

New Paradigms

Classic Model

Internet → data transfer

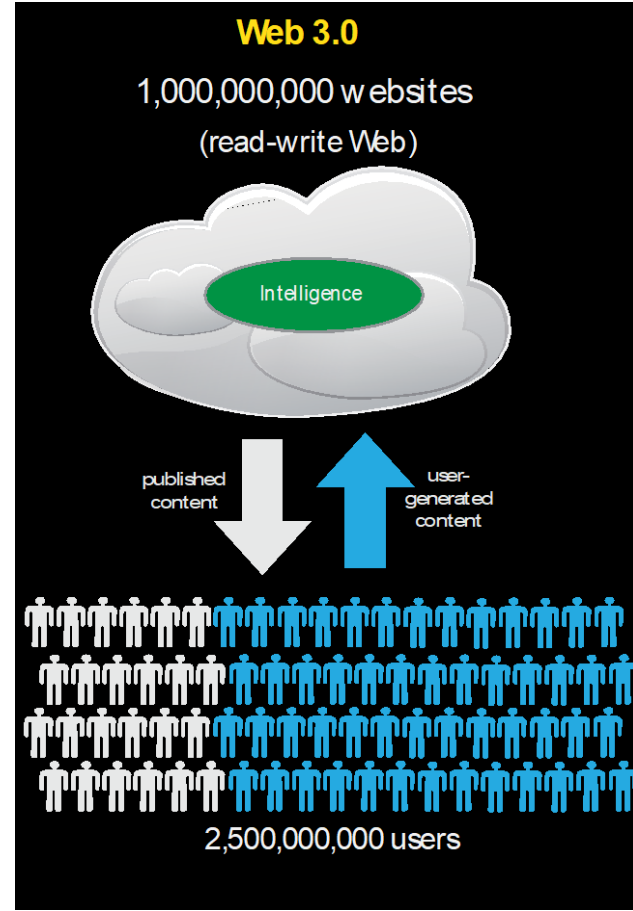
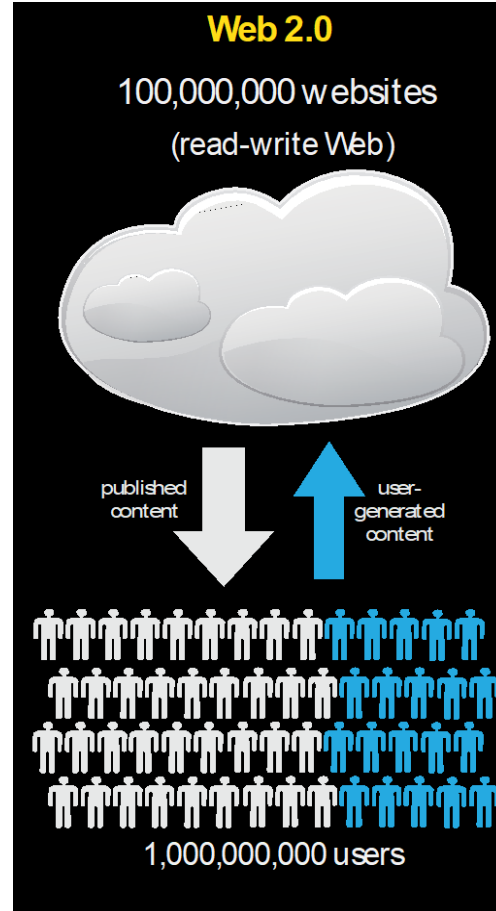
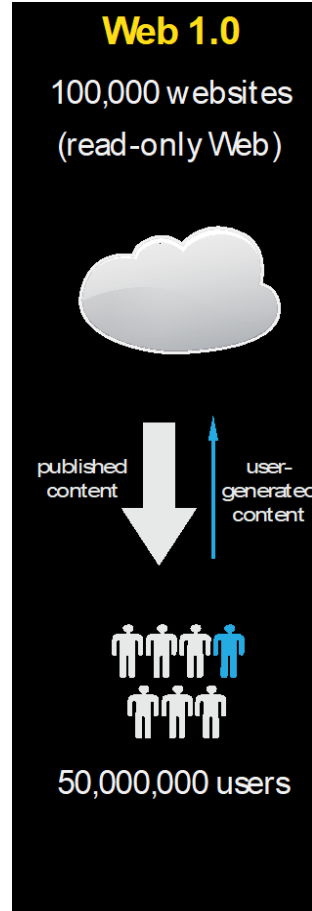
The information is generated by a source and reaches one or more destinations

