iJRASET
International Journal For Research in
Applied Science and Engineering Technology

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 4 **Issue:** XI **Month of publication:** November 2016

DOI:

International Journal for Research in Applied Science & Engineering Technology (IJRASET)

Enhanced Efficient Dynamic Round Robin CPU Scheduling Algorithm

Er. Meenakshi Saini[1], Er. Sheetal Panjeta[2], Dr. Sima[3]
[1,2,3] *Deptt.of Computer Science & Application, DAV College for Girls Yamunanagar, Kurukshetra University, Haryana India*

Abstract— Handle Scheduling is one of the central ideas of working framework. Round robin prepare booking calculation is ideal process planning calculation in time sharing frameworks. The productivity of the processor relies on upon the decision of time cut in time sharing frameworks. The TQ taken in round robin calculation is static because of which throughput of the processor diminishes. In this paper, choice of TQ is talked about and another procedure planning calculation for time sharing frameworks named as enhanced element round robin calculation is proposed. Proposed calculation consolidates favourable circumstances of both "round robin" and "briefest occupation first" process planning calculations which has a tendency to lessen odds of starvation and builds throughput of the framework. Round robin prepare booking calculation has high process switch rates and in like manner normal holding up time, normal turnaround time and framework throughput are unfavourably influenced. This circumstance can be enhanced by utilizing proposed prepare booking calculation. In this exploration, examination of number of process switches, the normal holding up time and the normal turnaround time of procedures in round robin handle booking calculation, "Enhanced effective element round robin" prepare planning calculation has been finished.
Keywords— Process Switch, Process Scheduling, Round Robin, Shortest Job First, First start things out serve and Improved Efficient Dynamic Round Robin

I. INTRODUCTION

The Central Processing Unit (CPU) is the heart of the PC framework so it ought to be used effectively. For this reason CPU planning is extremely vital. CPU Scheduling is one of the essential ideas of Operating System. Sharing of PC assets between numerous procedures is called planning [1].

The different CPU planning calculations are: **-**

A. FCFS (First-Come, First-Serve) CPU Scheduling

In this planning the procedure that demands the CPU first is distributed to CPU first.

B. SJF (Shortest Job First) CPU Scheduling

In this planning the procedure with the briefest CPU burst time is allotted to CPU first.

C. Priority Scheduling

In this planning the procedure with high need is distributed to CPU first.

D. Round Robin Scheduling

RR planning is utilized as a part of timesharing frameworks. It is same as FCFS booking with pre-Emption is added to switch between procedures. A static Time Quantum (TQ) is utilized as a part of this CPU Scheduling. The different planning parameters [4] [8] for the determination of the booking calculation are.

1) *Context Switch:* A setting switch is procedure of putting away and re-establishing setting (state) of a pre-empted handle, with the goal that execution can be continued from same point at a later time. Setting exchanging is wastage of time and memory that prompts to the expansion in the overhead of scheduler, so the objective of CPU planning calculations is to streamline just these switches.
2) *Throughput:* Throughput is characterized as number of procedures finished in a timeframe. Throughput is less in round robin planning. Throughput and setting exchanging are contrarily relative to each other.
3) *CPU Utilization:* It is characterized as the part of time CPU is being used. Normally, the augment the CPU usage is the objective of the CPU booking.

4) *Turnaround Time:* Turnaround time is characterized as the aggregate time which is spend to finish the procedure and is to what extent it requires the investment to execute that procedure.
5) *Waiting Time:* Waiting time is characterized as the aggregate time a procedure has been holding up in prepared line.
6) *Response Time:* Respond Time is preferable measure over turnaround time. Reaction time is characterized as the time utilized by the framework to react to the specific procedure. In this way the reaction time ought to be as low as could be allowed for the best booking.

The different attributes of good booking calculation are [3]:

a) Minimum setting switches.
b) Maximum CPU use.
c) Maximum throughput.
d) Minimum turnaround time.
e) Minimum holding up time.

II. RELATED WORK

The RR planning calculation has impeded that issues static time quantum (TQ). Numerous Research works has been done to enhance the execution of the RR booking calculation. Another approach SAAR [5] calculation utilizes dynamic time quantum which is more than once change by the burst time of running procedures. SMDRR [10] calculation utilizes sub opposite mean or consonant mean for element time quantum. So also SRBRR [8] calculation utilizes middle for element time quantum and another approach for time quantum is equivalent to ceil (sqrt (median* most elevated burst time)) is utilized as a part of ISRBRR [8]. In this paper, an examination of RR, SRBRR, ISRBRR, and new proposed calculation has been finished.

