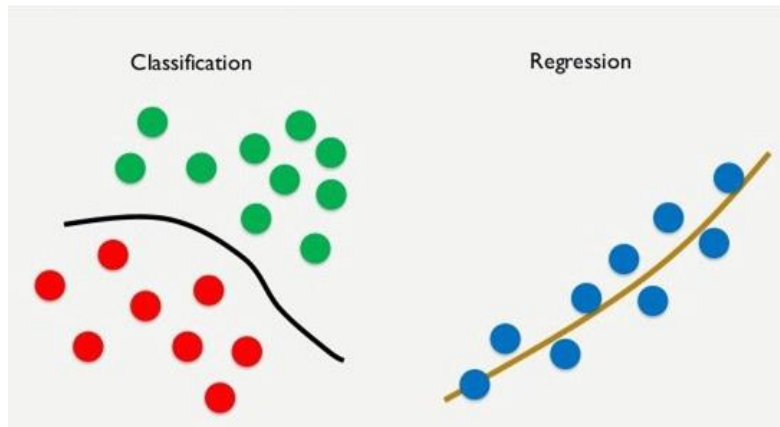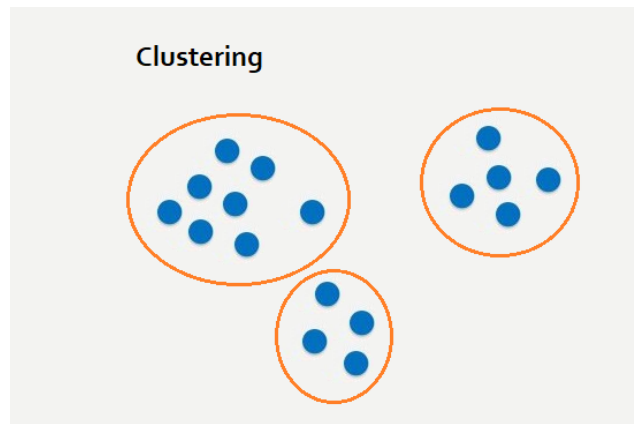# Supervised Learning

- Discover the relationship between input attributes (independent variables) and a target attribute (dependent variable)

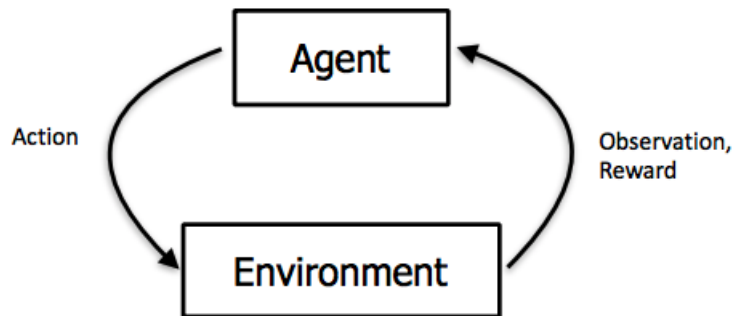- Labelled Dataset

- Regression, Classification
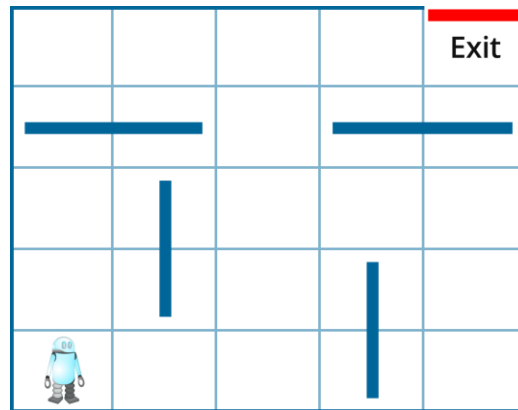
Unsupervised Learning

