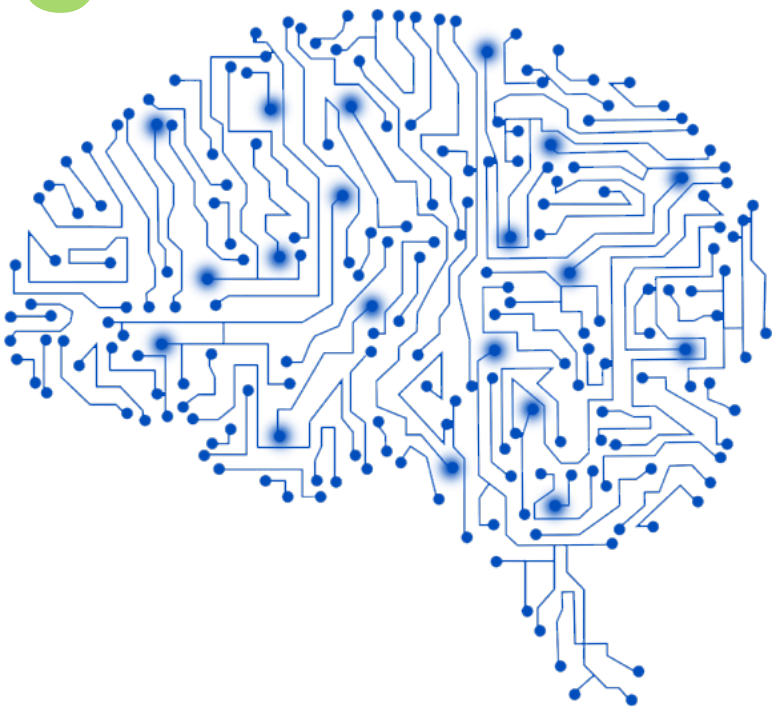
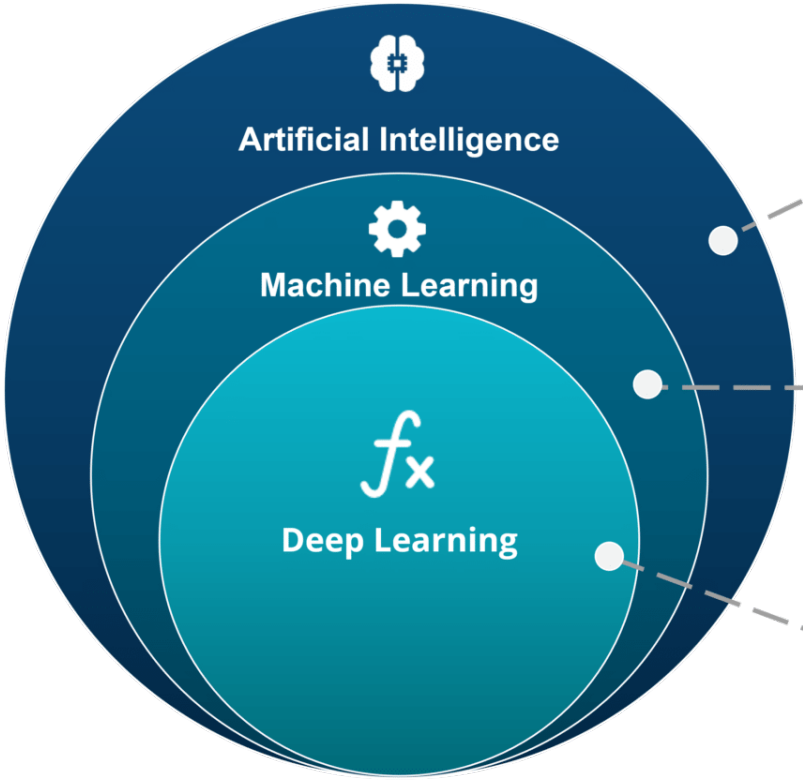
Introducción al Machine Learning



Francisco Manuel García Moreno
María Bermúdez Edo

Diagrama de Venn



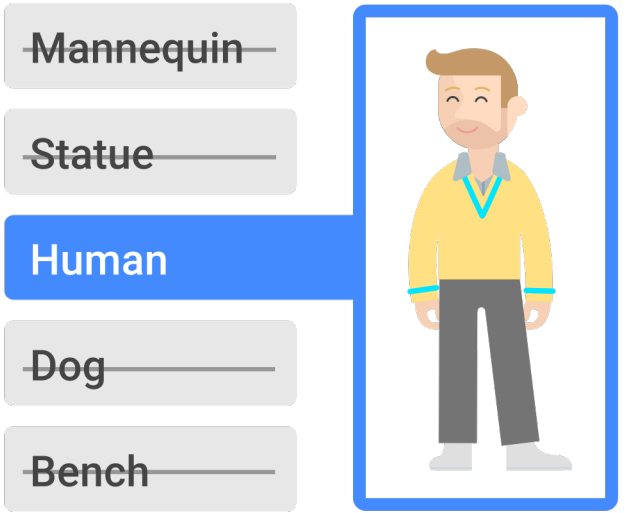
ARTIFICIAL INTELLIGENCE
A technique which enables machines to mimic human behaviour

