SE 544: Introduction to Machine Learning

Department of Software Engineering
Daffodil International University

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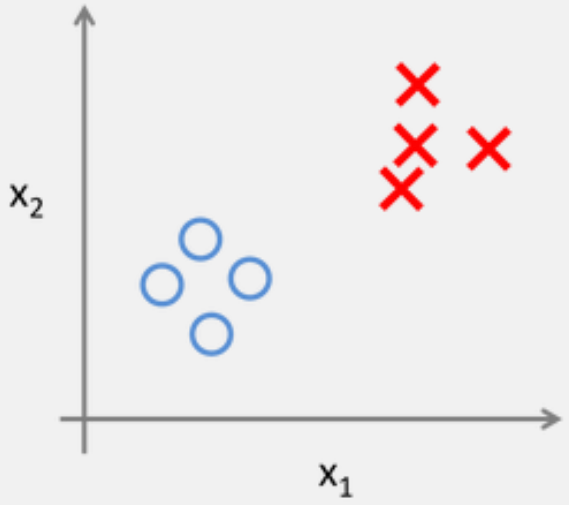
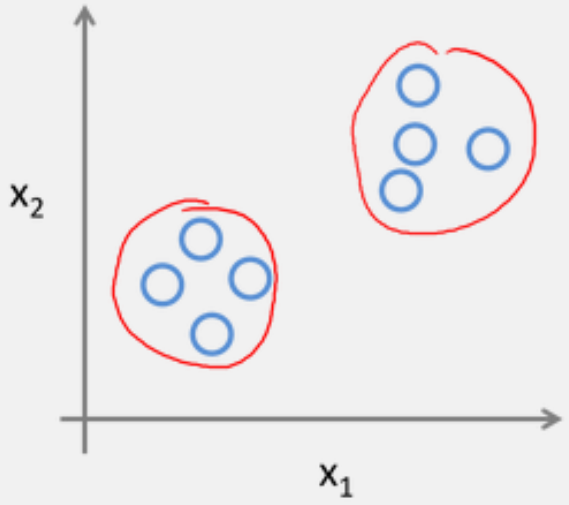
Supervised Learning



