>>> Inteligencia Artificial y aplicaciones de Machine Learning

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Date: 9 de octubre 2018

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>>> Outline

1. Introducción

2. Machine Learning - Aprendizaje Automático

3. Tipos de Machine Learning

4. Trabajando con Machine Learning

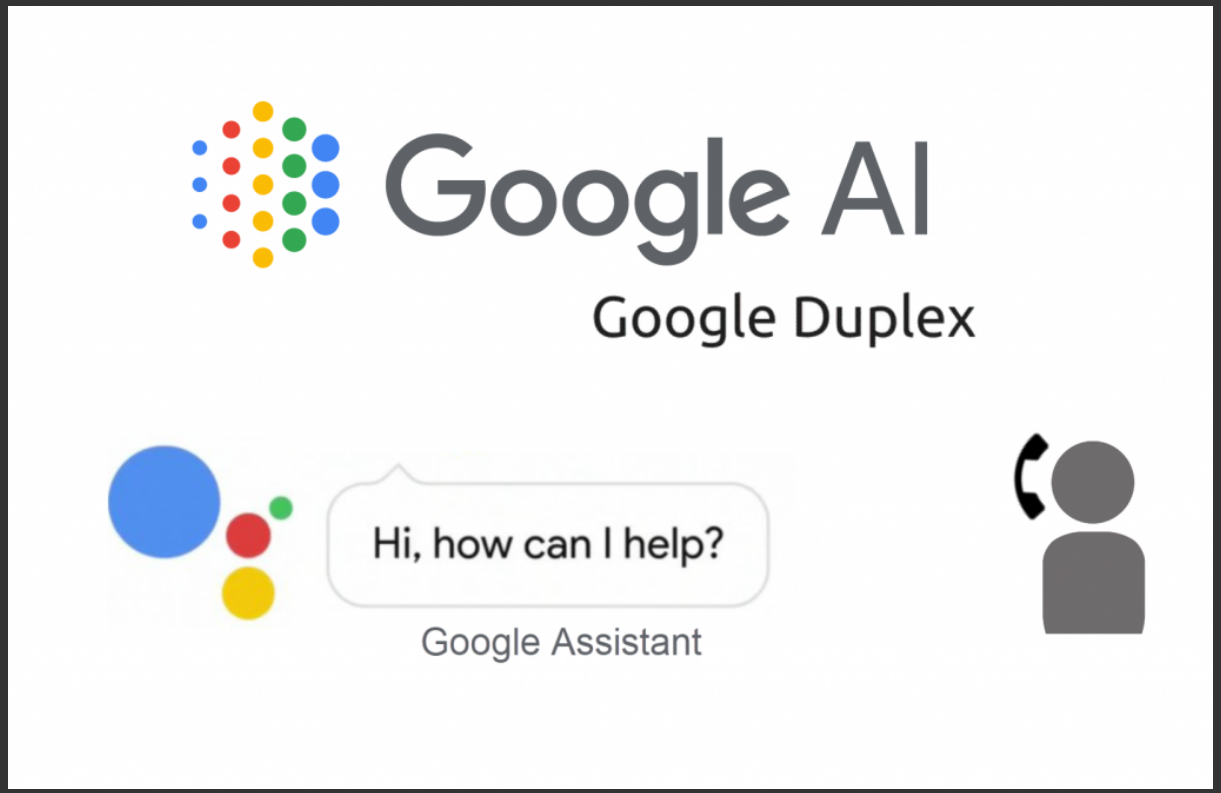
5. Aplicaciones Machine Learning

6. Práctica Machine Learning

7. Para terminar...

>>> Inteligencia Artificial IA

https://www.forbes.com/sites/louiscolumbus/2017/11/26/the-best-ai-companies-to-work-for-in-2018-based-on-glassdoor



https://www.yudiz.com/google-duplex-ai-to-replace-human-interaction/

>>> ¿Qué engloba IA?

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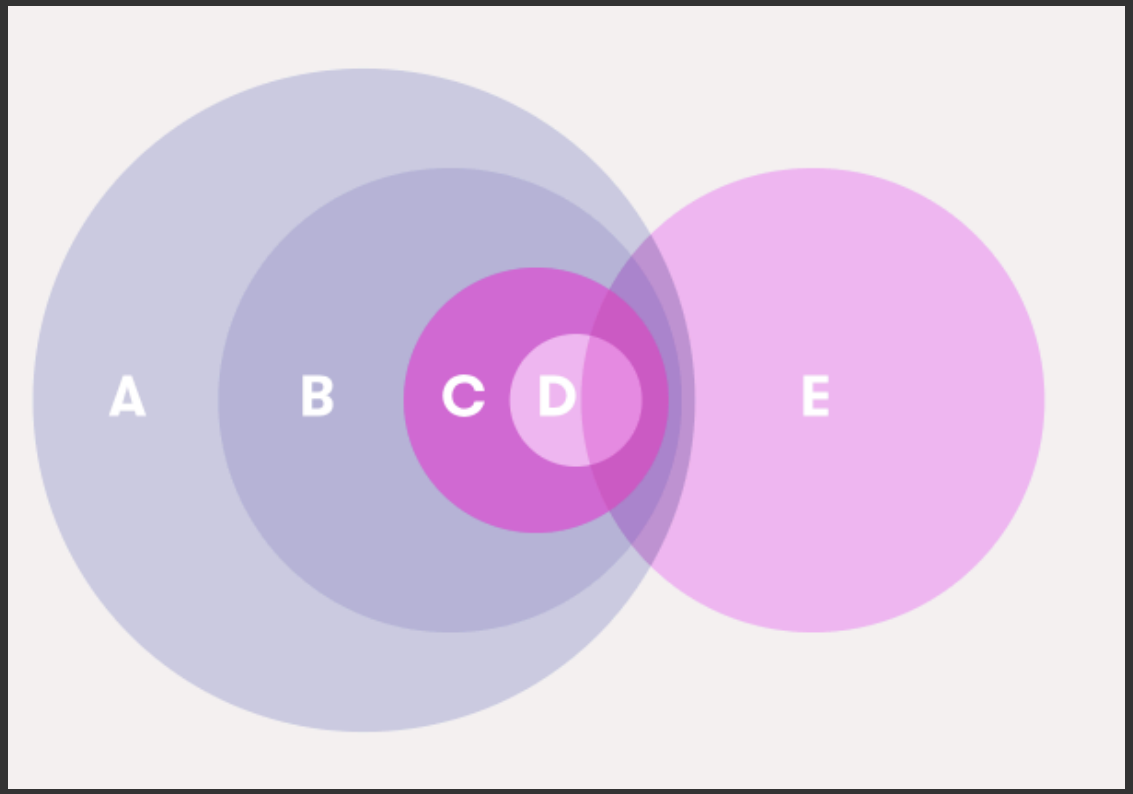
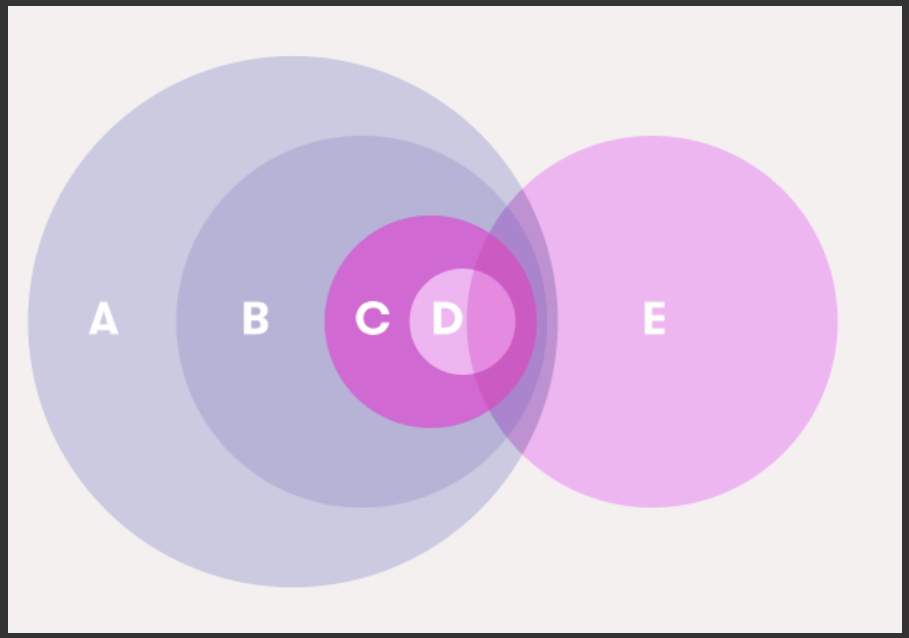


