CET2011A -Operating Systems

School of Computer Engineering and technology

Lab Assignment 3
Round Robin CPU Scheduling

Problem Statement : Round Robin CPU Scheduling
Write a program to simulate the **Round Robin** (Pre-emptive) CPU Scheduling algorithm

Round Robin (Pre-emptive)

Round Robin (Pre-emptive)

Processes with arrival times and burst time

Given **n** processes with their burst times and arrival times.

The task is to find average waiting time and average turn around time using Round Robin (Pre-emptive) scheduling algorithm.

Round Robin simply queues processes in the order they arrive in the ready queue and execute as per the assigned time quantum.

Take Time Quantum as tq

Completion Time

Time at which process completes its execution.

Turn Around Time

Time Difference between completion time and arrival time.

Turn Around Time = Completion Time – Arrival Time

Waiting Time(W.T)

Time Difference between turn around time and burst time.

Waiting Time = Turn Around Time – Burst Time

Example: Round Robin (By Default preemptive: Time Quantum 2)

Process	Arrival Time	Burst Time
P_1	0.0	7
P_2	2.0	4
P_3	4.0	1
P_4	5.0	4

Example: Round Robin (By Default preemptive: Time Quantum 2)

Process	Arrival Time	Burst Time
P_1	0.0	7
P_2	2.0	4
P_3	4.0	1
P_4	5.0	4

P1	P2	P1	P3	P2	P4	P1	P4	P1

```
0     2     4     6     7     9     11    13    15    16
```

Example: Round Robin (By Default preemptive: Time Quantum 2)

Process	Arrival Time	Burst Time
P_1	0.0	7
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P_3	4.0	1
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P1	P2	P1	P3	P2	P4	P1	P4	P1

0   2   4   6   7   9   11   13   15   16

Average waiting time = (9 + 3 + 2 +6)/4 =5
Average turnaround time =(16+7+3+10)/4=9

Round Robin (Preemptive)

Implementation

1) Input the processes along with their burst time (bt) and arrival time (at).

2) Find **waiting time (wt)** for all processes. i.e. for a given process i:

   wt[i] = (bt[0] + bt[1] + ... + bt[i-1]) - at[i] .

3) Now find **turnaround time** = waiting_time + burst_time for all processes.

4) Find **average waiting time** = total_waiting_time / no_of_processes.

5) Similarly, find **average turnaround time** = total_turn_around_time / no_of_processes.

Round Robin

Output

Processes	Burst time	Arrival Time	Waiting time	Turn-around time	Completion Time
P1	7	0	9	16	16
P2	4	2	3	7	9
P3	1	4	2	3	7
P4	4	5	6	10	15

Average waiting time = 5

Average turn around time = 9

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Round Robin Pseudo code

Assume arrival time AT[i] =0

Count =0;sum=0;

Store BT in some array.

Repeat for all processes n X n times

{

 if BT[i]<=quant && BT[i]>0

    { sum =sum + BT[i]

        BT[i]=0;}

Elseif(BT[i]>0)

     { BT[i] = BT[i] - quant;

        Sum=sum + quant; }

if BT[i] == 0

{ CT[i]=sum;

   count ++;}

If count==n { break;}

}

TAT[i]=CT[i] –AT[i]

WT[i]=TAT[i] – BT[i]