An introduction to Machine Learning

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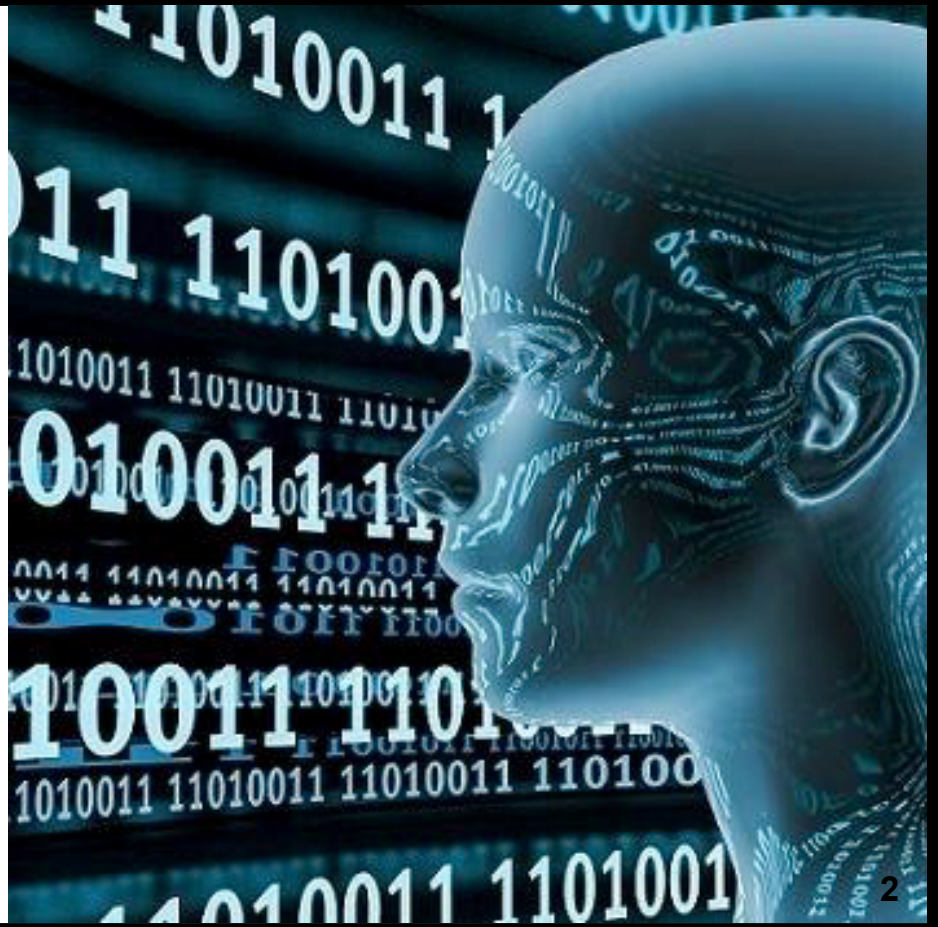
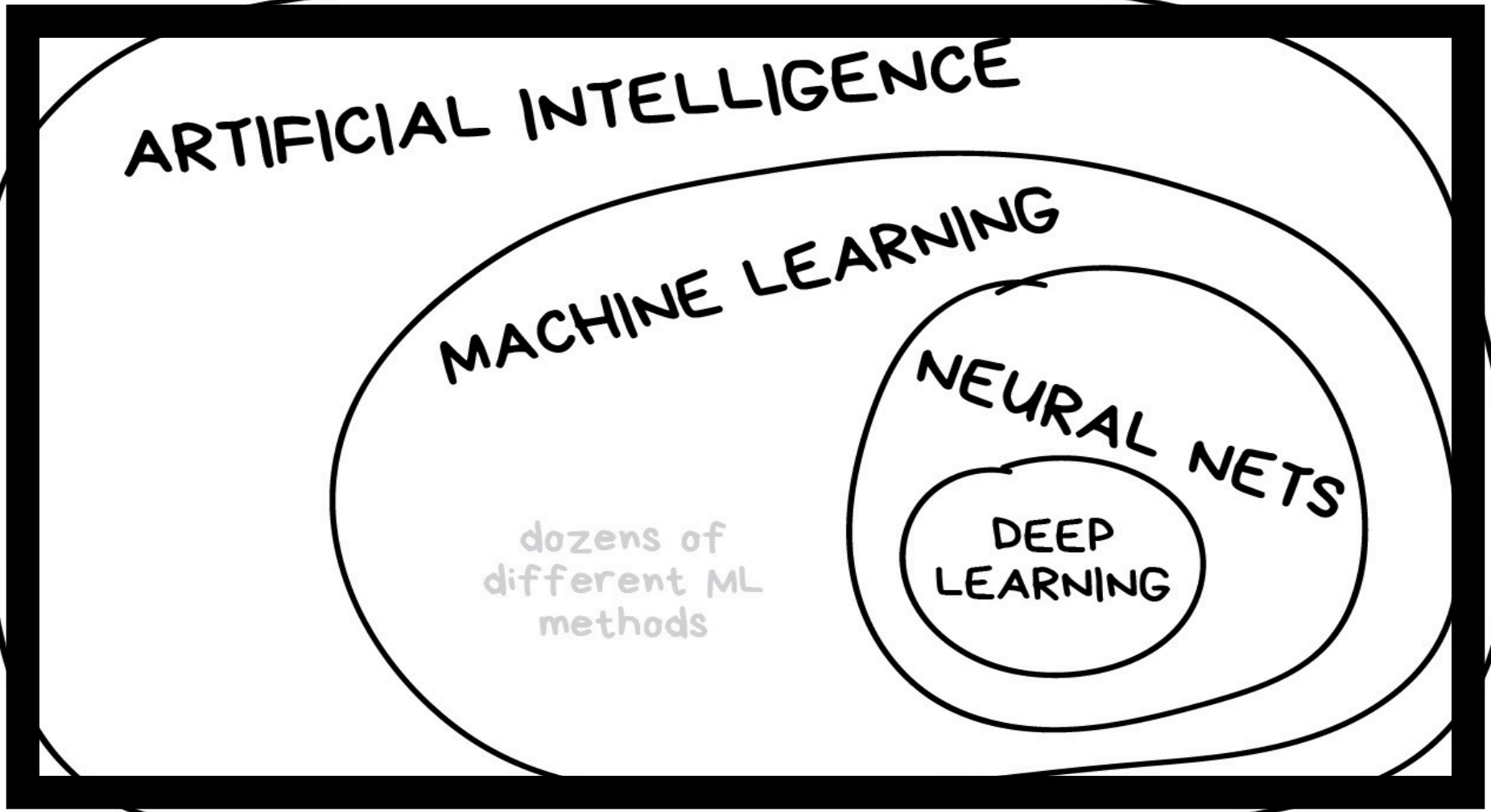
What is Machine Learning?

