OS LAB 1

AIM: Write a C program to simulate the following non pre-emptive CPU scheduling algorithm to find turnaround time and waiting time.

1. FCFS
2. SJF (pre-emptive & Non pre-emptive)

SOURCE CODE

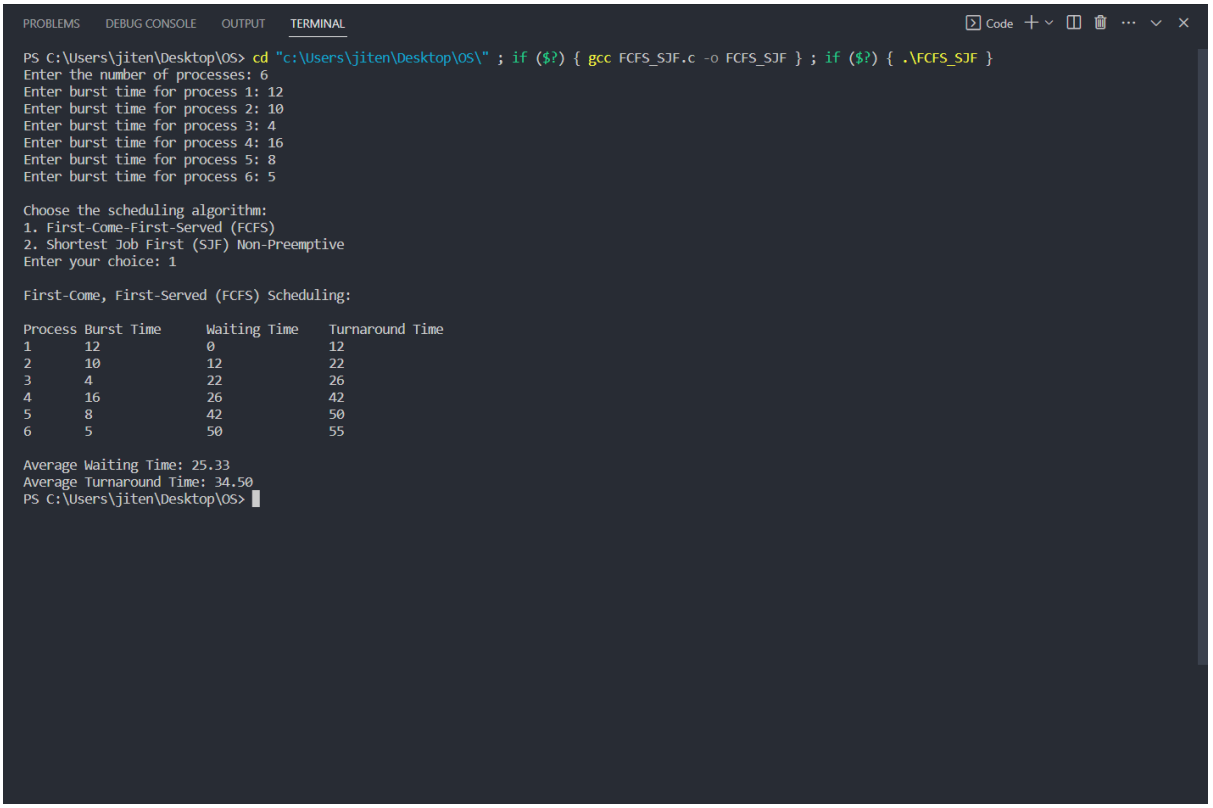
```
#include<stdio.h>

#include<stdlib.h>

void findWaitingTime(int processes[], int n, int burstTime[], int waitingTime[])

{

   waitingTime[0] = 0;


   for (int i = 1; i < n ; i++ )

      waitingTime[i] =  burstTime[i-1] + waitingTime[i-1] ;

}


void findTurnaroundTime( int processes[], int n, int burstTime[], int waitingTime[], int
turnaroundTime[])

{

   for (int i = 0; i < n ; i++)

      turnaroundTime[i] = burstTime[i] + waitingTime[i];

}


void findAverageTime( int processes[], int n, int burstTime[])

{

   int waitingTime[n], turnaroundTime[n], totalWaitingTime = 0, totalTurnaroundTime = 0;


   findWaitingTime(processes, n, burstTime, waitingTime);


   findTurnaroundTime(processes, n, burstTime, waitingTime, turnaroundTime);
```

```
    printf("\nProcess\tBurst Time\tWaiting Time\tTurnaround Time\n");

    for (int i=0; i<n; i++)
    {
        totalWaitingTime = totalWaitingTime + waitingTime[i];
        totalTurnaroundTime = totalTurnaroundTime + turnaroundTime[i];
        printf("%d\t%d\t\t%d\t\t%d\n", i+1, burstTime[i], waitingTime[i], turnaroundTime[i]);
    }

    printf("\nAverage Waiting Time: %.2f", (float)totalWaitingTime/n);
    printf("\nAverage Turnaround Time: %.2f", (float)totalTurnaroundTime/n);
}

void fcfsScheduling(int processes[], int n, int burstTime[])
{
    printf("\nFirst-Come, First-Served (FCFS) Scheduling:\n");
    findAverageTime(processes, n, burstTime);
}

void sjfNonPreemptiveScheduling(int processes[], int n, int burstTime[])
{
    // Sort the burst time in ascending order
    for (int i = 0; i < n-1; i++)
    {
        for (int j = 0; j < n-i-1; j++)
        {
            if (burstTime[j] > burstTime[j+1])
            {
                int temp = burstTime[j];
                burstTime[j] = burstTime[j+1];
                burstTime[j+1] = temp;
```

