Understanding AI can be child's play...

Computers are everywhere

But how do they work EXACTLY

How do we get from 1s and 0s to cat videos?

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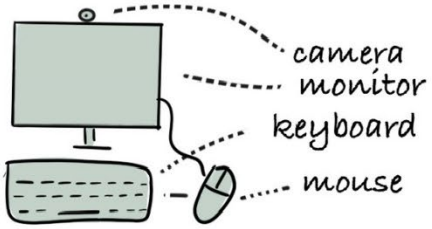
Computers are made up of two parts :

Hardware

Hardware is everything you can touch.



but also small but important things inside such as the microchip.

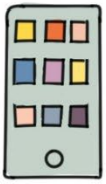
Hardware

It's like musical instruments in an orchestra

Software

Software tells hardware what to do to execute tasks.

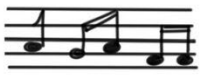
On phones you see it as applications.



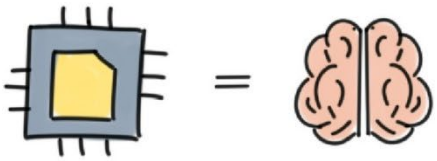
. Programmes like Windows and scrips are also software.

Software

You can imagine it as the musical notes to play



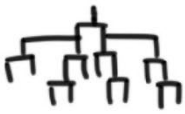
The most important hardware is the Central Processing Units, the brain of the computer



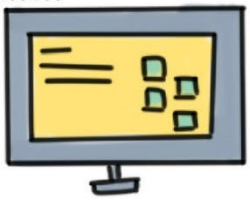
CPU pays attention to the input

Instructions you give with the mouse or keyboard

CLICK!



Looks up the rules in softwares and processes stored data



It then tells the monitor what to show

CPU runs a billions of cycles (instruction) in per second

It's measured as

Clock speed - Gigahertz
1.6 GHz OK for browsing
2-3 GHz standard
Over 3 GHz gigahertz even gamers are happy

CPU

It's like the conductor in our orchestra

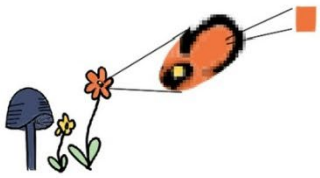
Computers can only work with numbers, so they translate everything.

'A' is → 65

This colour is → #678cb4 (6786228)

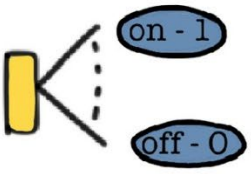
Sounds are captured as waves and digitalised → → 01001...

A picture is made up of 1000s dots (pixels) and the computer remembers the colour of each one. →



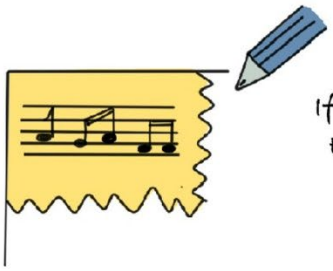
Fortunately when we look, we only see the Big Picture

These numbers are stored on transistors.



Transistors can only store 0 and 1.

They are on microchips and act as small switches

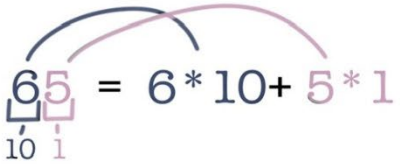


If you think of musical notes, transistors are like ink and microchips are paper.

But how do you store A or 65 just with 1s and 0s?

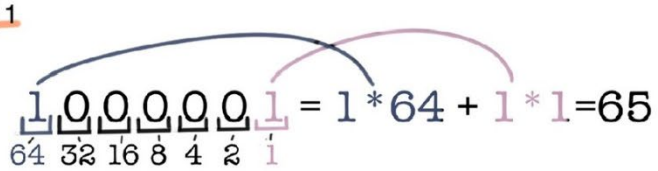
In our everyday life...

