Lab Exercise 4: Uniprocessor Scheduling Simulator

COMP3499 Operating Systems for Engineers
Department of Electrical and Computer Engineering
Wentworth Institute of Technology

Objectives:
- To create a simulator for the FCFS, SPN, and SRT scheduling algorithms.
  - Understand the operation of FCFS, SPN, and SRT.
  - Create a visual representation (Gantt chart) **optional**.

Note: This lab can be done in pairs or individually. Be prepared to demo the working code to your Instructor if requested.

Instructions:
Create a simulator in C that simulates First-Come-First Serve (FCFC), Shortest Process Next (SPN), and Shortest-Remaining Time (SRT).
- The simulator will need to accept the following inputs for each process: Process Name, Arrival Time, and Service Time.
- The simulator would need to calculate and display the following outputs (**in a table**) for each process: Process Name, Arrival Time, Service Time, Start Time, Finish Time, Wait Time, Turnaround Time.
- Similar to the examples we did in the lecture, you can ignore I/O i.e. in nonpreemptive algorithms, the processes run straight through to the end once started.

Part 1
For each algorithm – FCFS, SPN, and SRT
1. Run your simulator for the following inputs.

Process	Arrival Time	Service Time
A	0	3
B	2	6
C	4	4
D	6	5
E	8	2

2. Your simulator should output the following information in a table. Include a screenshot of the table in your report.

Process	Arrival Time	Service Time	Start Time	Finish Time	Wait Time	Turnaround Time
A	0	3				
B	2	6				
C	4	4				
D	6	5				
E	8	2				

Part 2
Redo Part 1 for the following inputs.

Process	Arrival Time	Service Time
A	0	8
B	1	5
C	2	9
D	3	2
E	4	6

The Lab Exercise Report
The Lab Exercise Report must be submitted as a **<u>single PDF</u>** on Blackboard. It must include:
- Student Information: Name, WIT ID, Course code and name, date, Lab Exercise number.
- Academic Honest pledge as shown below.

  By submitting this assessment, I hereby declare that I have neither given nor received any unauthorized help or used any unauthorized materials during this assessment, and that I have adhered to any additional policies regarding Academic Honesty set by Wentworth Institute of Technology.
  Please sign below to acknowledge this or your assessment will not be graded.

  Student Signature: Date:

- The input table followed by the screenshots for the outputs for Parts 1 & 2.

  Upload your final .c file(s) on Blackboard as well.

Bonus (optional)
Create a visual representation (Gantt chart) in C. For example, SPN for Part 1 will produce the following Gantt Chart:

```
A A A
      B B B B B B
                      C C C C
                        D D D D D
            E E
```

Submit a Gantt Chart for FCFS, SPN, and SRT in Part 1.