When a Machine - such as a computer - learns without human guidance.

Essentially - a machine builds its own mathematical model.

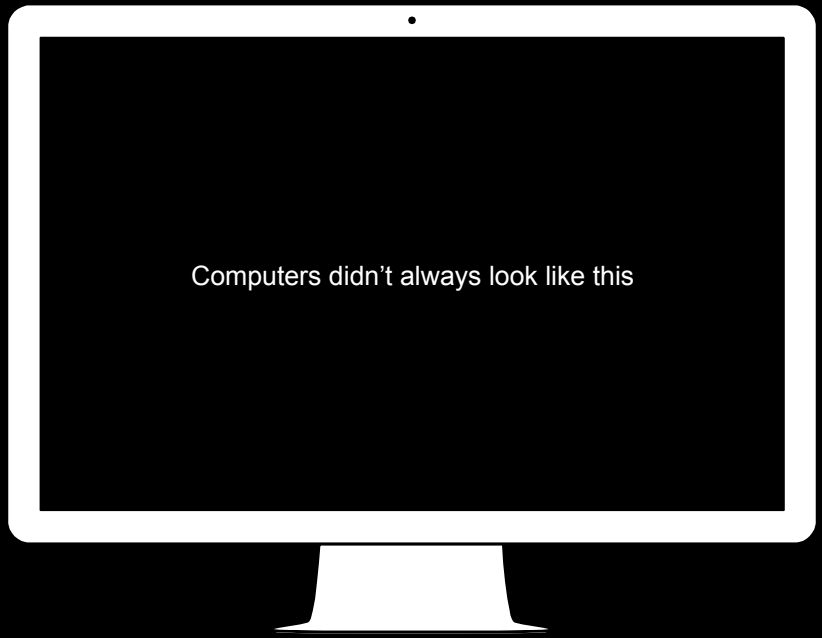


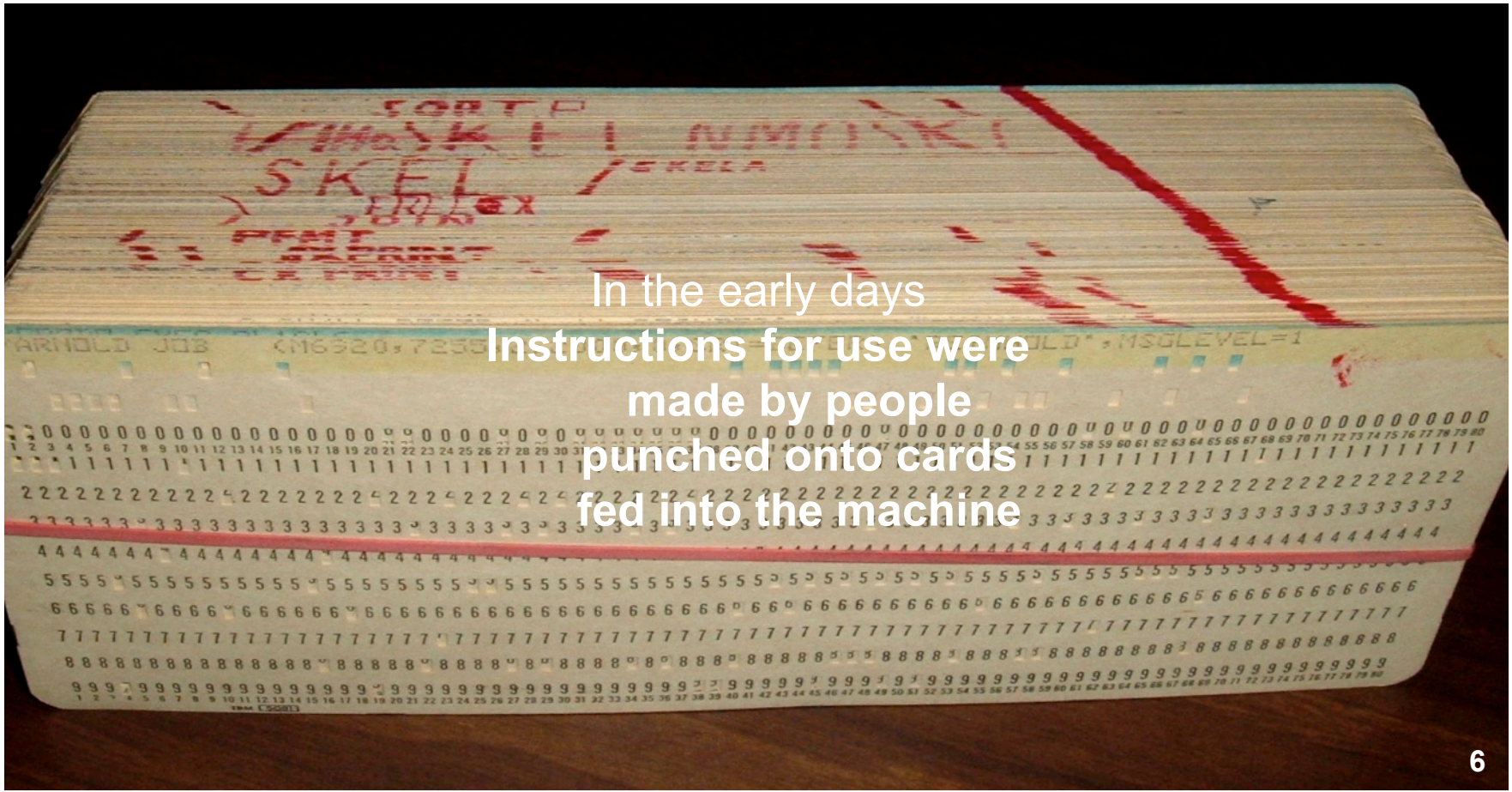
Is Machine Learning the same as Artificial Intelligence?

