

Operating System- CS604

Assignment # 02

Question # 1:

There are five processes A, B, C, D and E given below with their run time units. Assume that all processes arrive in numerical order at time as given below then answer the questions given below:

Process	CPU Time	Arrival Time
A.....	8	0
B.....	1	1
C.....	2	3
D.....	1	4
E.....	5	2

* Quantum = 3 ms

Find the Turnaround Times, Waiting time and draw the Gantt chart for these processes by using Shortest Job First and Round Robin scheduling Algorithms.

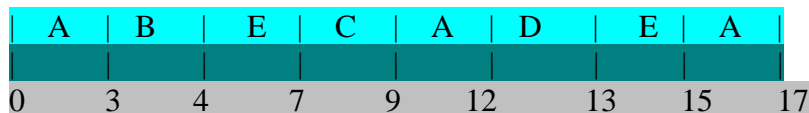
Solution:

SJF



Ready list -----	Choice -----	Wait Time -----	Turnaround time
A	A	0	A=8-0=8
B C D E	B	8-1=7	B=9-1=8
C D E	D	9-4=5	C=12-3=9
C E	C	10-3=7	D=10-4=6
E	E	12-2=10	E=17-2=15

RR



Ready list -----	Choice -----	Wait Time =(Turnaround time – CPU time – Arrival time)	Turnaround time
A B E C A E C A D C A D E A D E D E A E A A	A B E C A D E A	A=17-8-0= 9 B = 4-1-1= 2 C = 9-2-3 = 4 D= 13-1-4= 8 E= 15-5-2= 8	A=17-0 = 17 B = 4-1 = 3 C = 9-3 = 6 D =13-4 = 9 E=15-2= 13

Scheme	Wait time					Turnaround time				
	A	B	C	D	E	A	B	C	D	E
SJF	0	7	5	7	10	8	8	7	8	15
RR	9	2	4	8	8	17	3	6	9	13

Question # 2:

Five processes P₁, P₂, P₃, P₄ and P₅ are given below with their run time. Assume that all processes arrive in numerical order at time “0”.

Process ID	CPU Requirements
P ₁	5
P ₂	4
P ₃	2
P ₄	1
P ₅	8

For each process indicates the waiting time and turnaround time for Shortest Job First, Round Robin and First Come First Serve scheduling algorithms.(Where as Quantum = 2).

Solution:

Scheme	Wait time						Turnaround time				
	P ₁	P ₂	P ₃	P ₄	P ₅	Average Wait time	P ₁	P ₂	P ₃	P ₄	P ₅
FCFS	0	5	9	11	12	7.4	5	9	11	12	20
SJF	7	3	1	0	12	4.6	12	7	3	1	20
RR	11	9	4	6	12	8.4	16	13	6	7	20

Wait time for RR algorithm:

$$P_1 = 16 - 5 - 0 = 11$$

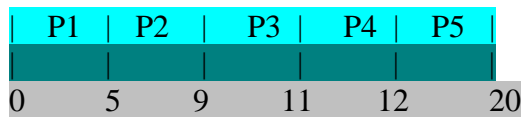
$$P_2 = 13 - 4 - 0 = 9$$

$$P_3 = 6 - 2 - 0 = 4$$

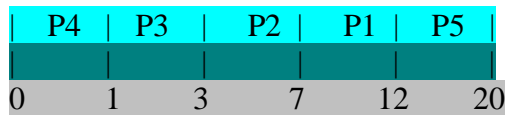
$$P_4 = 7 - 1 - 0 = 6$$

$$P_5 = 20 - 8 - 0 = 12$$

Gantt chart for FCFS Execution:



Gantt chart for SJF Execution



Gantt chart for RR Execution

