Introduction to Machine Learning

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Welcome to the Class

What we are going to learn

- What is machine learning?

  a) Is machine learning hard? (Spoiler: No)

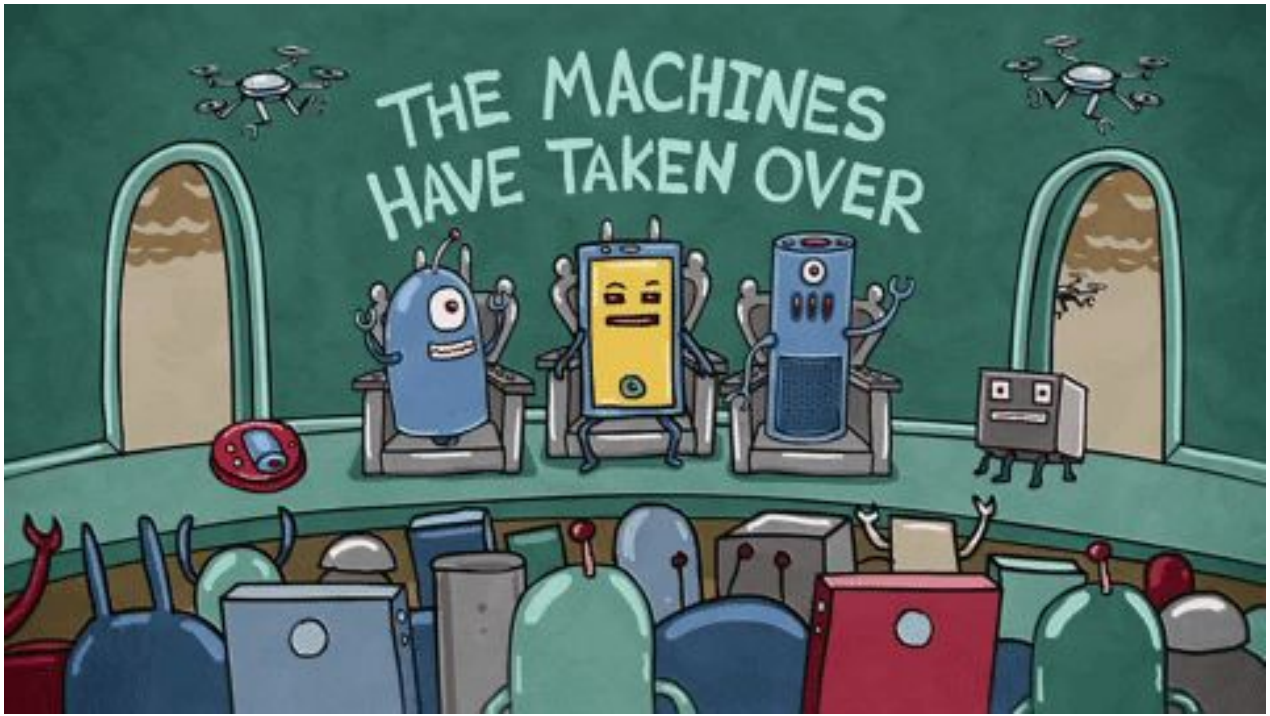
  b) What do we learn in this course?

  c) What is artificial intelligence and how does it differ from machine learning?

  d) How do humans think, and how can we inject those ideas into a machine?

- Some basic machine learning examples in real life.

