

Program: To implement Shortest Job First (SJF) scheduling program for process scheduling.

```
#include <iostream>

#include <vector>

#include <algorithm>

using namespace std;

struct Process {

    int pid;    // Process ID

    int burstTime; // CPU Burst Time

    int waitingTime; // Waiting Time

    int turnAroundTime; // Turnaround Time

};

bool compareBurstTime(Process a, Process b) {

    return a.burstTime < b.burstTime;

}

int main() {

    int n; // Number of processes

    cout << "Enter the number of processes: ";

    cin >> n;

    vector<Process> processes(n);

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

        processes[i].pid = i + 1;

        cout << "Enter the Burst Time for Process P" << processes[i].pid << ": ";

        cin >> processes[i].burstTime;

    }

    sort(processes.begin(), processes.end(), compareBurstTime);

    processes[0].waitingTime = 0; // First process has no waiting time

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

```

    processes[i].waitingTime = processes[i - 1].waitingTime + processes[i - 1].burstTime;
}

int totalWaitingTime = 0, totalTurnAroundTime = 0;
for (int i = 0; i < n; i++) {
    processes[i].turnAroundTime = processes[i].waitingTime + processes[i].burstTime;
    totalWaitingTime += processes[i].waitingTime;
    totalTurnAroundTime += processes[i].turnAroundTime;
}

cout << "\nProcess\tBurst Time\tWaiting Time\tTurnaround Time\n";
for (const auto &process : processes) {
    cout << "P" << process.pid << "\t\t" << process.burstTime << "\t\t"
        << process.waitingTime << "\t\t" << process.turnAroundTime << "\n";
}

float avgWaitingTime = (float)totalWaitingTime / n;
float avgTurnAroundTime = (float)totalTurnAroundTime / n;

cout << "\nAverage Waiting Time: " << avgWaitingTime << endl;
cout << "Average Turnaround Time: " << avgTurnAroundTime << endl;

return 0;
}

```

OUTPUT:

Enter the number of processes: 4

Enter the Burst Time for Process P1: 5

Enter the Burst Time for Process P2: 2

Enter the Burst Time for Process P3: 8

Enter the Burst Time for Process P4: 6

Process	Burst Time	Waiting Time	Turnaround Time
P2	2	0	2
P1	5	2	7
P4	6	7	13
P3	8	13	21

Average Waiting Time: 5.5

Average Turnaround Time: 10.75

Conclusion: The program Shortest Job First (SJF) scheduling was implemented successfully