III. PROPOSED IEDRR ALGORITHM

For the proposed calculation, input handle load is masterminded in a line in climbing request of procedures burst times (CPU Burst Time). The proposed CPU Scheduling calculation depends on the little change in round-robin booking Algorithm. It executes the most limited employment first rather than FCFS amid round robin calculation. The proposed wipes out on the downsides of round robin calculation in which procedures are planned in first started things out serve way. This round robin calculation is not productive for procedures with littler CPU burst. So it builds the holding up time and reaction time of procedures which diminishes in the framework throughput. The new proposed calculation utilizes the dynamic time quantum rather than static time quantum. The proposed design wipes out the imperfections of executing basic round robin engineering. The proposed calculation will be executed in two stages which will minimizes various Execution parameters, for example, setting switches, the normal turnaround time and the normal holding up time.

A. *Proposed planning calculation*

1) Processes are arranged in increasing order of their CPU burst time.
2) Set the time quantum is equal to the CPU burst time of the first process (The shortest process).
3) Calculate the median and mean of CPU burst time of all the processes.

a) $$\text{Mean} = \frac{\text{Sum of no of process}}{\text{Total no of process}}$$

b) Median=
For Odd no of process (n+1) /2
For Even no of process (n / 2) + (n / 2+1) / 2

4) Set the time quantum (TQ) as indicated by following strategy

If (mean>median)

Volume 4 Issue XI, November 2016
ISSN: 2321-9653

TQ1 = SQRT ((mean * most extreme burst time) + (middle * least burst time)))
Else
If (mean<median)
TQ1=SQRT ((middle * most extreme burst time) + (mean* least burst time)))
Else
TQ1 = mean

5) Allocate CPU to each procedure as indicated by the round robin calculation.
6) Go to step

