

Cairo University

Faculty of Engineering,

«Computer Engineering Department»

«Scheduling Project»

Team « Kernix »

Data Structures Used:

QUEUE	ReadyQueue,RR algorithm
MinHeap	SRT and HPF algorithms
Linked List	PCB

Algorithm Explanation:

HPF (Non-pre-emptive Highest Priority First)

- **Implementation:** Used a min-heap priority queue where the priority value determined execution order
- **Tie Handling:** For processes with equal priority, the one that arrived first was selected
- **Results:** Achieved high throughput for high-priority processes but could lead to starvation of low-priority processes

SRTN (Shortest Remaining Time Next)

- **Implementation:** Used a min-heap priority queue ordered by remaining runtime
- **Pre-emption:** Current process is pre-empted when a new process with shorter remaining time arrives
- **Results:** Minimized average waiting time and provided good responsiveness

RR (Round Robin)

- **Implementation:** Used a circular queue with fixed time quantum
- **Time Quantum:** Set to 2 time units based on testing different values
- **Results:** Provided fair execution time to all processes

Assumptions:

1-Priority values range from 0 to 10, with 0 being the highest priority

2-Time is measured in integer seconds with no fractions

3-For HPF, ties are broken by arrival time

4-For SRTN, ties are resolved by arrival time

5-Idle is wasted time

Workload:

Name	Work
Mohamed Abdelaziem Sayed	Input files HPF Worked in scheduler MINHEAP
Abdallah Ayman	Process generator SRTN Worked in scheduler MINHEAP
Omar Gamal	Process Worked in scheduler Process generator QUEUE
Omar Hassan	Output files RR Worked in scheduler QUEUE

TimeTaken:

Task	Time Spent (hours)
Design & Planning	3
Process Generator Implementation	2
Scheduler Core Implementation	5
HPF Algorithm	2
SRTN Algorithm	3
RR Algorithm	2
Process Module	1
Testing & Debugging	4
Documentation	2
Total	24