4ITRC2 Operating System Lab

Lab Assignment 5

**To perform**: Create and execute C programs for following CPU Scheduling Algorithms:

1. First Come First Serve (FCFS)

#include <stdio.h>

int main() {

int n, bt[20], wt[20], tat[20];

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

printf("Enter number of processes: ");

scanf("%d", &n);

printf("Enter Burst Time for each process:\n");

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

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

scanf("%d", &bt[i]);

}

wt[0] = 0;

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

wt[i] = wt[i-1] + bt[i-1];

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

tat[i] = wt[i] + bt[i];

avg\_wt += wt[i];

avg\_tat += tat[i];

}

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

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

printf("P%d\t%d\t%d\t%d\n", i+1, bt[i], wt[i], tat[i]);

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

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

return 0;

}

**OUTPUT:**

**P1 = 5, P2 = 9, P3 = 6**

**Avg WT = 6.33**

**Avg TAT = 13.00**

1. Shortest Job First (SJF)

#include <stdio.h>

int main() {

int n, bt[20], p[20], wt[20], tat[20];

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

printf("Enter number of processes: ");

scanf("%d", &n);

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

printf("Enter Burst Time for P%d: ", i+1);

scanf("%d", &bt[i]);

p[i] = i+1;

}

// Sort processes by burst time

for (int i = 0; i < n-1; i++) {

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

if (bt[i] > bt[j]) {

int temp = bt[i]; bt[i] = bt[j]; bt[j] = temp;

temp = p[i]; p[i] = p[j]; p[j] = temp;

}

}

}

wt[0] = 0;

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

wt[i] = wt[i-1] + bt[i-1];

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

tat[i] = wt[i] + bt[i];

avg\_wt += wt[i];

avg\_tat += tat[i];

}

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

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

printf("P%d\t%d\t%d\t%d\n", p[i], bt[i], wt[i], tat[i]);

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

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

return 0;

}

**OUTPUT:**

**Sorted: P1(5), P3(6), P2(9)**

**Avg WT = 5.33**

**Avg TAT = 12.00**

1. Round Robin Scheduling

#include <stdio.h>

int main() {

int n, tq, bt[10], rem\_bt[10], wt[10] = {0}, tat[10], t = 0;

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

printf("Enter number of processes: ");

scanf("%d", &n);

printf("Enter Burst Time for each process:\n");

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

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

scanf("%d", &bt[i]);

rem\_bt[i] = bt[i];

}

printf("Enter Time Quantum: ");

scanf("%d", &tq);

int done;

do {

done = 1;

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

if (rem\_bt[i] > 0) {

done = 0;

if (rem\_bt[i] > tq) {

t += tq;

rem\_bt[i] -= tq;

} else {

t += rem\_bt[i];

wt[i] = t - bt[i];

rem\_bt[i] = 0;

}

}

}

} while (!done);

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

tat[i] = wt[i] + bt[i];

avg\_wt += wt[i];

avg\_tat += tat[i];

}

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

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

printf("P%d\t%d\t%d\t%d\n", i+1, bt[i], wt[i], tat[i]);

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

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

return 0;

}

SAMPLE OUTPUT (TQ=4):

Avg WT = 10.67

Avg TAT = 17.33