Unsupervised Learning



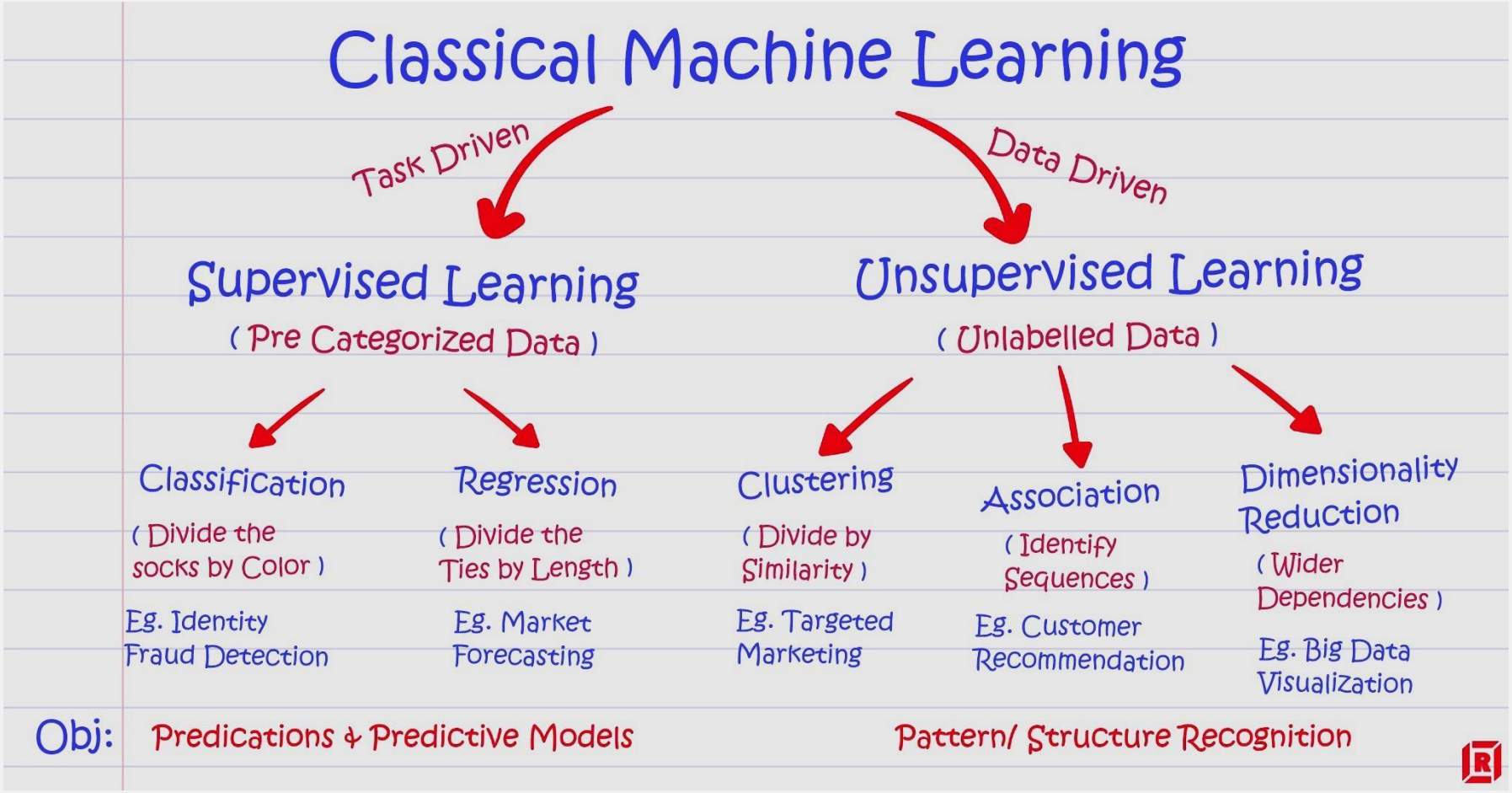
Machine Learning

Machine Learning Algorithms

- Supervised learning