https://course.elementsofai.com/1/2

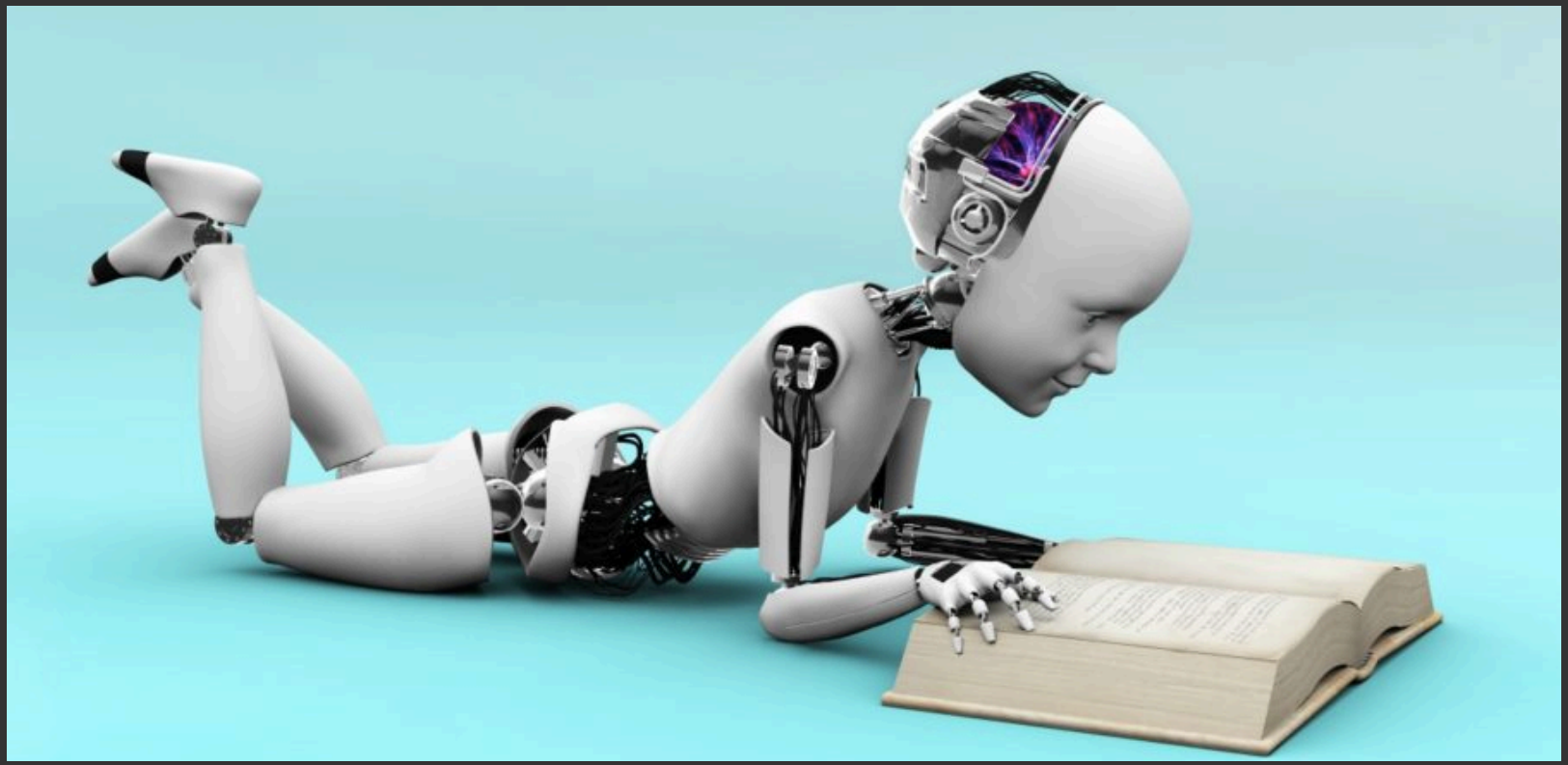
>>> ¿Qué es qué?



* A: Computer Science
* B: Artificial Intelligence
* C: Machine Learning
* D: Deep Learning
* E: Data Science

https://course.elementsofai.com/1/2

>>> Machine Learning



>>> Machine Learning - Definición Formal

"A computer program is said to learn from experience E with respect to some class of tasks T and performance measure P, if its performance at tasks in T, as measured by P, improves with experience E."

Tom Mitchell, 1999

>>> Machine Learning - Definición Formal

* Experiencias
* Tareas
* Performance - Rendimiento

For an example, let me ask you a quiz…

- 3 – 9
- 4 – 16
- 8 – 64
- 9 – ?

>>> Machine Learning - Aprendizaje Automático

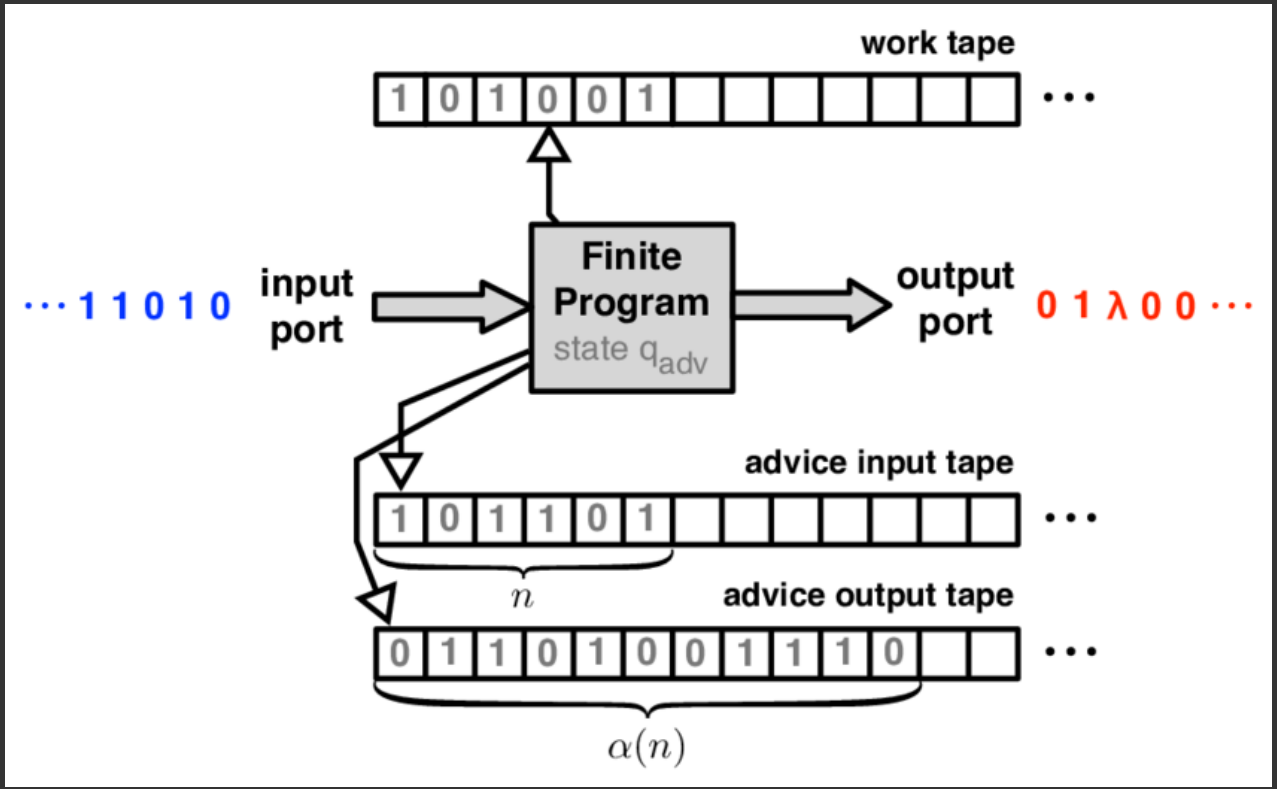
* Habilidad de autoaprendizaje
* Programación no explicita

>>> Computación

>>> Computación

* Computación / Computadora
* Máquina de Turing

Turing,1948 "Máquinas inteligentes"



https://www.researchgate.net/figure/An-interactive-Turing-machine-with-advice_fig2_272684665

>>> Machine Learning - History

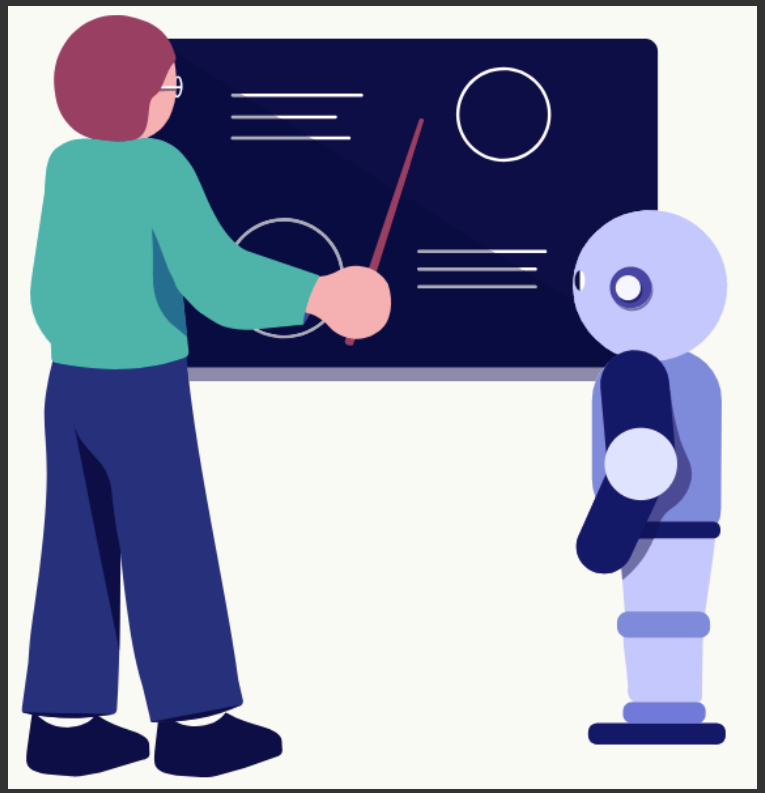
antes de 1950	Métodos estadísticos
1950	ML - algoritmos simples
1960	Probabilidad: Bayes
1970	AI winter
1980	Redescubrimiento backpropagation
1990	ML Data Driven approach
2000	Diferentes métodos ML
2010	Deep Learning

https://en.wikipedia.org/wiki/Timeline_of_machine_learning

>>> Tipos Machine Learning

* Supervised Learning
* Unsupervised Learning
* (Reinforcement Learning)

