Programming Thinking

Hardware

Pepe García

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Plan for this session

- Learn a bit about hardware

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Plan for this session

- Learn a bit about hardware
- Try the Spyder editor

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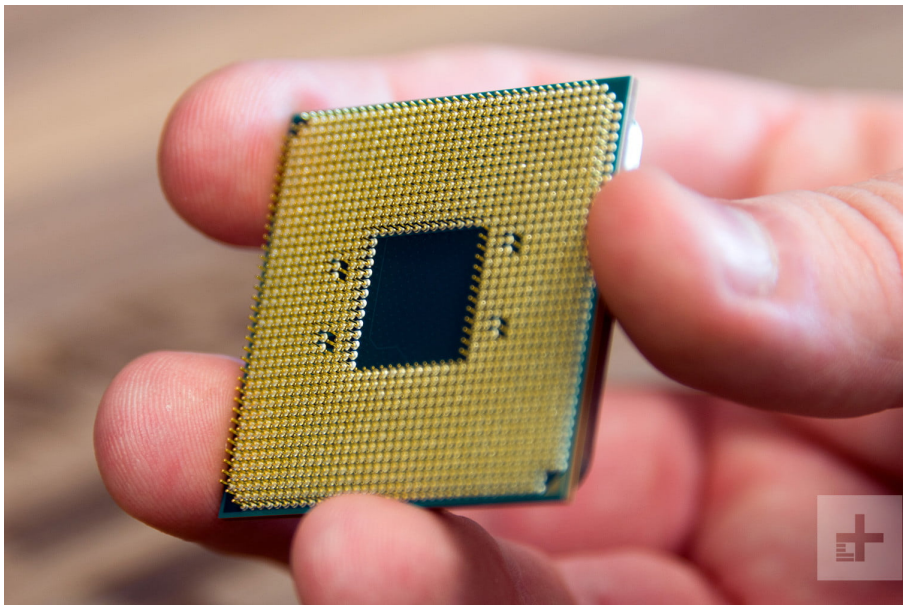
CPU



- It's the part of the computer capable of *computing*.

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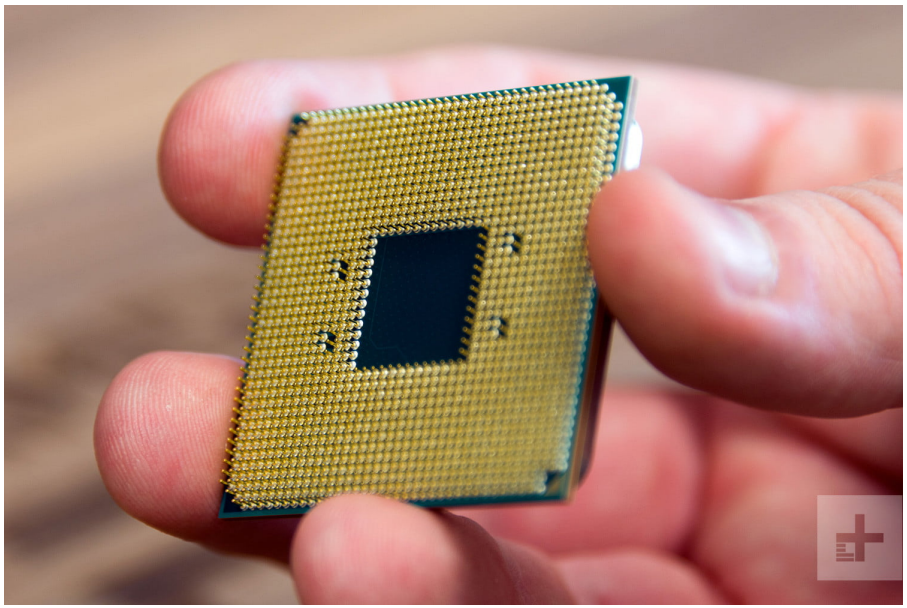
CPU



- It's the part of the computer capable of *computing*.
- Speed measured in hertz