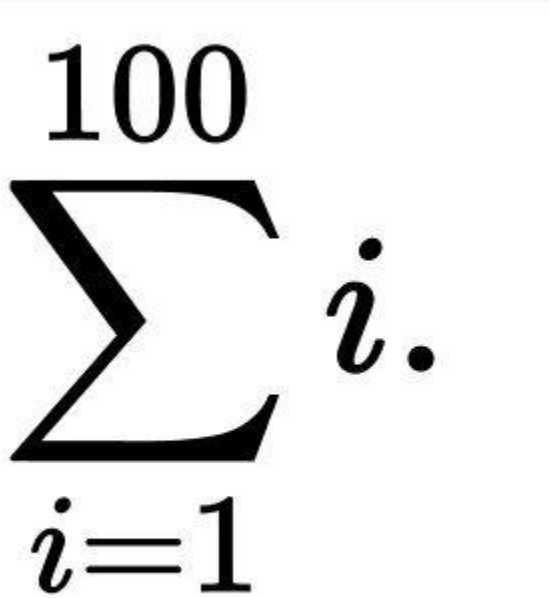
Machine Learning is Everywhere



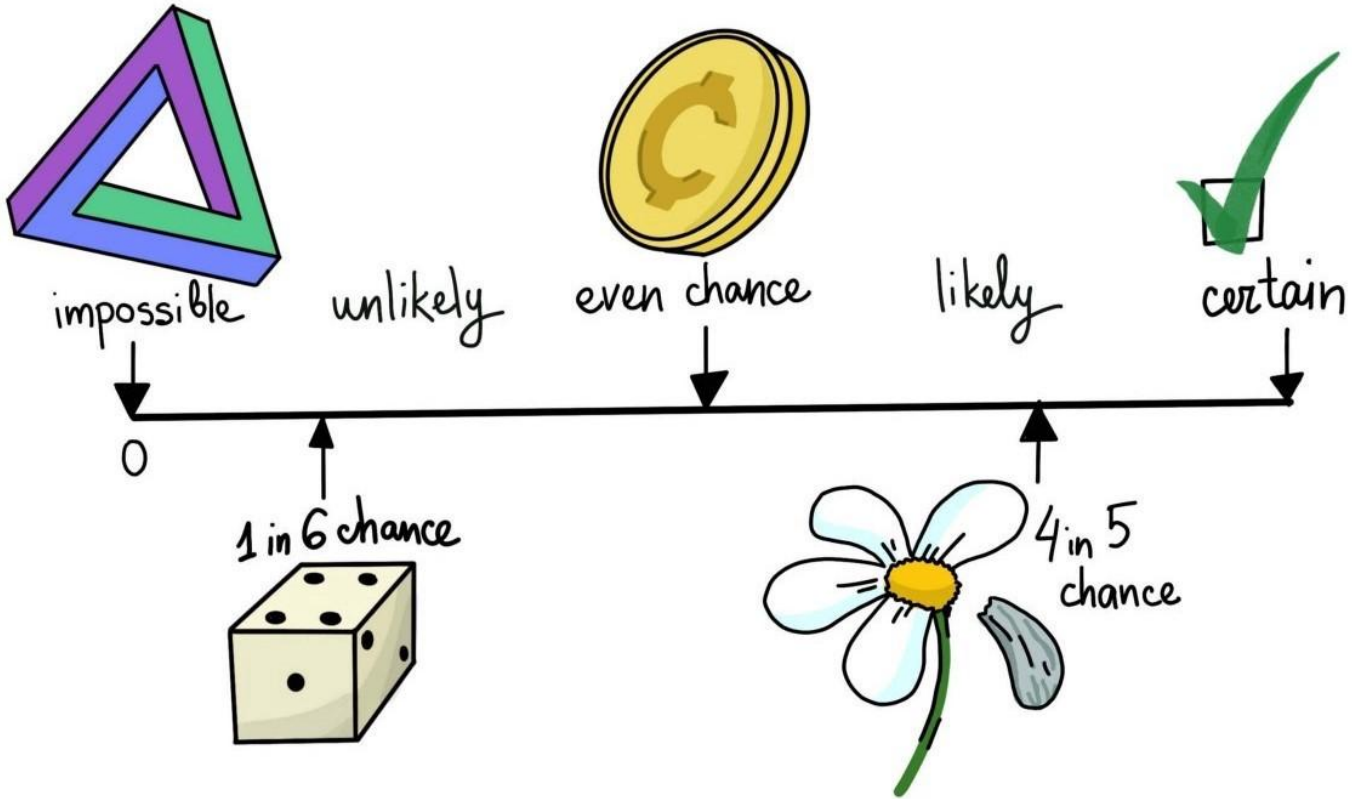
Do I need Heavy Math and Coding to Understand?

No.

