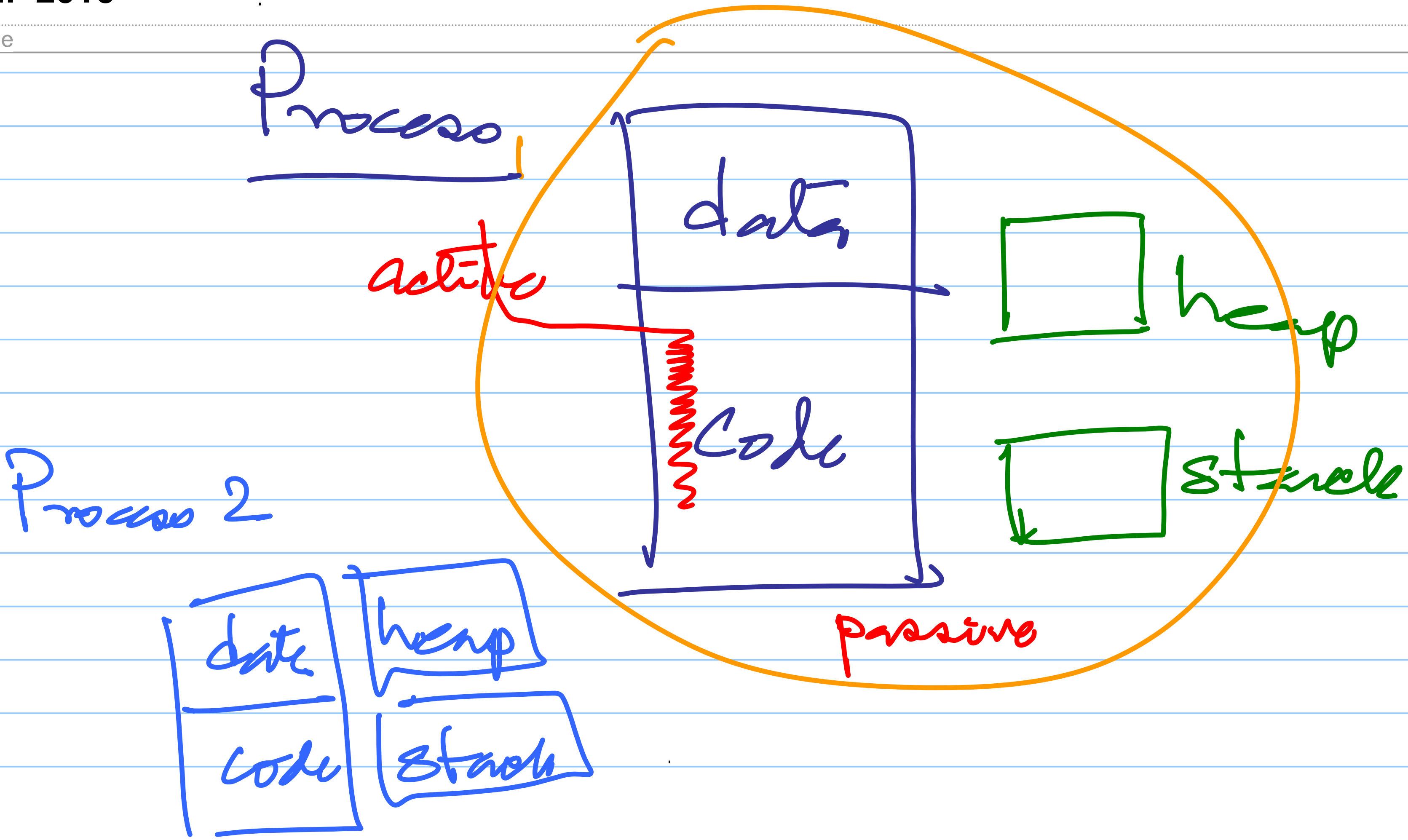
CSE 330: Operating Systems

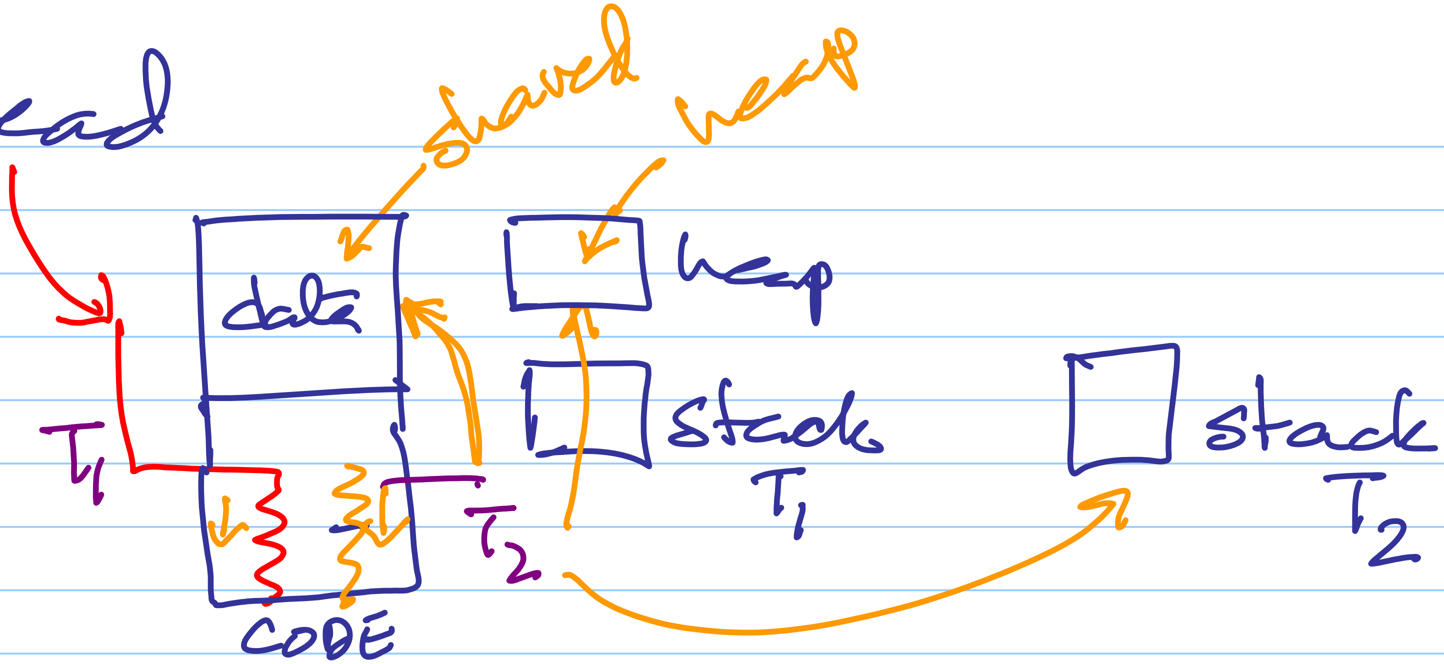
Class: 05 Date: 9/1

Fall 2016

Note Title



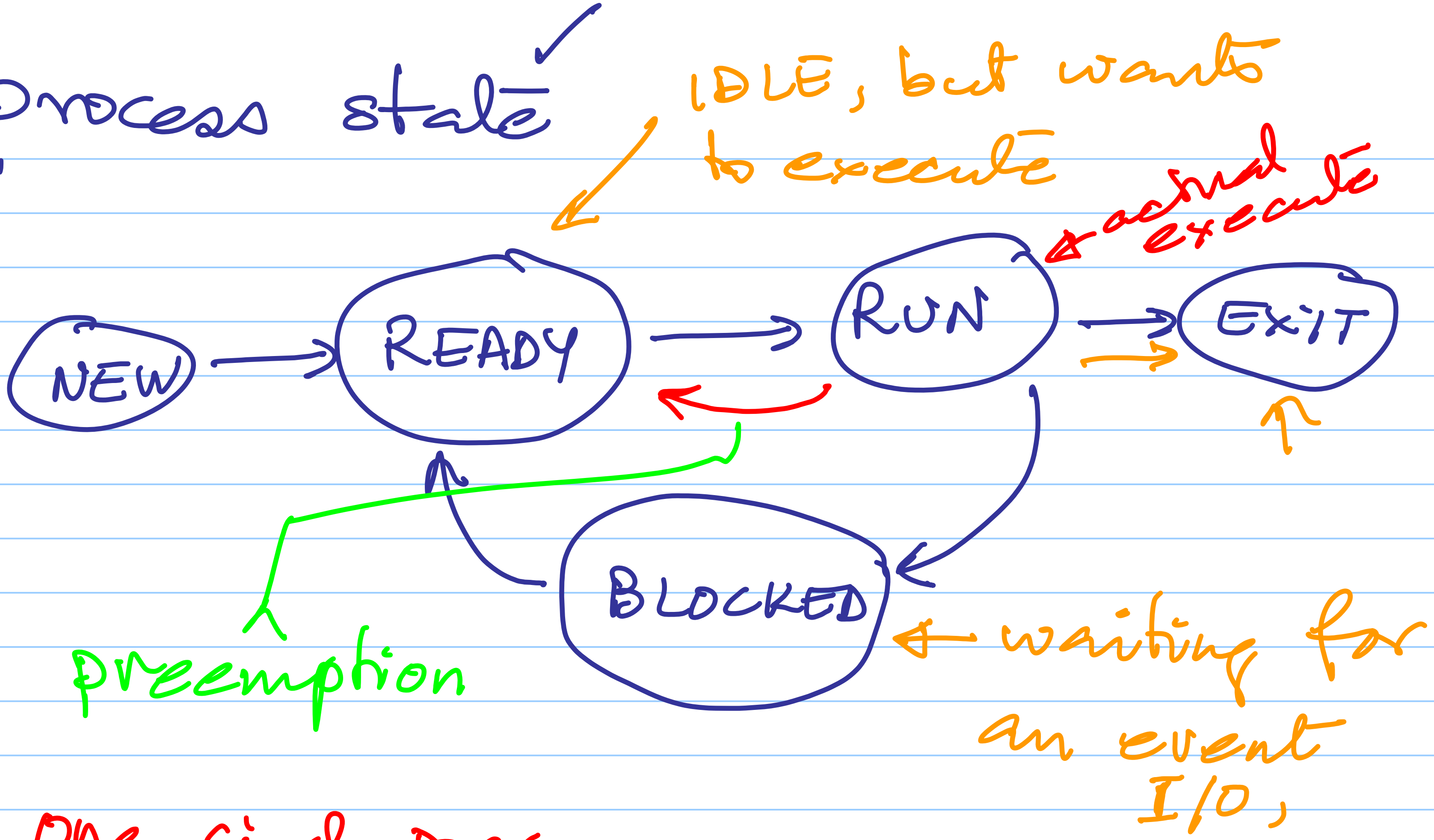
Thread



T_1 → parent thread / process

T_2 → thread

process state



One single process

