Pre-emptive SJF Algorithm

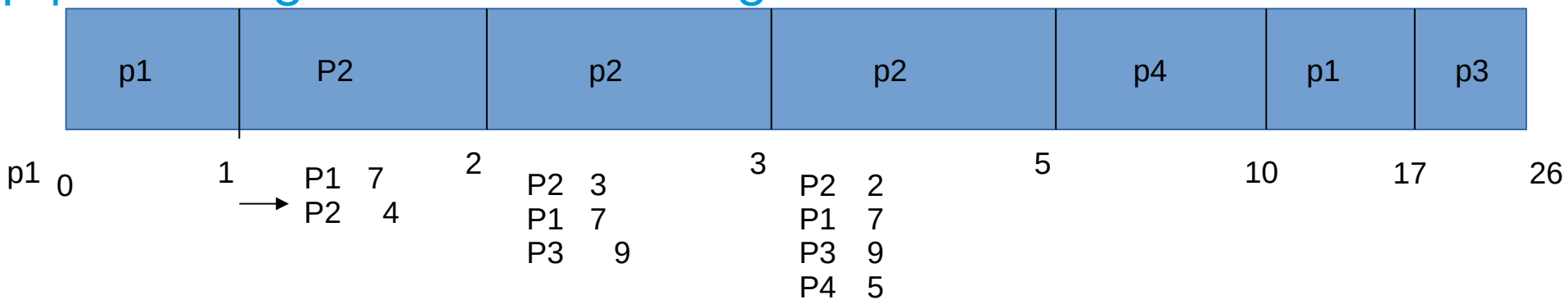
When a new process arrives at the ready queue while a previous process is executing, the new process may have a shorter CPU time than what is left of the currently executing process.

A pre-emptive SJF will pre-empt the currently executing process and the CPU will be given to the new process.

But a non pre-emptive SJF algorithm will allow the currently running process to finish its CPU time.

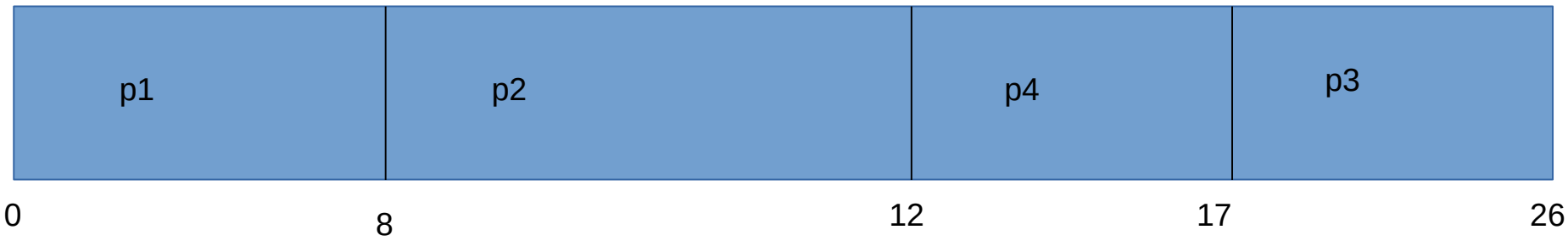
Consider the following situation

Process	arrival time	CPU time
P1	0	8
P2	1	4
P3	2	9
P4	3	5



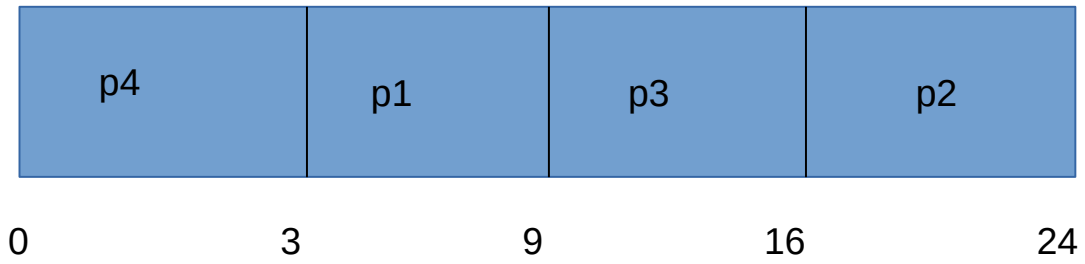
Average waiting time?

Apply Non pre emptive SJF in the same data and find out average waiting time



Consider the processes with arrival time 0.

Process	CPU time
P1	6
P2	8
P3	7
P4	3



Average waiting time

Waiting time for P1=3

Waiting time for p2=16

Waiting time for p3=9

Waiting time for p4=0

Average waiting time=(3+16+9+0)/4=7

What is the average waiting time for the above problem using FCFS?????

