Python

Multithreading / Concurrency

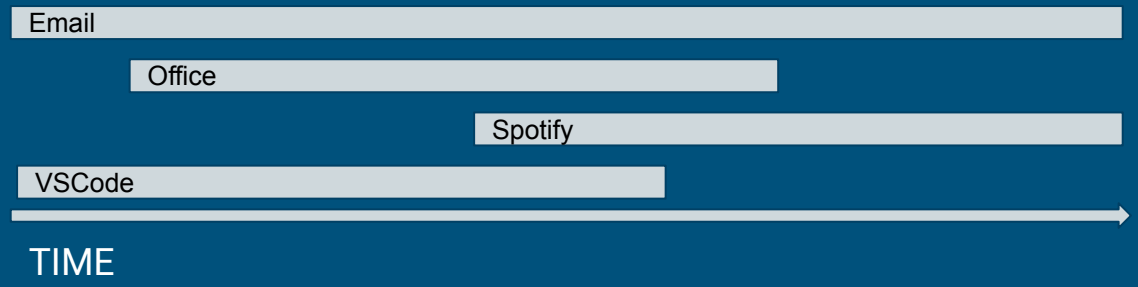
THREADS

*Attention, much text

Intro

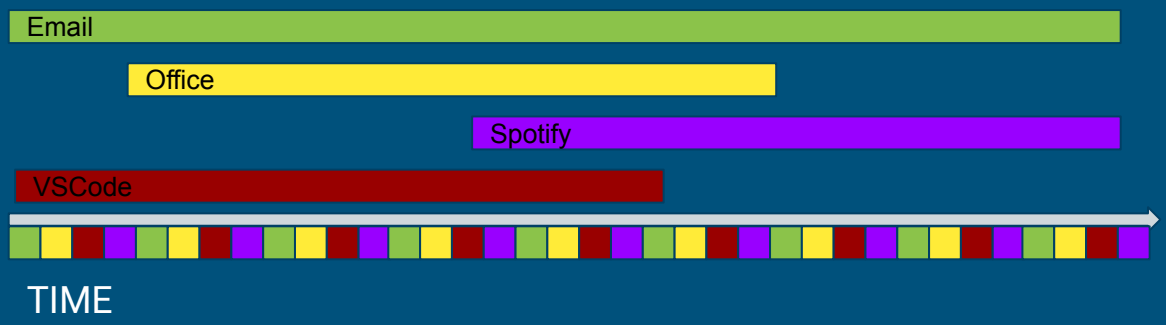
We work with Office, listen to music and coding on the side. Thus, we are used to having several programs (process) running at the same time.

In fact, a processor can only do one task at a time. So how can our scenario work on a computer with only 1 core?



Intro

Basically very simple, we trick the user ;-) We briefly give each program some time to run and then jump to the next. The rotation speed makes it look like the programs are working at the same time.



Preemptive Multitasking vs. Cooperative Multitasking

Thread	Process	Runtime
“Process in a process”	Parallel running programs	Program as dispatcher
Share memory	Share memory by communication	Save share memory
Lightweight (performance)	Memory save	Own communication
Preemptive	**Preemptive**	**Cooperative**

Python interfaces

Interface	Description	Reference
concurrent.futures	High abstract, less flexible, no option for synchronisation	https://docs.python.org/3/library/concurrent.futures.html
threading, multiprocessing	Less abstract, high flexible, options for synchronisation	https://docs.python.org/3/library/multiprocessing.html memory
asyncio	Cooperative interface	https://docs.python.org/3/library/asyncio.html

TIME TO PRACTICES