Interaction between process / Operating System

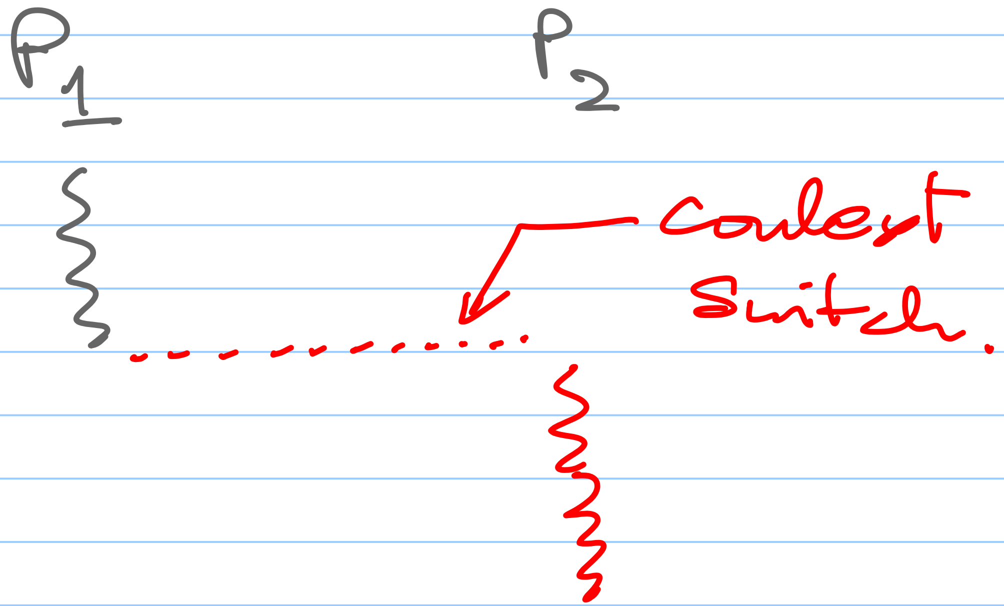
① Process requests the OS for <something> → system call

↳ context switch

② OS preempts the process. (maybe)

↳ context switch

Context Switch



Process has a context

→ all data items → memory