Formulas and Python are a Language



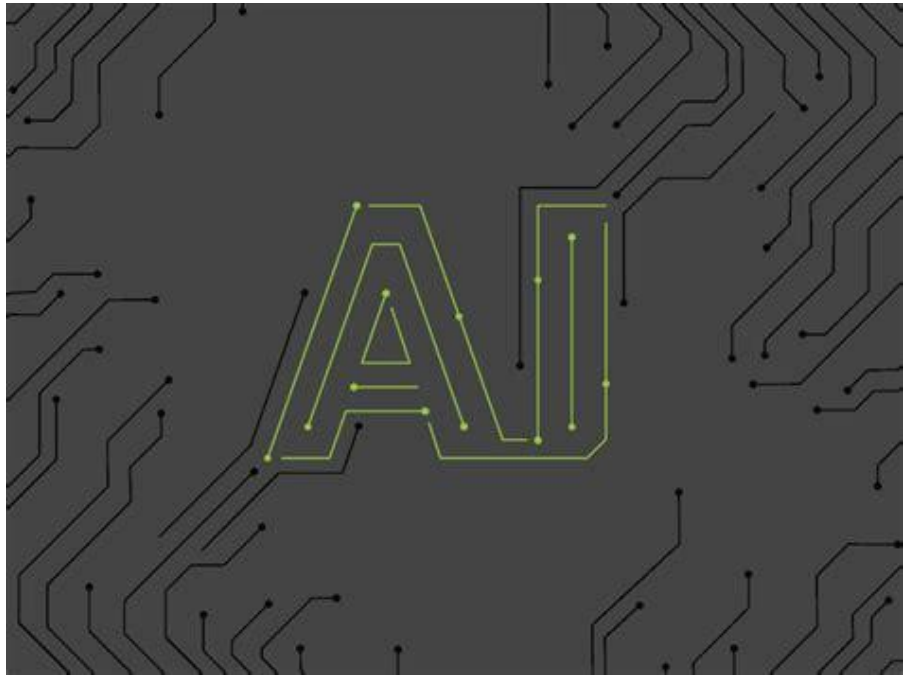
Probability



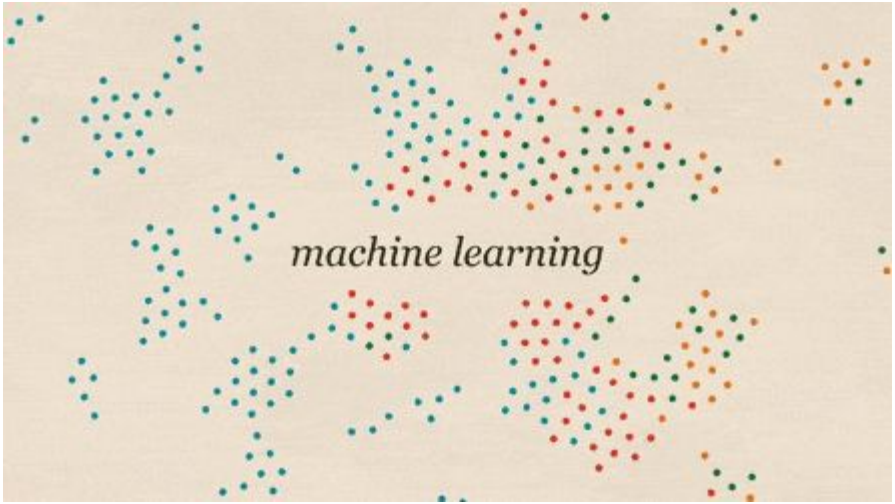
What is Machine Learning

What is AI?