- Unsupervised learning

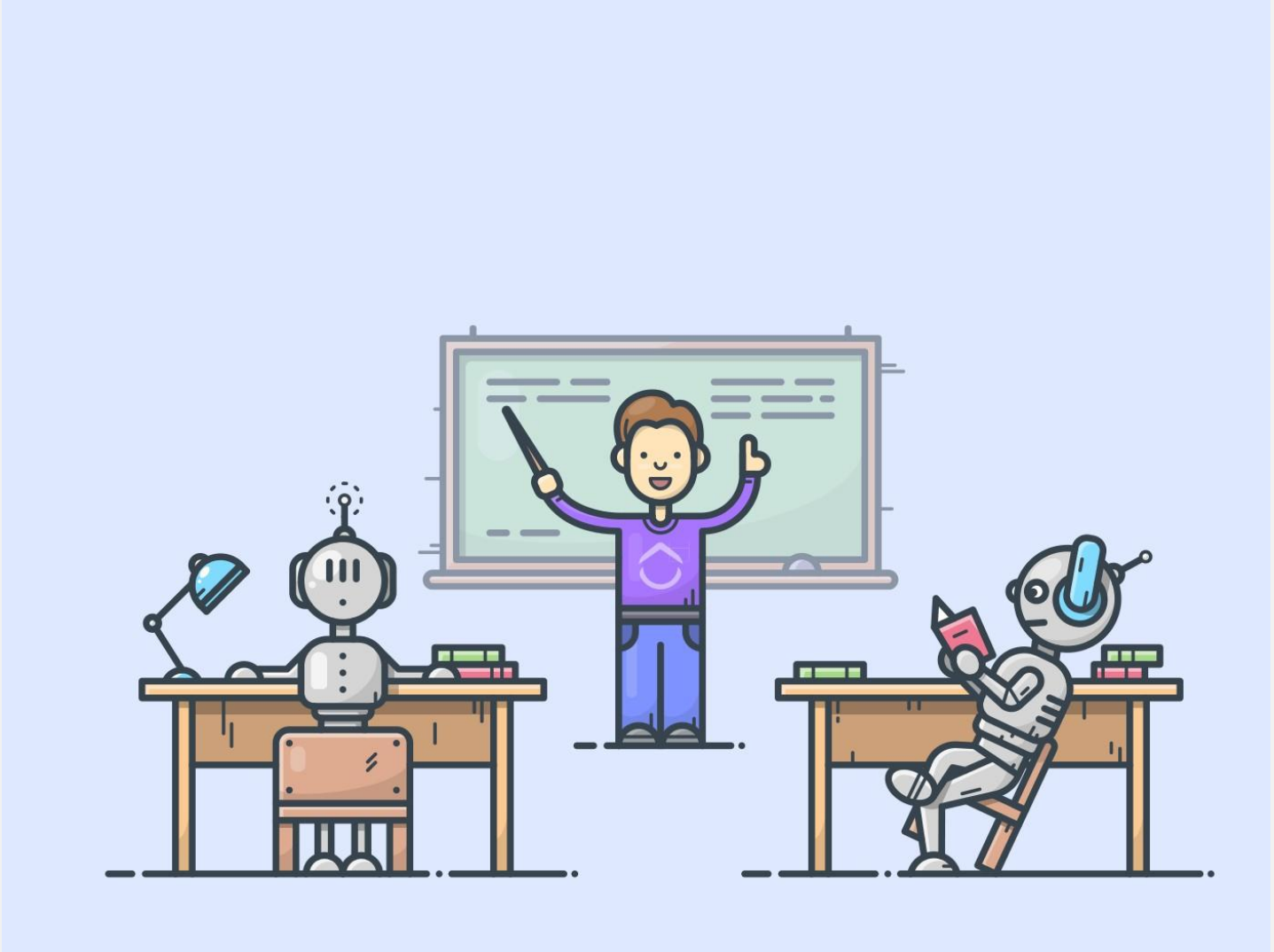
Others

- Reinforcement learning
- Semi-supervised learning