→ " register values → save them to PCB

→ stack ptr, heap ptr

→ MMU register (Base/Bound)

OS

Context switch

from CPU

① save context of P_1 to PCB of P_1

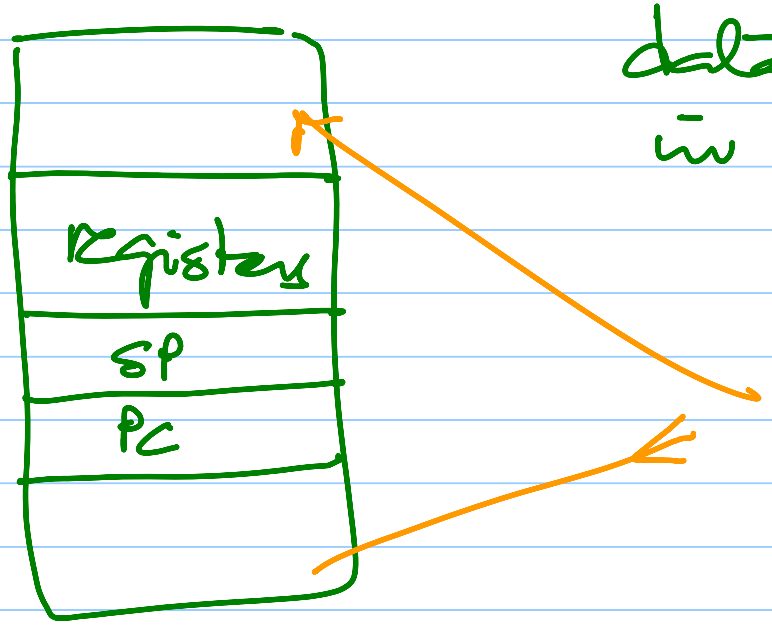
② load " " P_2 from PCB of P_2 → CPU

PCB → process control block

STRUCTURE

data structure in the kernel

TCB → thread



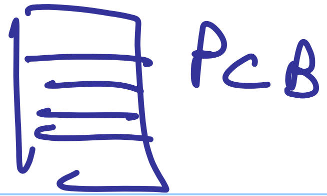
Process ID

User ID

account info

priority

Context switch



```
→ PCB = current PCB
    move R0 → PCB.R0
     "   R1 → PCB.R1
     ⋮   SP      SP
  PCB = next PCB
    move PCB.R0 → R0
     ⋮ "   "   " → SP
return → }
```