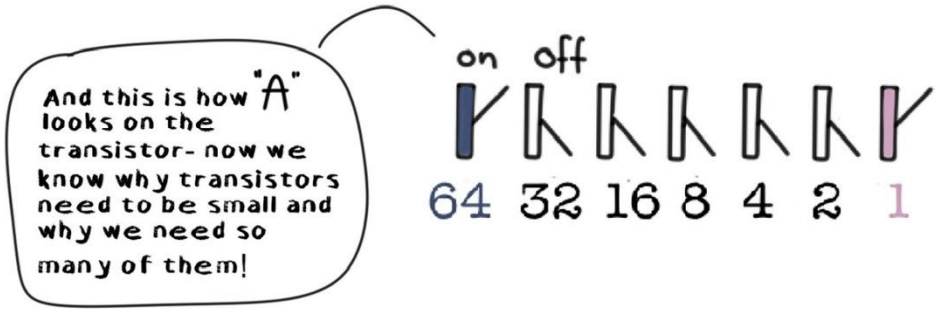
We use 10 digits (1.2.3.4.5.6.7.8.9.0) to count in a decimal system



Computers...

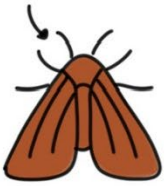
only use 2 digits (0 and 1), we use binary systems



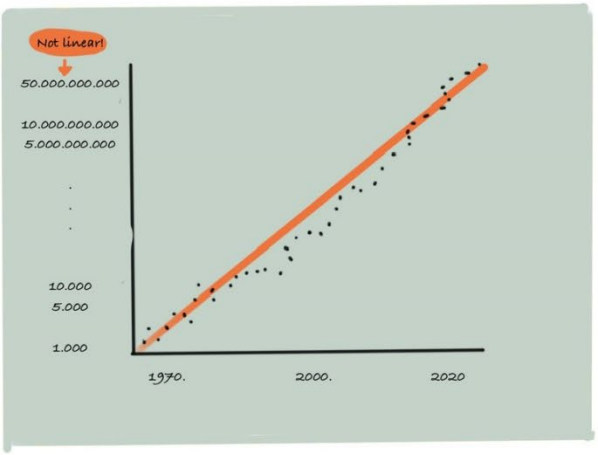


The first computer was built in 1945. It was as big as a room, would cost over $400.000 and know less than the phone in your pocket.

The first computer bug was actually a moth trapped inside the machine

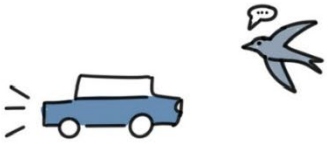


Since then, transistors and their homes, microchips got MUCH faster and cheaper.

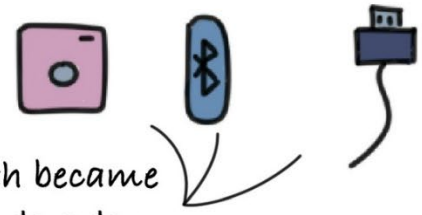


Moore's law: the number of transistors in an integrated circuit doubles every two years. It's true since the 1970s!

If cars developed so quickly, they would go faster than light and cost less than a cent.

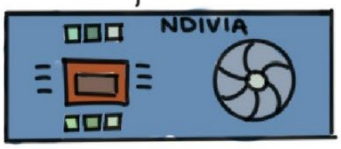


As our use of computer changes, so do the parts



Cameras, USB ports and Bluetooth became available and popular in the last decades

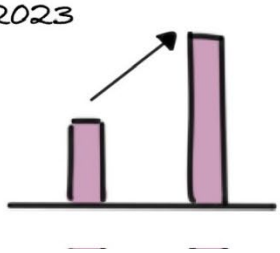
But there is also a hidden star of hardwares, the **GPU (Graphic Processing Unit)**



