

Operating Systems Lab Assignment 3

Brief structure of Code:

- The code is written in C language only.
- The data regarding process are read from input file are sorted according to the order of arrival time of process.
- The output of the simulator is of the form

Policy Name

pid at st pr ft tat wt

Process Schedue

Mean Waiting Time

Mean Turn Around Time

pid - process id
at - arrival time
st - service time
ft - finish time
tat - turn around time
wt - waiting time

- Each Process is stored as a struct with entries pid, at, st, priority
- Queue data structure (implemented using linked lists) has been used for Preemptive Scheduling Policies.
- For Policies of type Non-Preemptive arrays had been used.
- Determination which scheduling policy is best for a given input file is done by implenting compare-sch-policy() function

Form of data provided for a process in input file is as below:

pid at st pr

pid - process id
at - arrival time
st - service time
pr - priority

Testinput 1:

p1 0 3 2
p2 2 6 3
p3 4 4 5
p4 6 5 4
p5 8 2 1

Policy	FCFS	SJF	HRRN	Priority	SRTN	RR(t=3)	MLQ	MLFQ
M.W.T	4.6	3.6	4.0	3.8	3.2	6.6	4.4	5.0
M.T.A.T	8.6	7.6	8.0	7.8	7.2	10.6	8.4	9.0
Process Schedule	p1 p2 p3 p4 p5	p1 p2 p5 p3 p4	p1 p2 p3 p5 p4	p1 p2 p5 p4 p3	P1 p1 p2 p3 p3 p5 p2 p4	p1 p2 p3 p4 p2 p5 p3 p4	p1 p1 p2 p3 p5 p5 p3 p4 p4 p4 p2	p1 p1 p2 p3 p3 p4 p5 p5 p4 p2 p3 p4 p2

M.W.T - Mean Waiting Time

M.T.A.T - Mean Turn Around Time

Process Schedule - Is in the order from left to right

Queue Assignment function considered is of form.

If $st \leq 2$ process goes to level 1 Queue in MLQ policy

If $2 < st \leq 5$ process goes to level 2 Queue in MLQ policy

If $st > 5$ process goes to level 3 Queue in MLQ policy

Levels of Queues considered for MLQ, MLFQ are 3

Level 1 - RR (t=1)

Level 2 - SJF (t=2)

Level 3 - HRRN (t=3)

For the above mentioned testinput 1 and under mentioned assumptions **SRTN** is better policy.

Testinput 2:

A 0 3 2
B 0 6 3
C 0 4 5
D 0 5 4
E 0 2 1

Policy	FCFS	SJF	HRRN	Priority	SRTN	RR(t=3)	MLQ	MLFQ
M.W.T	8.6	6.0	6.2	6.8	6.0	10.4	6.0	9.2
M.T.A.T	12.6	10.0	10.2	10.8	10.0	14.4	10.0	13.2
Process Schedule	A B C D E	E A C D B	A E C D B	E A B D C	E A C D B	A B C D E B C D	E E A A C C D D D B B	A B C D E E A D C B C D B

Queue Assignment function considered is of form.

If $st \leq 2$ process goes to level 1 Queue in MLQ policy
If $2 > st \leq 5$ process goes to level 2 Queue in MLQ policy
If $st > 5$ process goes to level 3 Queue in MLQ policy

Levels of Queues considered for MLQ, MLFQ are 3

Level 1 - RR (t=1)
Level 2 - HRRN (t=2)
Level 3 - SJF (t=3)

For the above mentioned testinput 2 and under mentioned assumptions we can observe from table that **SJF**, **SRTN**, **MLQ** are better policies.

Testinput 3:

A 0 3 2
B 1 6 4
C 2 4 3
D 3 5 1
E 4 2 1

Policy	FCFS	SJF	HRRN	Priority	SRTN	RR(t=2)	MLQ	MLFQ
M.W.T	6.6	4.6	5.6	5.0	4.4	8.4	4.6	7.4
M.T.A.T	10.6	8.6	9.6	9.0	8.4	12.4	8.6	11.4
Process Schedule	A B C D E	A C E D B	A B E C D	A D E C B	A A A C E C D B	A B C A D E B C D B D	A A C E E C D D D B B	A B C D E E A C D B D C B

Queue Assignment function considered is of form.

If $st \leq 2$ process goes to level 1 Queue in MLQ policy
If $2 < st \leq 5$ process goes to level 2 Queue in MLQ policy
If $st > 5$ process goes to level 3 Queue in MLQ policy

Levels of Queues considered for MLQ, MLFQ are 3

Level 1 - HRRN ($t=1$)

Level 2 - SJF ($t=2$)

Level 3 - Priority ($t=3$)

For the above mentioned testinput 3 and under mentioned assumptions
SRTN is better policy.