>>> Supervised Learning



https://course.elementsofai.com/4/1

>>> Supervised Learning

* Clasificación
* Predicción

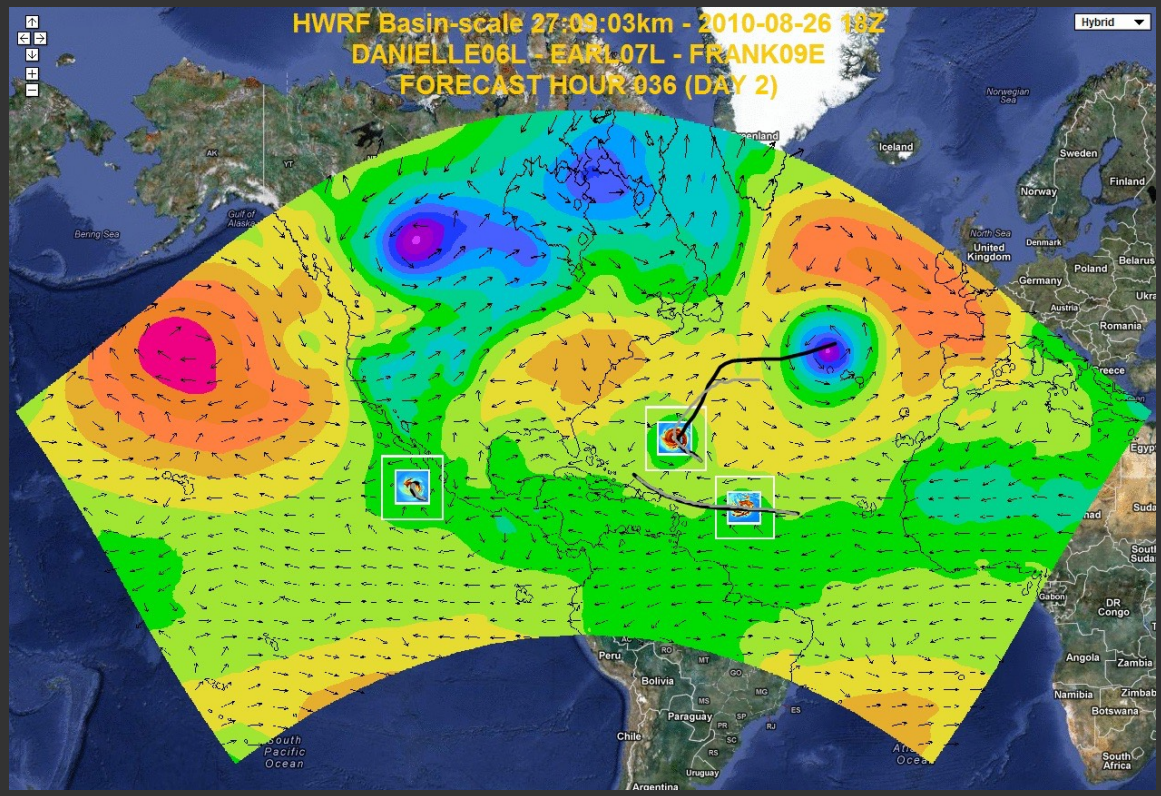
>>> Supervised Learning - Clasificación

https://course.elementsofai.com/4/1

>>> Supervised Learning - Clasificación

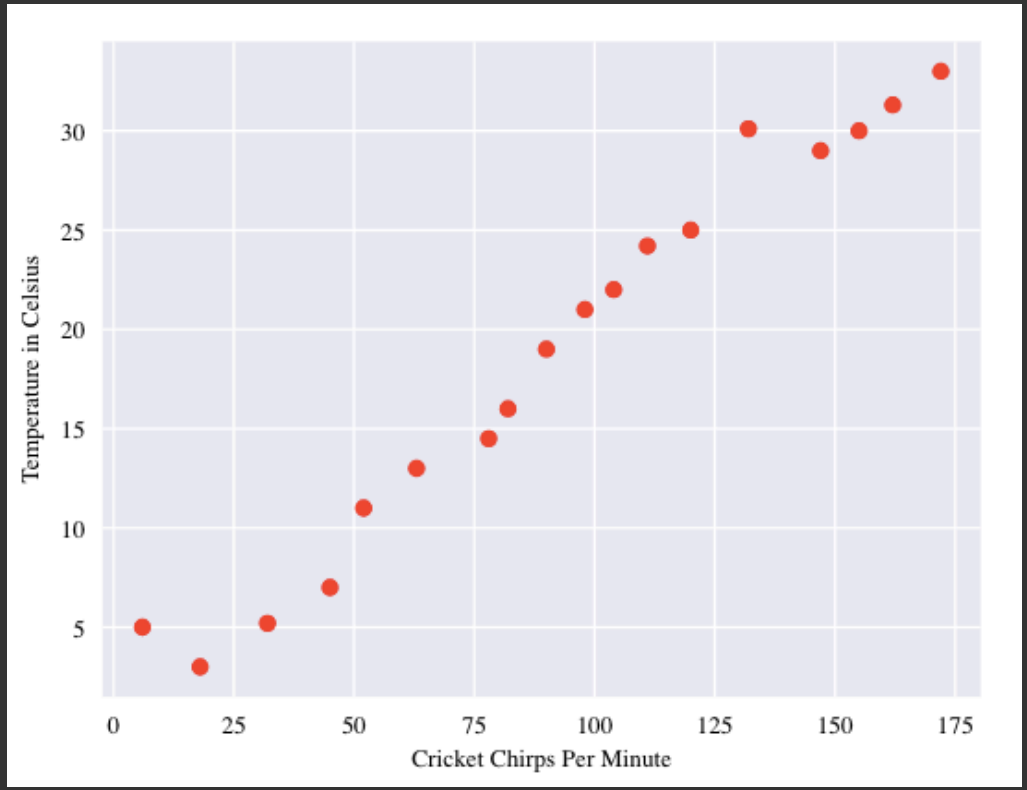
En poco lo veremos de forma práctica, prepara tu computador

>>> Supervised Learning - Predicción



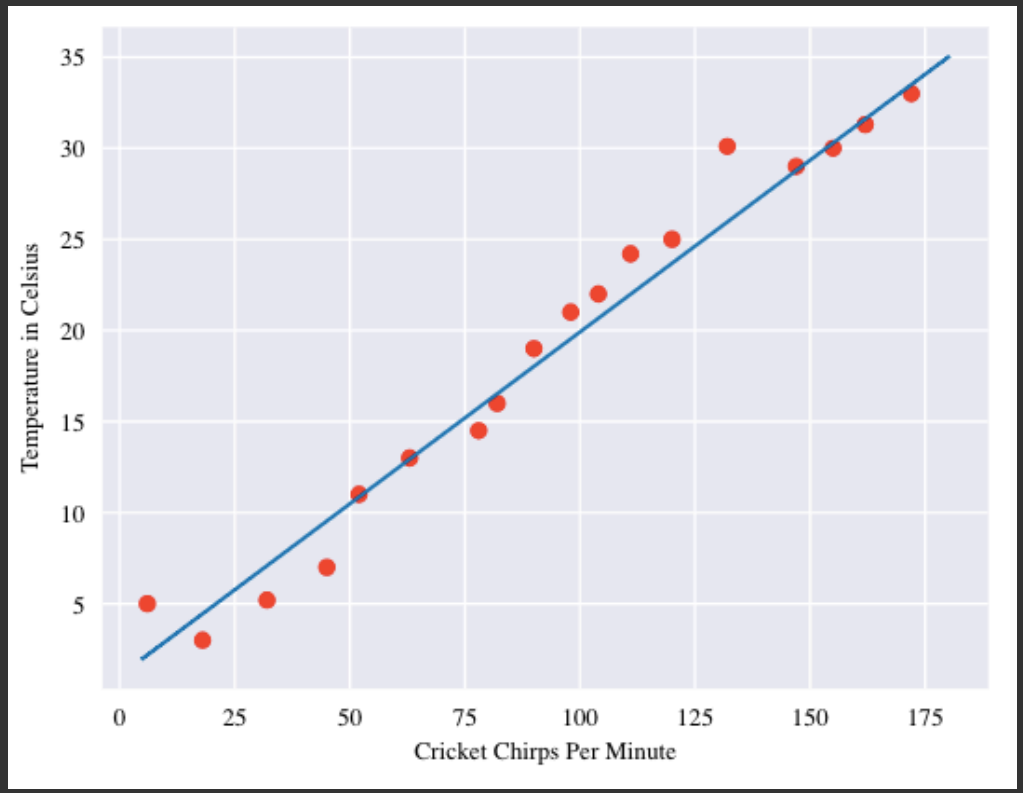
http://brewminate.com/
predicting-the-past-digital-art-history-modeling-and-machine-learnir