- Discover similarities or patterns in data without any guidance
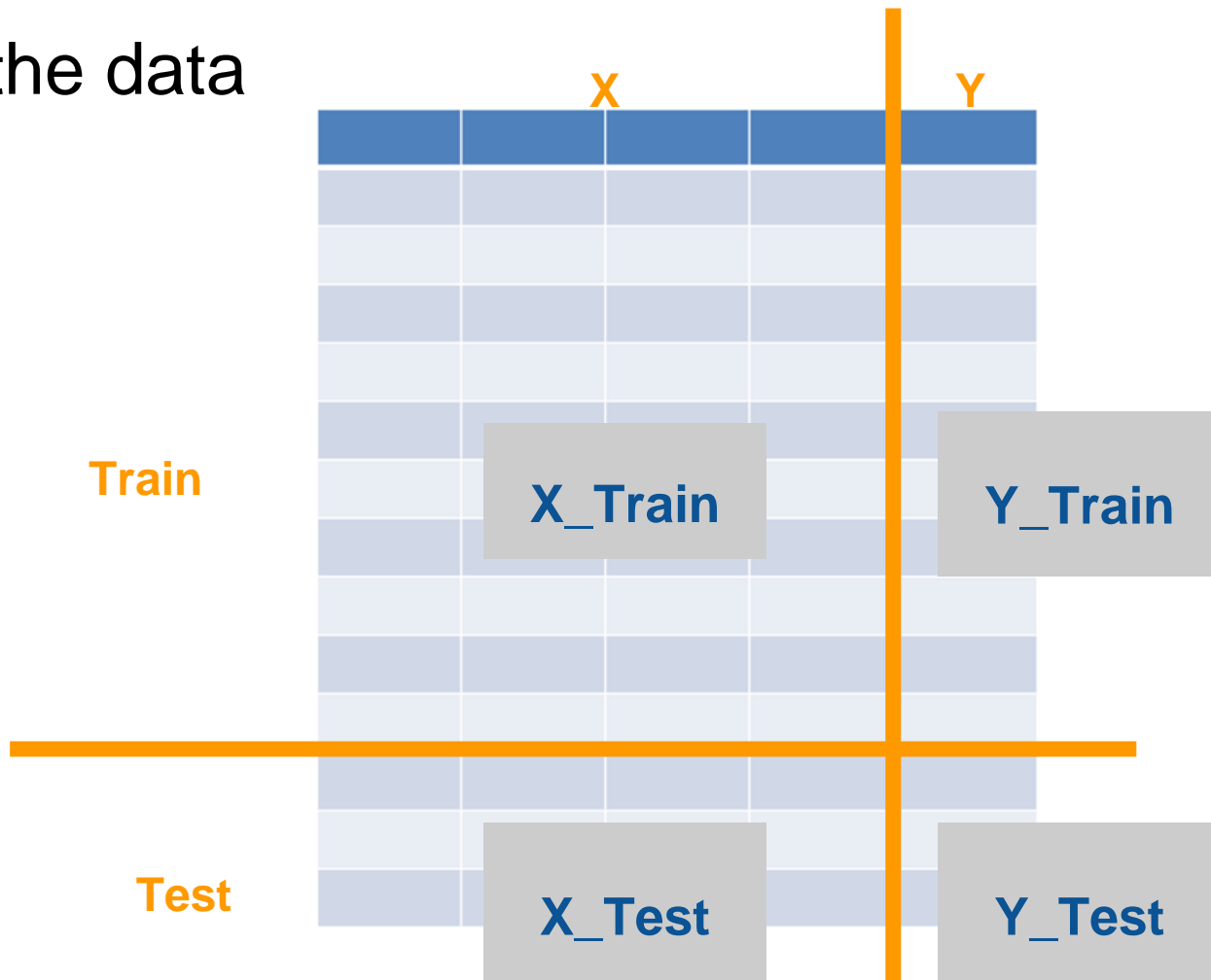
- Unlabelled Dataset

- Clustering

Reinforcement Learning

- State - Action -Reward
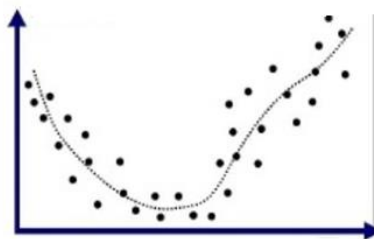
- Q-Learning, SARSA

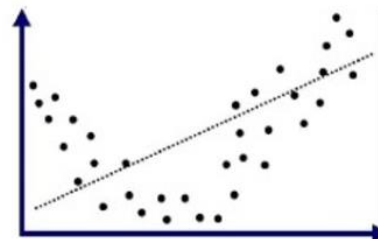- Self-Driving Cars

Splitting the data

Overfitting & Underfitting

Underfitting

- Model doesn't perform well.

- Model doesn't learn the underlying pattern of data

- Can happen if

  - Too simple model
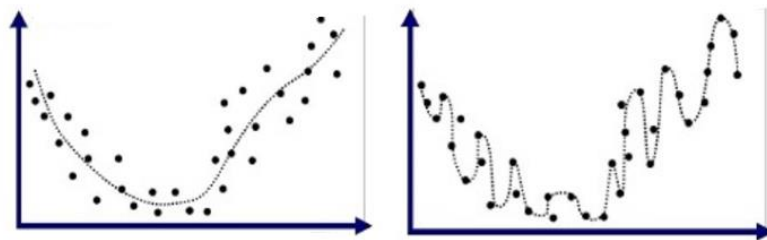
  - Not enough data for training

Good Fit   Underfit

Overfitting

- Model performs **very good** on **training data**, but **poorly** on **new data**

