Multi-threaded vs Single-threaded

Multi-threading does necessarily means things are executed in parallel

➡ We only have one CPU !

So, why do we need multithreading ?

➡ Because programming languages have blocking I/O, and by default, programs wait for the I/O to be completed

But multithreading is expensive

- in terms of software design (synchronization)
- in terms of performances (context switch)

What is the alternative to multi-threading?

➡ Single-threaded with non-blocking I/O

Can you run a single-threaded web server?

Good performance, as long as the requests handlers :

- do some asynchronous I/O
  (filesystem, database, cache, network and so on)

- do NOT do any heavy but yet synchronous computations
  (complex math, intensive data processing and so on)