>>> Predicción - Regresión Lineal



https://developers.google.com/machine-learning/crash-course/descending-into-ml/linear-regression

>>> Predicción - Regresión Lineal



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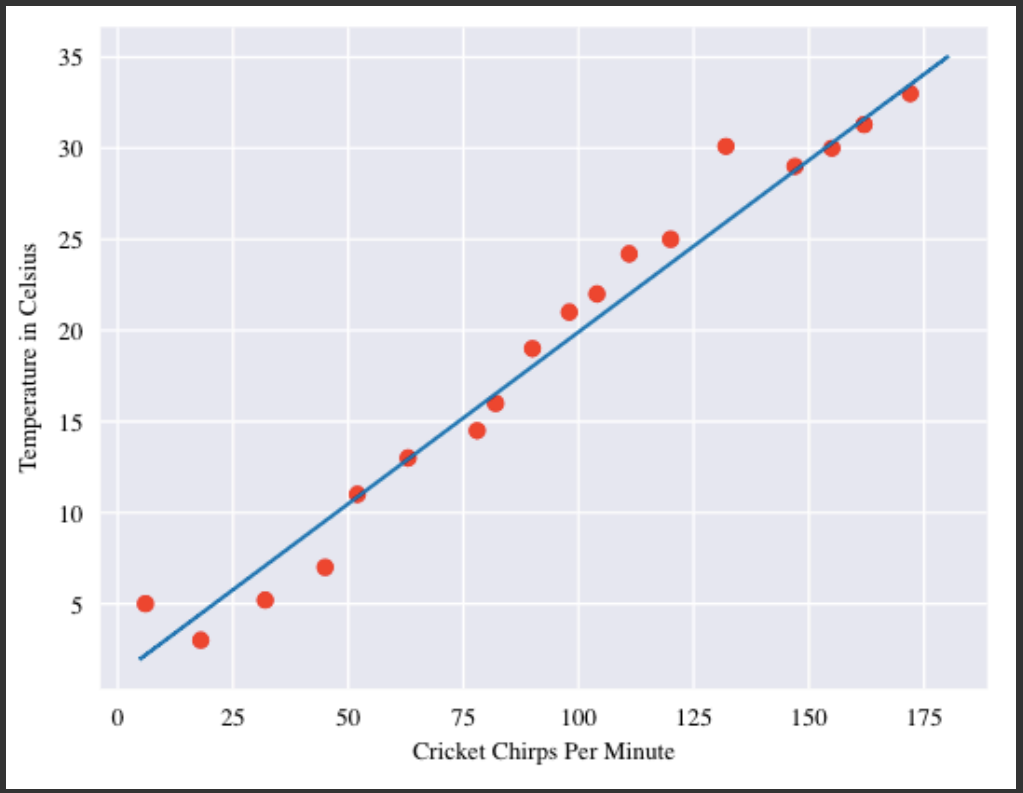
>>> Supervised Learning

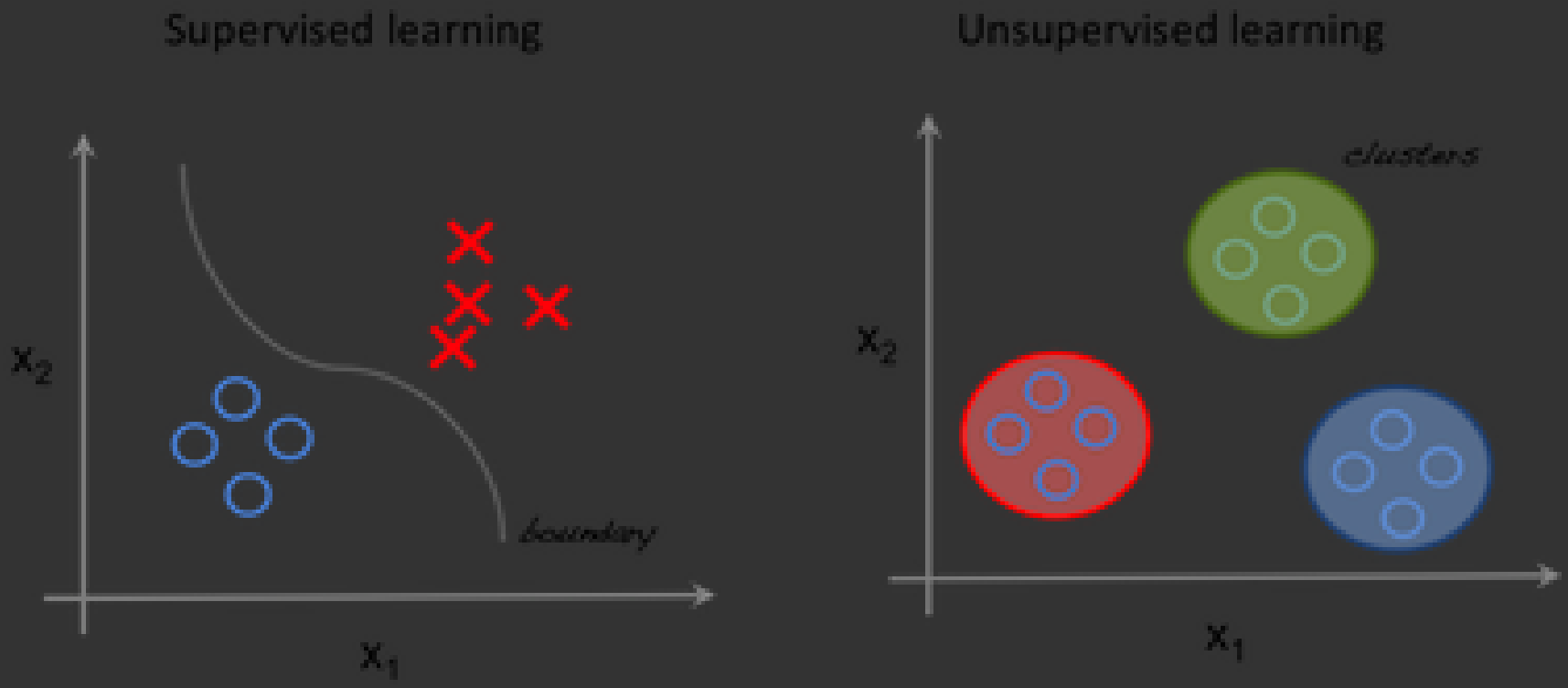


$$y = mx + b$$

$$y' = b + w_1 x_1$$

https://developers.google.com/machine-learning/crash-course/descending-into-ml/linear-regression

>>> Unsupervised Learning



https://towardsdatascience.com/
unsupervised-learning-with-python-173c51dc7f03

>>> Unsupervised Learning

* *unlabeled data*
* Estructurar un set de datos
* Ajustar datos por observaciones

>>> Unsupervised Learning - Principalmente

* *clustering* - Agrupamiento
* Reduccion dimensionalidad

>>> Unsupervised Learning - Ejemplos

* Plataforma publicitaria

>>> Unsupervised Learning - Ejemplos

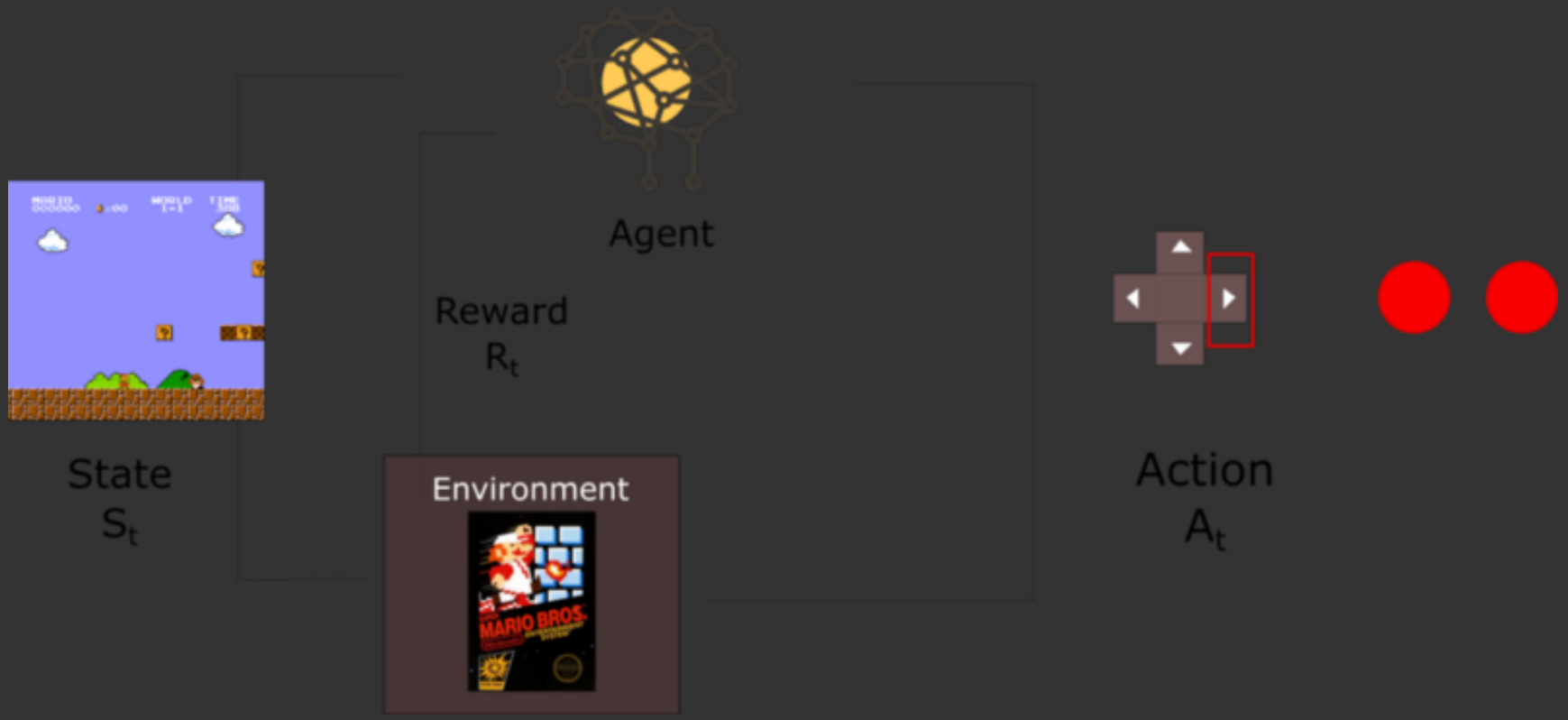
* Plataforma publicitaria
* AirBnb y su lista de casas

