Experiment:4-Construct a scheduling program with C that selects the waiting process with the smallest execution time to execute next

Aim:

To implement the Shortest Job Next (SJN) CPU Scheduling algorithm.

Procedure:

1. Sort processes based on their burst time in ascending order.
2. Calculate waiting time, turnaround time, and display the scheduling order.

C Program:

```
#include <stdio.h>
#include <stdlib.h>

struct Process {
    int id;
    int burst_time;
    int waiting_time;
    int turnaround_time;
};

int compare(const void *a, const void *b) {
    return ((struct Process *)a)->burst_time - ((struct Process *)b)->burst_time;
}

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

    struct Process processes[n];
    int total_waiting_time = 0, total_turnaround_time = 0;
    for (int i = 0; i < n; i++) {
```

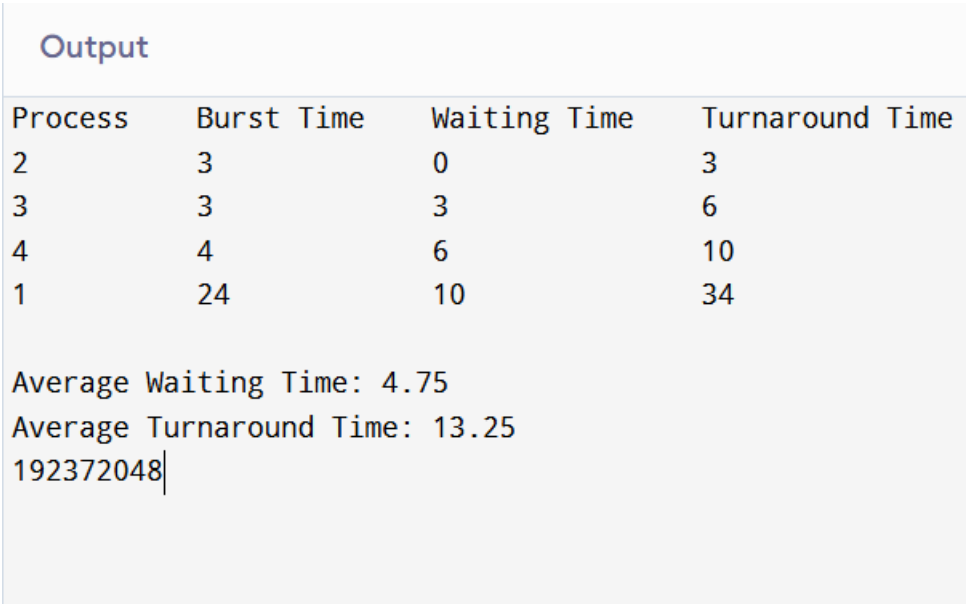
```
        processes[i].id = i + 1;
        printf("Enter burst time for process %d: ", i + 1);
        scanf("%d", &processes[i].burst_time);
    }
    qsort(processes, n, sizeof(struct Process), compare);
    processes[0].waiting_time = 0;
    processes[0].turnaround_time = processes[0].burst_time;
    total_turnaround_time = processes[0].turnaround_time;

    for (int i = 1; i < n; i++) {
        processes[i].waiting_time = processes[i - 1].waiting_time + processes[i - 1].burst_time;
        processes[i].turnaround_time = processes[i].waiting_time + processes[i].burst_time;
        total_waiting_time += processes[i].waiting_time;
        total_turnaround_time += processes[i].turnaround_time;
    }
    printf("\nProcess\tBurst Time\tWaiting Time\tTurnaround Time\n");
    for (int i = 0; i < n; i++) {
        printf("%d\t%d\t\t%d\t\t%d\n", processes[i].id, processes[i].burst_time,
processes[i].waiting_time, processes[i].turnaround_time);
    }

    printf("\nAverage Waiting Time: %.2f\n", (float)total_waiting_time / n);
    printf("Average Turnaround Time: %.2f\n", (float)total_turnaround_time / n);

    return 0;
}
```

Output:



Result:

This program implements the **Shortest Job First (SJF)** scheduling algorithm, where the CPU executes the process with the shortest burst time first. The program sorts the processes based on their burst times and then calculates the waiting time and turnaround time for each process, as well as the averages for all processes.