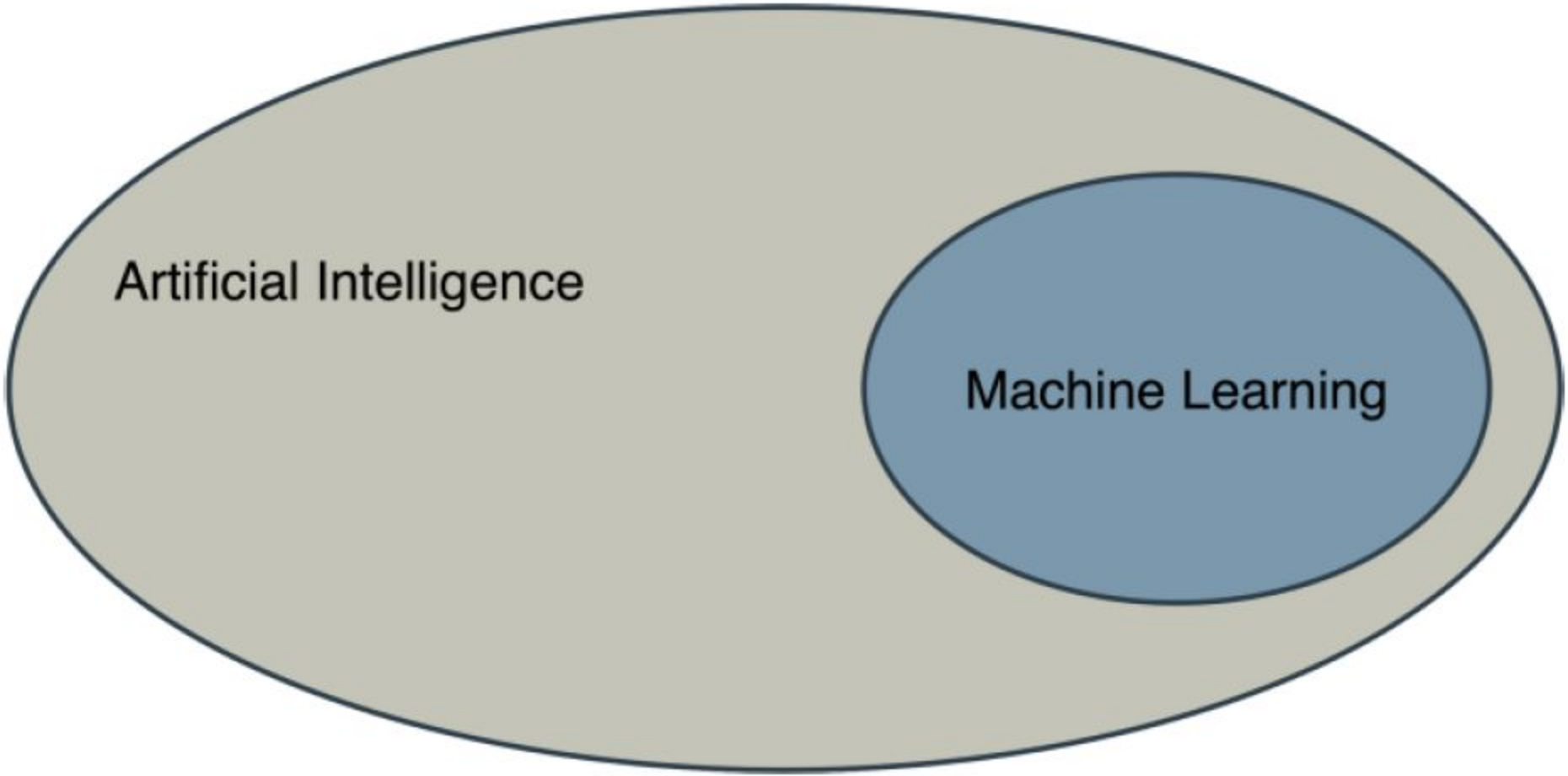
AI is when a computer mimics human behavior.



What is Machine Learning?



MACHINE LEARNING The set of all tasks in which a computer can make decisions based on data.


Artificial Intelligence
Machine Learning

What is Machine Learning?

Machine Learning is COMMON SENSE… except done by a computer.

Machine learning encompasses all the tasks in which computers make decisions based on data.

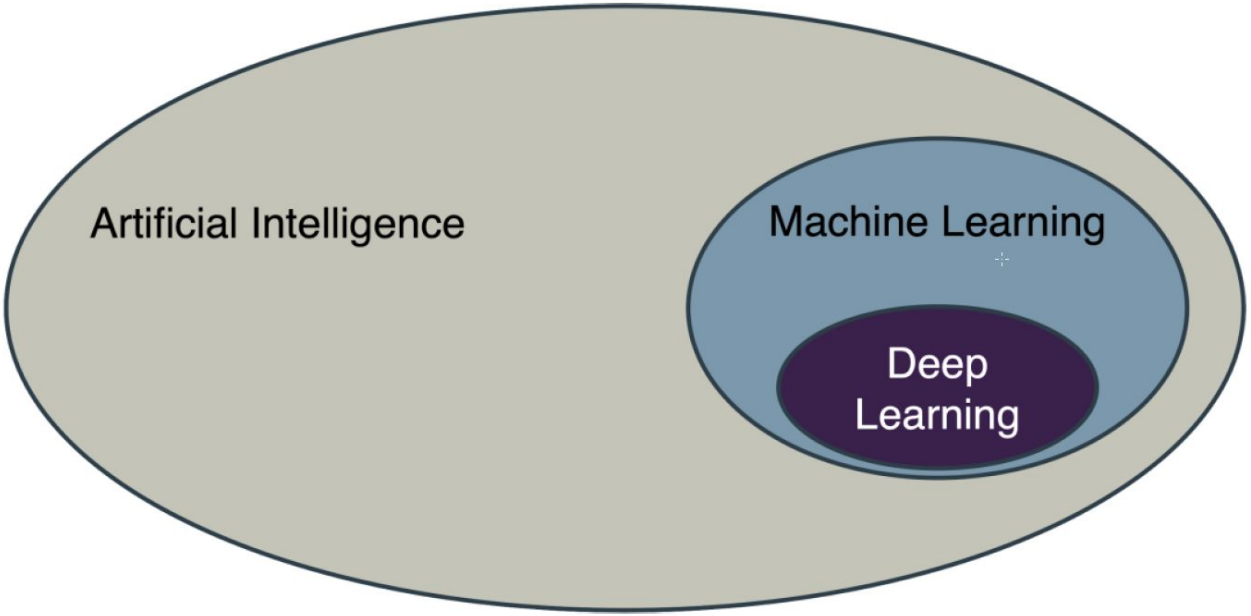
In the same way that humans make decisions based on previous experiences, computers can make decisions based on previous data.

