Perform implementation of all of the following CPU scheduling algorithms with a collection of processes, and also perform comparison of the given algorithms using different scheduling criteria.

 FCFS (First Come First Served)-based pre-emptive Priority:

Scheduling is based on priority. When two or more processes have the same priority, the process arrived first is selected.

If a new process arrives with a higher priority, it will pre-empt the running process. Priority ranges from 1 to 6 with smaller number indicates higher priority.

 Round Robin Scheduling:

Round Robin (RR) scheduling is the preemptive version of FCFS algorithm that selects the process that has been in the ready queue for the longest period of time. (i.e) the process is selected in round- robin manner. The FCFS is used to select the process, after the expiry of specified time quantum.

 Three-level Queue Scheduling:

A three level scheduling algorithm partitions the ready queue into two separate queues. Assume that the processes are permanently assigned to the queues based on priority. Assume that processes with priority number from 1 to 2 are assigned to queue 1, priority number 3 to 4 are assigned to queue 2 and the processes with priority number more than 4 are assigned to queue 3. Priority ranges from 1 to 6.

Each queue has its own scheduling algorithm. Processes within Queue 1 is scheduled by Round Robin (RR) algorithm while processes within Queues 2 and 3 are scheduled by First-Come-First-Serve (FCFS) algorithm.

Scheduling between queue 1, queue 2 and 3 is implemented as fixed- priority preemptive scheduling. No process in queue 2 can run unless queue 1 is empty. If there are no processes in queue 2, those in queue 3 will be elevated to queue 2. If a new process enters queue 1, while a process from queue 2 was running, that process will be preempted and new process from queue 1 will be given the control of CPU.

 Shortest Remaining Time Next (SRTN/Preemptive SJF) scheduling:

This scheduling algorithm is preemptive version of Shortest Job First (SJF) algorithm. The next process to be removed from the ready queue is the one with the shortest CPU burst time. If two or more processes having the smallest burst time, the one that arrived first is selected.

When a new process arrives at the ready queue, the scheduler will compare the remaining CPU time required for the currently running process with the next CPU burst time required for the newly arrived process.

If the next CPU burst time required for the newly arrived process is shorter, it will preempt the currently running process and it will be placed in the ready queue and newly arrived process will be given the control of CPU. But if the remaining time required for the currently running process is shorter, it will be allowed to continue.

Expected display:

1. User should be able to enter the details about the processes such as Arrival Time, Burst Time, Priority, Time Quantum assigned at the beginning of simulation and the number of processes can range from 3 to 10.