P10 – SJF PROCESS SCHEDULER

This program is going to implement a very simple version of a process scheduler that employs the Shortest Job First (SJF) scheduling policy. Job or process scheduling policies are used to dequeue the most appropriate job to execute next. In particular, Shortest Job First (SJF), or shortest job next scheduling policy selects the ready process with the smallest execution time (aka burst time) to execute next. [*Burst Time*: Time required by a process to be executed in the Central Processing Unit (CPU).] This represents an interesting use case of the priority queue abstract data type implemented using a min-heap.

The goals of this project include developing, using, and testing an implementation of a Priority Queue as a min-heap. It will implement several fundamental operations on this data structure including insertion, removal, and peek operations with respect to the problem specification.

A demo of the output:

```
==========  Welcome to the SJF Process Scheduler App  ========

Enter command:
[schedule <burstTime>] or [s <burstTime>]
[run] or [r]
[quit] or [q]

sch 5
WARNING: Please enter a valid command!

Enter command:
[schedule <burstTime>] or [s <burstTime>]
[run] or [r]
[quit] or [q]

s 5
Process ID 1 scheduled. Burst Time = 5

Enter command:
[schedule <burstTime>] or [s <burstTime>]
[run] or [r]
[quit] or [q]

s 10
Process ID 2 scheduled. Burst Time = 10

Enter command:
[schedule <burstTime>] or [s <burstTime>]
[run] or [r]
[quit] or [q]

s 3
Process ID 3 scheduled. Burst Time = 3
```

```
Enter command:
[schedule <burstTime>] or [s <burstTime>]
[run] or [r]
[quit] or [q]

r
Starting 3 processes

Time 0 : Process ID 3 Starting.
Time 3 : Process ID 3 Completed.
Time 3 : Process ID 1 Starting.
Time 8 : Process ID 1 Completed.
Time 8 : Process ID 2 Starting.
Time 18 : Process ID 2 Completed.

Time 18 : All scheduled processes completed.

Enter command:
[schedule <burstTime>] or [s <burstTime>]
[run] or [r]
[quit] or [q]

s 1
Process ID 4 scheduled. Burst Time = 1

Enter command:
[schedule <burstTime>] or [s <burstTime>]
[run] or [r]
[quit] or [q]

r
Starting 1 process

Time 18 : Process ID 4 Starting.
Time 19 : Process ID 4 Completed.

Time 19 : All scheduled processes completed.

Enter command:
[schedule <burstTime>] or [s <burstTime>]
[run] or [r]
[quit] or [q]

q
4 processes run in 19 units of time!
Thank you for using our scheduler!
Goodbye!
```