Current Model

Internet → data gathering

Information is extracted from the data

Web evolution



“web intelligence” examples

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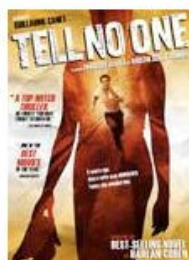
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I've Loved You So Long

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Good Night, and Good Luck

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Downfall

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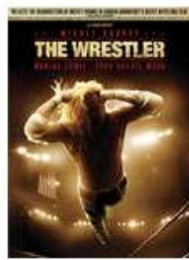
Das Boot
The Killing Fields
Seven Samurai

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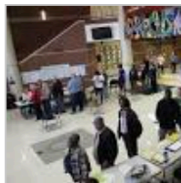
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Los republicanos se hacen con la mayoría en el Senado y ...

20minutos.es - hace 36 minutos



El Partido Republicano logró este martes la mayoría en el Senado de Estados Unidos al arrebatar al menos seis escaños a los demócratas en la Cámara Alta, haciéndose así con el control total del Congreso de la nación. Con las elecciones de este martes ...

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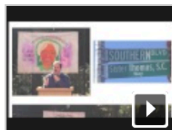
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Relacionados

[Partido Republicano »](#)

[Partido Demócrata »](#)

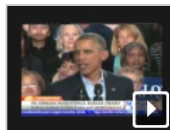
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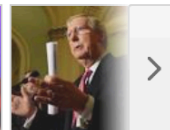
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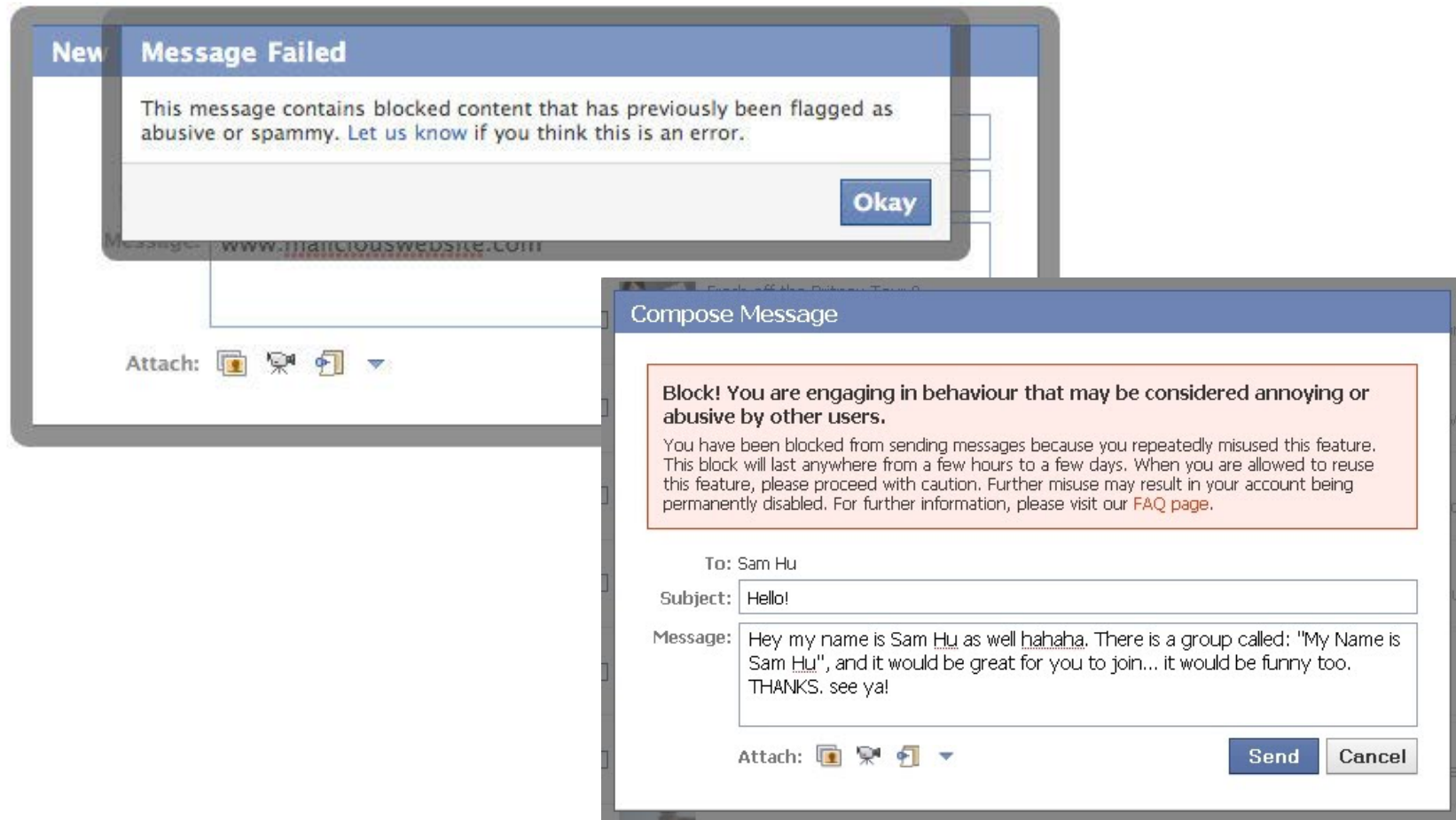