Context switching

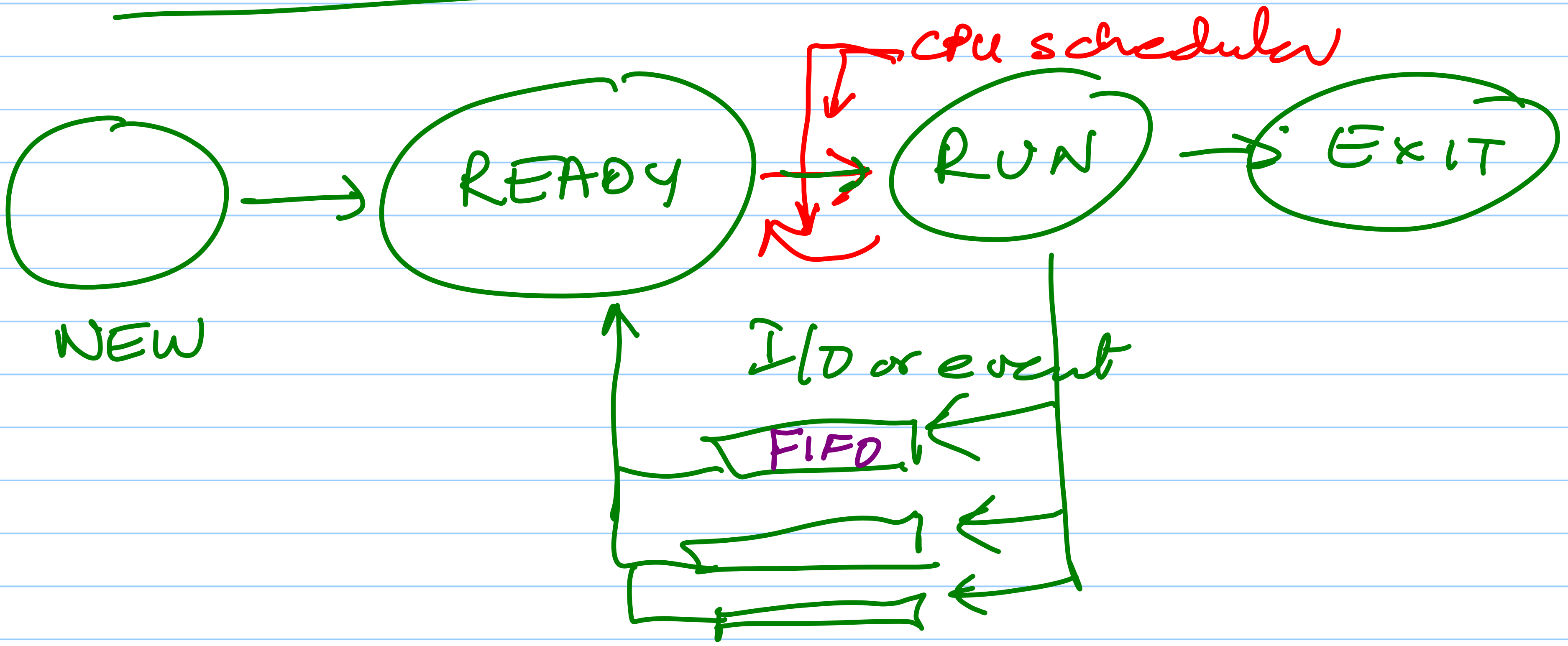
→ "mechanism" → basic tool

Scheduling → "policy"

↳ algorithms to pick process to run (or block)

