

# Operating System: Round-Robin

By: Vishvadeep Gothi



# VISHVADEEP GOTHI SIR

# AIR 19

in GATE 2010



**ME from IISc Bangalore  
MTech BITS Pilani (Data Sc.)**



**13+ Years of Teaching Experience,  
9+ Years in GATE/IES**



**Subjects Taken:**  
Computer Organization,  
Data Structure,  
Coding Interview Problems

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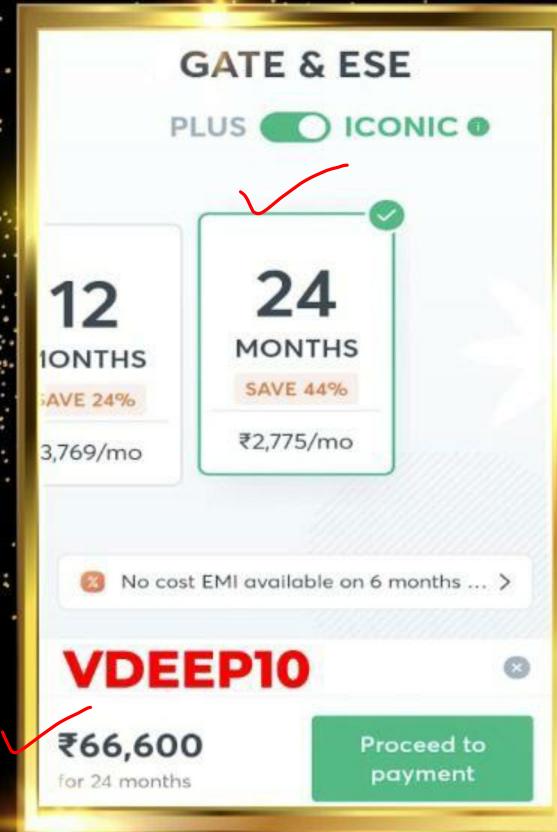
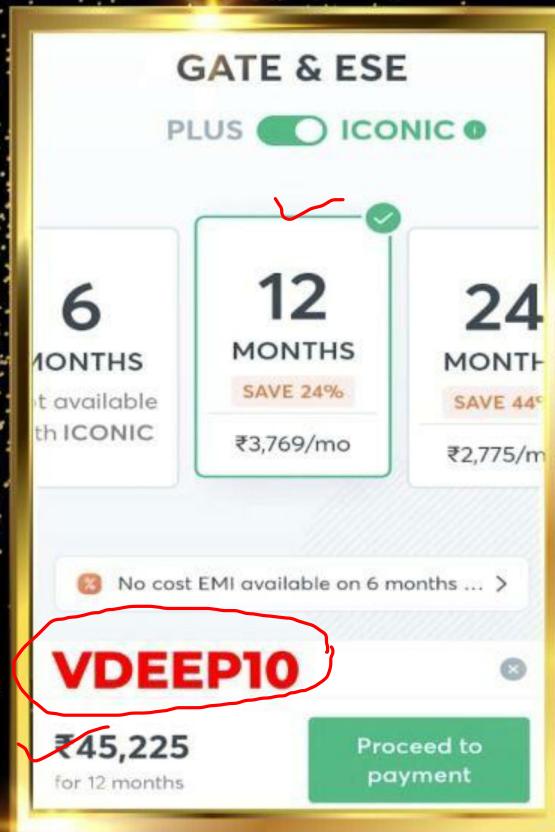
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# Round-Robin



- ◎ Criteria: AT + Q       $Q$  = Time Quantum
  - Tie-breaker: Brown's Id
- ◎ Type: Pre-emptive

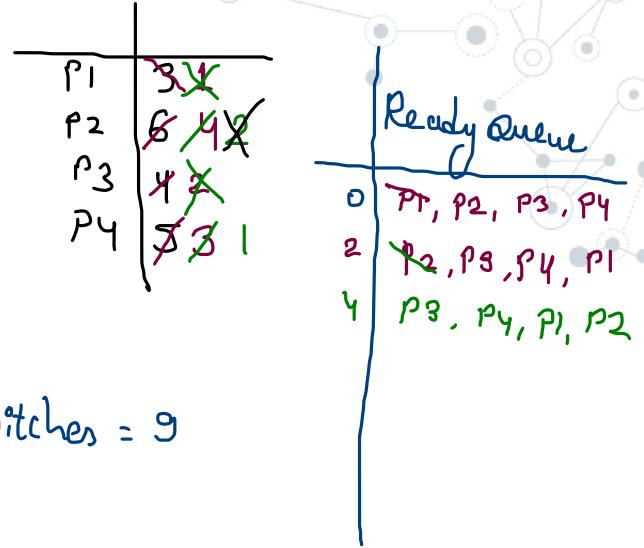
objective:- provides interactivity  
fairness