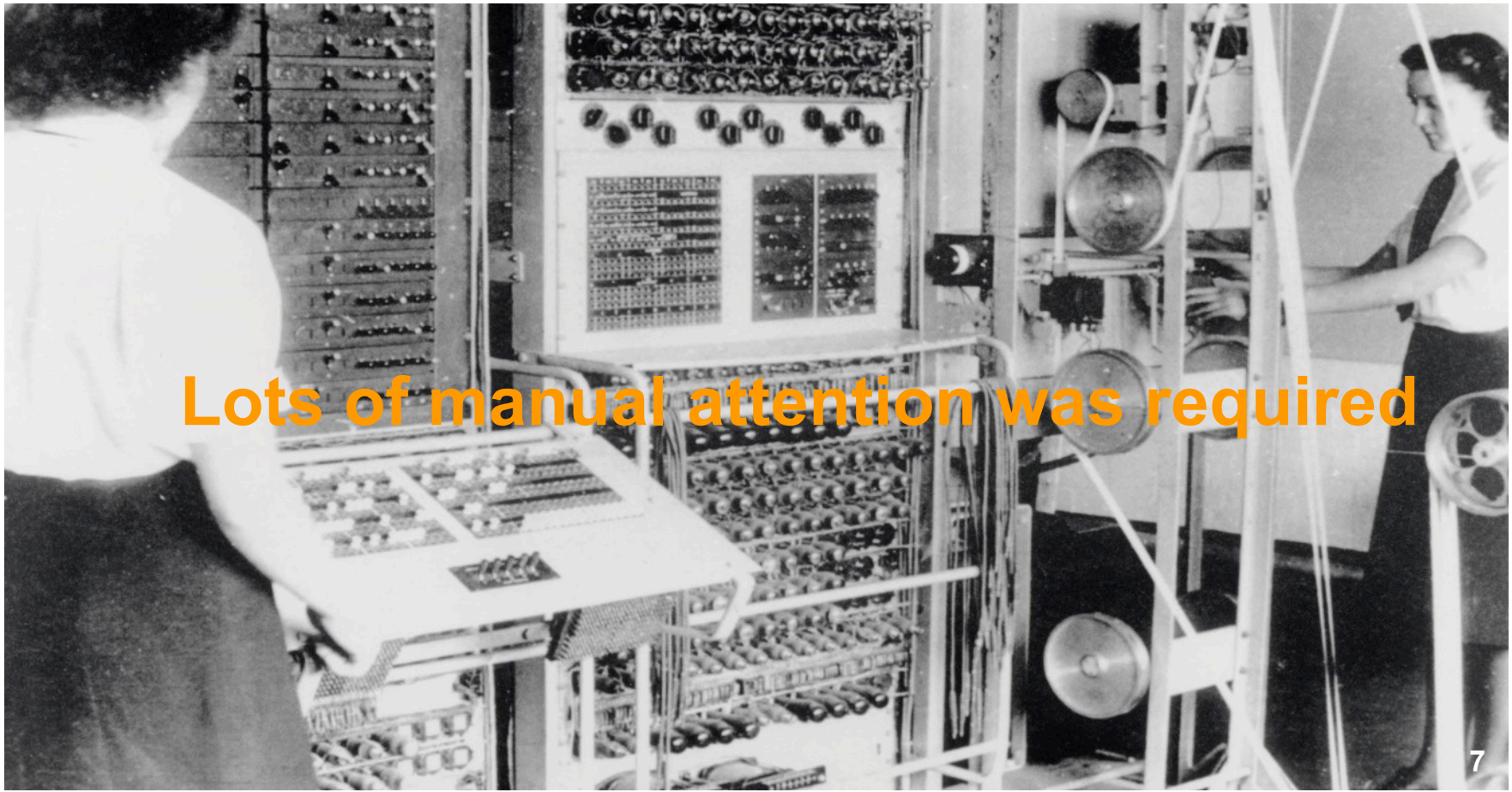

ARTIFICIAL INTELLIGENCE
MACHINE LEARNING
NEURAL NETS
DEEP LEARNING
dozens of different ML methods

Consider the history

Think of the way computers developed from the beginning