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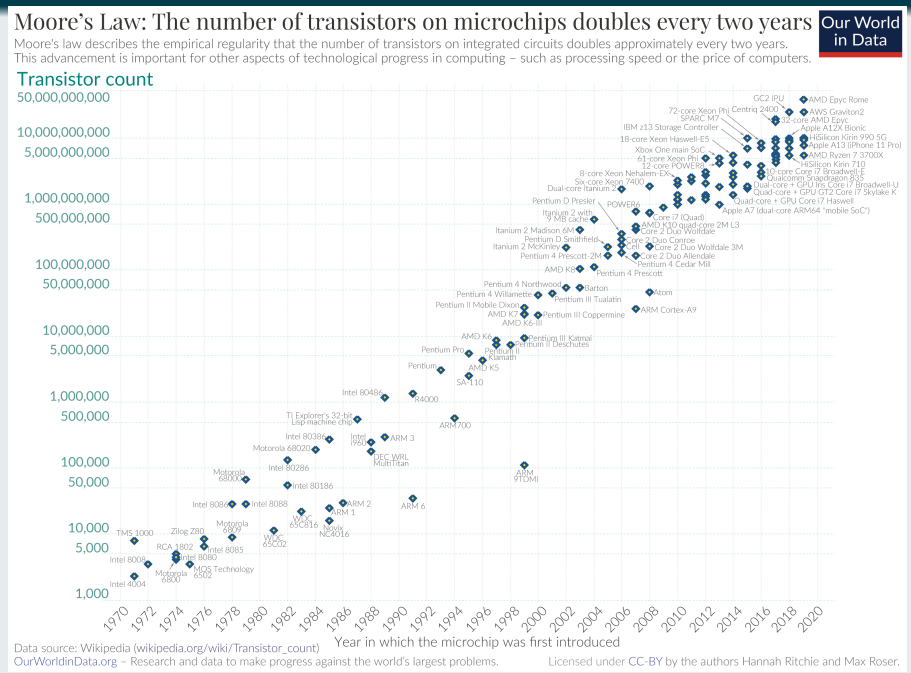
Moore's law

Moore's law is the observation that the number of transistors in a dense integrated circuit (IC) doubles about every two years. Moore's law is an observation and projection of a historical trend. Rather than a law of physics, it is an empirical relationship linked to gains from experience in production.



CPU

Moore's law

Nowadays, although the number of transistors in chips is still increasing over the years, the pace has slowed down. The way we're achieving faster speeds nowadays is by having more cores working at the same time.

http://www.gotw.ca/publications/concurrency-ddj.htm

RAM

Not this *Random Access Memories*...

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RAM

But **this** Random Access Memory!

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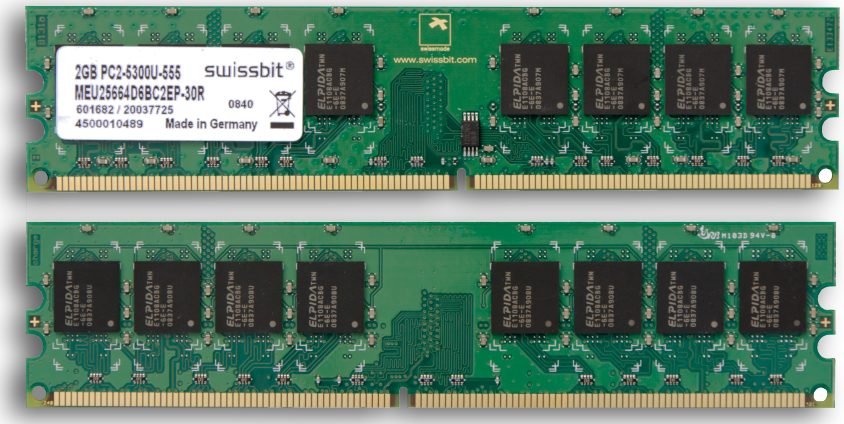
RAM

- RAM is the short term memory of a computer



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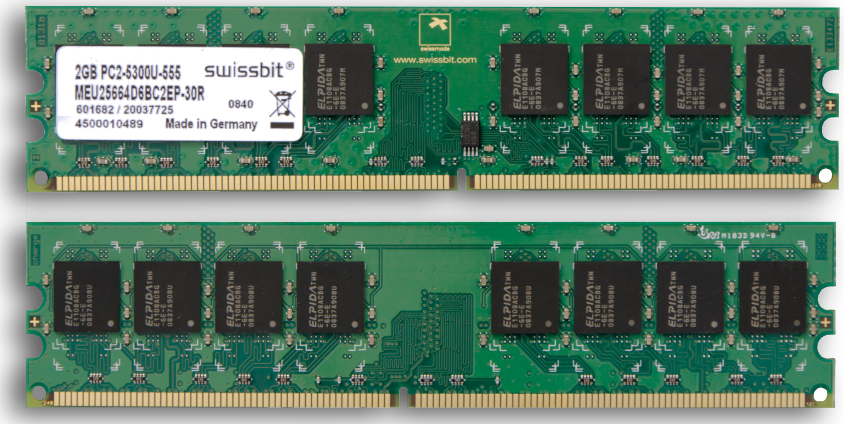
RAM

- RAM is the short term memory of a computer
- Think of it like a big shared blackboard