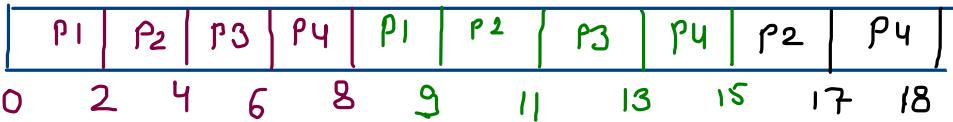
# Round-Robin

Process	Arrival Time	Burst Time
P1	0	3
P2	0	6
P3	0	4
P4	0	5

no. of context switches = 9



Q=2



# Round-Robin

Process	Arrival Time	Burst Time	Completion Time	Turnaround Time	Waiting Time
P1	0	3	9	9	6
P2	0	6	17	17	11
P3	0	4	13	13	9
P4	0	5	18	18	13

Response time

0  
2  
4  
6

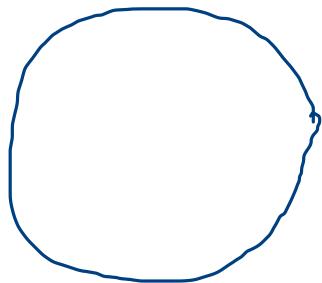
$$Q=2$$

$$\text{avg TAT} = \frac{57}{4}$$

$$\text{avg WT} = \frac{39}{4}$$

Example:-

4PM



you, f<sub>1</sub>, f<sub>2</sub>

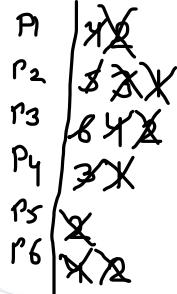
~~f<sub>1</sub>~~, ✓, f<sub>2</sub>, you, f<sub>3</sub>, f<sub>4</sub>

f<sub>2</sub>, you, f<sub>3</sub>, f<sub>4</sub>, f<sub>1</sub>

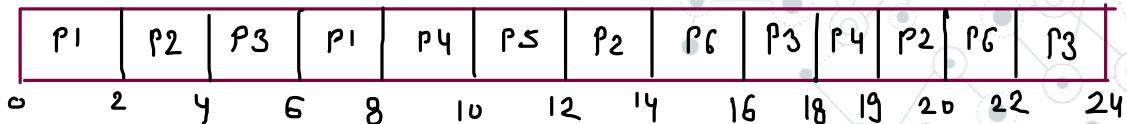
# Round-Robin

Process	Arrival Time	Burst Time
P1	0	4 ← 2
P2	1	5 ← 3
P3	2	6 ← 3
P4	3	3 ← 2
P5	4	2 ← 1
P6	5	4 ← 2

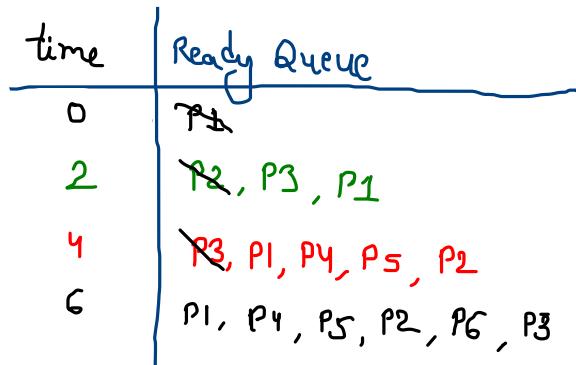
Q=2



Total context  
Switches = 13 - 1



Nb. of context switches = 12



Process	AT	BT	CT	TAT	WT
P1	0	4	8	8	4
P2	1	5	26	19	14
P3	2	6	24	22	16
P4	3	3	19	16	13
P5	4	2	12	8	6
P6	5	4	22	17	13

