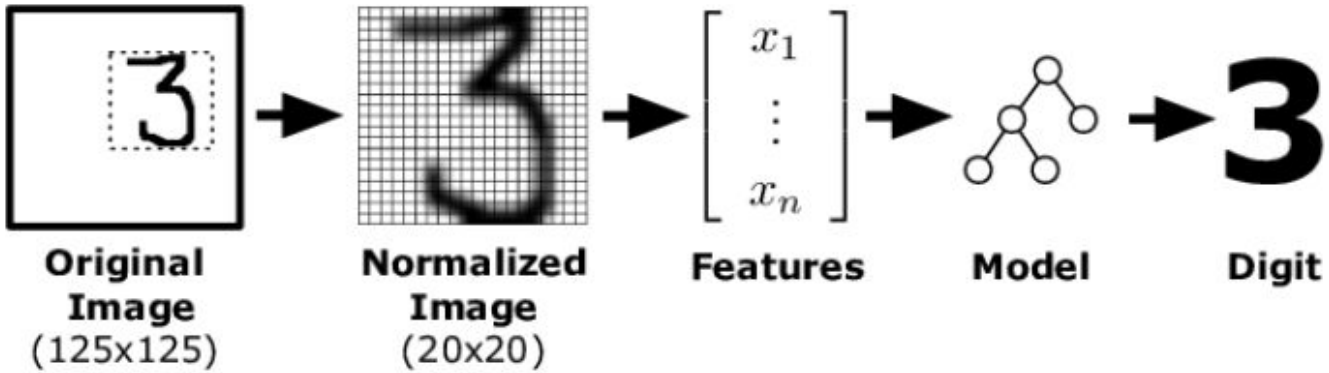
Digit Classification

- Collect Images or Data
- Extract features from the images
- Apply statistical machine learning algorithms
- Evaluate the effectiveness of their system



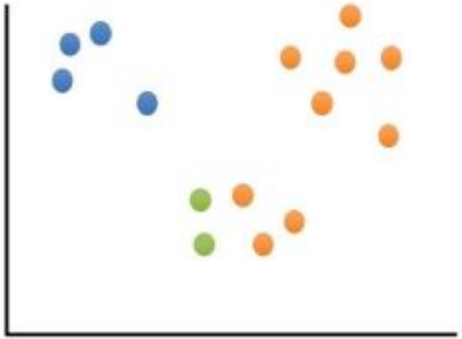
Regression

- Simple Linear Regression
- Polynomial Regression

House Price Prediction

Clustering

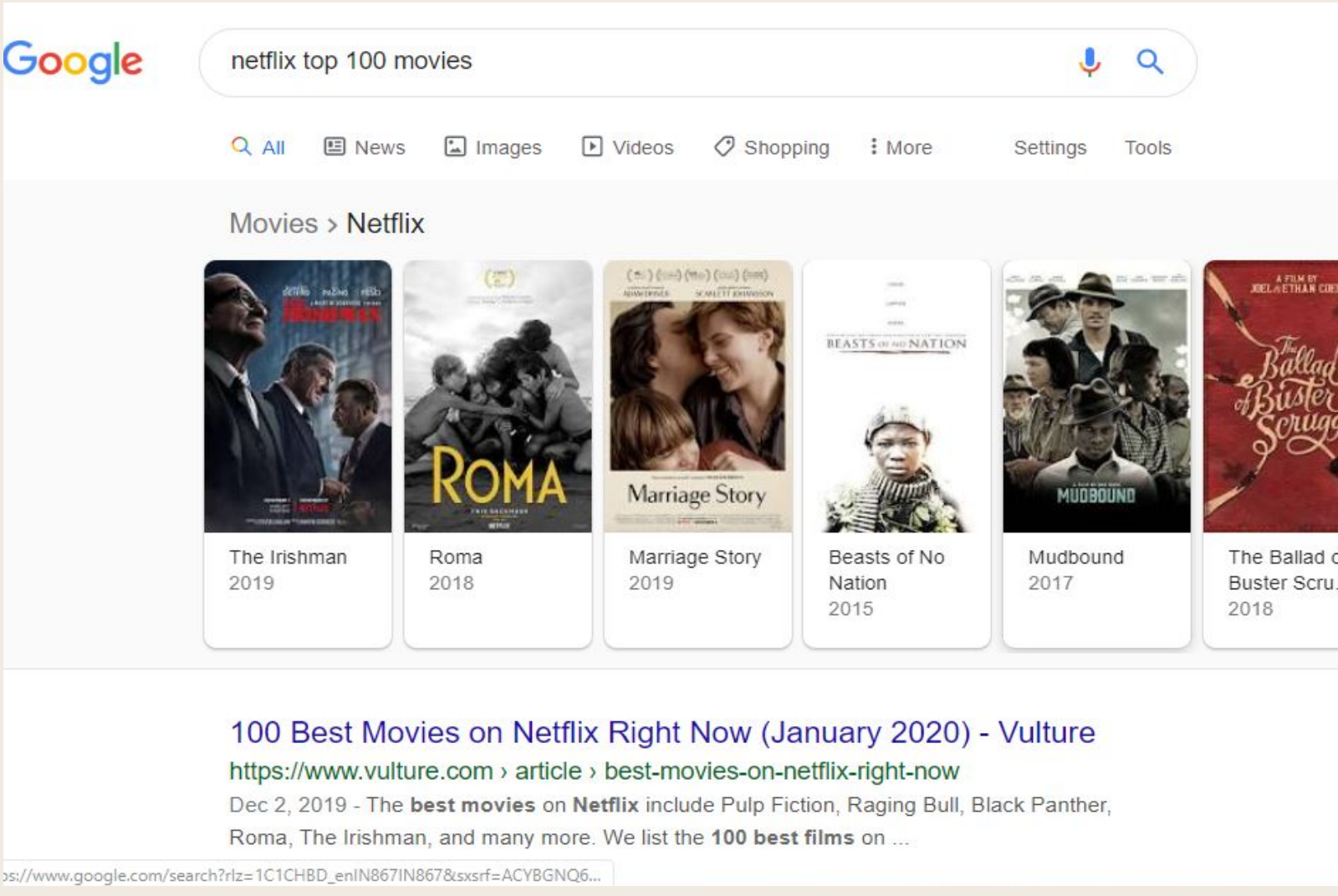
- K - means algorithm
- Gaussian distributions



Social Network Analysis

#2
Unsupervised learning

Netflix Movie Recommendation



Features / Independent Variables

Gender	Head Size
male	4112
female	3690
female	4557
male	3986
female	3299
male	4723

Target / Dependent Variables

Brain Weight
1590
1366
1588
1411
1237
1569