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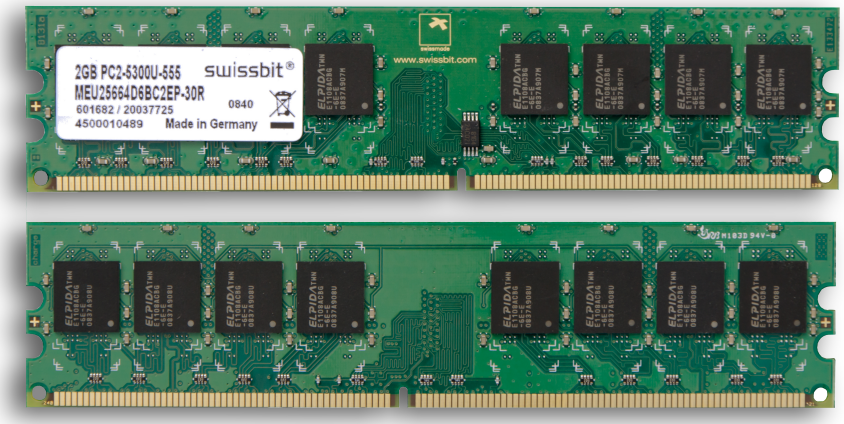
- Divided in addresses



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- RAM is the short term memory of a computer
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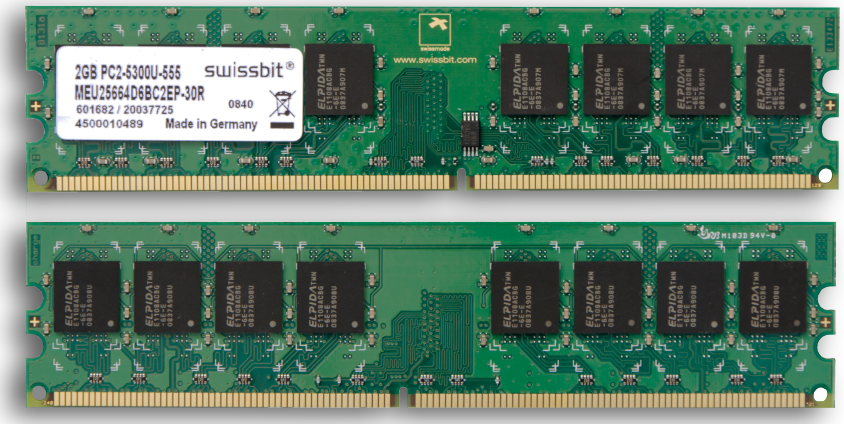
- Divided in addresses
- Not persistent. *if computer is powered down, contents are lost*



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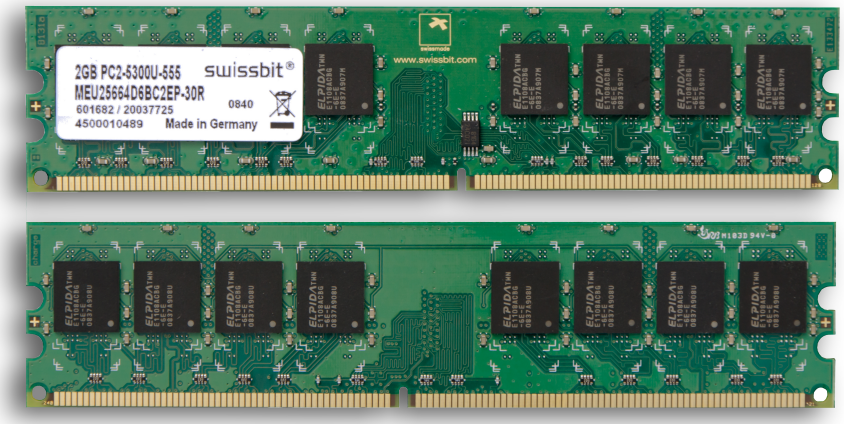
RAM

- RAM is the short term memory of a computer
- Think of it like a big shared blackboard
- Divided in addresses
- Not persistent. *if computer is powered down, contents are lost*
- Fast (Random Access)



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HDD / SSD

- Hard Disk Drives or Solid State Drives are the long term storage of the computer

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- Persistent

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- Persistent
- Slower than RAM

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HDD / SSD

- Hard Disk Drives or Solid State Drives are the long term storage of the computer
- Persistent
- Slower than RAM
- Higher capacity than RAM

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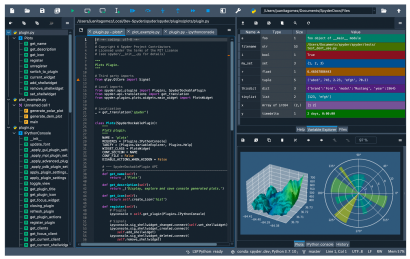
Spyder



Spyder is the editor we're going to use to develop Python programs.

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Spyder

Using Spyder

Spyder lets you edit source code files, and run them. Let's see how to use it!

Recap. What happens when Spyder runs a file?

Whiteboard

Let's understand what happens in under the hoodour computer when we run a file in Spyder.

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Review

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Review

- **CPU** is the *computing* part of our computer
- **RAM** is used for the runtime of our programs to hold volatile data
- **HDD / SSD** stores non-volatile data, it's **way** slower than RAM. (http://norvig.com/21-days.html#answers)