$$\text{Avg TAT} = \frac{90}{6} = 15$$

$$\text{Avg WT} = \frac{66}{6} = 11$$

# Round-Robin

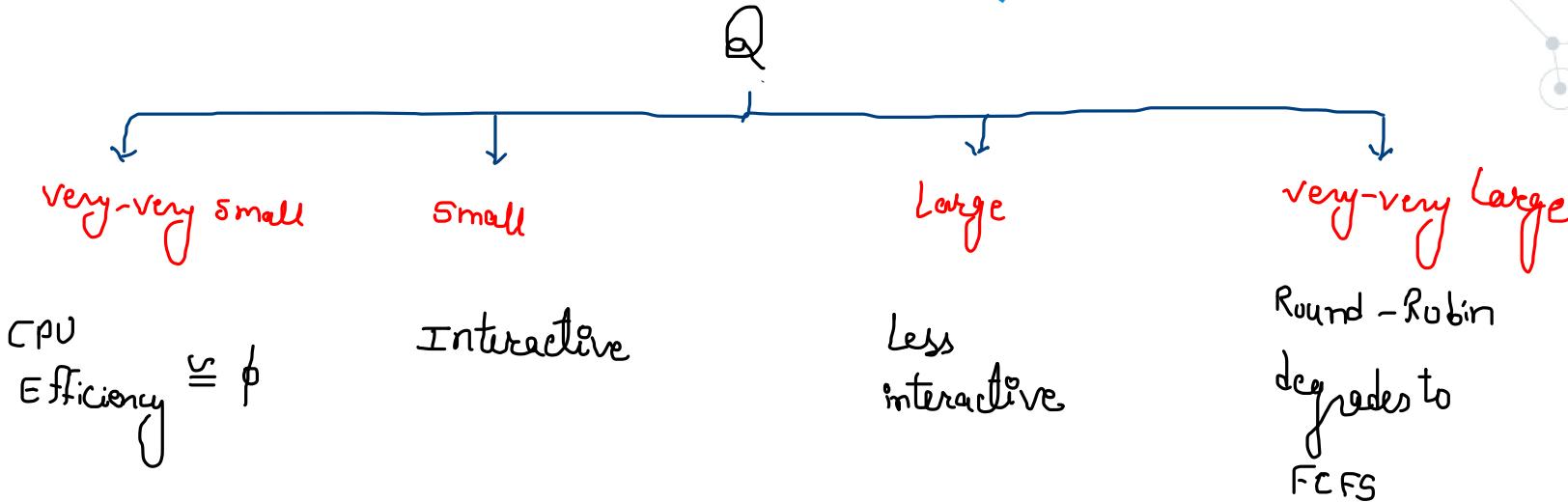
(Homework)

Process	Arrival Time	Burst Time
P1	5	6
P2	8	7
P3	3	8
P4	6	3
P5	2	2
P6	4	4

Q=3



# What Should Be the Quantum Value?



CPU spends more time in context switch & very less time in process execn.

## Adv. of RR

1. fairness
2. interactiveness for time-sharing system
3. Burst times of processes should not be known precisely.

# Question

H. W.

If the time-slice used in the round-robin scheduling policy is more than the maximum time required to execute any process, then the policy will?

- (A) degenerate to shortest job first
- (B) degenerate to priority scheduling
- (C) degenerate to first come first serve
- (D) none of the above



# Question

H.  $\omega$ .

Four processes to be executed on a single processor system arrives at time 0+ in the order A, B, C and D. Their CPU burst time requirements are 4, 1, 8, 1 time units respectively. The completion time of A under Round-Robin scheduling with time slice of one time unit is?



# Question GATE-2013

H.W.

A scheduling algorithm assigns priority proportional to the waiting time of a process. Every process starts with priority zero (the lowest priority). The scheduler re-evaluates the process priorities every T time units and decides the next process to schedule. Which one of the following is TRUE if the processes have no I/O operations and all arrive at time zero?

- (A) This algorithm is equivalent to the first-come-first-serve algorithm
- (B) This algorithm is equivalent to the round-robin algorithm.
- (C) This algorithm is equivalent to the shortest-job-first algorithm
- (D) This algorithm is equivalent to the shortest-remaining-time-first algorithm

# Next Class

Practice Question ✓

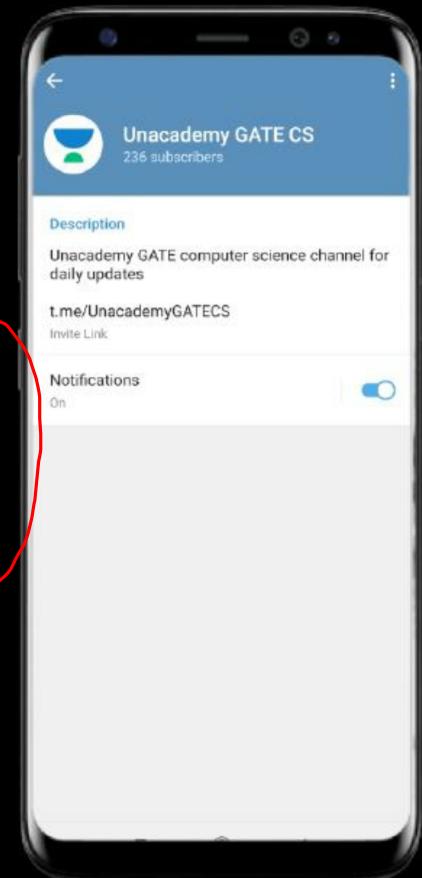


✓ Multilevel Queue Scheduling





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