Fair Share Schedule

Another metric: fair share

- How to make sure P1 gets exactly K-times the execution time of P2

- How to enforce the fair share in a dynamic and modular way
  - Adjustable at run time
  - Alice's decision shouldn't affect Bob's processes' behavior

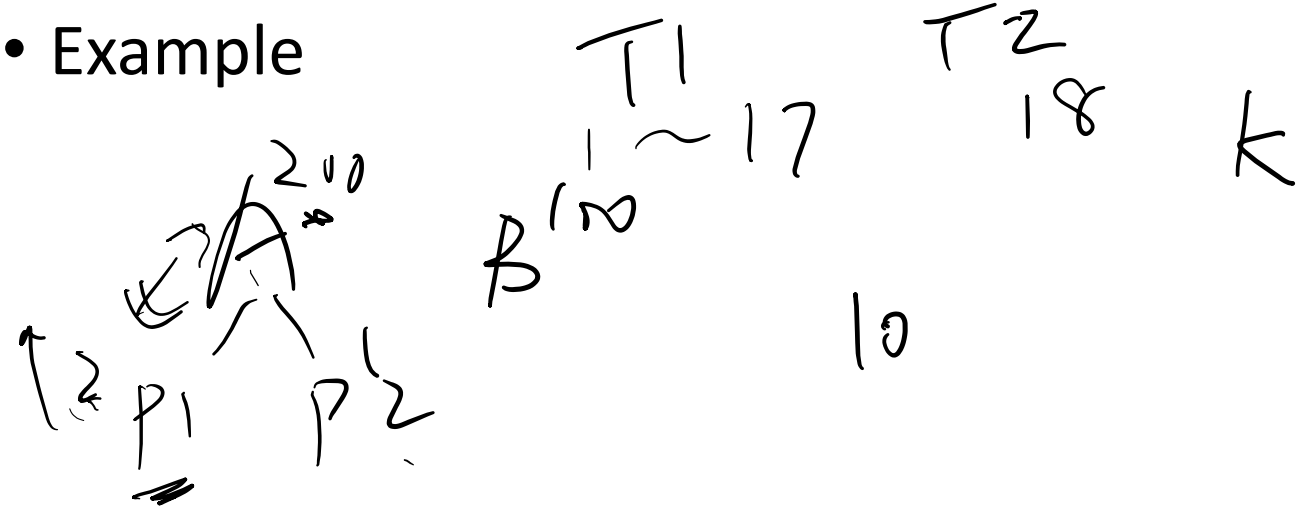
1 ms
→ 10 ms

Naïve solutions

- Adjust the time slice length
  - Problem: can lead to unreasonable slice length
- Adjust the number of process instances in the ready queue
  - Problem: …

Lottery schedule

- Every process gets x lottery tickets
  - X is determined by the “fair share”
- Scheduler runs lottery; the process holding the winning number runs
- Example



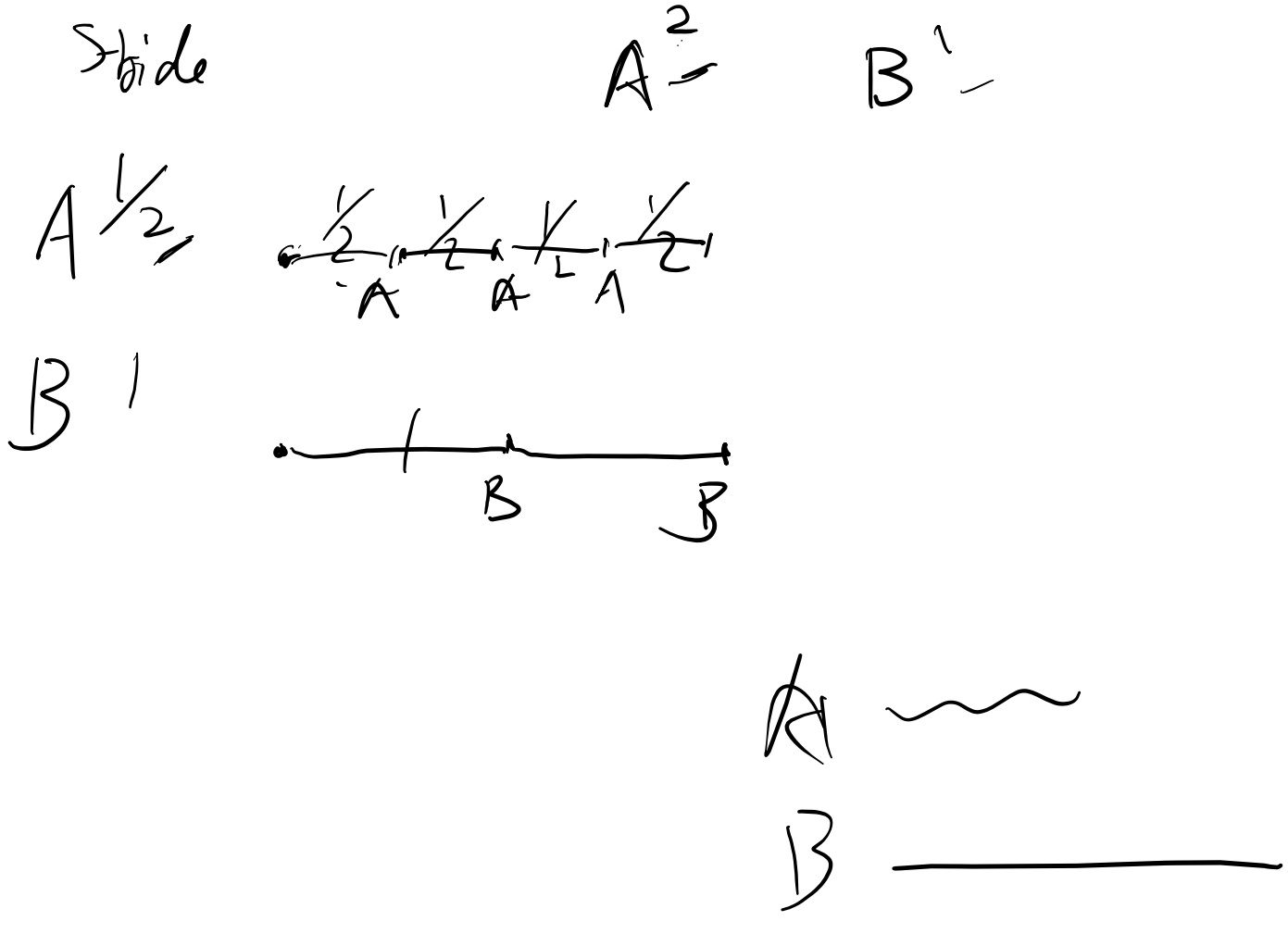
Lottery schedule – ticket exchange rate

- Base tickets
- Regional tickets
- ➔ ensure dynamic and modular management
- Example

Is lottery schedule perfect?

- No!
- Non-deterministic
- Complexity

Before we move on …



Stride schedule

- Motivation
  - How to make lottery schedule deterministic?
- Algorithm
  - Every process has a stride and a start time
  - Every time a process is scheduled, it progresses its stride
  - The scheduler picks the least-progressed process to run
- Example

Linux Complete Fair Scheduler

- Which process to run?
  - Similar with stride scheduling
  - “Nice” level decides the stride length
- What is the time slice?
  - Vary based on the number of ready processes, etc.
- An efficient scheduler is VERY important these days