>>> Unsupervised Learning - Ejemplos

* Plataforma publicitaria
* AirBnb y su lista de casas
* Ciencia de datos: reducciones en su set de datos

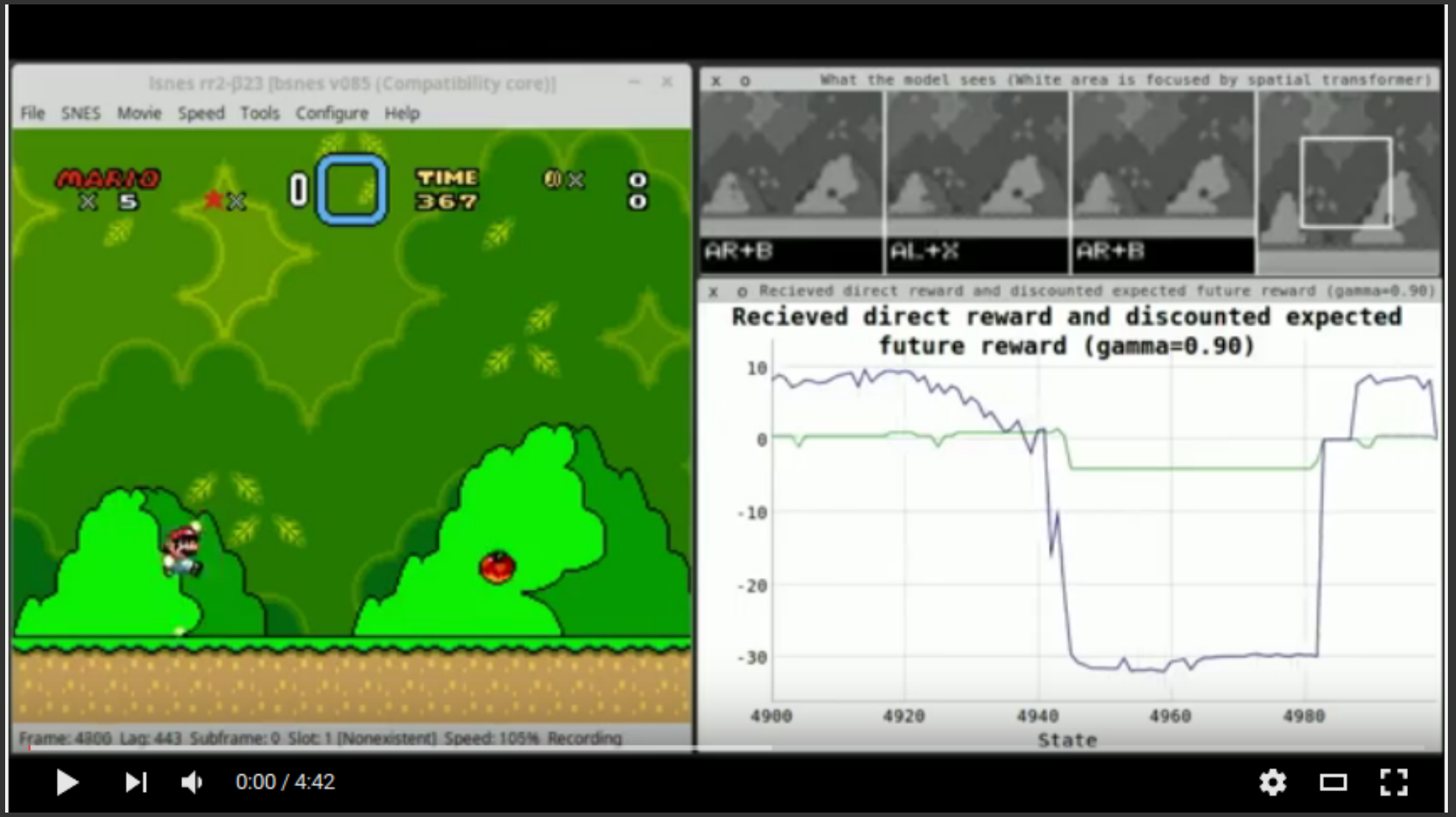
>>> Machine Learning - Reinforcement Learning

>>> Reinforcement Learning



https://medium.freecodecamp.org/
an-introduction-to-reinforcement-learning-4339519de419

>>> Reinforcement Learning



https://github.com/aleju/mario-ai

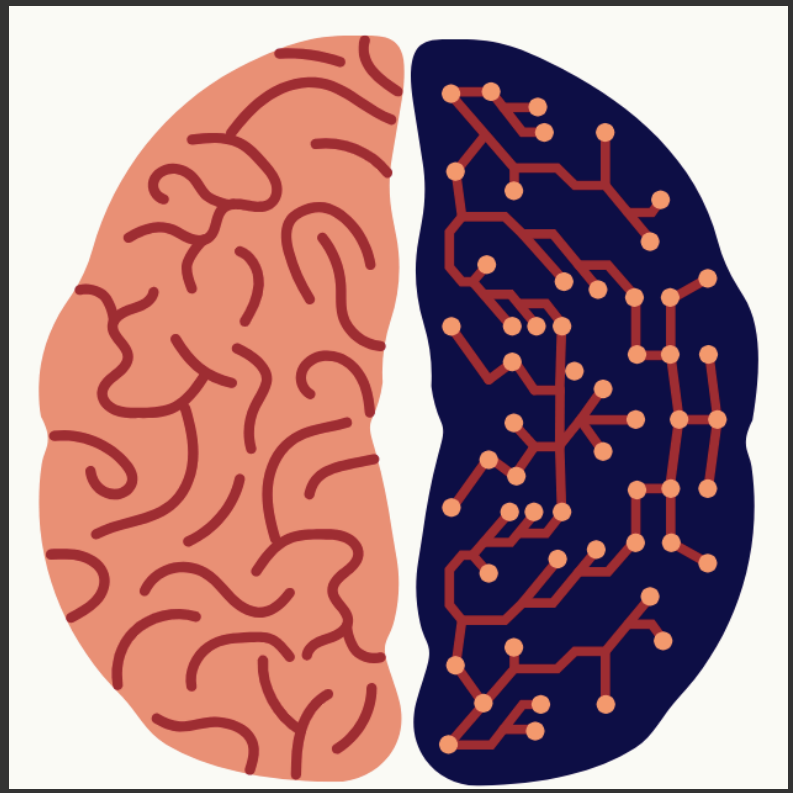
Revisemos otros conceptos importantes:

* Redes Neuronales - *Artificial Neural Networks*

Revisemos otros conceptos importantes:

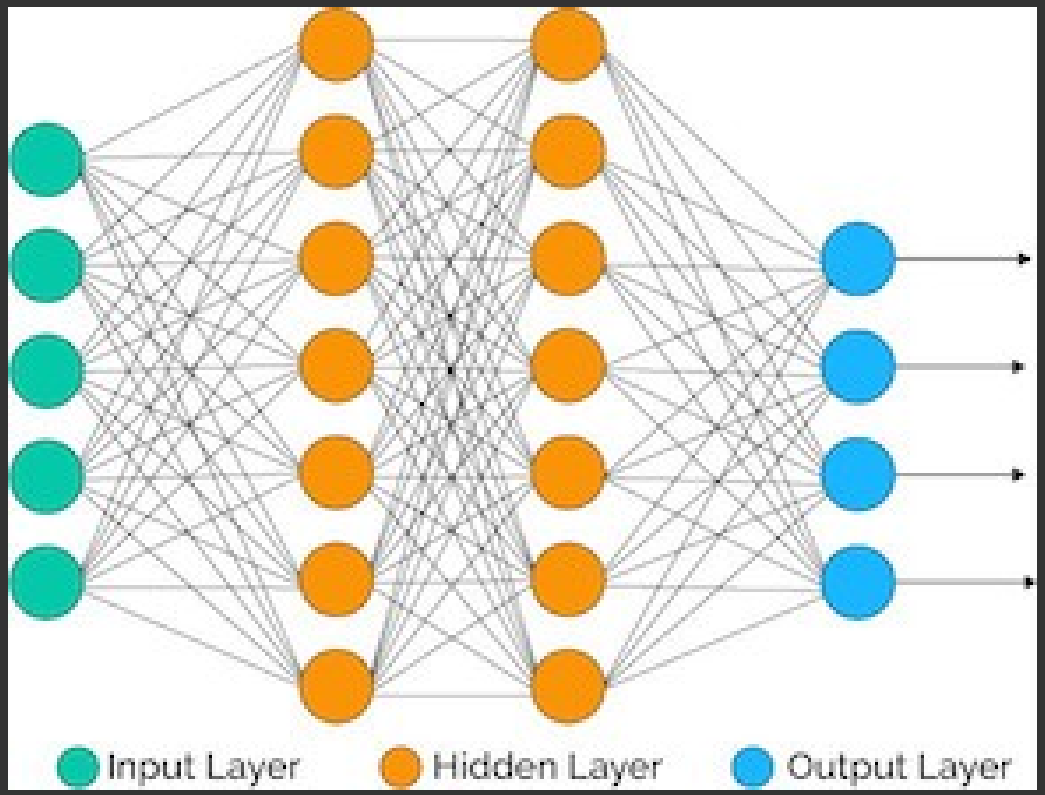
* Redes Neuronales - *Artificial Neural Networks*
* Aprendizaje Profundizado - *Deep Learning*

>>> Neural Networks



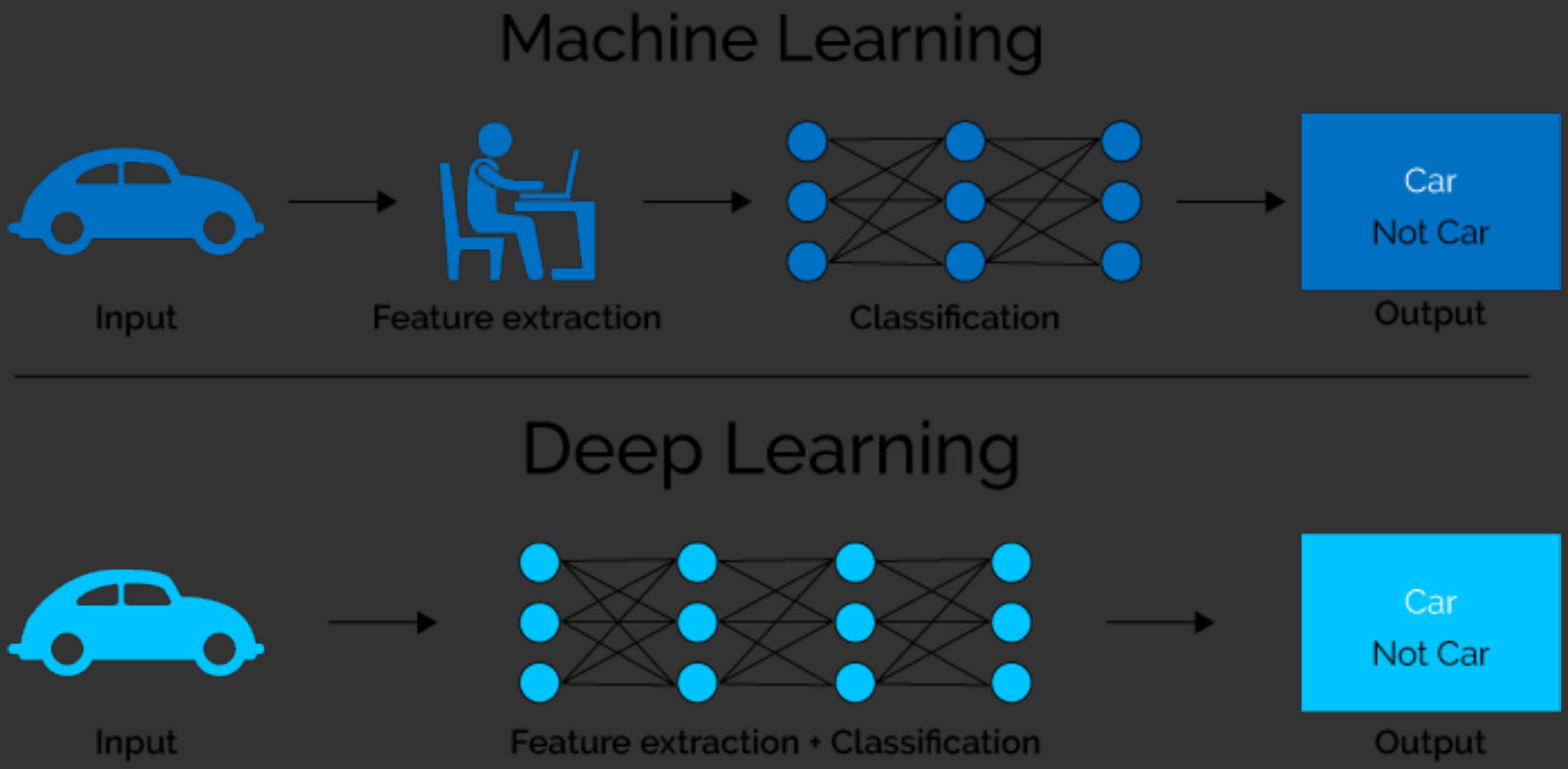
https://course.elementsofai.com/5/1

>>> Neural Networks



https://towardsdatascience.com/machine-learning-fundamentals-ii-neural-networks-f1e7b2cb3eef

>>> Deep Learning



https://medium.com/swlh/
ill-tell-you-why-deep-learning-is-so-popular-and-in-demand-5aca7262

>>> Trabajando con Machine Learning

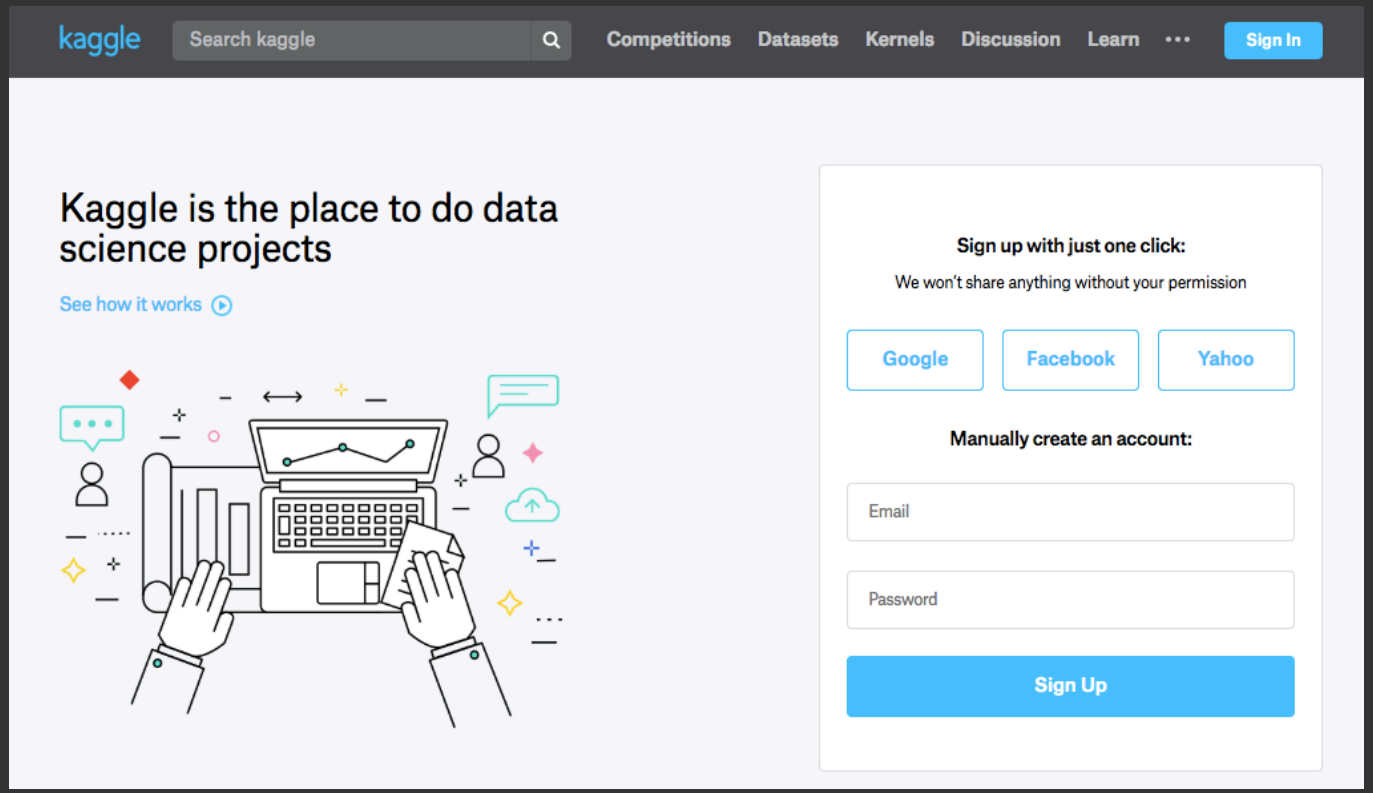
* Datos
* Modelos ML
* Evaluación

>>> Set de Datos

Los datos?

