Objective:

To provide deeper understanding of Process Scheduling using CPU- OS Simulator.

Process Scheduling

Consider the following 4 source codes:

Source Code 1:

```
program My_Pgm1
        i = 1
        for n = 1 to 10
                x = i + n
        next
end
```

Source Code 2:

```
program My_Pgm2
        i = 10
        for n = 1 to 8
                x = i + n
        next
end
```

Source Code 3:

```
program My_Pgm3
        i = 10
        for n = 1 to 15
                x = i + n
        next
end
```

Source Code 4:

```
program My_Pgm4
        i = 10
        for n = 1 to 5
                x = i + n
        next
end
```

Create 4 processes P1, P2. P3 and P4 from source codes 1, 2, 3and 4 respectively with following properties. Fill up the following table by considering **Log data only**

	Scheduling Algorithm: FCFS		
Process	Arrival Time		Waiting time
P1	0		0.25 sec
P2	2		19.95 sec
P3	6		48.31 sec
P4	4		36.31 sec
Average waiting time			26.21 sec
	Scheduling Algorithm: Round Robin with time quantum 2		
Process	Arrival Time		Waiting time
P1	0		4.58 sec
P2	2		4.85 sec
P3	6		5.05 sec
P4	4		4.77 sec
Average waiting time			4.8125 sec
	Scheduling Algorithm: Shortest Job First (Pre-emptive)		
Process	Arrival Time	Priority	Waiting time
P1	0	1	0.23 sec
P2	2	2	52.16 sec
P3	6	1	123.74 sec
P4	4	2	94.81 sec
Average waiting time			67.735 sec
	Scheduling Algorithm: Shortest Job First (Non-Pre-emptive)		
Process	Arrival Time	Priority	Waiting time
P1	0	1	0.24 sec
P2	2	2	46.47 sec
P3	6	3	108.11 sec

P4	4	4	83.41sec
Average waiting time			59.5575

Out of three cases, which one is better and why?

The calculation of three algorithms shows the different average waiting time. Out of three cases, Round Robin algorithm has less waiting time. In this algorithm each process is served by the CPU for a fixed time quantum, so all processes are given the same priority. Starvation doesn ’t occur because for each round robin cycle, every process is given fixed time to execute. No process is left behind.

The FCFS is better for a small burst time. The SJF is better if the process comes to processor simultaneously. The last algorithm, Round Robin, is better to adjust the average waiting time desired. Round Robin quantum time will set it towards more SJF or FCFS value.

Hence, Round Robin scheduling works efficiently here because it does not cause starvation and also gives equal time quantum for each process.