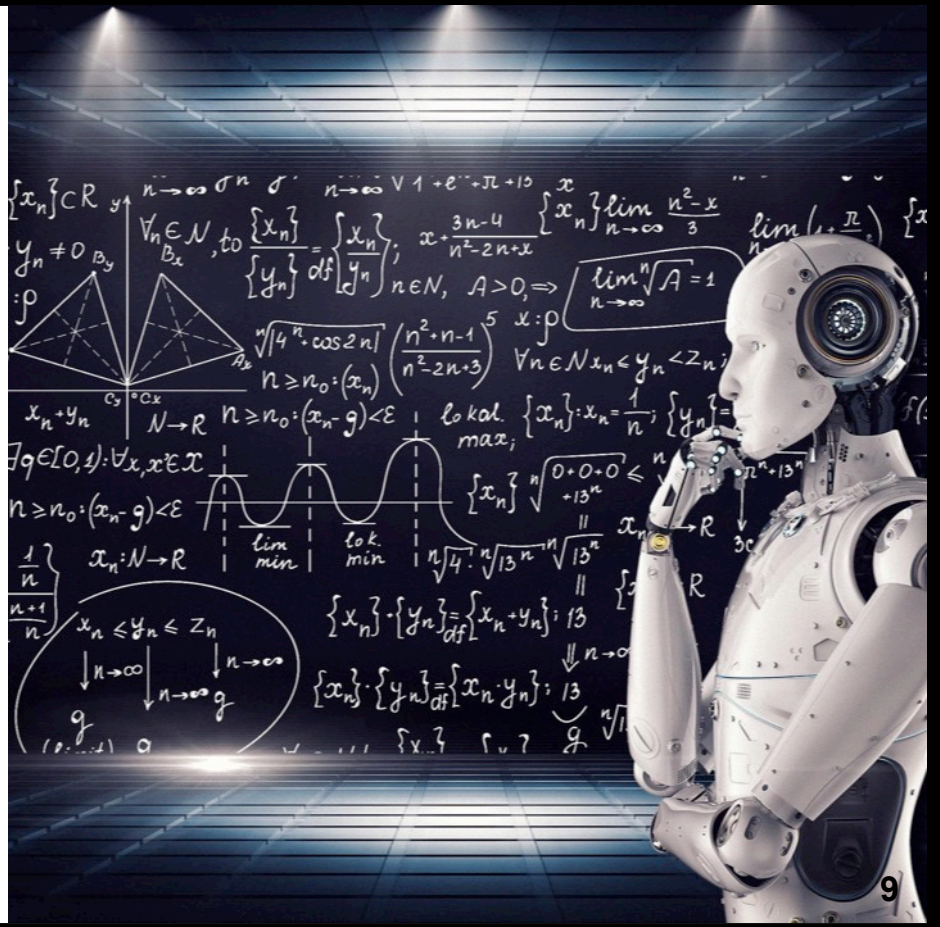



In the early days
Instructions for use were
made by people
punched onto cards
fed into the machine


Lots of manual attention was required

The way people code now can be seen as a natural evolution towards...