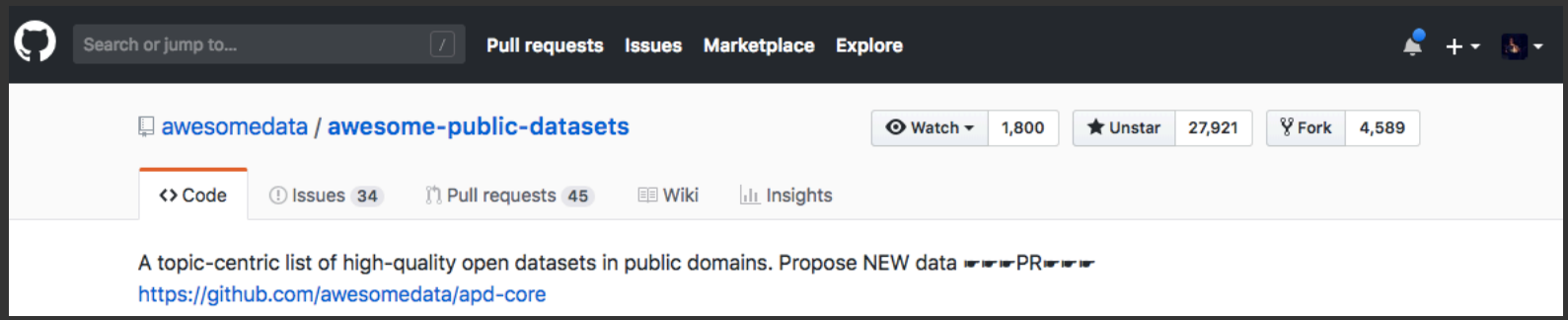
Diferentes fuentes

>>> Data Set



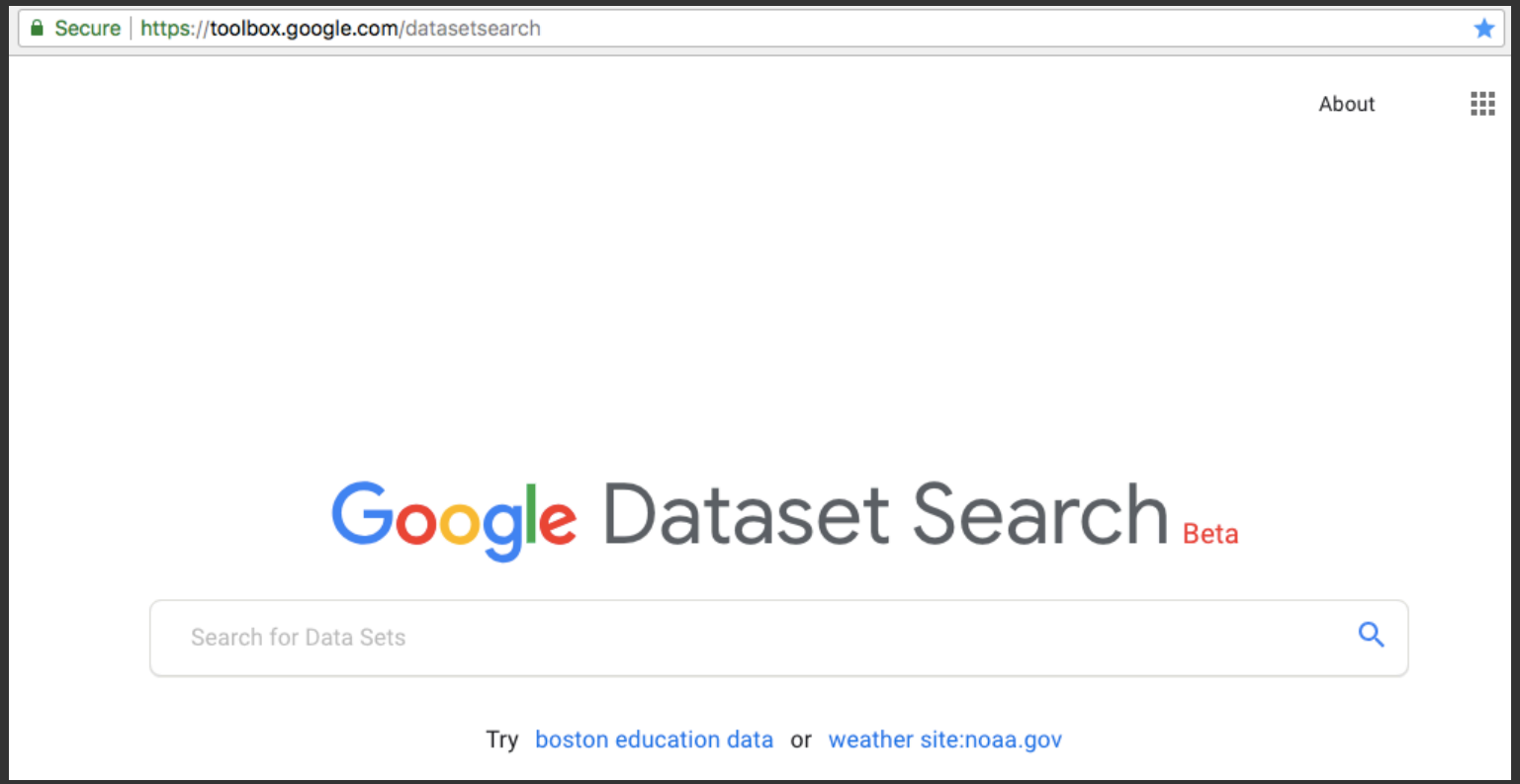
https://www.kaggle.com/

>>> Data Set



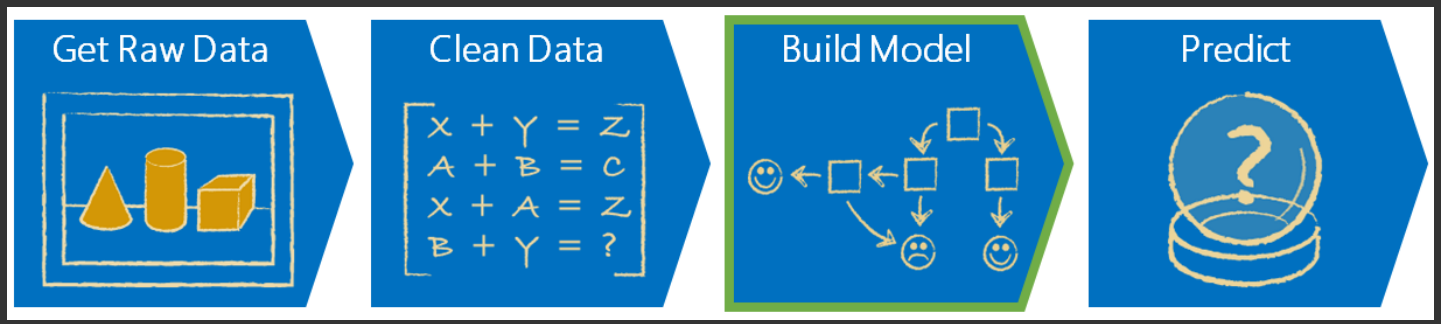
https://github.com/awesomedata/awesome-public-datasets