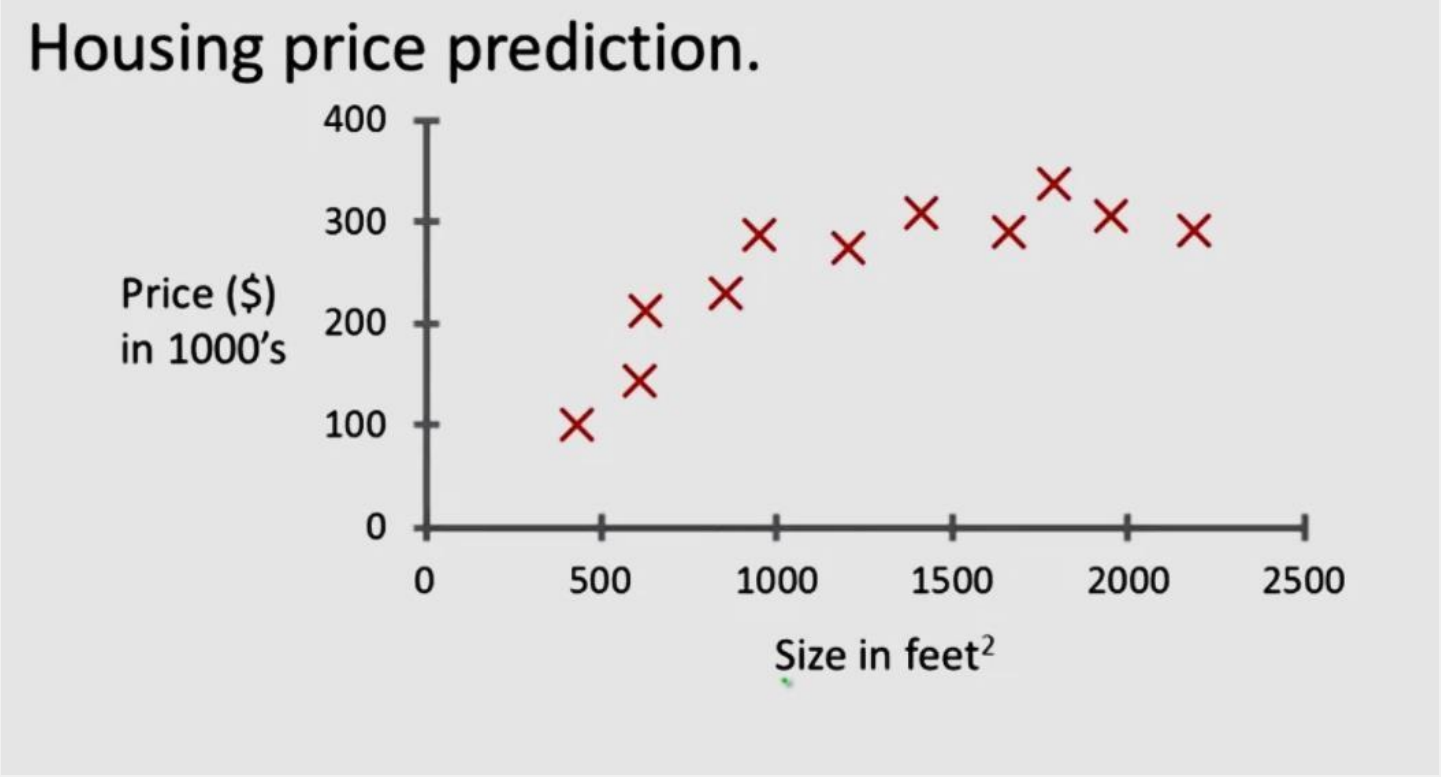


Machine Learning

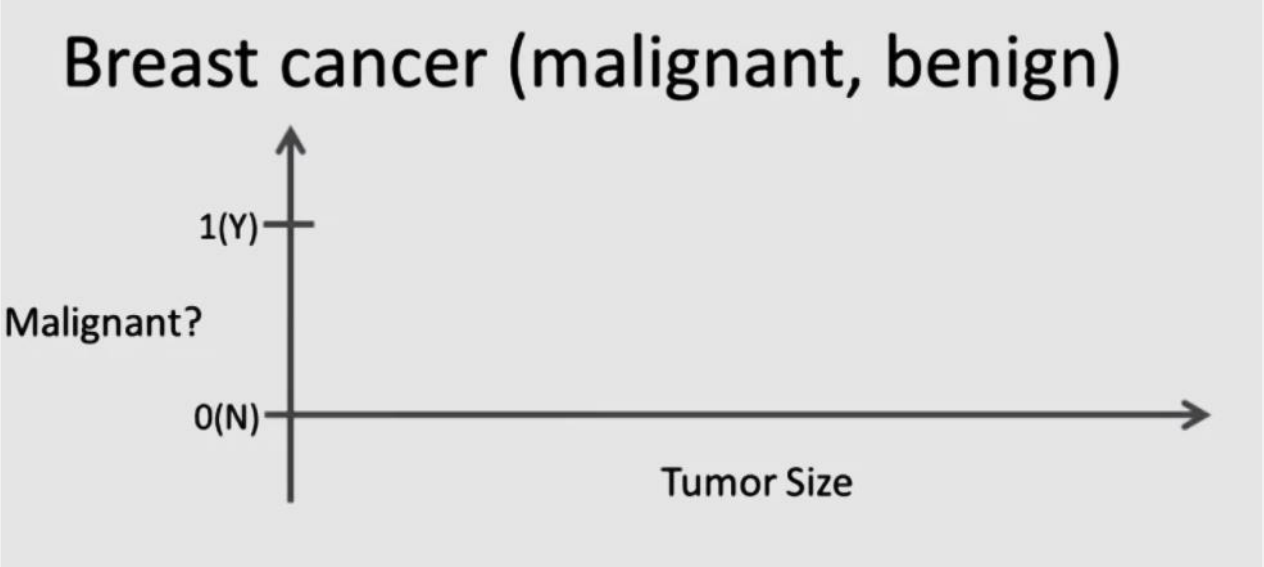
- QA -



- Supervised learning (regression)

