ClassActivity_8

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Q1. Describe real-time systems. What is the difference between hard and soft real-time systems?

Real-time systems means there is importance to take into account response time, which involves real time scheduling.
For hard real time systems, the task must be serviced at its deadline or else it is a system failure.
For soft real time systems, timing is still important but not crucial to service at the deadline. However, the usefulness and quality of the service is degraded if the deadline passes.

Q2. Compare the waiting time, turnaround time and response time scheduling criteria.

Waiting time is the amount of time a process has been waiting in the ready queue.

Turnaround time is the amount of time to execute a particular process. The turnaround time includes the waiting time and the time taken to get to the final/overall output.

Response time is the total amount of time from when a request was submitted until the first response is produced. Response time is shorter than Turnaround time as it is the wait time and the amount of time for the first response to be produced.

Q3. Consider an FCFS scheduler for P1, P2 and P3 as shown below (arrived in this order). Draw the Gantt chart and calculate the average waiting time.

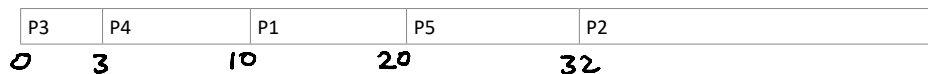| Process	Burst Time
P_1	24
P_2	3
P_3	3

P1		P2	P3
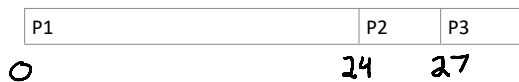
0　　　　　　　　24　　27

Avg waiting time = (0 + 24 + 27) / 3 = 17

Q4. Draw the Gantt charts for the SJF, and RR schedulers, and calculate the average waiting time for each.

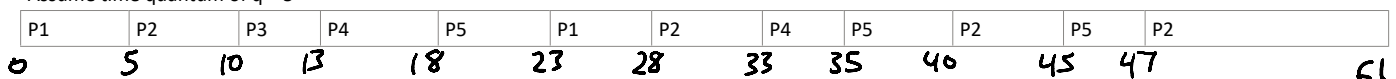| Process	Burst Time
P_1	10
P_2	29
P_3	3
P_4	7
P_5	12

SJF

P3	P4	P1	P5	P2

0　　3　　　10　　　20　　　　32

Avg wait time = (0 + 3 + 10 + 20 + 32) / 5 = 13

RR
There are n = 5 processes
Assume time quantum of q = 5

P1	P2	P3	P4	P5	P1	P2	P4	P5	P2	P5	P2

0　　5　　10　13　　18　　23　　28　　33　35　　40　　45　47　　　　61

Avg wait time =
([end time of first time the last process is run] - [time quantum] + [sum of waiting times of first time each process is run])/[#processes]

Avg wait time = ((23 - 5) + 5 + 10 + 13 + 18) / 5 = 12.8

Or
With q = 4

P1	P2	P3	P4	P5	P1

0   4   8   11   15   19

Avg wait time = ((19 - 4) + 4 + 8 + 11 + 15) / 5 = 10.6

Q5. What are the two types of latencies that affect the real-time scheduling performance? Explain.

The two types of latencies that affect performance are interrupt latency and dispatch latency.

Interrupt latency is the time from the arrival of the interrupt to the start of the routine that services interrupt.
Dispatch latency is the time for scheduler to take current process of CPU and switch to another.