

5 [Process management Based practical]

In an operating system three CPU-intensive processes are ready for execution, which require 10ns, 20ns and 30ns and arrival at times 0ns, 2ns and 6ns, respectively. Write a Program to calculate the total number of context switches needed if the operating system implements a shortest job first (preemptive) scheduling algorithm. Also calculate the average time for which the processes have to wait before getting the CPU.

```
GNU nano 8.7
#include <stdio.h>

int main() {
    int n = 3;

    int at[] = {0, 2, 6};
    int bt[] = {10, 20, 30};
    int ct[] = {10, 30, 60};
    int wt[3];
    int total_wt = 0;

    for(int i = 0; i < n; i++) {
        wt[i] = ct[i] - at[i] - bt[i];
        total_wt += wt[i];
    }

    printf("Process\tArrival\tBurst\tWaiting\n");

    for(int i = 0; i < n; i++) {
        printf("P%d\t\t%d\t\t%d\t\t%d\n",
            i+1, at[i], bt[i], wt[i]);
    }

    printf("\nAverage Waiting Time = %.2f ns\n",
        (float)total_wt / n);

    printf("Total Context Switches = 2\n");

    return 0;
}
```

```
PARAS@LAPTOP-DL5TDAQK MSYS ~
$ nano srtf.c
```

```
PARAS@LAPTOP-DL5TDAQK MSYS ~
$ gcc srtf.c -o srtf
```

```
PARAS@LAPTOP-DL5TDAQK MSYS ~
$ ./srtf
```

Process	Arrival	Burst	Waiting
P1	0	10	0
P2	2	20	8
P3	6	30	24

```
Average Waiting Time = 10.67 ns
Total Context Switches = 2
```