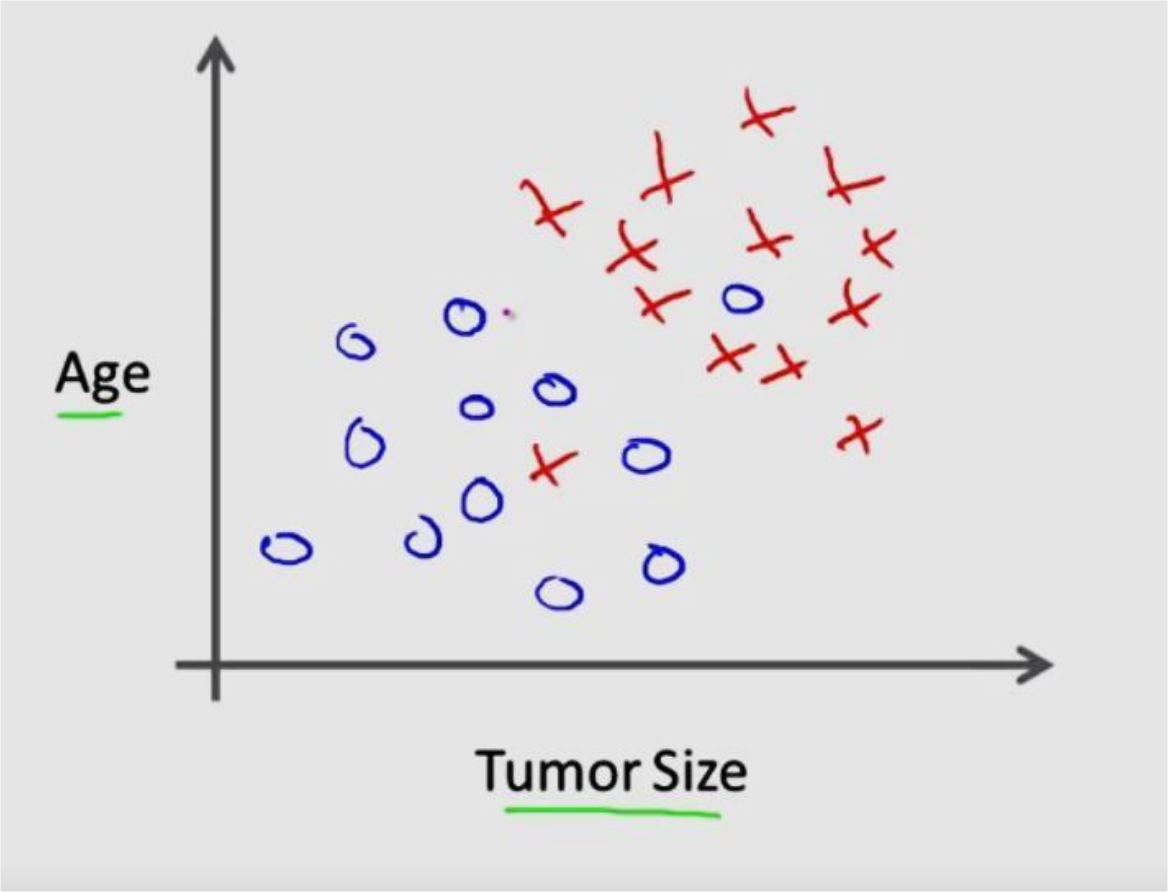


- Supervised learning (classification)

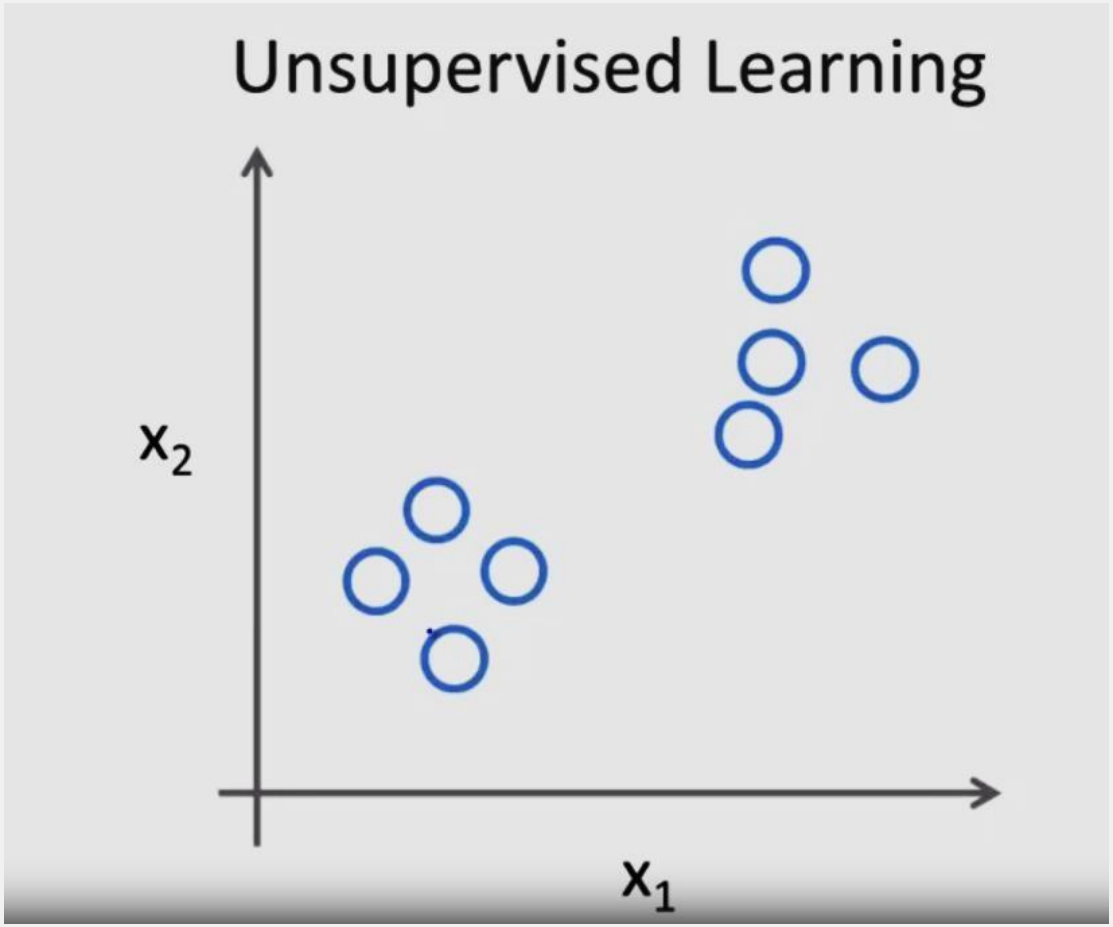


Machine Learning

- Supervised learning (classification)