↳ via context switch

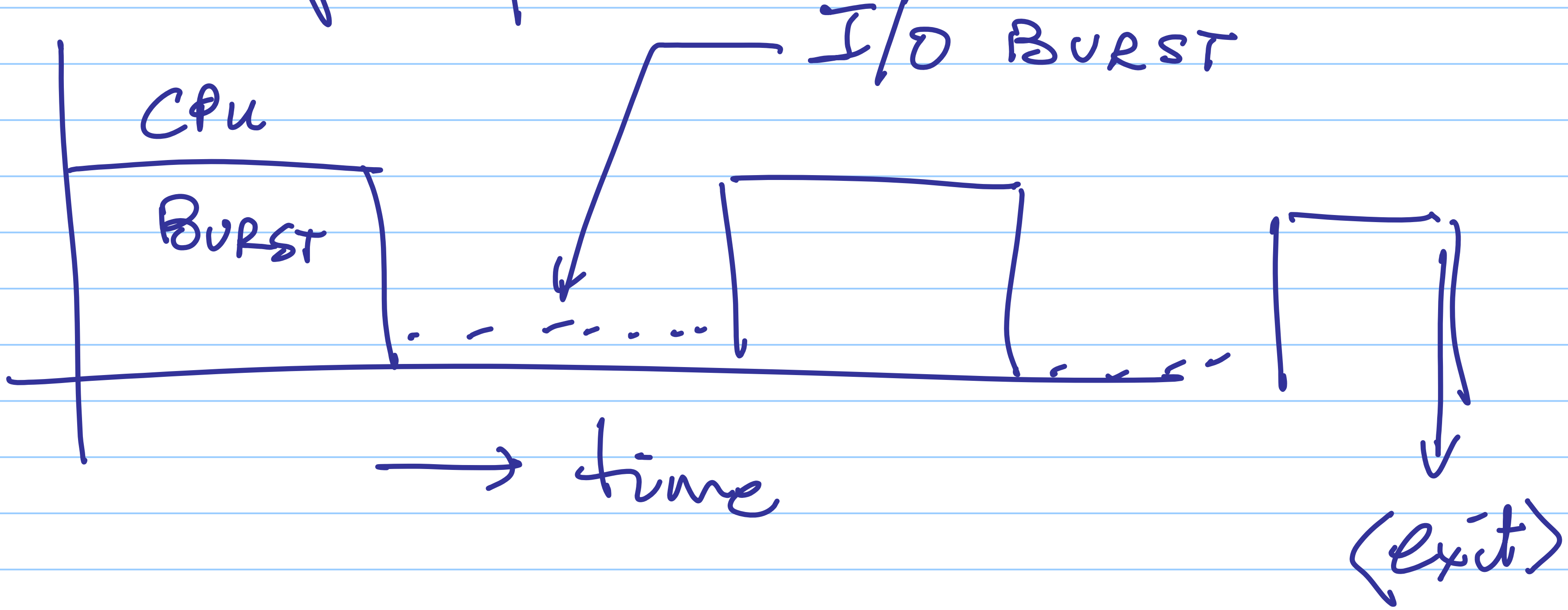
Scheduling queues



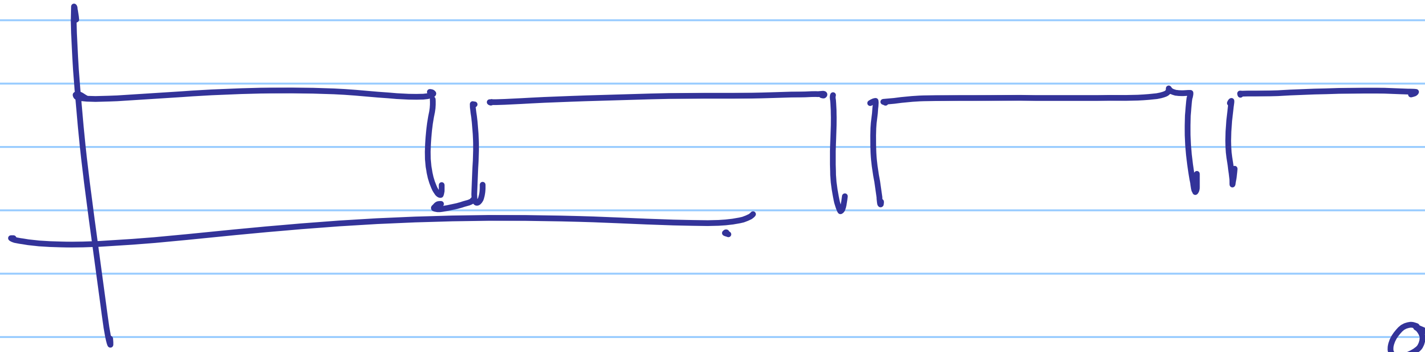
CPU scheduler → pick a ready process to run

