

Programming Thinking

Hardware

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Plan for this session

- Learn a bit about hardware

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- Learn a bit about hardware
- Try the Spyder editor

CPU



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

CPU

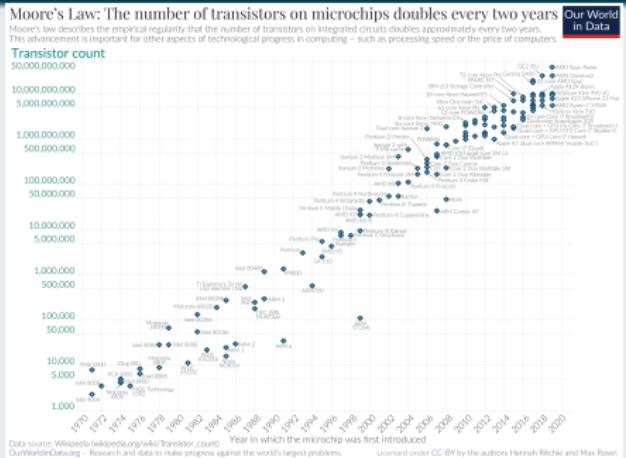


- It's the part of the computer capable of *computing*.
- Speed measured in hertz

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.



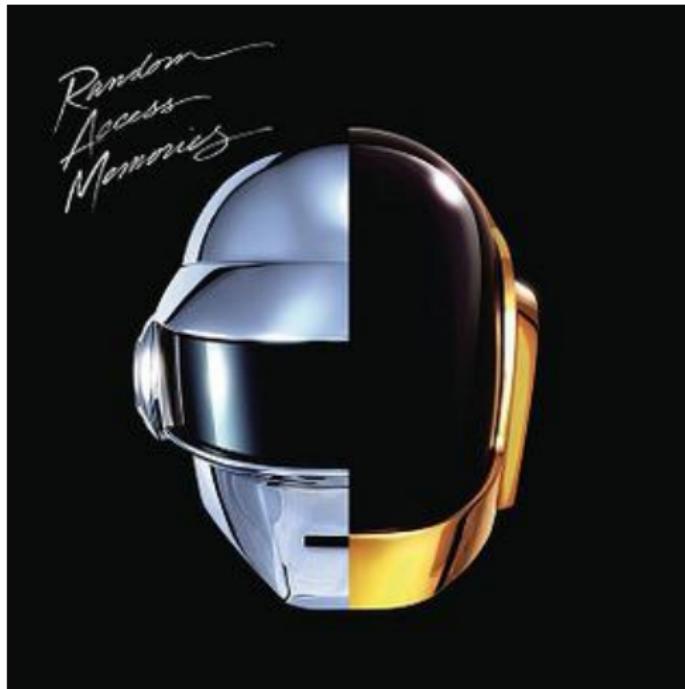
Moore's law

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...*



RAM

But **this** Random Access Memory!



RAM

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- Divided in addresses
- Not persistent. *if computer is powered down, contents are lost*
- Fast (Random Access)



HDD / SSD

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- Persistent
- Slower than RAM
- Higher capacity than RAM

Spyder



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

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.



Review

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- **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>)