MACHINE LEARNING
Subset of AI technique which use statistical methods to enable machines to improve with experience

DEEP LEARNING
Subset of ML which make the computation of multi-layer neural network feasible

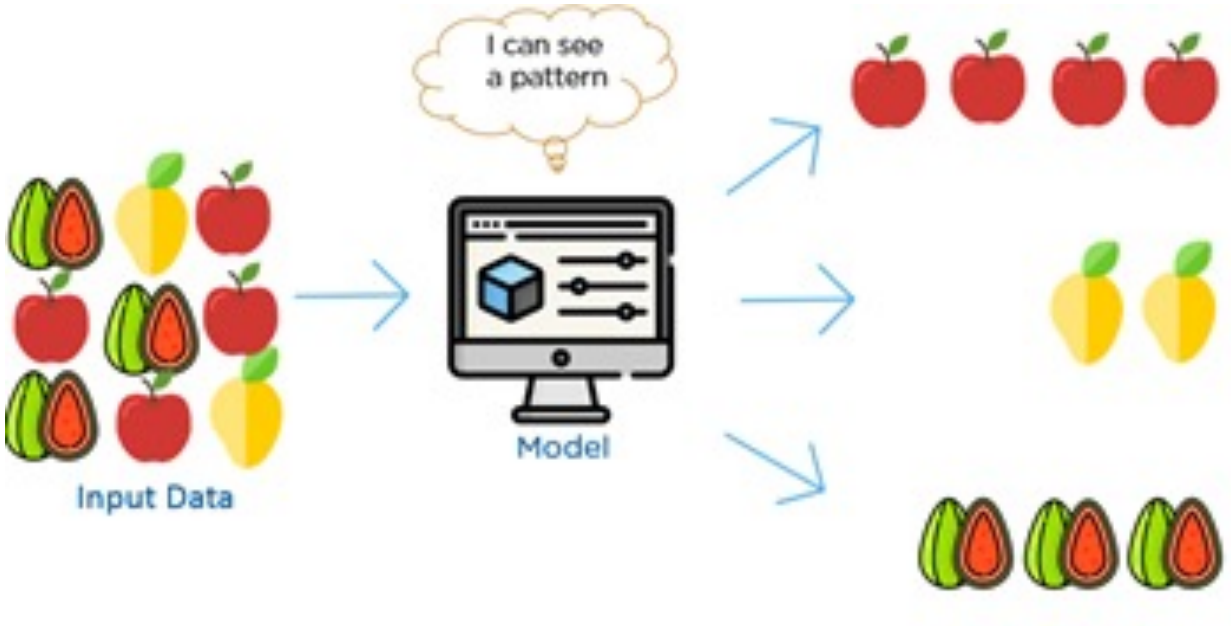
Machine Learning

- Inteligencia Artificial
- Imitar aprendizaje humano
- Aprender de datos históricos