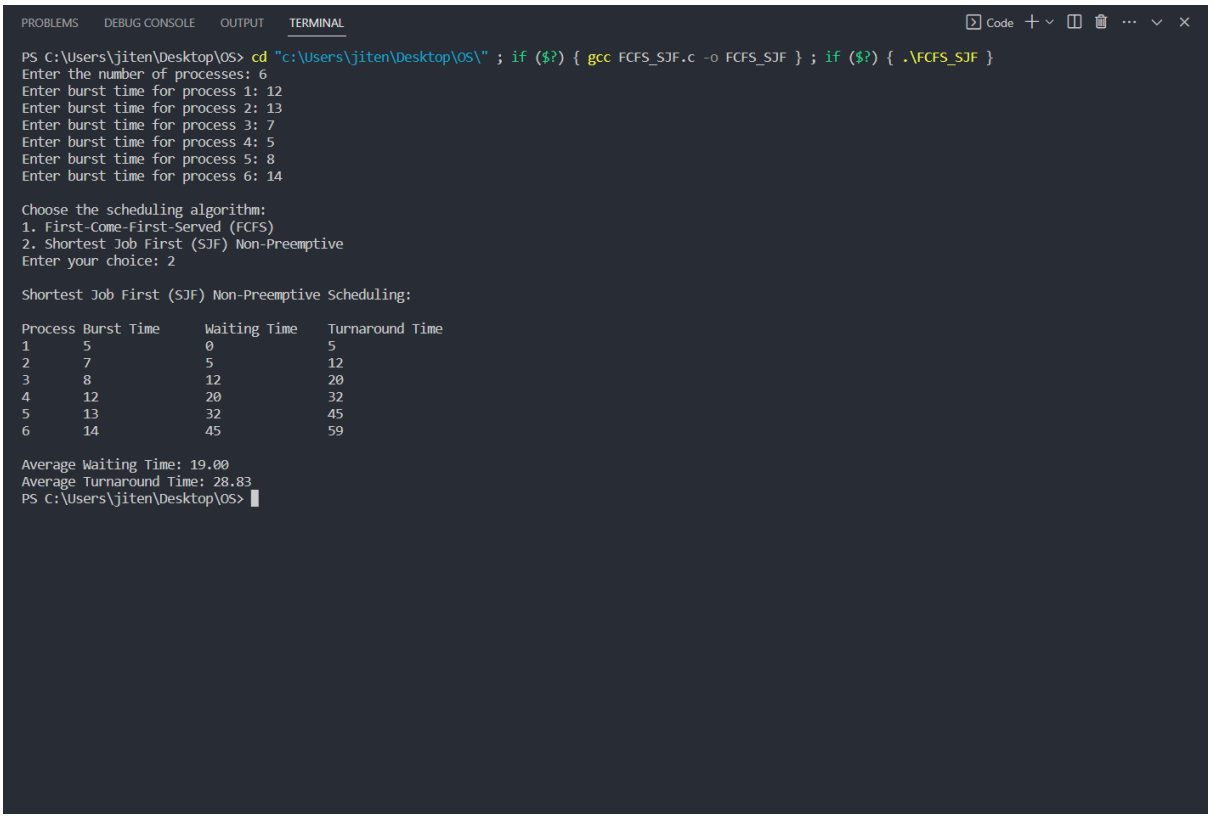
```
            temp = processes[j];
            processes[j] = processes[j+1];
            processes[j+1] = temp;
          }
        }
    }

    printf("\nShortest Job First (SJF) Non-Preemptive Scheduling:\n");
    findAverageTime(processes, n, burstTime);
}

int main()
{
    int n, choice;
    printf("Enter the number of processes: ");
    scanf("%d", &n);

    int processes[n], burstTime[n];

    for (int i = 0; i < n; i++)
    {
        printf("Enter burst time for process %d: ", i+1);
        scanf("%d", &burstTime[i]);
        processes[i] = i+1;
    }

    printf("\nChoose the scheduling algorithm:\n");
    printf("1. First-Come-First-Served (FCFS)\n");
    printf("2. Shortest Job First (SJF) Non-Preemptive\n");
    printf("Enter your choice: ");
    scanf("%d", &choice);
```

```
    switch(choice)
    {
        case 1:
            fcfsScheduling(processes, n, burstTime);
            break;

        case 2:
            sjfNonPreemptiveScheduling(processes, n, burstTime);
            break;

        default:
            printf("Invalid choice. Exiting...\n");
            return 0;
    }

    return 0;
}
```