B. Flowchart

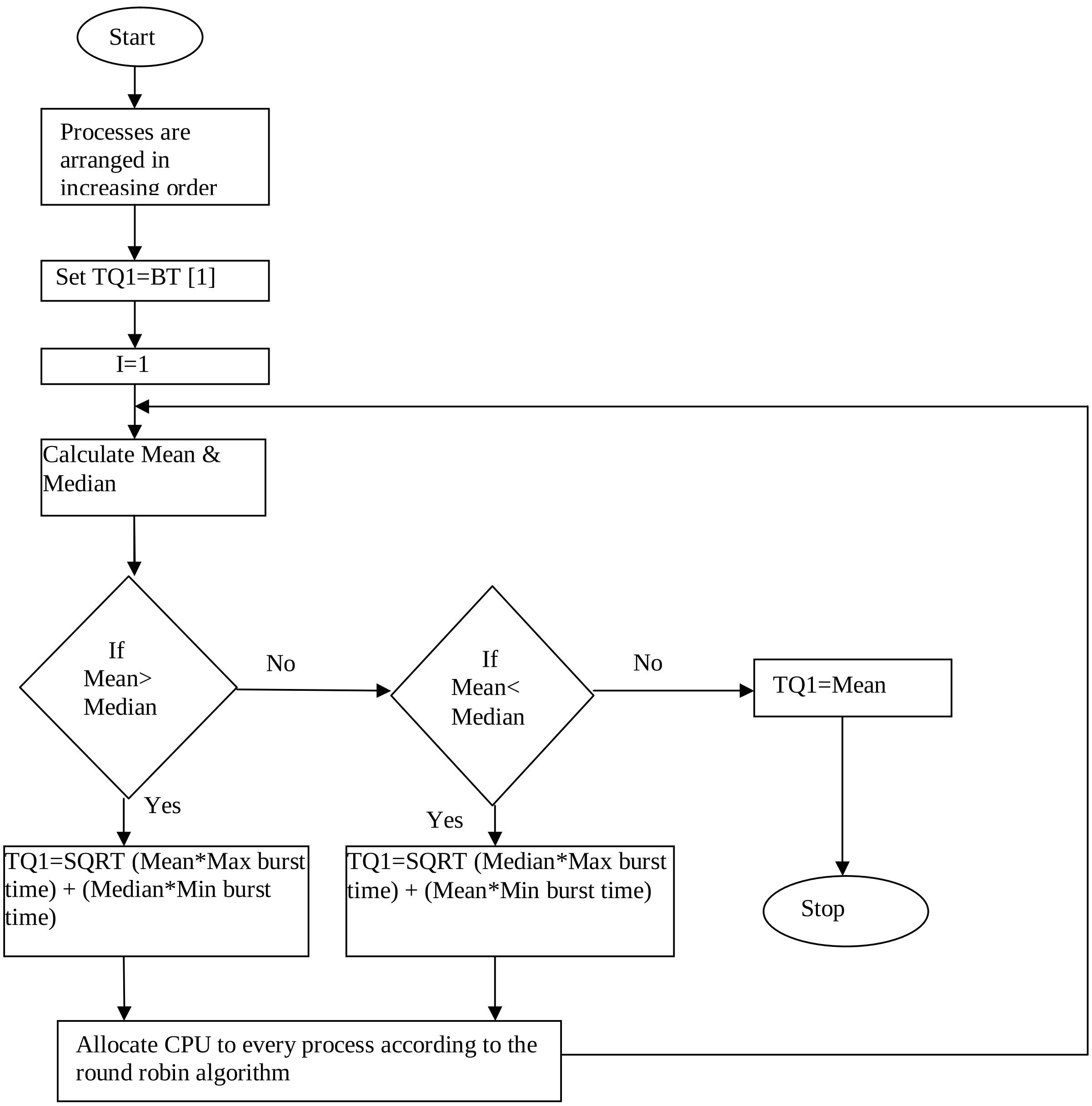

Fig.: (A) Flow graph of IEDRR planning.

For Example:
1) Random Order

Volume 4 Issue XI, November 2016
ISSN: 2321-9653
International Journal for Research in Applied Science & Engineering Technology (IJRASET)

Consider five procedures with 80, 60, 20, 10 and 30 ms CPU burst time.
Let the time quantum is 30 ms for the RR booking.

Table 3.1: INPUTS TABLE

Process Name	CPU Burst Time
A	80
B	60
C	20
D	10
E	30

Table 3.2: Comparisons between RR, SRBRR ISRBRR and Proposed calculation

Algo.	TQ	Avg.WT	Avg.TAT	CS
RR	30	94.00	134.00	7
SRBRR	30 , 50	50.00	90.00	6
ISRBRR	49	53.80	93.80	6
IEDRR	60 , 20	44.00	84.00	4

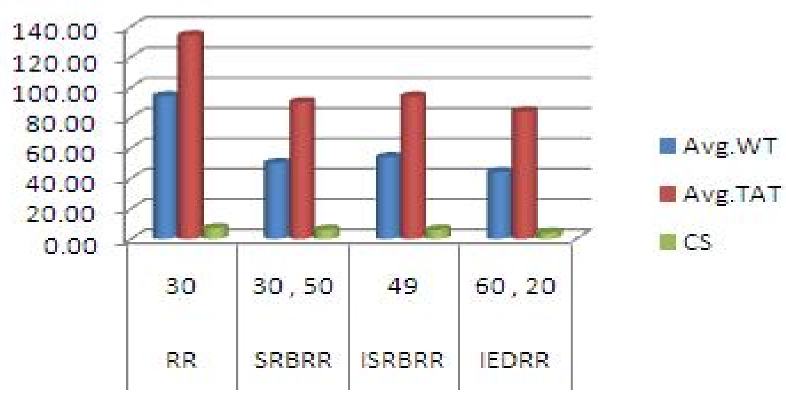

Fig. 3.2 Comparisons between RR, SRBRR, and ISRBRR Also, Proposed calculation

2) *Increasing Order***:** Consider seven procedures named A, B, C, D, E, F and G with their CPU burst time.

Table 3.3: INPUTS TABLE

Process Name	CPU Burst Time
A	20
B	25
C	35
D	50
E	80
F	90
G	120

Volume 4 Issue XI, November 2016
ISSN: 2321-9653

Round Robin Scheduling:
Let the time quantum is 40 ms.

Gantt Chart	A	B	C	D	E	F	G	D	E	F	G	F	G
	0 20	45	80	120	160	200	240	250	290	330	370	380	420

Setting switches: 12
Normal holding up Time: 152.14 ms
Normal Turnaround Time: 212.14 ms
As indicated by proposed calculation:

Gant Chart	A	B	C	D	E	F	G
	0 20	45	80	130	210	300	420

Setting switches: 6
Normal holding up Time: 112.14ms
Normal Turnaround Time: 172.14 ms

Table 3.4: Comparisons between RR, SRBRR, ISRBRR and Proposed calculation

Algo.	TQ	Avg.WT	Avg.TAT	CS
RR	40	152.14	212.14	12
SRBRR	50,40,30	137.57	193.57	9
ISRBRR	78	179	205.57	9
IEDRR	91,29	112.14	172.14	6