A Machine learning a set of instructions for itself

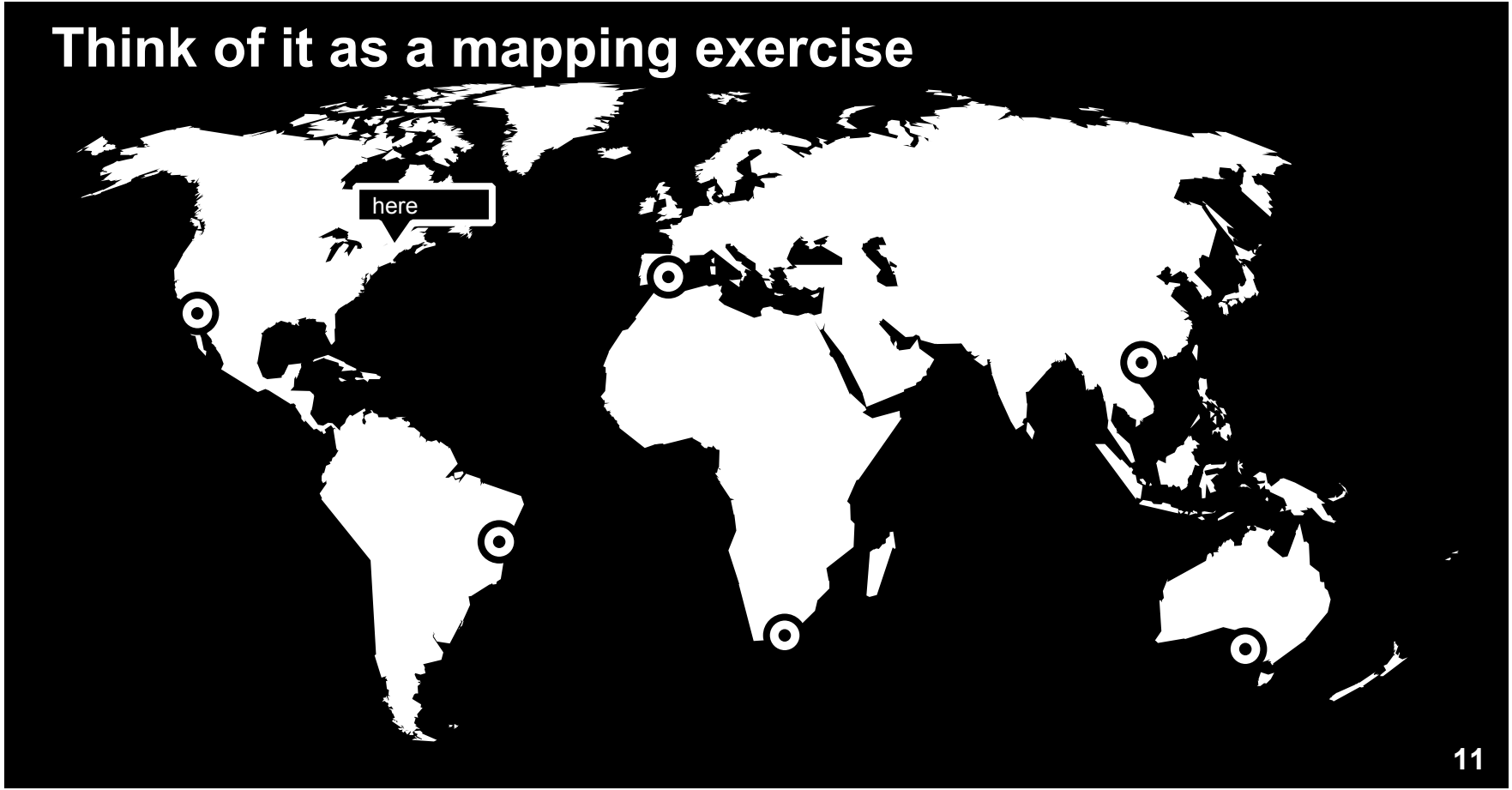


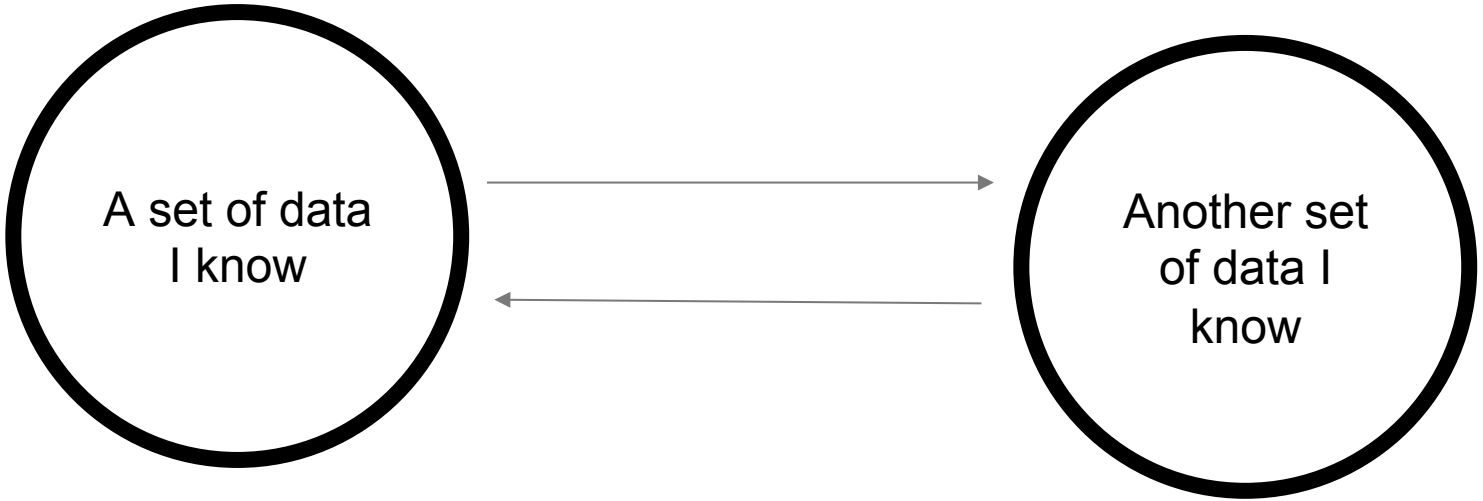
How could

A machine

Write instructions or learn from data of its own accord?