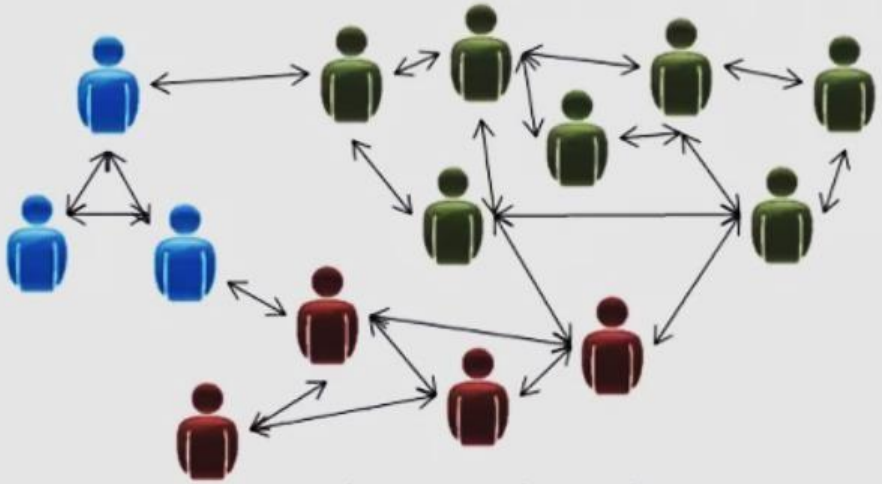
- Unsupervised learning (clustering)