What is Machine Learning?

Machine Learning is a LABEL MAKER.

What is Deep Learning?

DEEP LEARNING: The field of machine learning that uses certain objects called neural networks.



Remember, Formulate, Predict

1. We remember past situations that were similar.

2. We formulate a general rule.

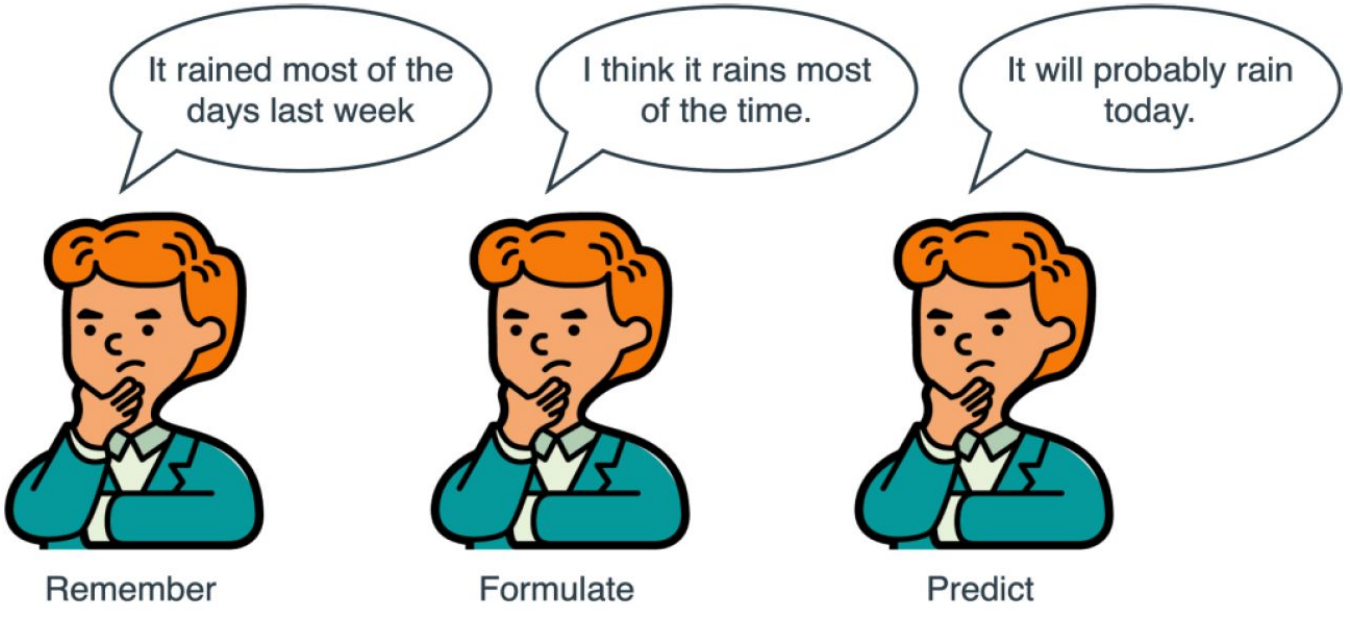
3. We use this rule to predict what may happen in the future.

How do Humans Think?

1. We remember that last week it rained most of the time.

2. We formulate that in this place, it rains most of the time.

3. We predict that today it will rain.



Model versus and Algorithm

MODEL: A set of rules that represent our data and can be used to make predictions.