- → non-preemptive ← a process runs till a blocking system call (or terminate)
- → preemptive

model of a process

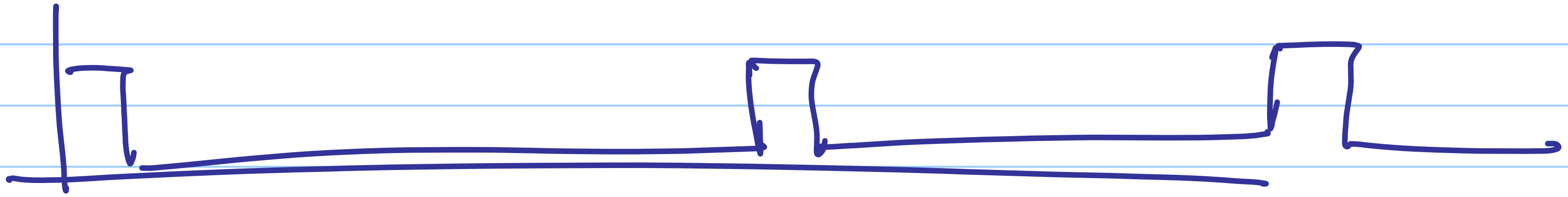


CPU bound



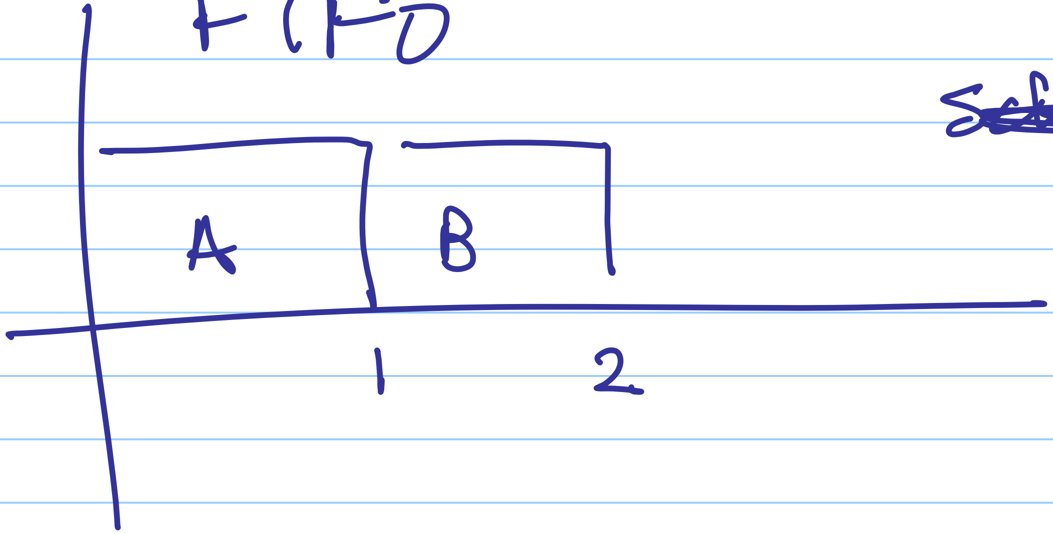
or Balanced.