Machine Learning

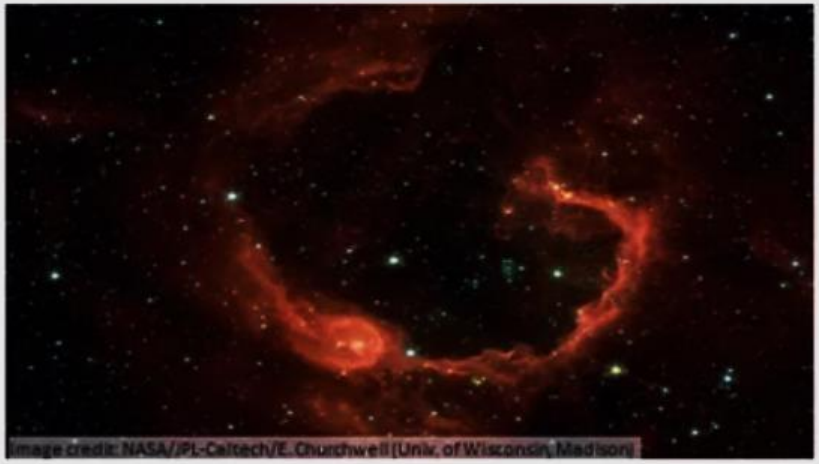
- Example

Organize computing clusters



Social network analysis

Market segmentation



Astronomical data analysis

Machine Learning

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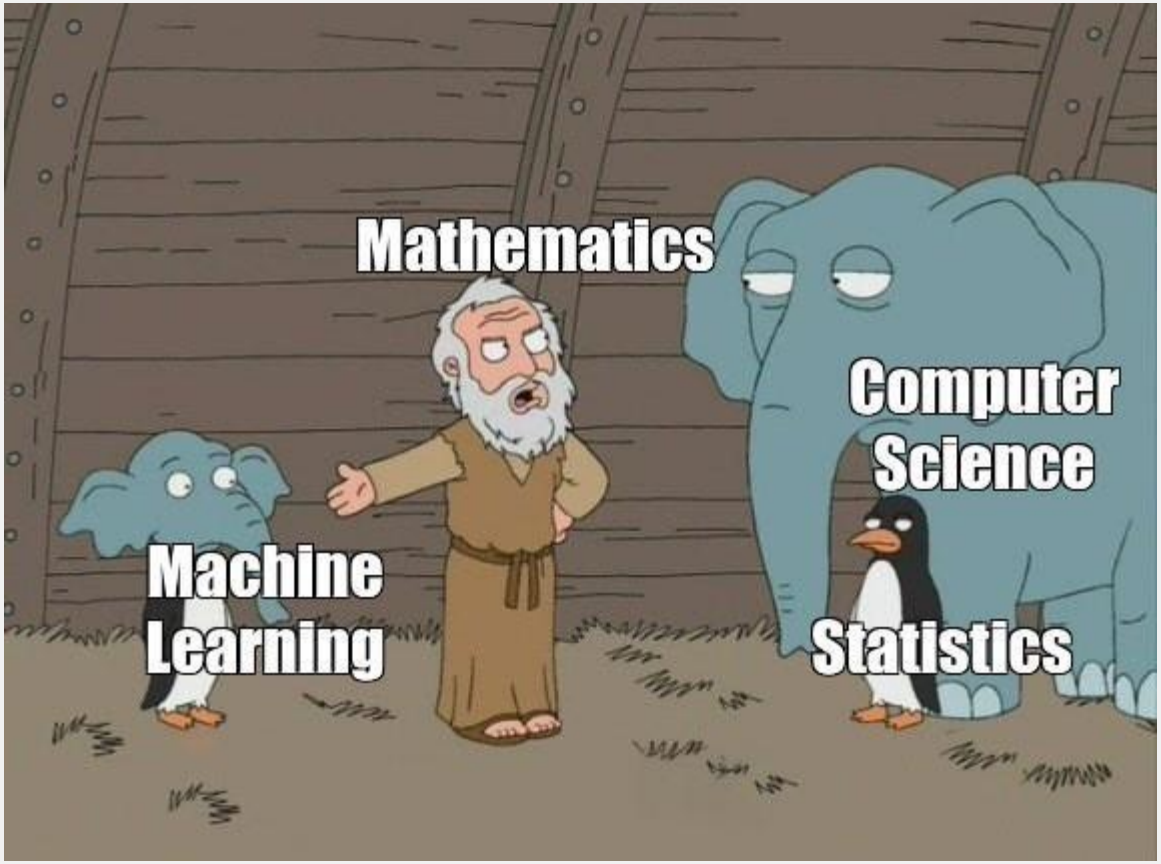
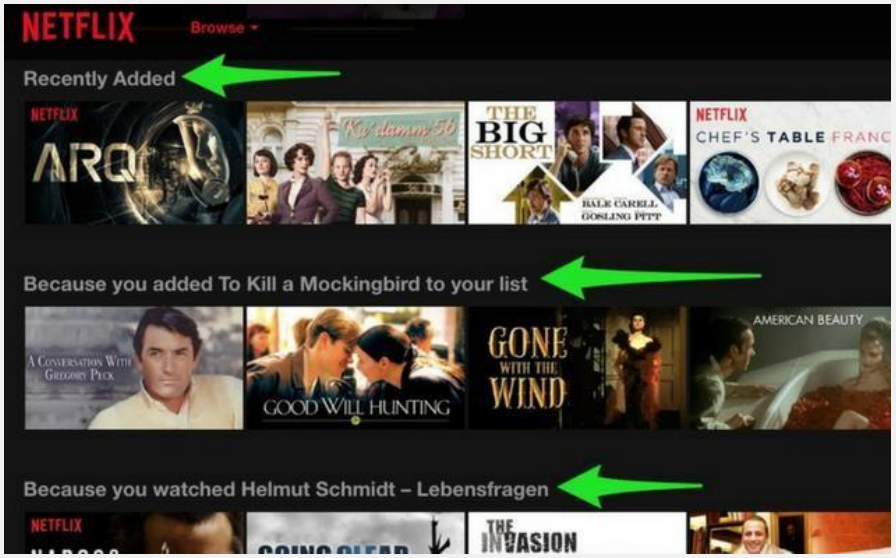
Let's have a look into the