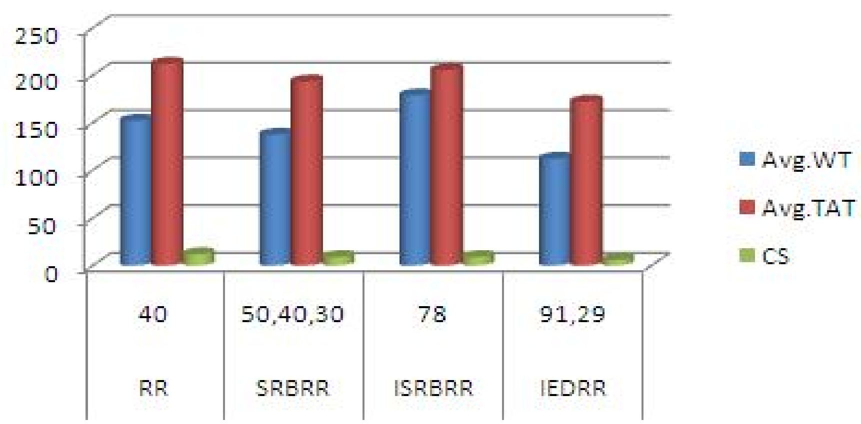

Fig. 3.4Comparisons between RR, SRBRR, ISRBRR and Proposed calculation

3.5 Decreasing Order

Consider seven procedures with 80, 50, 40, 20, 15, 10 and 5 ms CPU burst time.

Table 3.5: Comparisons between RR, SRBRR, ISRBRR and Proposed calculation

Algo.	TQ	Avg.WT	Avg.TAT	CS
RR	20	108.57	140	12
SRBRR	20,30,30	55.71	87.14	9
ISRBRR	40	64.28	84.28	8
IEDRR	51,29	47.14	78.57	6

Volume 4 Issue XI, November 2016
ISSN: 2321-9653

IV. CONCLUSION AND FUTURE WORK

The paper shows another CPU planning calculation. Correlation of different calculations i.e. Round robin, SRBRR, ISRBRR and the proposed calculation IEDRR has been finished. It is reasoned that the proposed calculation is more productive than round robin calculation in light of it has less normal holding up time, less normal turnaround time and less number of setting changes when contrasted with round robin, so it lessens the working framework overhead. The proposed calculation is the blend of the most brief occupation first CPU booking calculation and the round robin CPU planning calculation with productive and element time quantum. In future work, forms at various landing times can be considered for the proposed calculation.

REFERENCES

[1] Abraham Silberschatz, Peter Baer Galvin, Greg Gagne, "Working System Concepts", Sixth Edition.
[2] Sukanya Suranauwarat, "A CPU Scheduling Algorithm Simulator", 37th ASEE/IEEE Frontiers in Education Conference October 10 – 13, 2007.
[3] Tarek Helmy, Abdelkader Dekdouk "Burst Round Robin: As a Proportional- Share Scheduling Algorithm",IEEE Proceedings of the fourth IEEE-GCC Conference on towards Techno-Industrial Innovations, pp. 424-428, 11-14 November, 2007.
[4] Ishwari Singh Rajput" A priority based Round-Robin CPU scheduling Algorithm for real Time system" (IJIET) International Journal of innovation in Engineering & technology. Vol.1, issue 3, 2012.
[5] Rami J. Matarneh."Self-Adjustment Time Quantum in Round Robin Algorithm Depending on Burst Time of Now Running Processes", American J. of Applied Sciences 6(10):1831- 1837, 2009.
[6] A. Noon, A. Kalakech, and S. Kadry, "A new Round Robin Based scheduling Algorithm for Operating Systems: DynamicQuantum time Mean Average", International Journal of Computer Science Issues. 8(3), 224-229, 2011.
[7] M.H. Zahedi, M. Ghazizadeh¸ and M. Naghibzadeh, "Fuzzy Round Robin CPU Scheduling (FRRCS) Algorithm", Advances in Computer and Information Sciences and Engineering. 348-353, 2008.
[8] P.Surendra Varma "A finest time Quantum for improving shortest Remaining burst Round- Robin Algorithm" Journal of global research in Computer science. Vol 4, no.3, 2013.
[9] Jason Nieh"Virtual-Time Round- Robin: An O (1) Proportional Share Scheduler" Proceedings of the 2001 USENIX Annual Technical Conference, Boston, Massachusetts, USA 2001.
[10] C.Yaashuwanth and R.Ramesh,"Intelligent Time Slice for Round Robin in Real Time Operating System", IJRRAS, 2(2), 126-131, 2010.
[11] Sukumar Babu Bandarupalli, Neelima Priyanka Nutulapati, Prof.Dr.P.Suresh Varma,"A Novel CPU Scheduling Algorithm Pre-emptive & Non-Pre-emptive", International Journal of Modern Engineering Research (IJMER) Vol.2, Issue.6, Nov-Dec.2012.
[12] Sourav Kumar Bhoi, Sanjaya Kumar Panda, Debashee Tarai,"Enhancing CPU Performance using subcontrary means dynamic round robin(SMDRR) Scheduling Algorithm",JGRCS,Volume 2,No.12,December 2011.
[13] H.S.Behera, R.Mohanty, S.Sahu and S.K.Bhoi,"Comparative performance analysis of multi Dynamic time quantum round robin (MDTQRR) algorithm with arrival time",Indian Journal of Science and Engineering , 2(2), 262-271,2011.