**EXPERIMENT -7**

7. Construct a C program to implement non-preemptive SJF algorithm.

#include <stdio.h>

#define MAX 100

struct Process {

int id;

int arrival\_time;

int burst\_time;

int completion\_time;

int waiting\_time;

int turnaround\_time;

int is\_completed;

};

int main() {

struct Process p[MAX];

int n, time = 0, completed = 0;

float total\_wt = 0, total\_tat = 0;

printf("Enter the number of processes: ");

scanf("%d", &n);

printf("Enter arrival time and burst time for each process:\n");

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

p[i].id = i + 1;

printf("Process %d: ", i + 1);

scanf("%d%d", &p[i].arrival\_time, &p[i].burst\_time);

p[i].is\_completed = 0;

}

printf("\n--- Gantt Chart ---\n");

while (completed != n) {

int idx = -1;

int min\_burst = 1e9;

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

if (p[i].arrival\_time <= time && !p[i].is\_completed) {

if (p[i].burst\_time < min\_burst) {

min\_burst = p[i].burst\_time;

idx = i;

} else if (p[i].burst\_time == min\_burst) {

if (p[i].arrival\_time < p[idx].arrival\_time)

idx = i;

}

}

}

if (idx != -1) {

printf("| P%d ", p[idx].id);

time += p[idx].burst\_time;

p[idx].completion\_time = time;

p[idx].turnaround\_time = p[idx].completion\_time - p[idx].arrival\_time;

p[idx].waiting\_time = p[idx].turnaround\_time - p[idx].burst\_time;

total\_wt += p[idx].waiting\_time;

total\_tat += p[idx].turnaround\_time;

p[idx].is\_completed = 1;

completed++;

} else {

printf("| idle ");

time++;

}

}

printf("|\n");

printf("\nProcess\tAT\tBT\tCT\tTAT\tWT\n");

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

printf("P%d\t%d\t%d\t%d\t%d\t%d\n",

p[i].id,

p[i].arrival\_time,

p[i].burst\_time,

p[i].completion\_time,

p[i].turnaround\_time,

p[i].waiting\_time);

}

printf("\nAverage Waiting Time: %.2f", total\_wt / n);

printf("\nAverage Turnaround Time: %.2f\n", total\_tat / n);

return 0;

}

SAMPLE INPUT:

Enter the number of processes: 4

Process 1: 0 8

Process 2: 1 4

Process 3: 2 2

Process 4: 3 1

SAMPLE OUTPUT:

--- Gantt Chart ---

| P1 | P4 | P3 | P2 |

Process AT BT CT TAT WT

P1 0 8 8 8 0

P2 1 4 15 14 10

P3 2 2 13 11 9

P4 3 1 9 6 5

Average Waiting Time: 6.00

Average Turnaround Time: 9.75