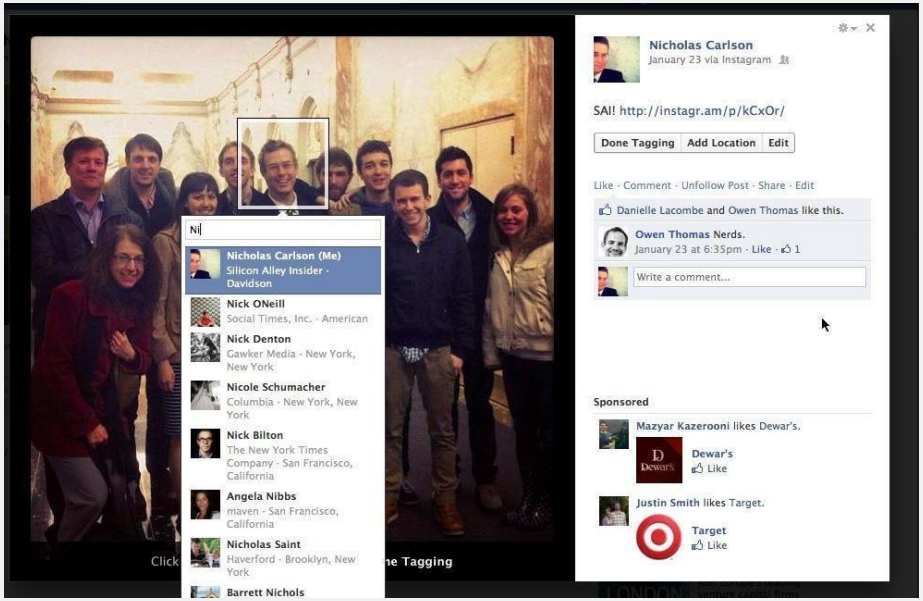
Course Planning

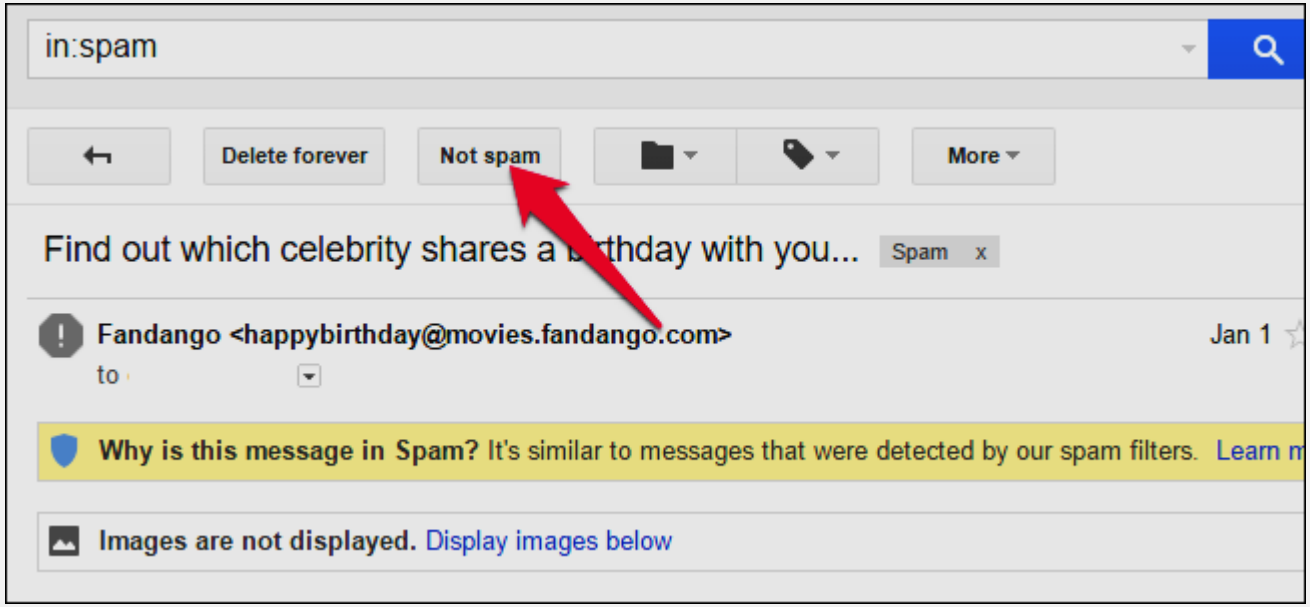
- **What to do**
- **Not to do**

Welcome!


Mathematics
Computer Science
Machine Learning
Statistics







Machine Learning

Machine Learning

- New capability for computers
- AI is the new electricity

Examples

1. Database mining

Mining information from large data on web/memory

- E.g., Web click data, medical records, biology, engineering

2. Automation and replacement of hand

- E.g., Autonomous vehicle, handwriting recognition, natural language processing, Computer vision

3. Self customizing programs

- E.g., Amazon, Netflix recommendation

4. Understanding human learning (brain, real AI)

Machine Learning definition

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

- Tom Mitchell (1998) Well-posed Learning Problem: A computer program is said to *learn* from experience E with respect to some task T and some performance measure P, if its performance on T, as measured by P, improves with experience E.

Machine Learning

- QA -

"A computer program is said to *learn* from experience E with respect to some task T and some performance measure P, if its performance on T, as measured by P, improves with experience E."

Suppose your email program watches which emails you do or do not mark as spam, and based on that learns how to better filter spam. What is the task T in this setting?

- ○ Classifying emails as spam or not spam.
- ○ Watching you label emails as spam or not spam.
- ○ The number (or fraction) of emails correctly classified as spam/not spam.
- ○ None of the above—this is not a machine learning problem.

Machine Learning