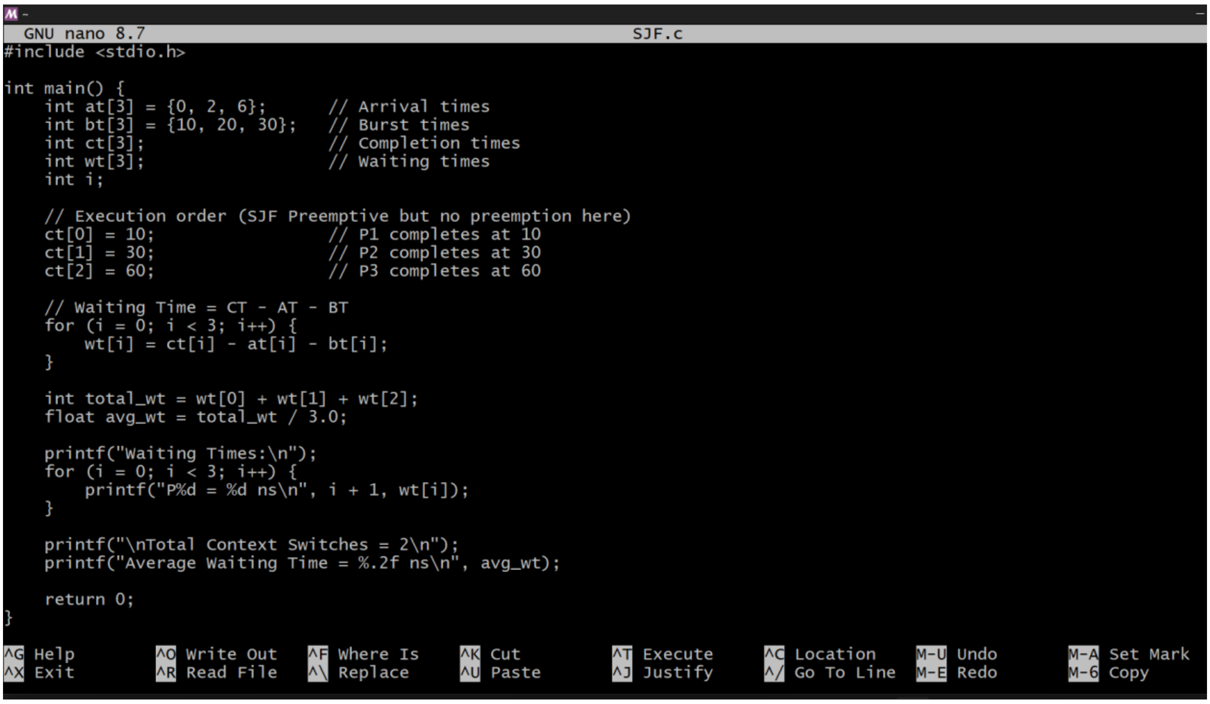
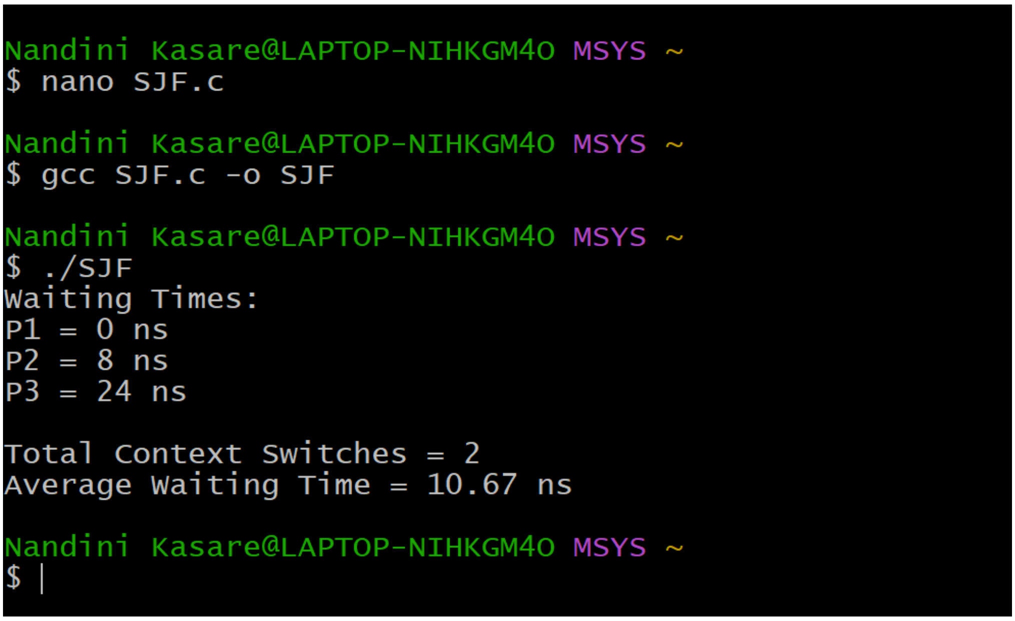
PRACTICAL: 04

Aim: Write a program to implement Shortest Job First (SJF) Preemptive Scheduling for three processes and calculate the total context switches and average waiting time. The processes have burst times 10ns, 20ns, and 30ns, arriving at 0ns, 2ns, and 6ns, respectively**.**



```c
#include <stdio.h>

int main() {
    int at[3] = {0, 2, 6};      // Arrival times
    int bt[3] = {10, 20, 30};   // Burst times
    int ct[3];                  // Completion times
    int wt[3];                  // Waiting times
    int i;

    // Execution order (SJF Preemptive but no preemption here)
    ct[0] = 10;                 // P1 completes at 10
    ct[1] = 30;                 // P2 completes at 30
    ct[2] = 60;                 // P3 completes at 60

    // Waiting Time = CT - AT - BT
    for (i = 0; i < 3; i++) {
        wt[i] = ct[i] - at[i] - bt[i];
    }

    int total_wt = wt[0] + wt[1] + wt[2];
    float avg_wt = total_wt / 3.0;

    printf("Waiting Times:\n");
    for (i = 0; i < 3; i++) {
        printf("P%d = %d ns\n", i + 1, wt[i]);
    }

    printf("\nTotal Context Switches = 2\n");
    printf("Average Waiting Time = %.2f ns\n", avg_wt);

    return 0;
}
```

OUTPUT:



```
Nandini Kasare@LAPTOP-NIHKGM4O MSYS ~
$ nano SJF.c

Nandini Kasare@LAPTOP-NIHKGM4O MSYS ~
$ gcc SJF.c -o SJF

Nandini Kasare@LAPTOP-NIHKGM4O MSYS ~
$ ./SJF
Waiting Times:
P1 = 0 ns
P2 = 8 ns
P3 = 24 ns

Total Context Switches = 2
Average Waiting Time = 10.67 ns

Nandini Kasare@LAPTOP-NIHKGM4O MSYS ~
$ |
```