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“web intelligence” examples



Objectives of web intelligence algorithms

- Manage large volumes of data
- Extract relevant information from this data
- Add value to applications based on this information

Do all of the above automatically

How to attain these goals

Through automatic learning, known as **Machine Learning** (in the field of Artificial Intelligence)

Arthur Samuel (1959). Machine Learning: Field of study that gives computers the ability to learn without being explicitly programmed.

Tom Mitchell (1998): It is said of a computer program that learns from an experience E with respect to a task T and a performance measure P , if its performance T , measured by P , improves with the experience E .

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Suppose an email application observes which messages you mark as spam and, based on this, learns to better filter spam. What is the task T in this case?

- ☐ Classify emails as spam or non spam.
- ☐ Observe how the user marks emails as spam.
- ☐ The number (or fraction) of emails correctly marked as spam/non-spam.
- ☐ None of the above-This is not a machine learning problem.

Algorithms applicable to each example

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Regression

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I'VE LOVE

I've Love

Because you enjoyed:

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Los republicanos se hacen con la mayoría en el Senado y ...

20minutos.es - hace 36 minutos

El Partido Republicano logró este martes la mayoría en el Senado de Estados Unidos al arrebatar al poder a los demócratas. Los republicanos se hicieron con el control total del congreso, una noticia que se confirmó tras la votación de este martes ...

Mayoría republicana en Senado forzará negociaciones en LEUO

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Cluster

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Classification

Types of algorithms

We'll see two major types of algorithms:

Supervised learning:

- Regression
- Classification
- Recommendation

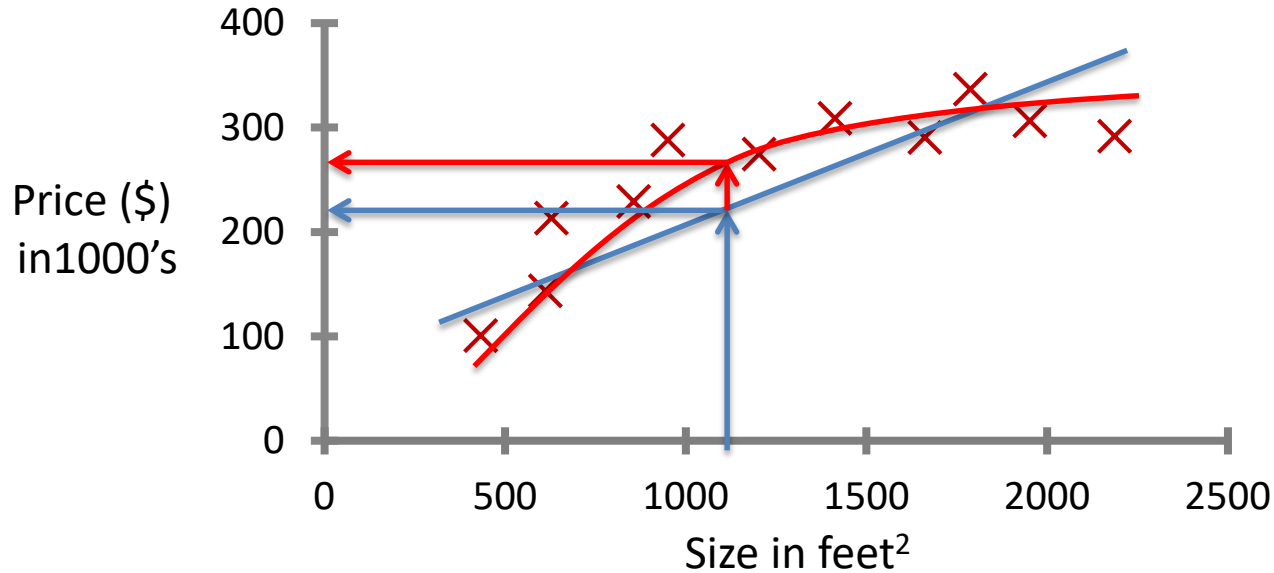
Unsupervised learning

- Clustering

There are other types: Reinforcement Learning, Online Learning, etc.

Supervised learning

Example: predicting housing prices



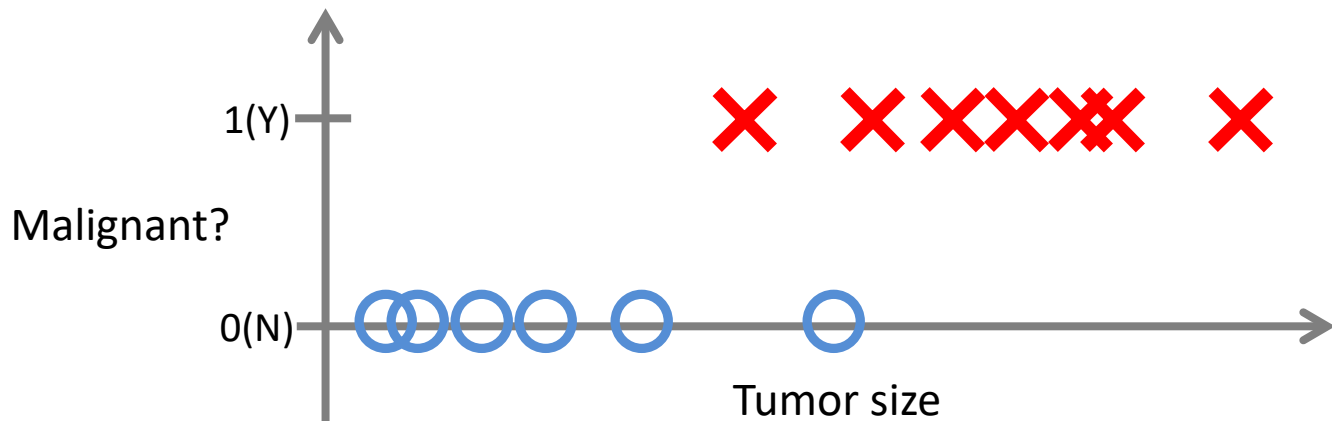
Supervised learning

“right answers” given

Regression: Predict continuous valued output (price)