OUTPUT SCREENSHOTS



```
PROBLEMS  DEBUG CONSOLE  OUTPUT  TERMINAL                                   Code

PS C:\Users\jiten\Desktop\OS> cd "c:\Users\jiten\Desktop\OS\" ; if ($?) { gcc FCFS_SJF.c -o FCFS_SJF } ; if ($?) { .\FCFS_SJF }
Enter the number of processes: 6
Enter burst time for process 1: 12
Enter burst time for process 2: 10
Enter burst time for process 3: 4
Enter burst time for process 4: 16
Enter burst time for process 5: 8
Enter burst time for process 6: 5

Choose the scheduling algorithm:
1. First-Come-First-Served (FCFS)
2. Shortest Job First (SJF) Non-Preemptive
Enter your choice: 1

First-Come, First-Served (FCFS) Scheduling:

Process Burst Time      Waiting Time    Turnaround Time
1       12              0               12
2       10              12              22
3       4               22              26
4       16              26              42
5       8               42              50
6       5               50              55

Average Waiting Time: 25.33
Average Turnaround Time: 34.50
PS C:\Users\jiten\Desktop\OS>
```



```
PROBLEMS  DEBUG CONSOLE  OUTPUT  TERMINAL                                   Code

PS C:\Users\jiten\Desktop\OS> cd "c:\Users\jiten\Desktop\OS\" ; if ($?) { gcc FCFS_SJF.c -o FCFS_SJF } ; if ($?) { .\FCFS_SJF }
Enter the number of processes: 6
Enter burst time for process 1: 12
Enter burst time for process 2: 13
Enter burst time for process 3: 7
Enter burst time for process 4: 5
Enter burst time for process 5: 8
Enter burst time for process 6: 14

Choose the scheduling algorithm:
1. First-Come-First-Served (FCFS)
2. Shortest Job First (SJF) Non-Preemptive
Enter your choice: 2

Shortest Job First (SJF) Non-Preemptive Scheduling:

Process Burst Time      Waiting Time    Turnaround Time
1       5               0               5
2       7               5               12
3       8               12              20
4       12              20              32
5       13              32              45
6       14              45              59

Average Waiting Time: 19.00
Average Turnaround Time: 28.83
PS C:\Users\jiten\Desktop\OS>
```