I/O bound

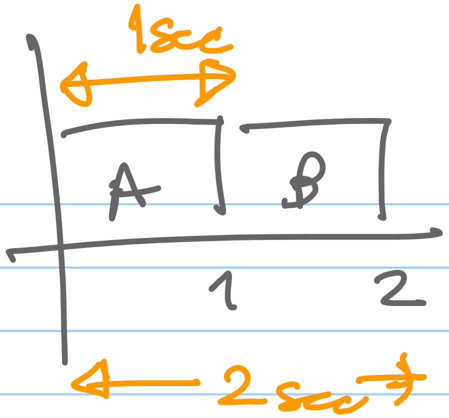


2 processes → 1 CPU burst only of 1 sec

FIFO

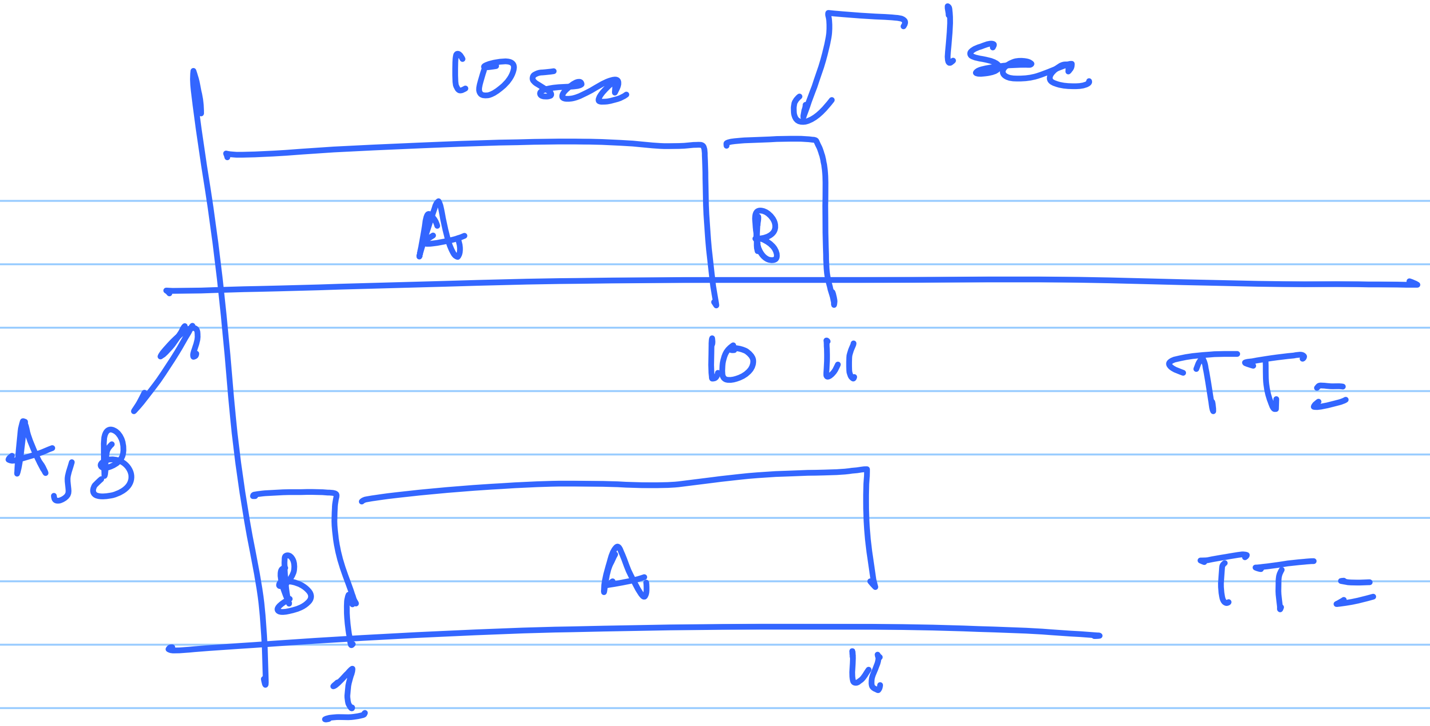


Scheduling metrics



- CPU utilization
- Turn around time
- Response time (preemptive)

→ average completion time = 1.5s



TT = 10.5

TT = 6

Shortest Job first has optimal turnaround time