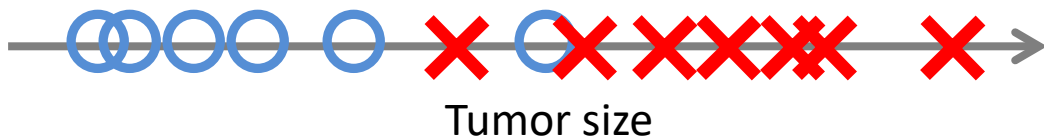
Supervised learning

Cancer prediction (malignant, benign)

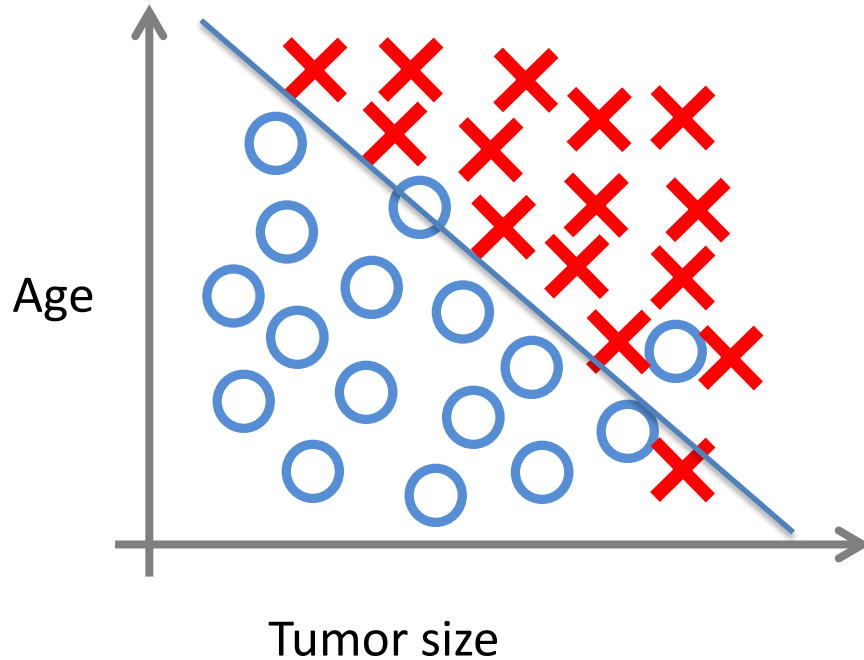


Classification

Discrete valued
output (0 or 1)



Supervised learning



- Clump Thickness
- Uniformity of Cell Size
- Uniformity of Cell Shape
- ...

You work for a large company, and you want to develop learning algorithms that solve one of the following problems

Problem 1: You have a large inventory of identical items. You want to predict how many of these items will be sold over the next 3 months.

Problem 2: You'd like the software to examine individual customer accounts, and for each of them, decide whether the account has been hacked or not.

How should you address these problems, as a regression or as a classification?

Both as classification problems.

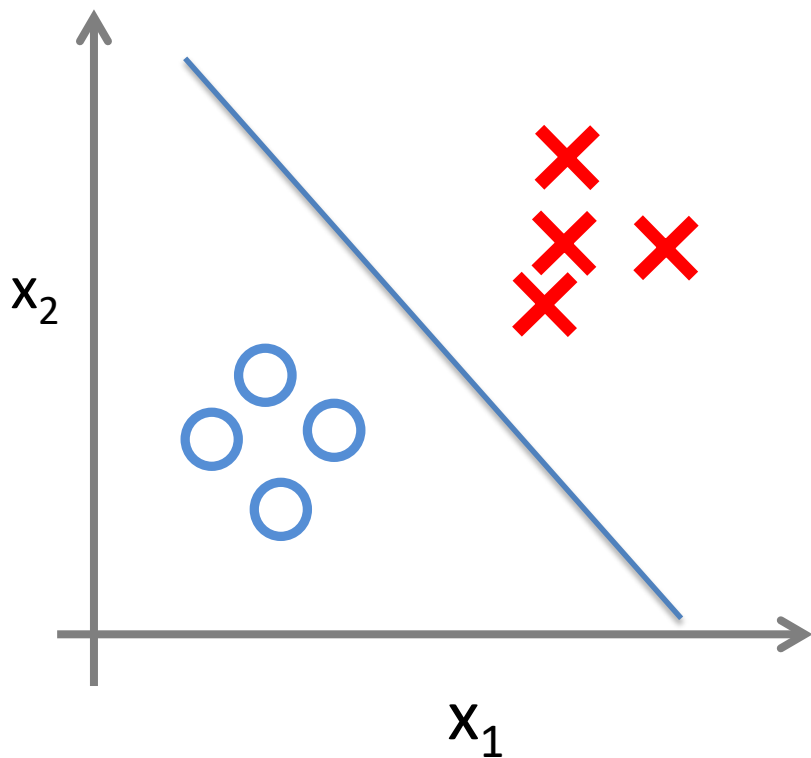
Problem 1 as classification, problem 2 as regression.