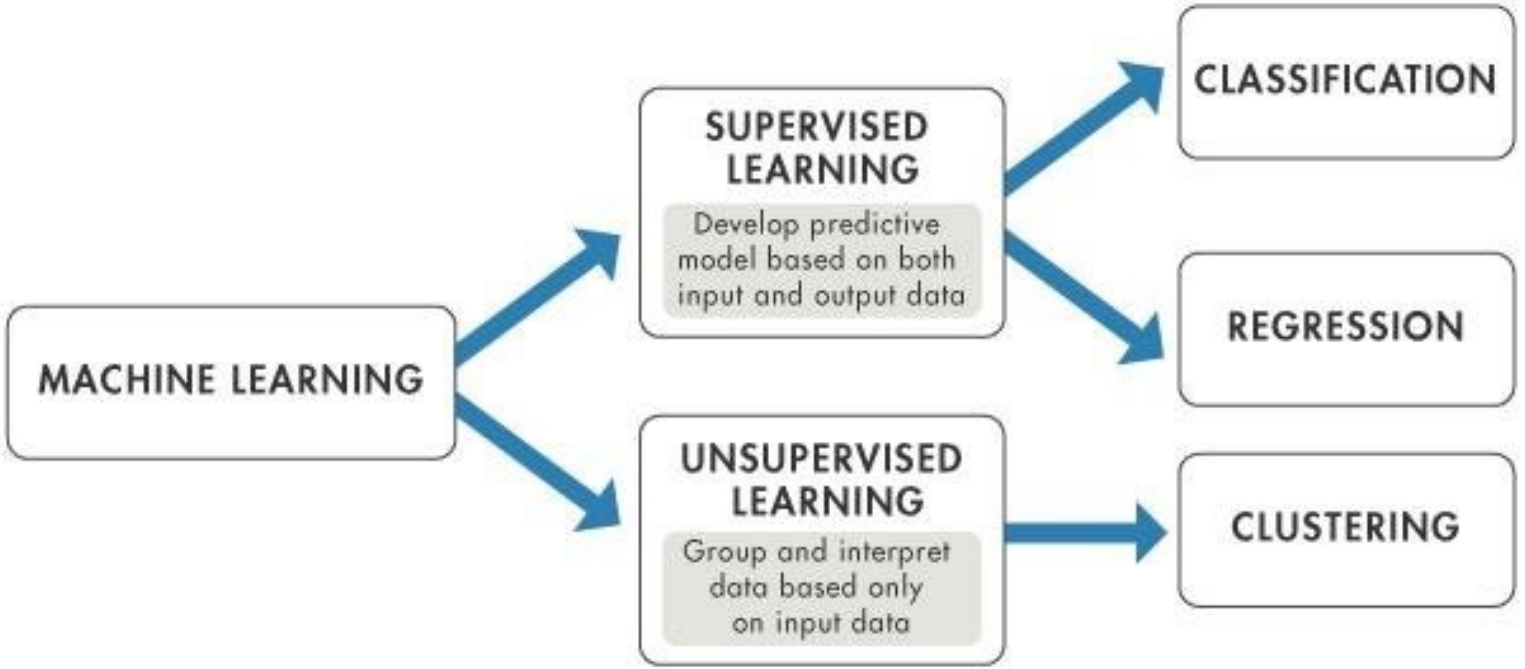


Cloud AutoML[BETA]