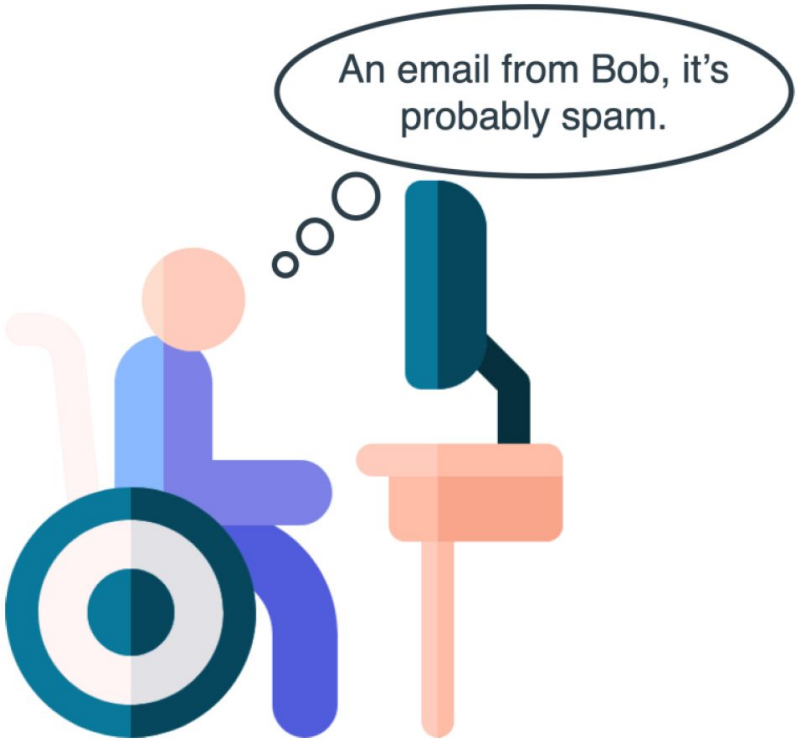
ALGORITHM: A procedure, or a set of steps, used to solve a problem or perform a computation. In this course, the goal of an algorithm is to build a model.

EMAIL EXAMPLE

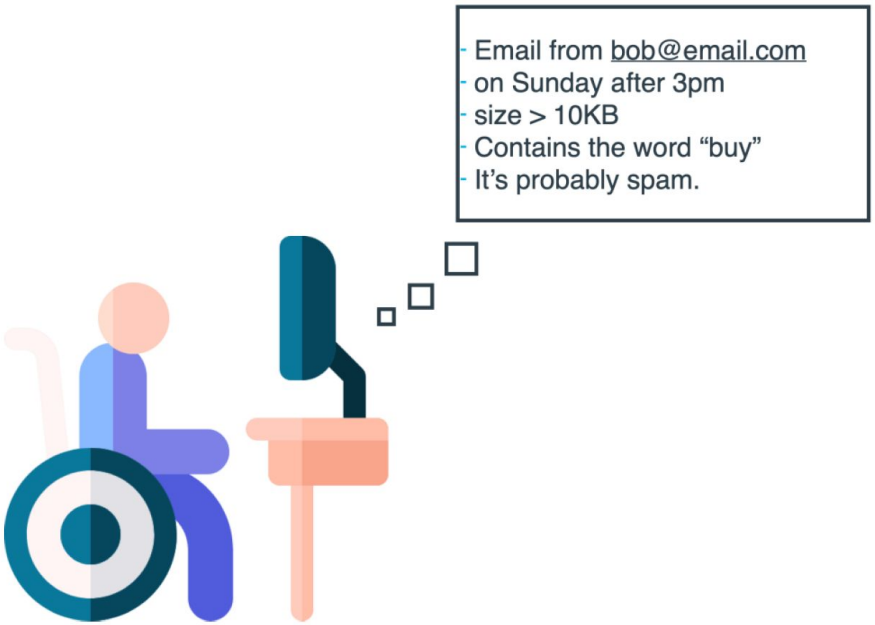
The last 10 emails that we got from Bob. That is our data. We **remember** that 4 of them were spam and the other 6 were ham. From this information, we can **formulate** the following model:

Model 1: 4 out of every 10 emails that Bob sends us are spam.

We **predict** that 60% of emails are ham.



Email Example



(size) + 10(number of spelling mistakes) - (number of appearances of the word ‘mom’) +

4(number of appearances of the word ‘buy’) > 10,

then we classify the message as spam. Otherwise we classify it as ham.

Summary

- Remember: Look at previous data.
- Formulate: Build a model, or a rule, based on this data.
- Predict: Use the model to make predictions about future data.