Write a C program to simulate the following CPU scheduling algorithm to find turnaround time and waiting time.

c) Priority(Pre-emptive and Non - pre-emptive)

#include <stdio.h>

#define MAX 100

void priorityPreemptive(int n, int at[], int bt[], int pr[]) {

int ct[n], tat[n], wt[n], rem\_bt[n], is\_completed[n];

int time = 0, completed = 0, min\_priority, index;

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

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

is\_completed[i] = 0;

}

while (completed < n) {

min\_priority = 9999;

index = -1;

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

if (at[i] <= time && is\_completed[i] == 0 && pr[i] < min\_priority && rem\_bt[i] > 0) {

min\_priority = pr[i];

index = i;

}

}

if (index == -1) {

time++;

} else {

rem\_bt[index]--;

time++;

if (rem\_bt[index] == 0) {

ct[index] = time;

is\_completed[index] = 1;

completed++;

}

}

}

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

printf("\nP#\tAT\tBT\tPR\tCT\tTAT\tWT\n");

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

tat[i] = ct[i] - at[i];

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

total\_tat += tat[i];

total\_wt += wt[i];

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

}

printf("Average TAT: %.2f\n", total\_tat / n);

printf("Average WT: %.2f\n", total\_wt / n);

}

void priorityNonPreemptive(int n, int at[], int bt[], int pr[]) {

int ct[n], tat[n], wt[n], is\_completed[n], rem\_bt[n];

int time = 0, completed = 0;

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

is\_completed[i] = 0;

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

}

while (completed < n) {

int min\_priority = 9999, index = -1;

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

if (at[i] <= time && is\_completed[i] == 0 && pr[i] < min\_priority) {

min\_priority = pr[i];

index = i;

}

}

if (index == -1) {

time++;

} else {

time += bt[index];

ct[index] = time;

is\_completed[index] = 1;

completed++;

}

}

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

printf("\nP#\tAT\tBT\tPR\tCT\tTAT\tWT\n");

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

tat[i] = ct[i] - at[i];

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

total\_tat += tat[i];

total\_wt += wt[i];

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

}

printf("Average TAT: %.2f\n", total\_tat / n);

printf("Average WT: %.2f\n", total\_wt / n);

}

int main() {

int n, choice;

printf("Enter number of processes: ");

scanf("%d", &n);

int at[n], bt[n], pr[n];

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

printf("Enter AT, BT, and Priority P%d: ", i + 1);

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

}

printf("\nChoose Scheduling Algorithm:\n");

printf("1. Preemptive Priority Scheduling\n");

printf("2. Non-Preemptive Priority Scheduling\n");

printf("Enter choice: ");

scanf("%d", &choice);

if (choice == 1) {

priorityPreemptive(n, at, bt, pr);

} else if (choice == 2) {

priorityNonPreemptive(n, at, bt, pr);

} else {

printf("Invalid choice!\n");

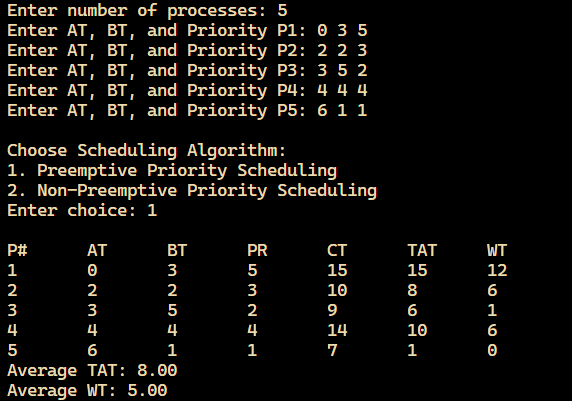
}

return 0;

}

Output :

Pre-emptive



Non Pre-emptive