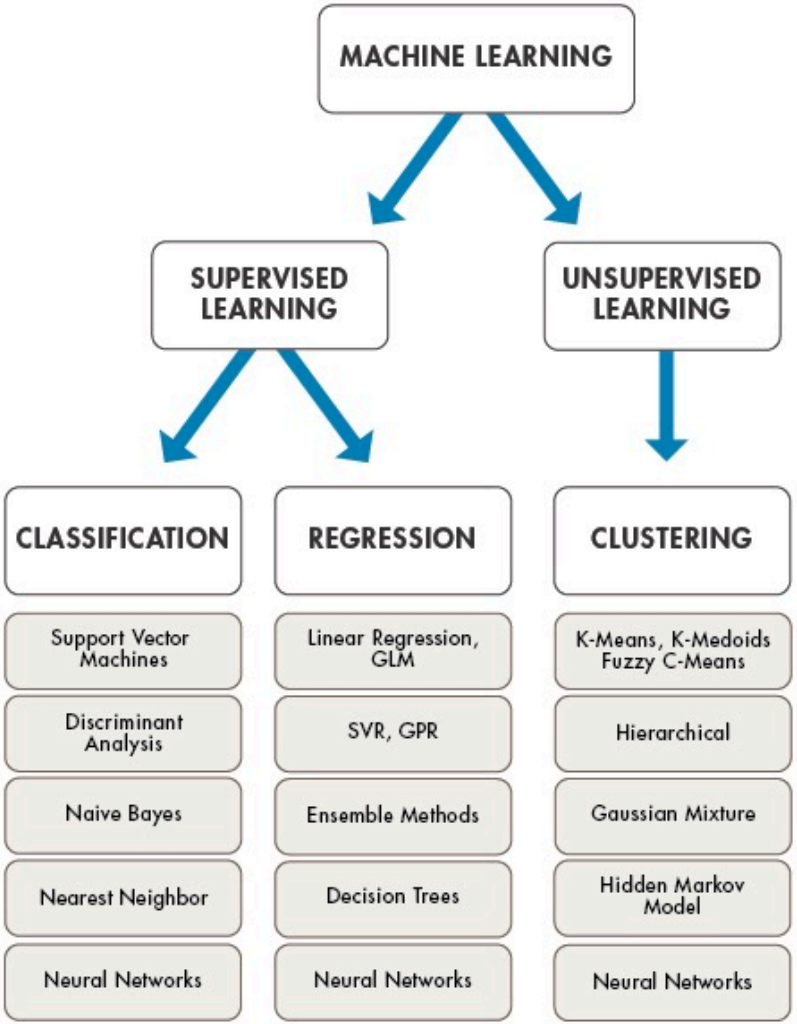
Encontrar patrones



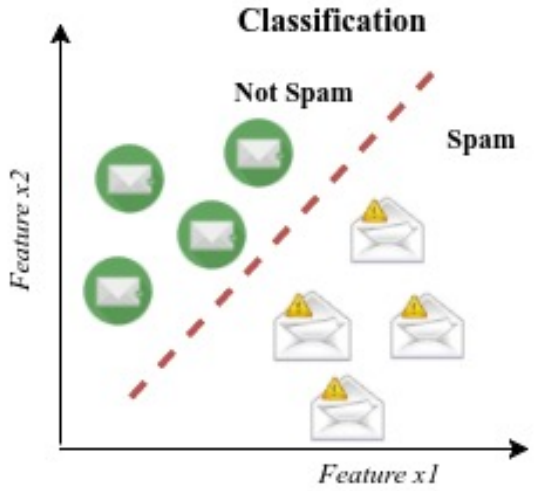
Técnicas

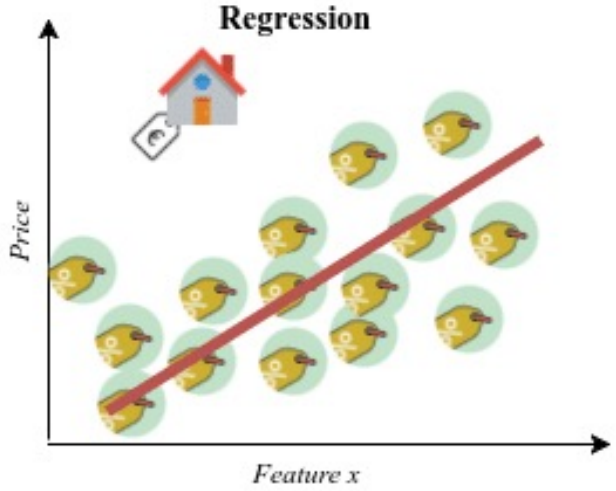

MACHINE LEARNING
SUPERVISED LEARNING
Develop predictive model based on both input and output data
UNSUPERVISED LEARNING
Group and interpret data based only on input data
CLASSIFICATION
REGRESSION
CLUSTERING

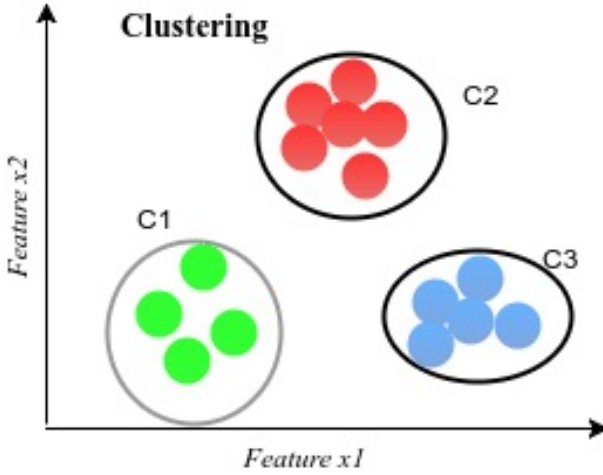
Técnicas


MACHINE LEARNING
