

Scheduling Algorithms

This report covers various scheduling algorithms both dependent and independent on priority.

Five runs were performed on each algorithm with different five sets of 30 processes, statistics used in the report is the average of those five runs (total 40 runs).

Algorithms Covered:

- First Come First Serve (FCFS)
- Shortest Job First (SJF)
- Shortest Remaining Time First (SRTF)
- Round Robin (RR)
- Highest Priority First – Pre-emptive (With and without aging) (HPF (P))
- Highest Priority First _ Non-pre-emptive (With and without aging) (HPF (NP))

1. Nonpriority Algorithms

As shown in Table 1, RR has the highest turnaround time while SJF and SRTF have the least turnaround time and FCFS comes in between.

As for wait time, RR has the longest wait time which is 51.4 quanta. SRTF has the least wait time at 8.7 quanta and SJF is slightly longer than SRTF.

RR has the least response time at 4.6 and FCFS is around 5 times as much.

SRTF and SJF has the best throughput time at around 0.21 process/quantum.

	Turnaround	Wait Time	Response Time	Throughput
FCFS	28.569853	23.645833	23.645833	0.16479378
SJF	13.019091	9.3772726	9.3772726	0.21018569
SRTF	12.344264	8.7120129	7.1892857	0.21059875
RR	56.176288	51.421403	4.6346131	0.17114864

Table 1: Nonpriority algorithms final statistics

Overall, best algorithm for turnaround time, wait time and throughput is SRTF. While best algorithm for response time is round robin.

2. Priority Algorithms

As shown in Table 2, HPF(P) With aging has the worst turnaround time and wait time, and this is because the aging goes only in one direction (after 5 cycles priority bumps to the higher level but no processes go to the lower level). Thus, all processes end up having the same priority and that makes it a normal nonpriority algorithm but then again this prevents starvation.

HPF(NP) has both best turnaround time and wait time while HPF(P) has best response time but starvation may happen in the no aging algorithms in fourth and third queue as most of the time priority queue one, two and three keeps running until time goes over 100 quanta and then it doesn't accept any more processes.

	Turnaround	Wait Time	Response Time	Throughput
HPF(P)	28.736812	23.817544	5.3751348	0.16558298
HPF(NP)	15.825262	10.6865032	10.6865032	0.15941101
HPF(P) With aging	41.174736	36.403189	14.784724	0.17016817
HPF(NP) With aging	29.288643	24.409069	24.409069	0.16605165

Table 2: Priority algorithms final statistics

Overall, best algorithm for turnaround time and wait time is HPF(NP).

Best algorithm for response time is HPF(P).

HPF(P) with aging has the best throughput.

Nonaging algorithms has better scores but they can cause starvation while aging algorithms prevents starvation.