Think of it as a mapping exercise



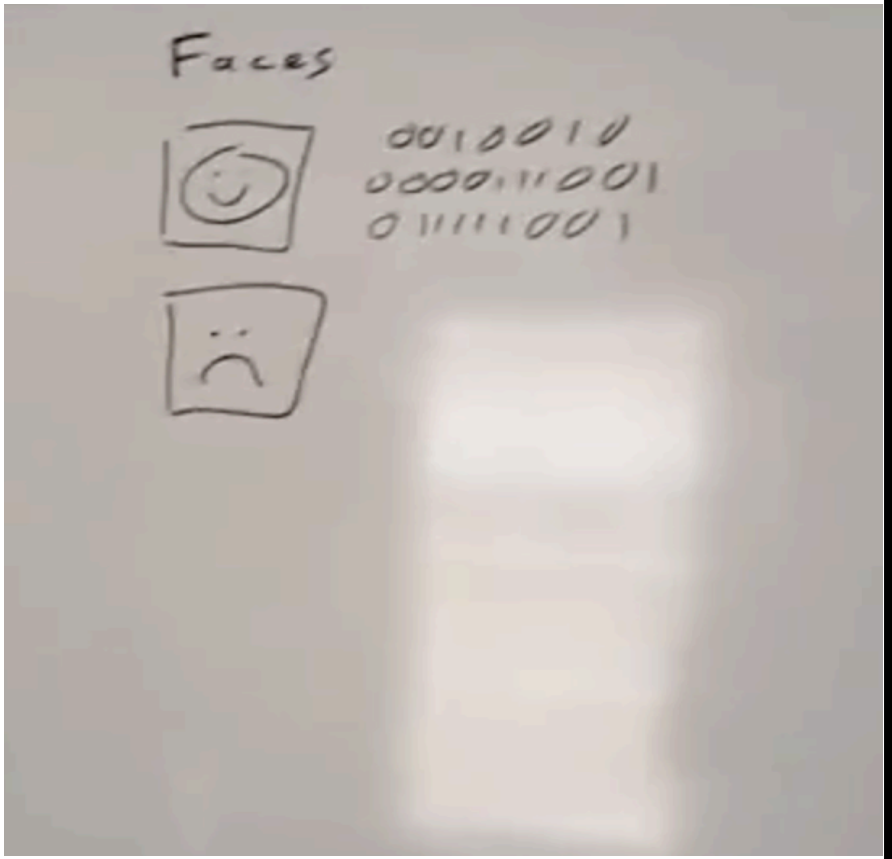


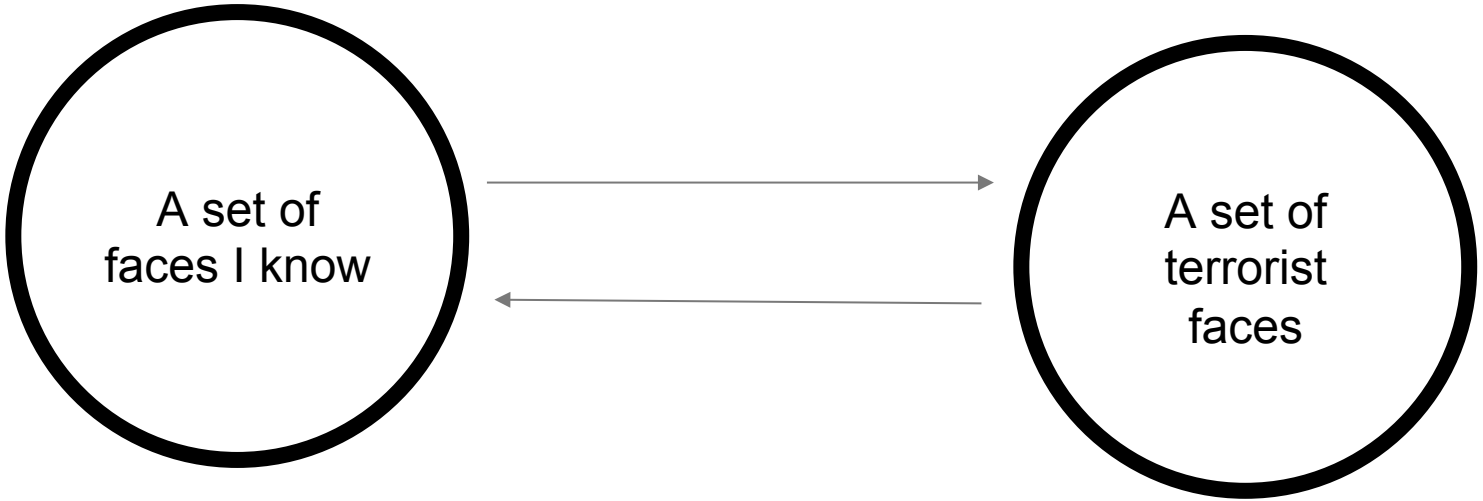
...this kind of mapping

Let’s choose a real example.

Suppose I know a set of faces...

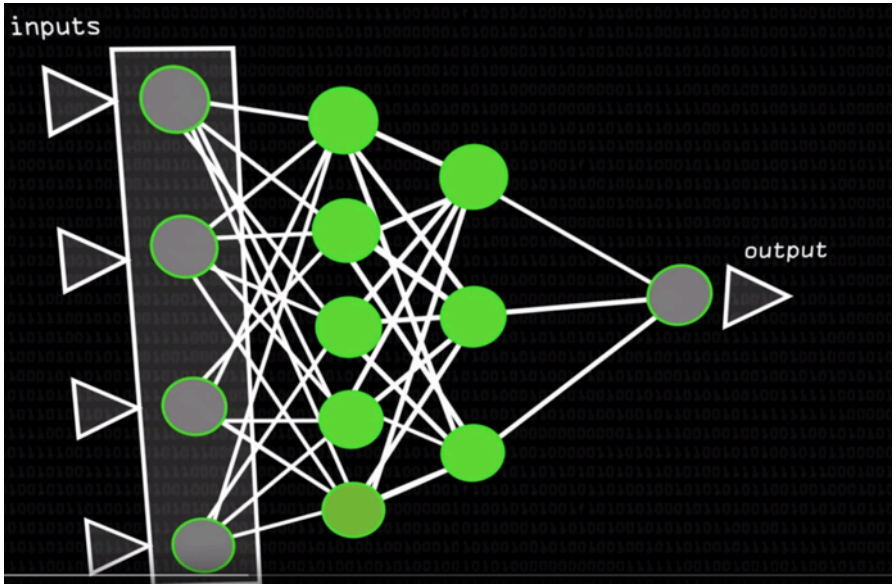
And I want the machine to map them against another set of faces





