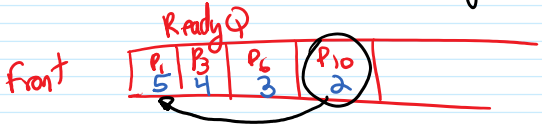
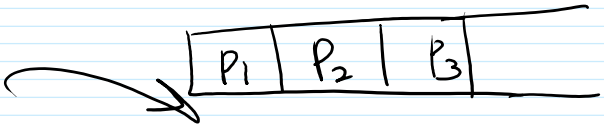
Priority Based

↳ readyQ is ordered in some other way (not FCFS)

↳ order our process based on any other priority other than time...





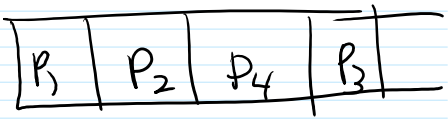
What are some priority based attributes?

★ For example: The process that has not run for a long time could be given the highest priority...

possible

→ scheduler could even assign a longer CPU timeslice for certain processes.

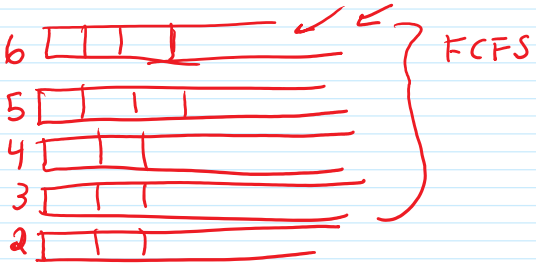
P4



Multi-level Feedback Policies

↳ A form of priority-based scheduling.

Multilevel: OS maintain one ready Q per priority level



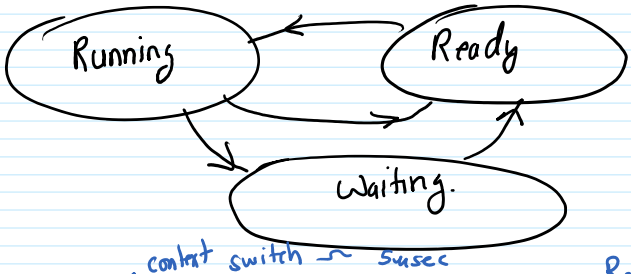
↳ schedule the process from the front of the highest priority non-empty queue

Feedback: ⇒ priorities are not fixed

↳ a process could be moved to a lower/higher priority for fairnesss

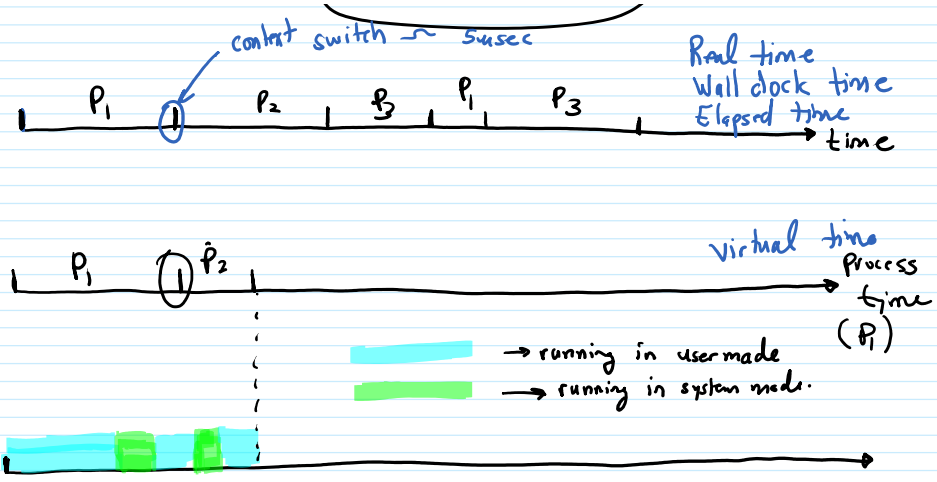
Process Lifetime

Process Lifetime → Time between execution (fork()) and graceful exit (exit()) of a process



context switch ~ 5usec

Real time
Wall clock time



Running Preempted Processes

- OS preemption code must run on the CPU
  - ↳ How does OS get control of CPU from running process to run its preemption code?
- Answer: Hardware timer interrupt (1msec)
  - ↳ periodically generates an event (a fraction CPU slice time)
    - ↳ When this event occurs hardware automatically transfers control to OS code.
      - ↳ timer interrupt handler.
- A timer interrupt is an example phenomenon → exception

Exceptions

- Exceptions are certain exceptional (rare, unusual) events that occur during program execution
  - ↳ Handled by the hardware
- In general there are two classes of exceptions
  - ① Traps ⇒ software generated
    - ↳ Page fault, system calls, divide by zero
  - ② Interrupts ⇒ hardware generated
    - Hardware timer interrupt, keyboard, disk

Events During An Exceptions

① Hardware

ⓐ Saves the processor state

ⓑ transfer control to corresponding OS code called exception handler

② Software (exception handler)

ⓐ takes care of the situation as appropriate

ⓑ Ends with return from exception instructor

③ Hardware

ⓐ restore the saved processor state

ⓑ transfer control over to the PC