SUPERVISED LEARNING
UNSUPERVISED LEARNING
CLASSIFICATION
REGRESSION
CLUSTERING
Support Vector Machines
Discriminant Analysis
Naive Bayes
Nearest Neighbor
Neural Networks
Linear Regression, GLM
SVR, GPR
Ensemble Methods
Decision Trees
Neural Networks
K-Means, K-Medoids Fuzzy C-Means
Hierarchical
Gaussian Mixture
Hidden Markov Model
Neural Networks

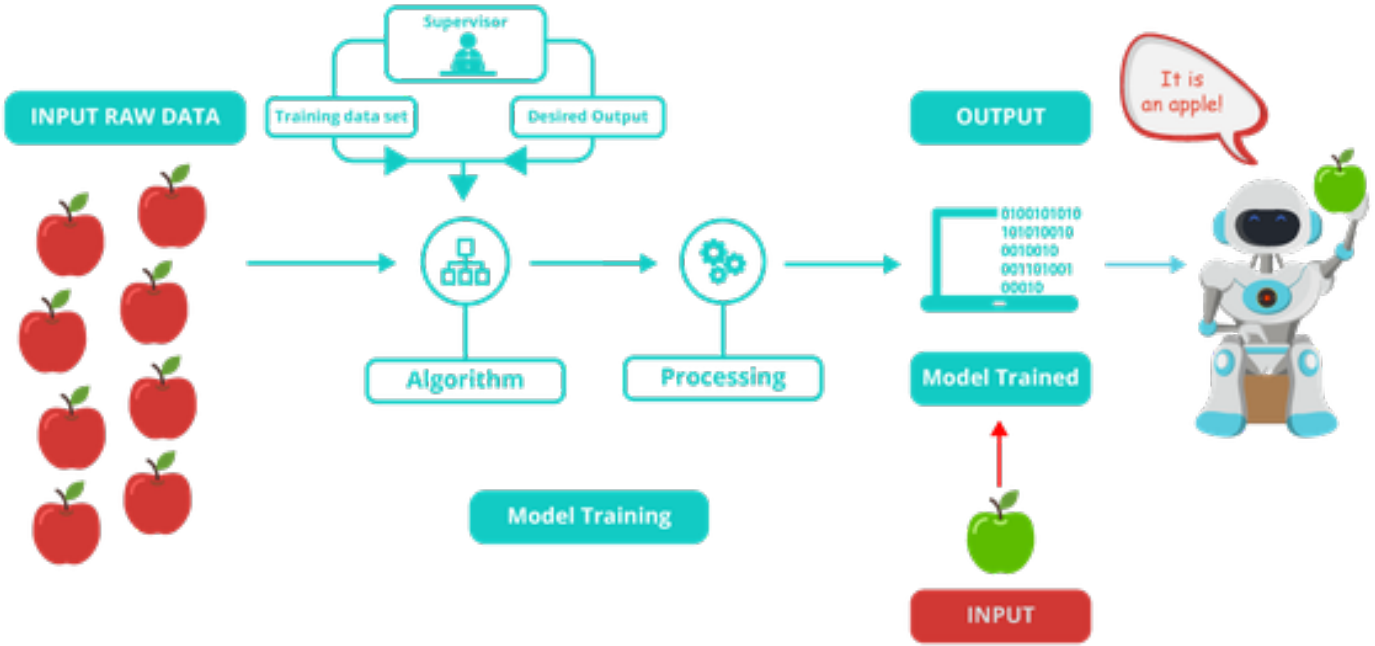
Diferencias entre supervisado y no supervisado