>>> Data Set



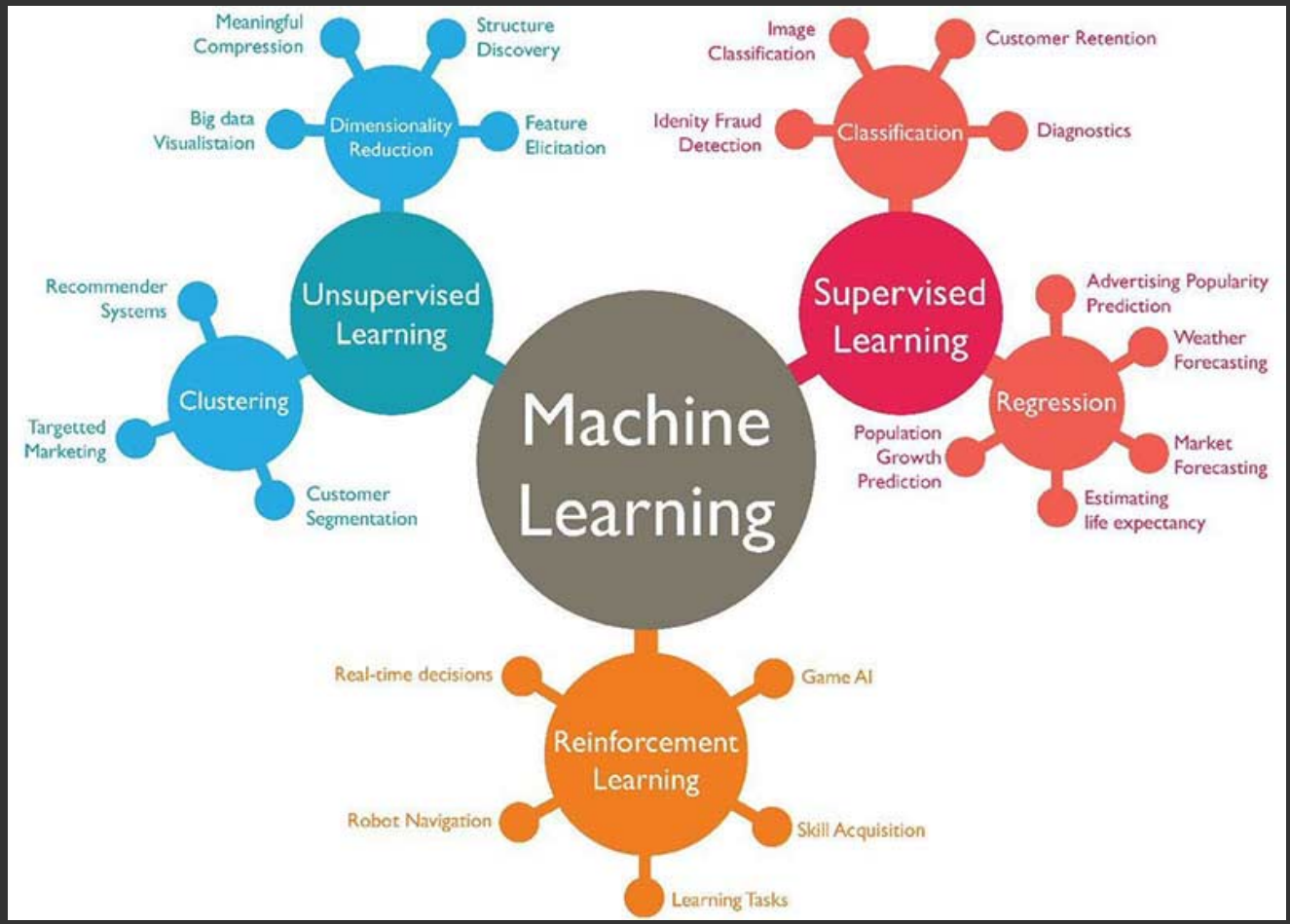
https://toolbox.google.com/datasetsearch

>>> Models



http://oliviaklose.azurewebsites.net/machine-learning-11-algorithms-explained/

>>> Models



https://www.techleer.com/articles/203-machine-learning-algorithm-backbone-of-emerging-technologies/

>>> Evaluación

* Training - Test Data Set

>>> Evaluación

* Training - Test Data Set
* Cross Validation

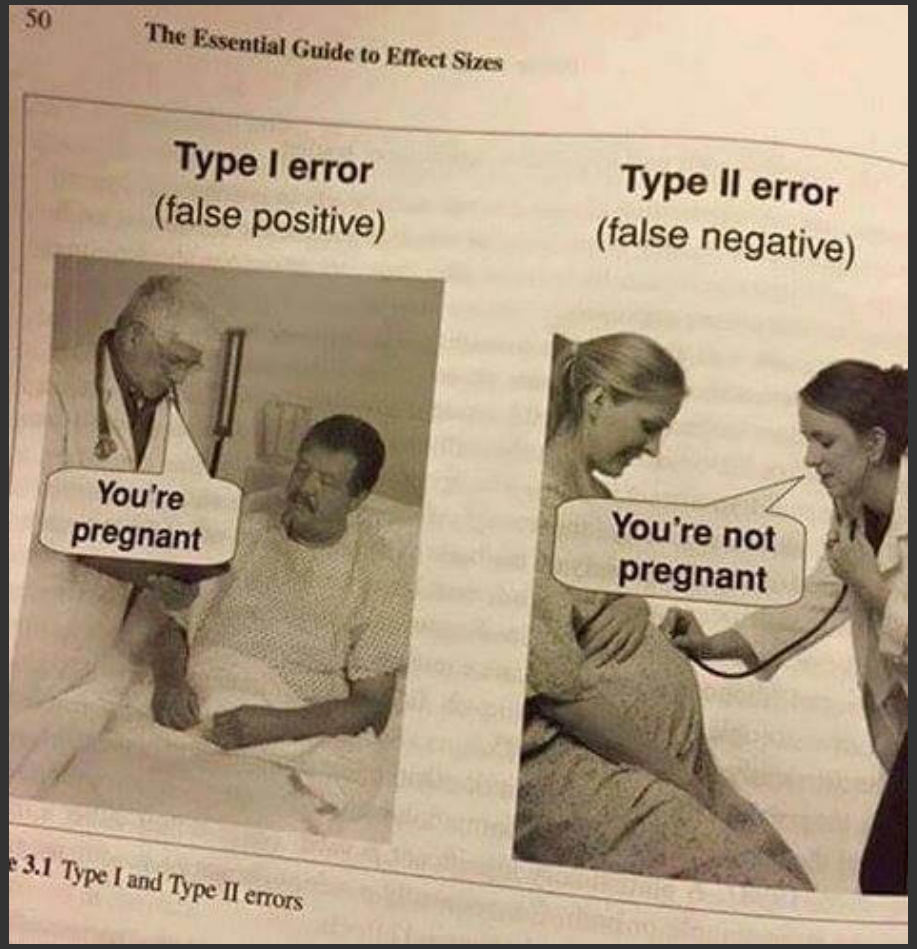
>>> Evaluación

* Training - Test Data Set
* Cross Validation
* Testing algorithms

>>> Evaluación

* Training - Test Data Set
* Cross Validation
* Testing algorithms
* Confusing matrix

>>> Evaluación



https://www.machinelearningplus.com/machine-learning/evaluation-metrics-classification-models-r/

>>> Aplicaciones Machine Learning

* Reconocimiento de voz
* Autos autónomos
* Traducciones
* Reconocimiento facial
* Reconocimiento personas por medio de imágenes
* Sistemas de recomendaciones
* ...

>>> Aplicaciones Machine Learning

* Reconocimiento de voz
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* Traducciones
* Reconocimiento facial
* Reconocimiento personas por medio de imágenes
* Sistemas de recomendaciones
* ...
* ...

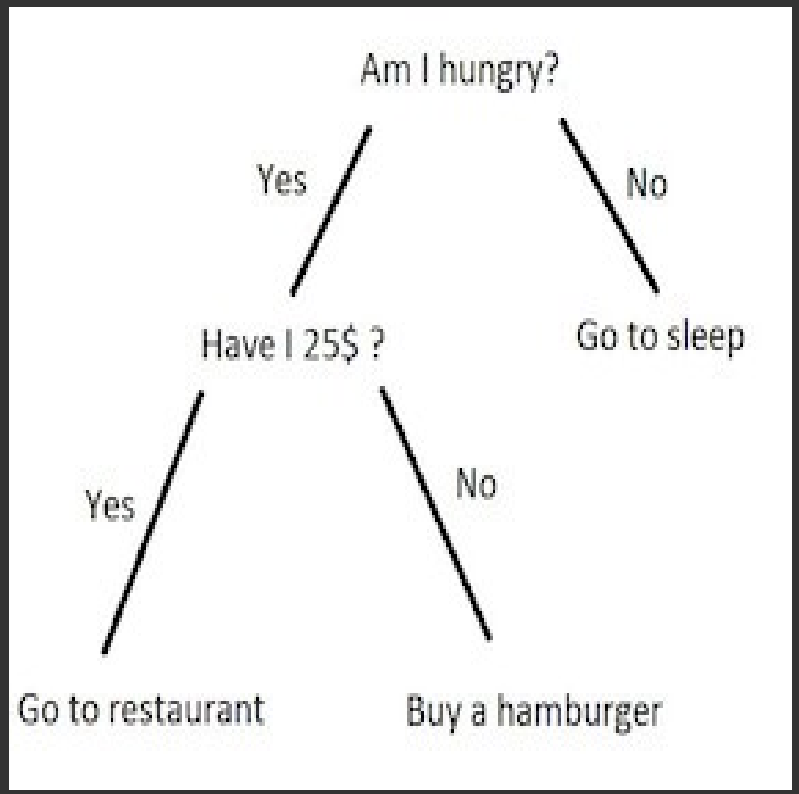
>>> Aplicaciones Machine Learning

>>> Ejemplo

https://github.com/l3s777/CCBOL_mlexample

>>> Práctica Machine Learning

>>> Arbol de Decisiones - Decission Tree



https://becominghuman.ai/understanding-decision-trees-43032111380f

>>> Resumen

* Machine Learning - Inteligencia Artificial

>>> Resumen

* Machine Learning - Inteligencia Artificial
* Matemáticas

>>> Resumen

* Machine Learning - Inteligencia Artificial
* Matemáticas
* Set de datos

>>> Resumen

* Machine Learning - Inteligencia Artificial
* Matemáticas
* Set de datos
* Modelos y pruebas

>>> Referencias

* Cursos online: Udacity, Coursera

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* Libros: Intro Machine Learning, Machine Learning for Humans

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* Google, Microsoft, IBM, Amazon Tools
* Comunidades Desarrolladores

>>> Contacto

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Muchas gracias!