

HW5 5.5、5.7、5.13

注意：請用中文作答 (除專有名詞外)

5.5 consider a system implementing multilevel queue scheduling. What strategy can a computer user employ to maximize the amount of CPU time allocated to the user's process?

ANS: The program could maximize the CPU time allocated to it by not fully utilizing its time quantum. It could use a large fraction of its assigned quantum, but relinquish the CPU before the end of the quantum, thereby increasing the priority associated with the process.

5.7 explain the differences in how much the following scheduling algorithms discriminate in favor of short processes:

a. FCFS

b. RR

c. Multilevel feedback queues

ANS:

- a. FCFS—discriminates against short jobs since any short jobs arriving after long jobs will have a longer waiting time.
- b. RR—treats all jobs equally (giving them equal bursts of CPU time) so short jobs will be able to leave the system faster since they will finish first.
- c. Multilevel feedback queues work similar to the RR algorithm— they discriminate favorably toward short jobs.

5.13 consider the following set of processes, with the length of the CPU burst given in milliseconds:

Process	Burst Time	Priority
P1	10	3
P2	1	1
P3	2	3
P4	1	4
P5	5	2

The processes are assumed to have arrived in the order P1, P2, P3, P4, P5, all at time 0.

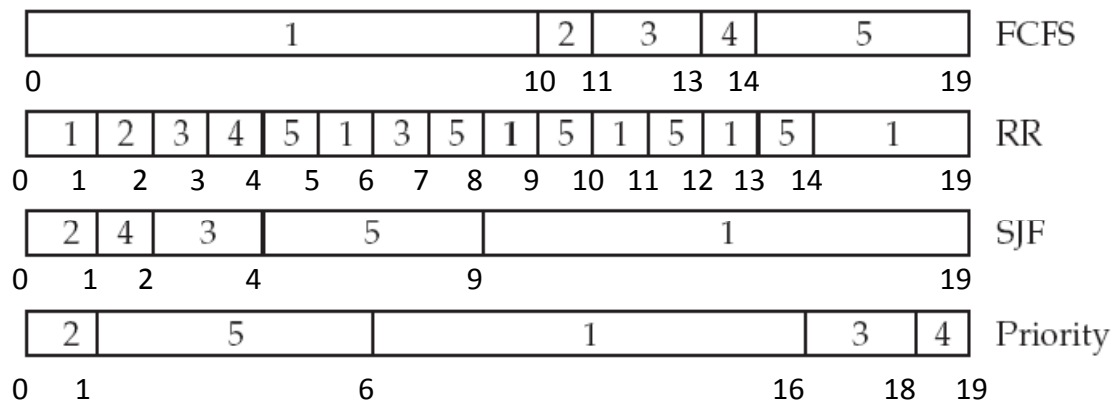
- a. Draw four Gantt charts that illustrate the execution of these processes using the following scheduling algorithms: FCFS, SJF, nonpreemptive priority (a smaller priority number implies a higher priority), and RR (quantum = 1).
- b. What is the turnaround time of each process for each of the scheduling

algorithms in part a?

- c. What is the waiting time of each process for each of these scheduling algorithms?
- d. Which of the algorithms results in the minimum average waiting time (over all processes)?

ANS:

- a. The four Gantt charts are



- b. Turnaround time

	FCFS	RR	SJF	Priority
P_1	10	19	19	16
P_2	11	2	1	1
P_3	13	7	4	18
P_4	14	4	2	19
P_5	19	14	9	6

- c. Waiting time (turnaround time minus burst time)

	FCFS	RR	SJF	Priority
P_1	0	9	9	6
P_2	10	1	0	0
P_3	11	5	2	16
P_4	13	3	1	18
P_5	14	9	4	1

- d. Shortest Job First (SJF waiting time = $(9+0+2+1+4)/5 = 3.2$)