- Can happen if

  - Model is too complex, fits the data too well

  - Captures noise of data
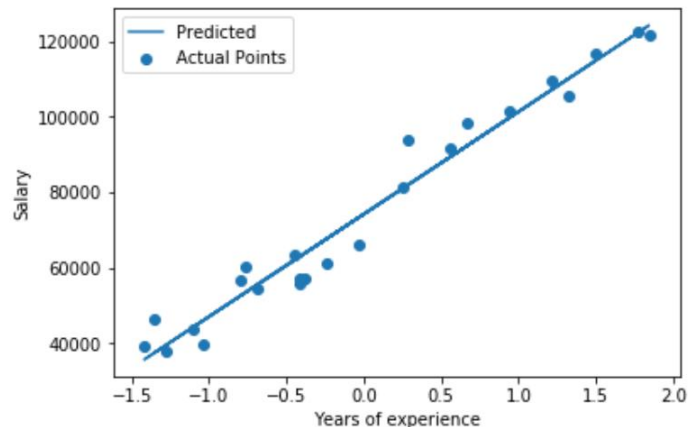

Good Fit   Overfit

Overfitting

Supervised Tasks
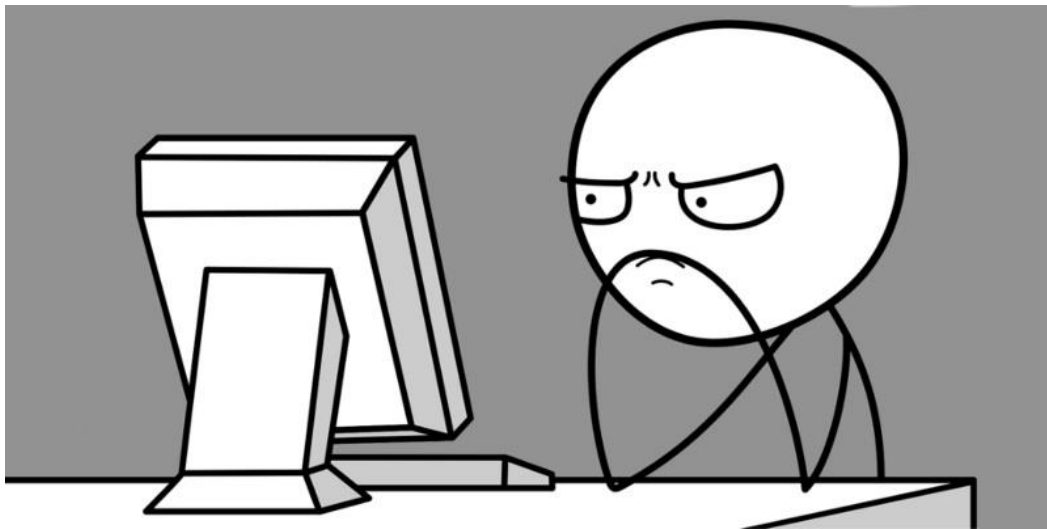
Regression & Classification

Regression

- Models a target **prediction value** based on independent variables

- Predicts **Continuous** Values

- Used for
  - Forecasting
  - Finding relationship between variables

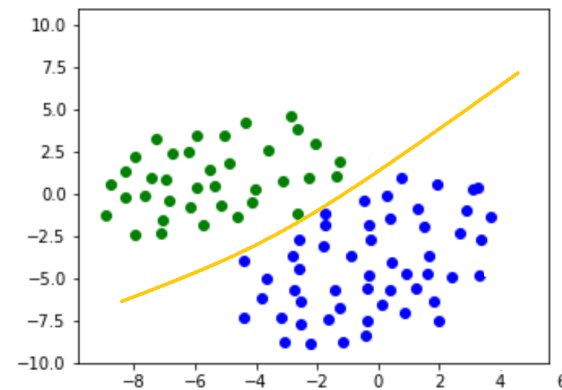- Models: Linear Regressor, Support Vector Regressor, etc

Regression

Let the machines start learning !
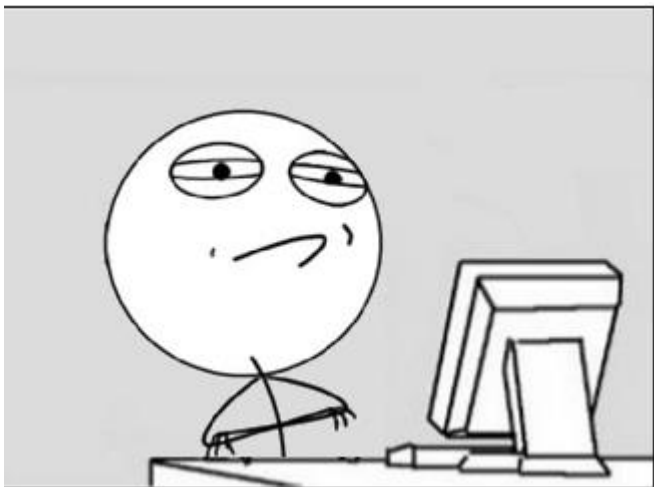
https://tinyurl.com/exploreml-salary

Classification

- Models a target **class value** based on independent variables

- Predicts **Discrete** Values

- Used for
  - Categorizing into classes
  - Detecting presence of classes, ex Object Detection

- Models: Support Vector Classifier, K-Nearest Neighbour, etc

Classification

What did one support vector say to another support vector? I feel so marginalized.

https://tinyurl.com/exploreml-banknote