Objetivo del Supervised Learning



Fases del Supervised Learning

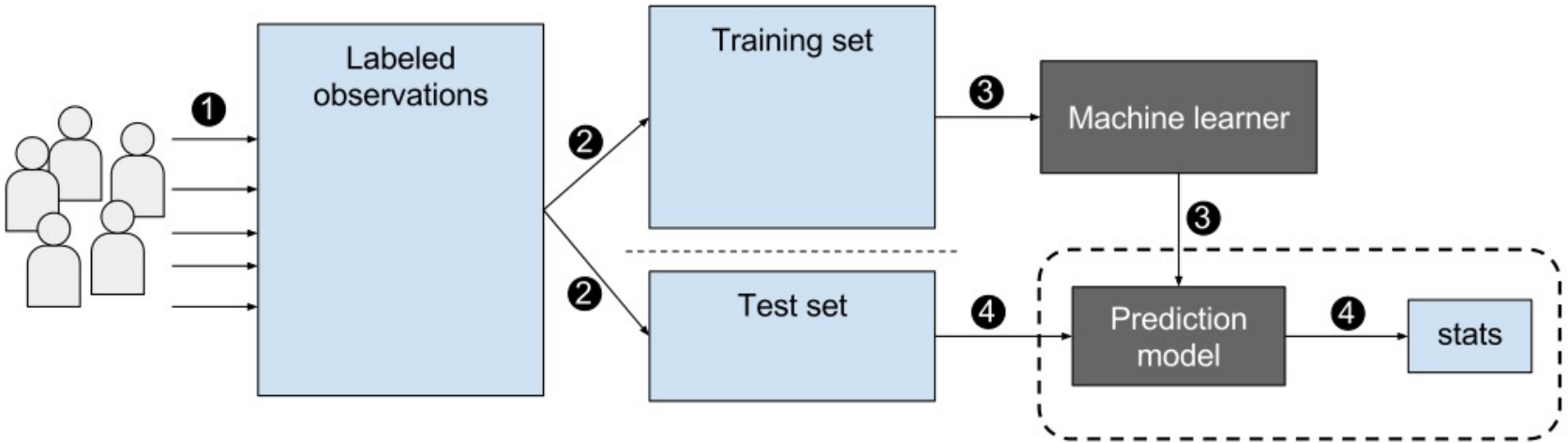
Problema de clasificación clásico

1. Etiquetar
2. Entrenar
3. Validar

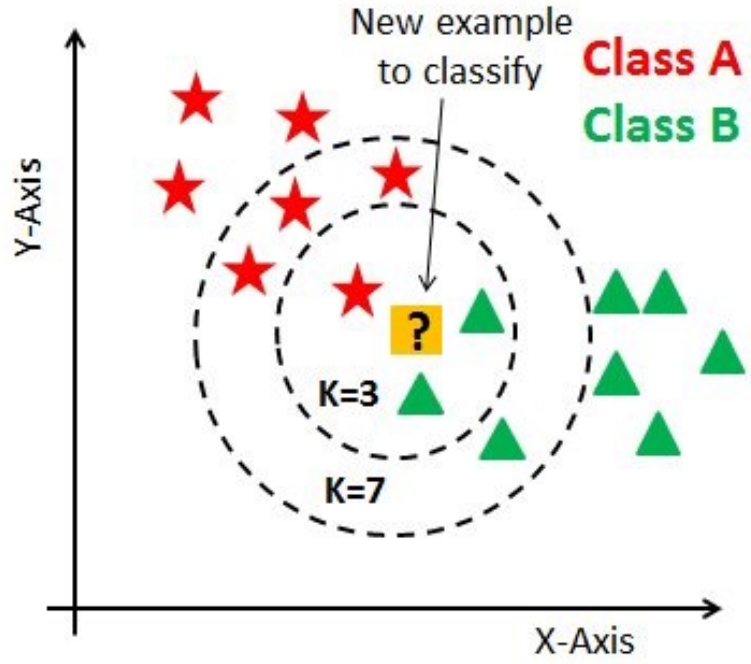
Formatos de los datos

EXHAUST_F1 Exhaustion F1	**WEAK_F1** Lowest 20% grip strength F1	**SLOW_F1** Usual pace slowest quintile F1	**SLOW_F1B** Fast pace slowest quintile F1	**INACTIVE_F1** Lowest 20% of PASE by gender F1	**FRAILTY_F1** Frailty Index F1
(2) No	(2) No	(2) No	(2) No	(2) No	0
(2) No	(2) No	(2) No	(2) No	(2) No	0
(2) No	(2) No	(2) No	(2) No	(2) No	0
(2) No	(2) No	(2) No	(1) Yes	(2) No	0
(1) Yes	(1) Yes	(1) Yes	(1) Yes	(1) Yes	4
(2) No	(2) No	(2) No	(2) No	(2) No	0
(2) No	(2) No	(2) No	(2) No	(2) No	0
(2) No	(2) No	(2) No	(2) No	(2) No	0
(2) No	(2) No	(2) No	(2) No	(2) No	0
(2) No	(2) No	(1) Yes	(2) No	(2) No	1
(2) No	(1) Yes	(1) Yes	(1) Yes	(1) Yes	3

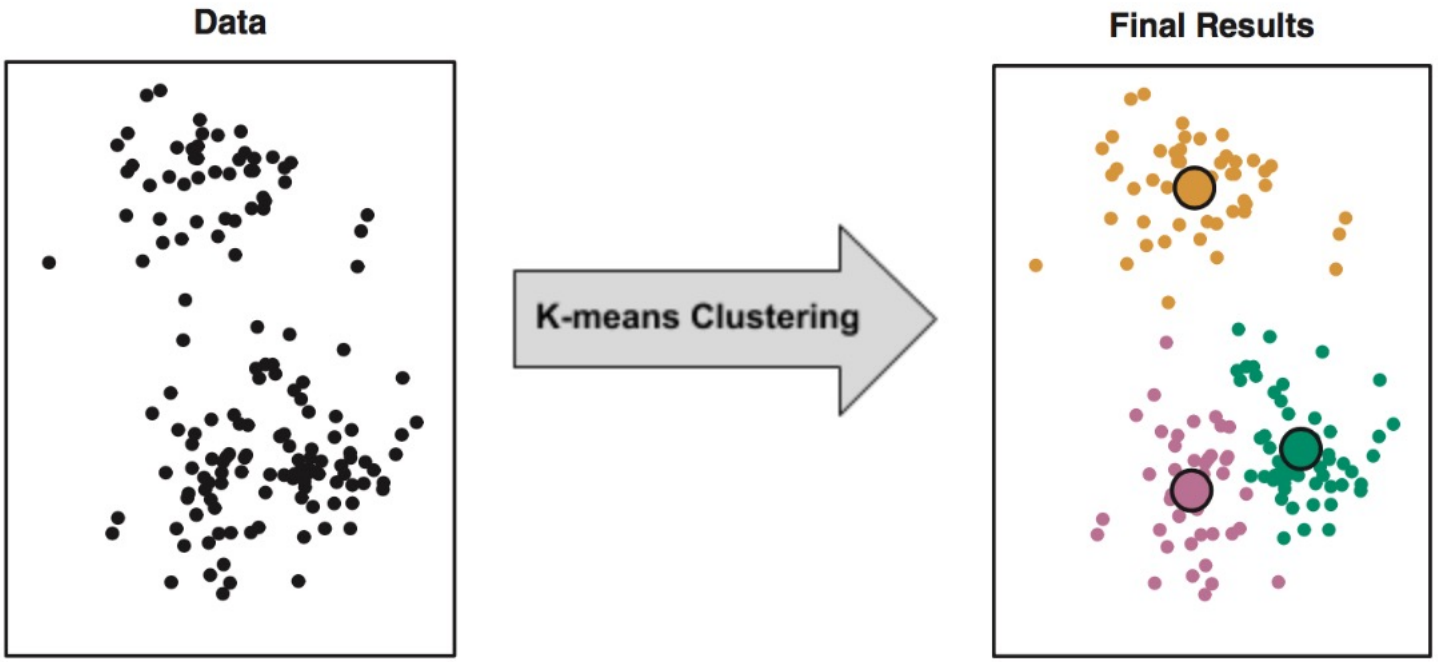
Proceso del Supervised Learning



k-Nearest Neighbors (kNN)