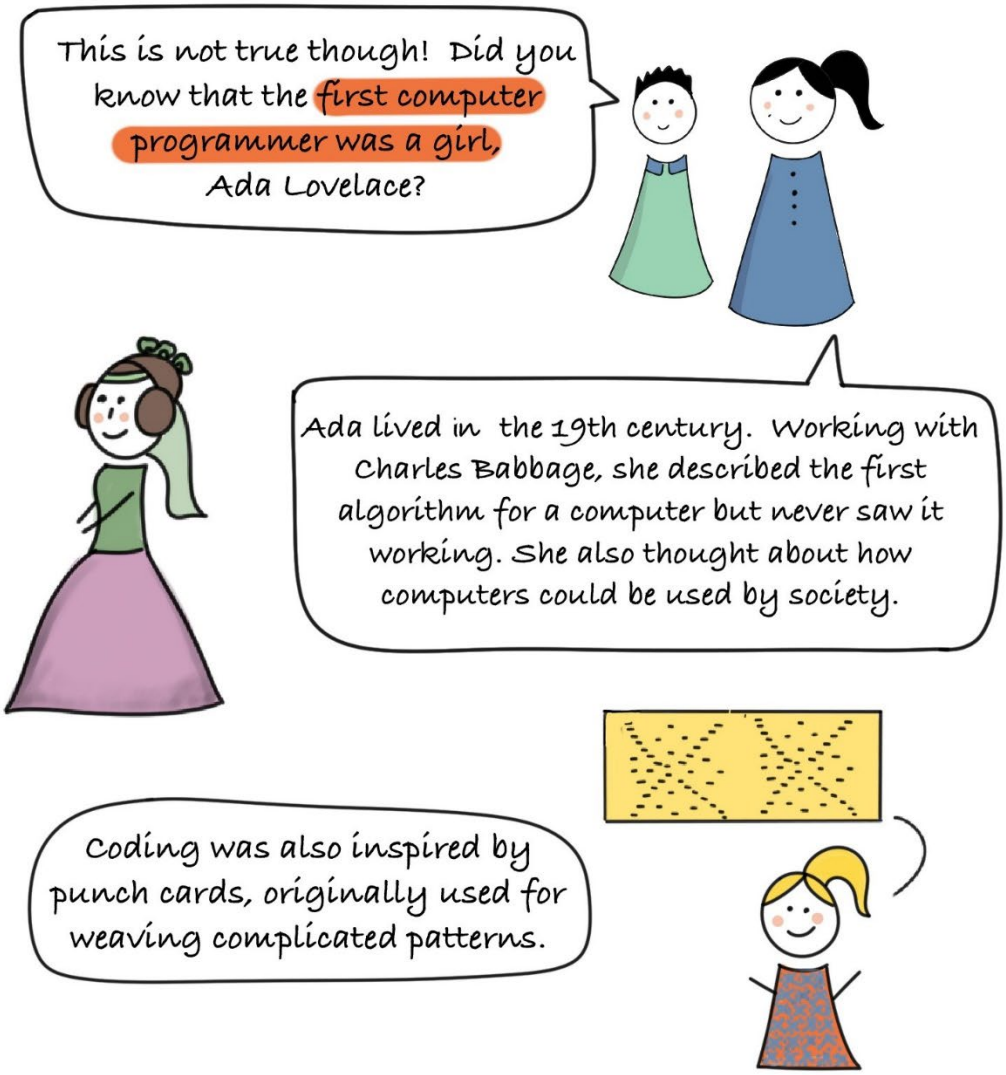
Originally, GPUs are used to process and display pictures and animations on the screen.

But it turned out that **GPUs are great at AI** deep learning systems as they can create and **handle parallel processes.**

Now it shouldn't surprise you that the average price of GPUs doubled between 2020 and 2023



Many people think that working with computers are for boys because you need numbers and maths.



Computers are shaping our world - we need everyone on board!