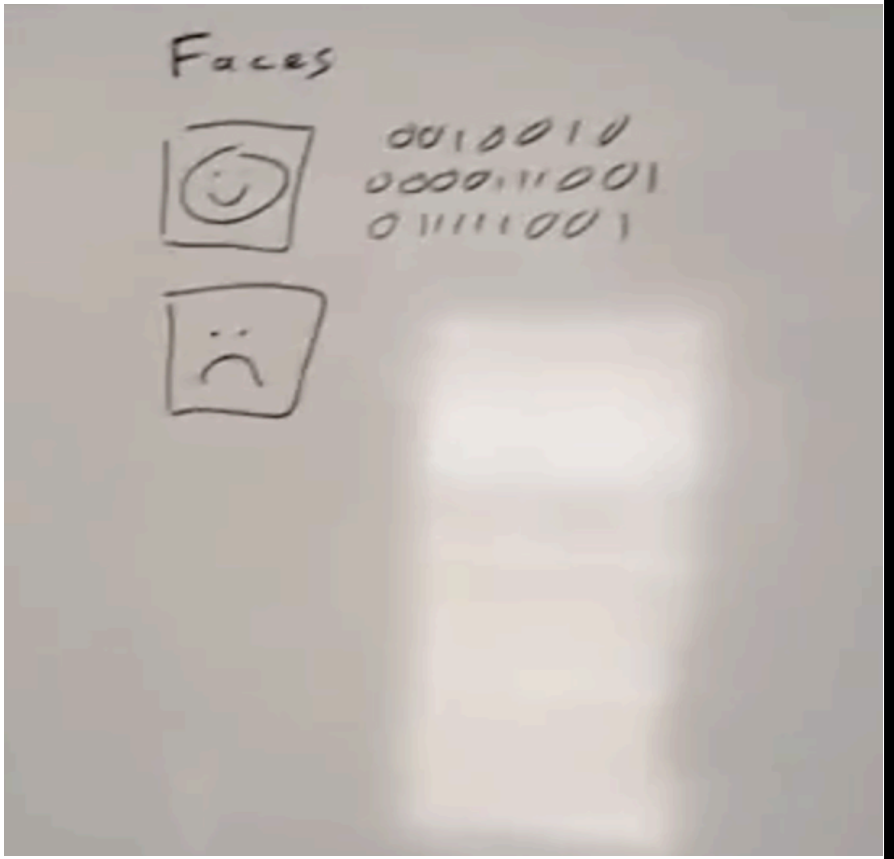
...I do this because I have a purpose

And “the set of arrows” between my data sets might look like this

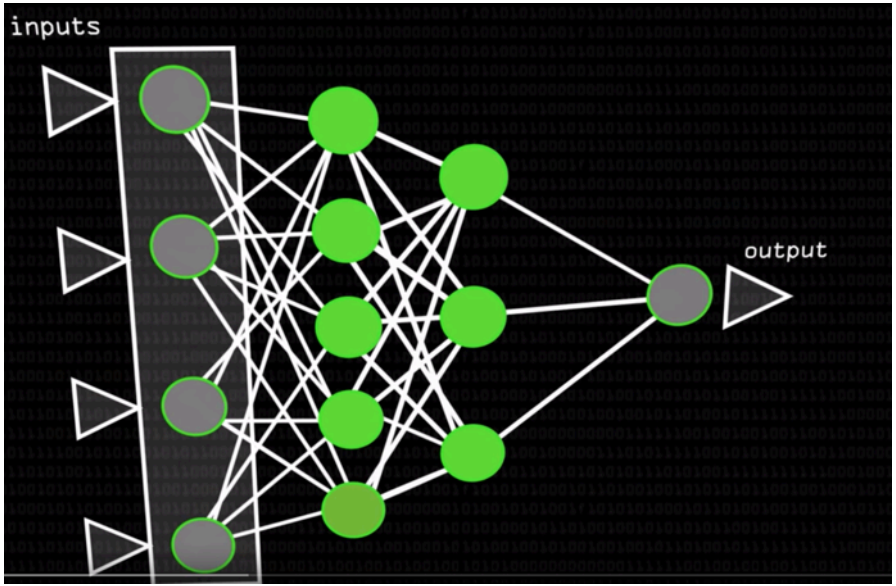


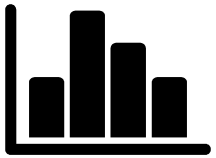
Remember the computer assigns a numerical value to each face

And because it’s a computer those values are binary



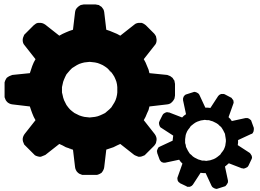
So think of this as a fancy calculator



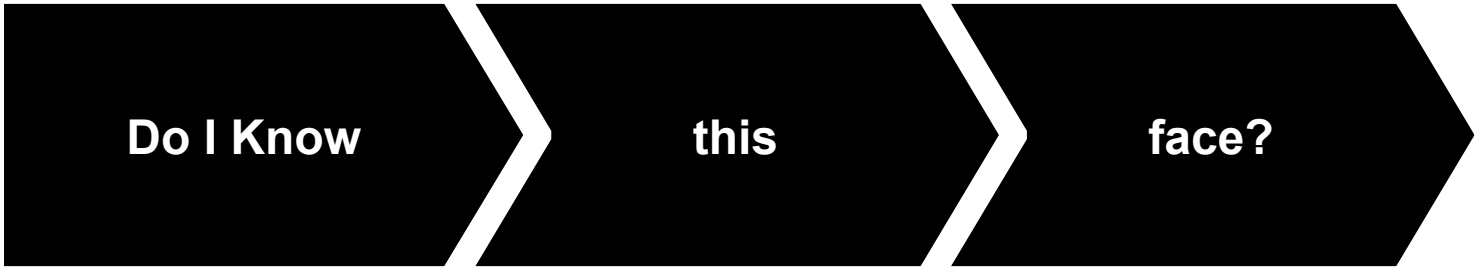


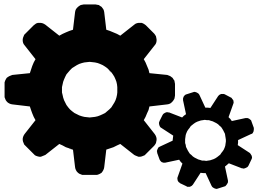
89,526,124

Because the computer thinks in numbers



It calculates this





It requires this answer

Does it match → a terrorist → face?

The neural network - as the name suggests - “sort of” mimics the human brain

We do this mapping ourselves. How many times have you thought: “I know that face from somewhere…..”

We can use Machine Learning techniques

- When you buy something: “You may also like this”
- Offer you a personalised energy tariff
- Suggest a route through a complex transport system
- Predict coastal erosion

Thanks!

Any questions?

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