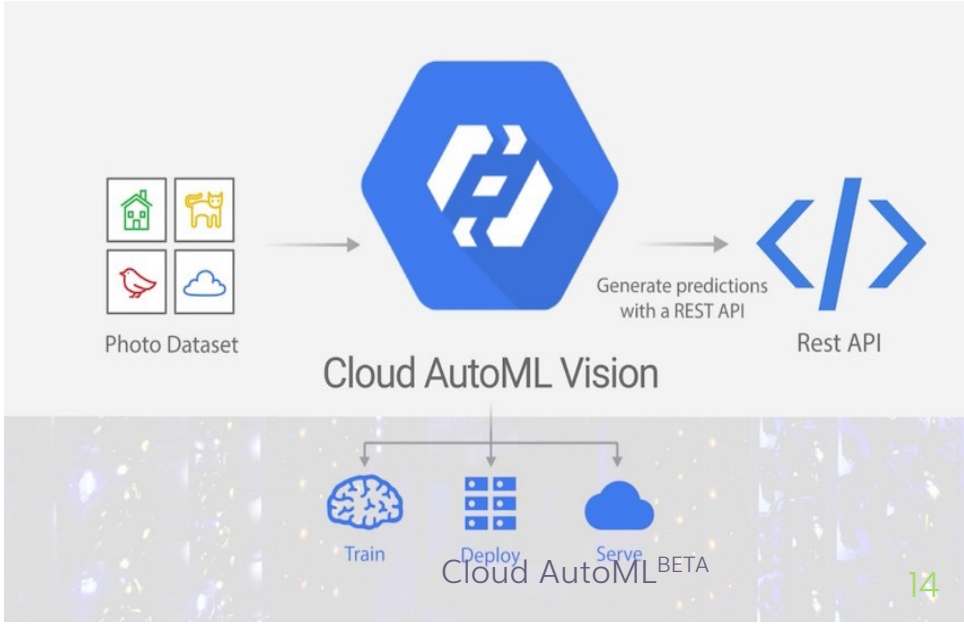


Unsupervised Learning

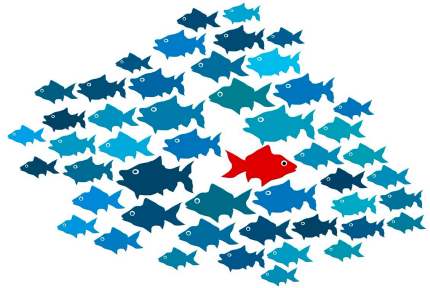


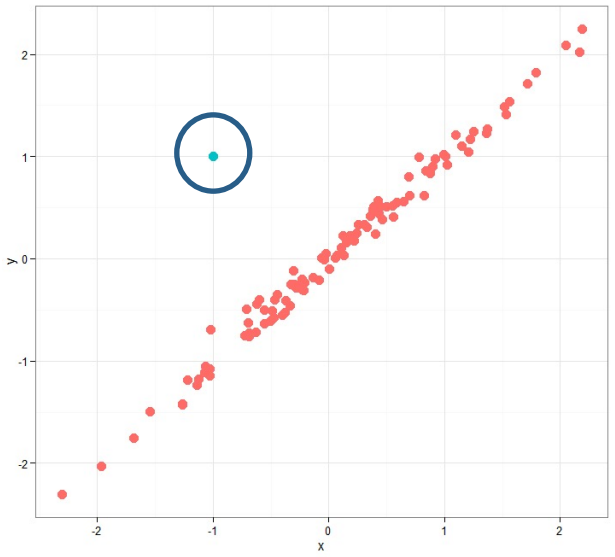
Machine Learning para todos (MLaaS)

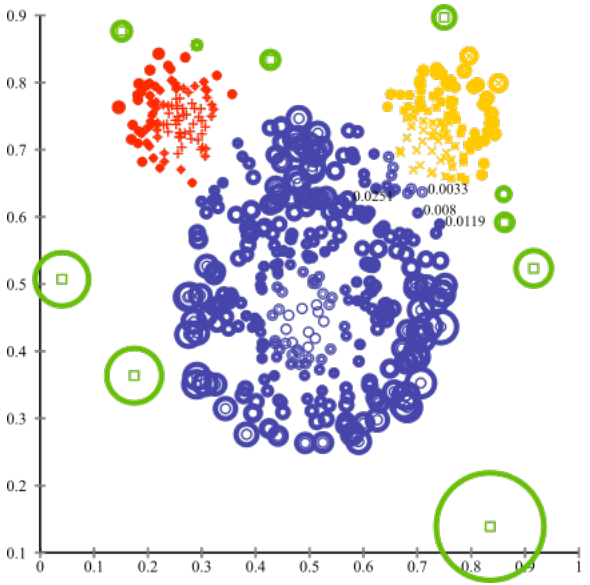
- Democratización
- Google Cloud Platform
- Google Cloud AutoML BETA
- AutoML UI