Advantage & Disadvantage

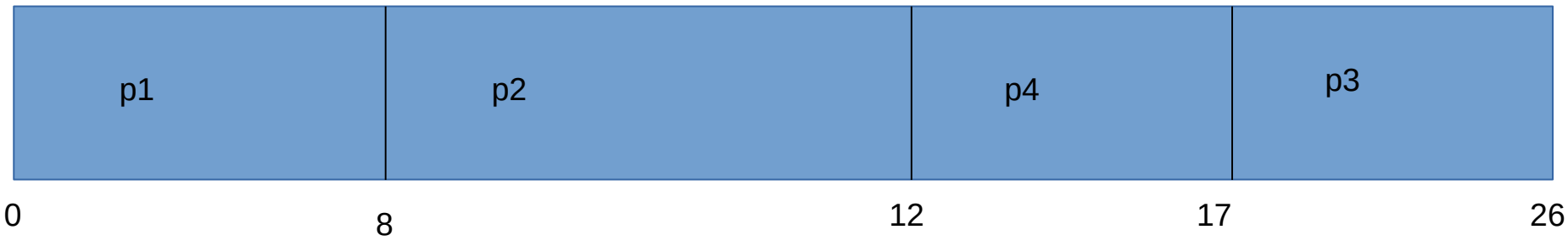
Adv: It gives the the minimum average waiting time.

Dis adv:

It is difficult to get the length of the next CPU time.

Average waiting time?

Apply Non pre emptive SJF in the same data and find out average waiting time

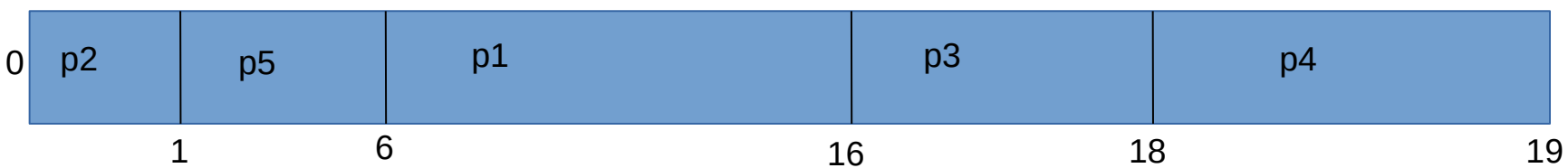


Priority scheduling

In this algorithm a priority is associated with each process and the CPU is assigned to the process with the highest priority .

Consider the following situation with arrival time 0

Process	CPU time	priority
P1	10	3
P2	1	1
P3	2	3
P4	1	4
P5	5	2



Average waiting time?

Priority scheduling may be either pre-emptive or non pre-emptive

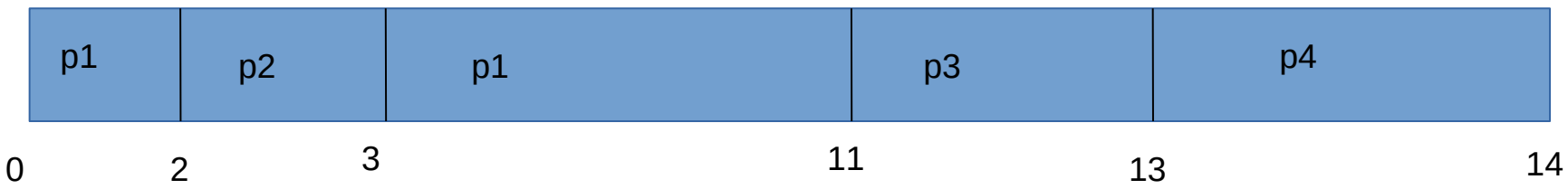
When a new process arrives at the ready queue while a previous process is executing, the new process may have a higher priority than the currently executing process.

A pre-emptive priority scheduling algorithm will pre-empt the currently executing process, and the cpu will be given to the new process.

But a non pre-emptive priority scheduling algorithm will allow the currently running process to finish its CPU time

Consider the following situation

Process	CPU time	priority	arrival time
P1	10	3	0
P2	1	1	2
P3	2	3	2
P4	1	4	3



disadvantage

Blocking

A process is ready to run but it is not able to get the CPU is said to be blocked.

It could happened that a low priority process wait indefinitely for the CPU.

This is true in heavily loaded systems.

It is rumoured that when they shut down the IBM 7094 at MIT in 1973 they found a low priority process that had been submitted in 1967 and not yet been run.

One solution to this problem is aging.

Gradually increase the priority of the processes that wait in the system for a long time.