Problem 1 as regression, problem 2 as classification.

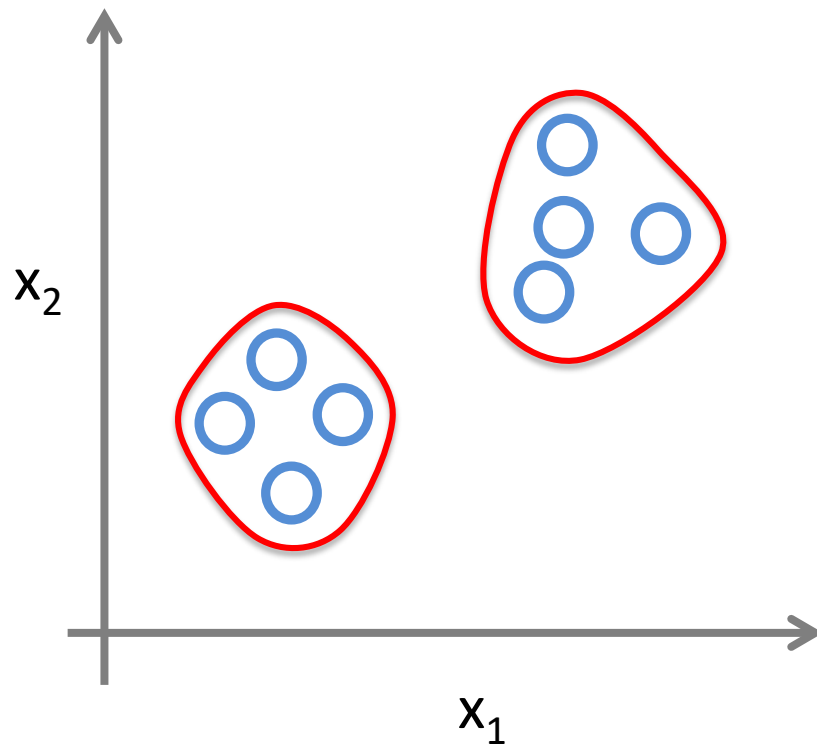
Both as regression problems.

Unsupervised learning

Supervised learning



Unsupervised learning

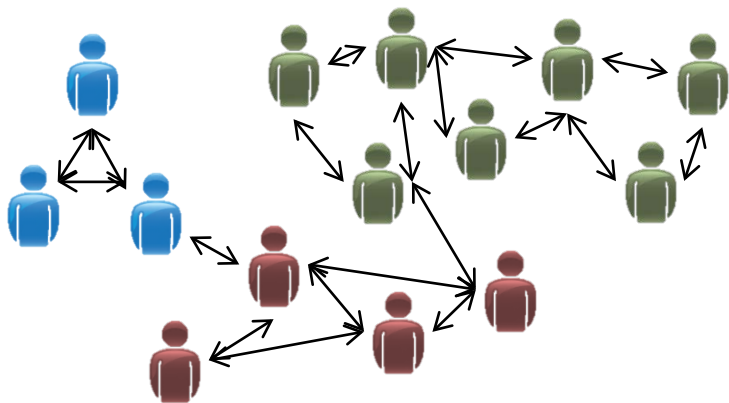


Unsupervised learning

Clustering

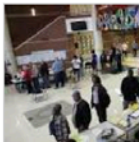


Market Segmentation



Social network analysis

Noticias destacadas



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