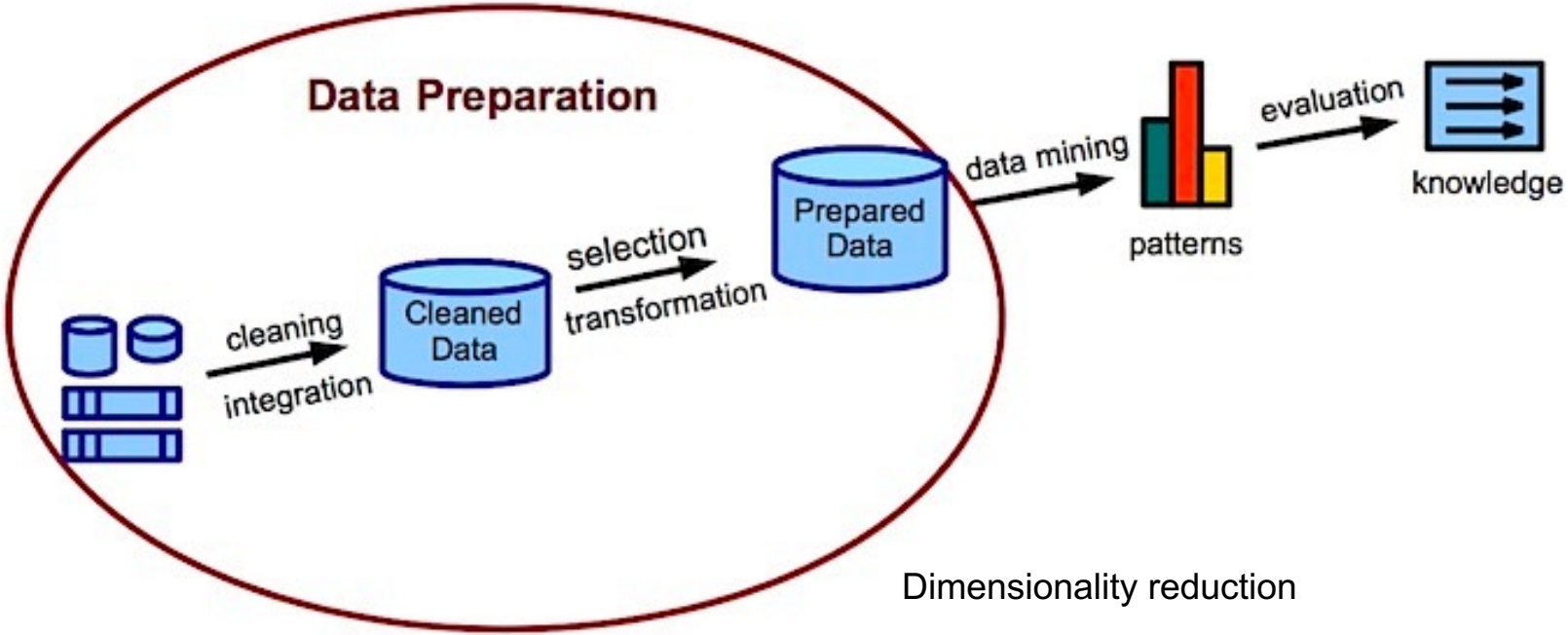
Outlier Detection





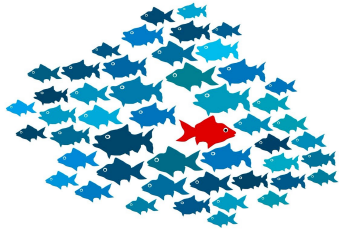


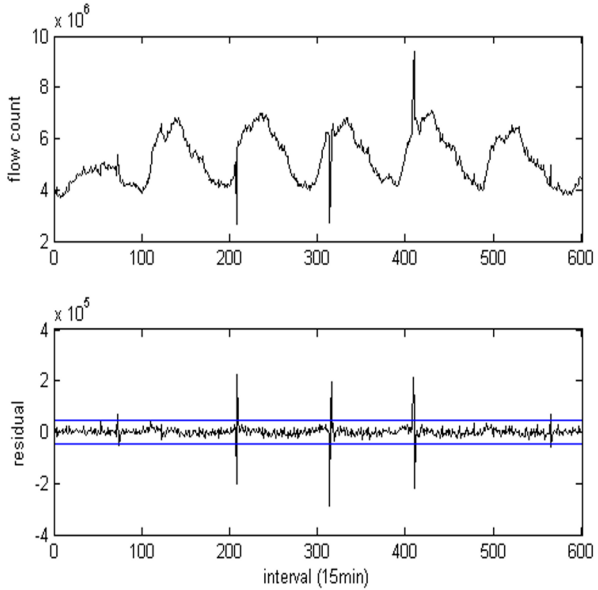
Datos de Sensores: Preprocesamiento

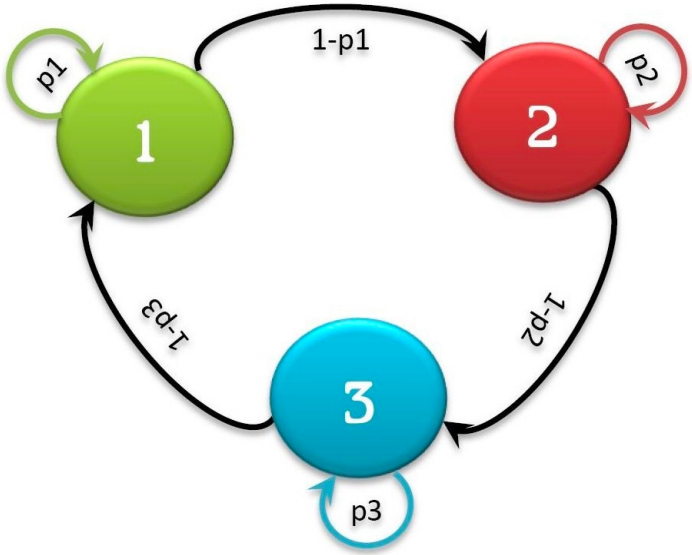


Dimensionality reduction

Series Temporales Predicción y Outliers







Kalman Filter (series temporales –sensores-)

Markov chains

¡Gracias!

¿Preguntas?