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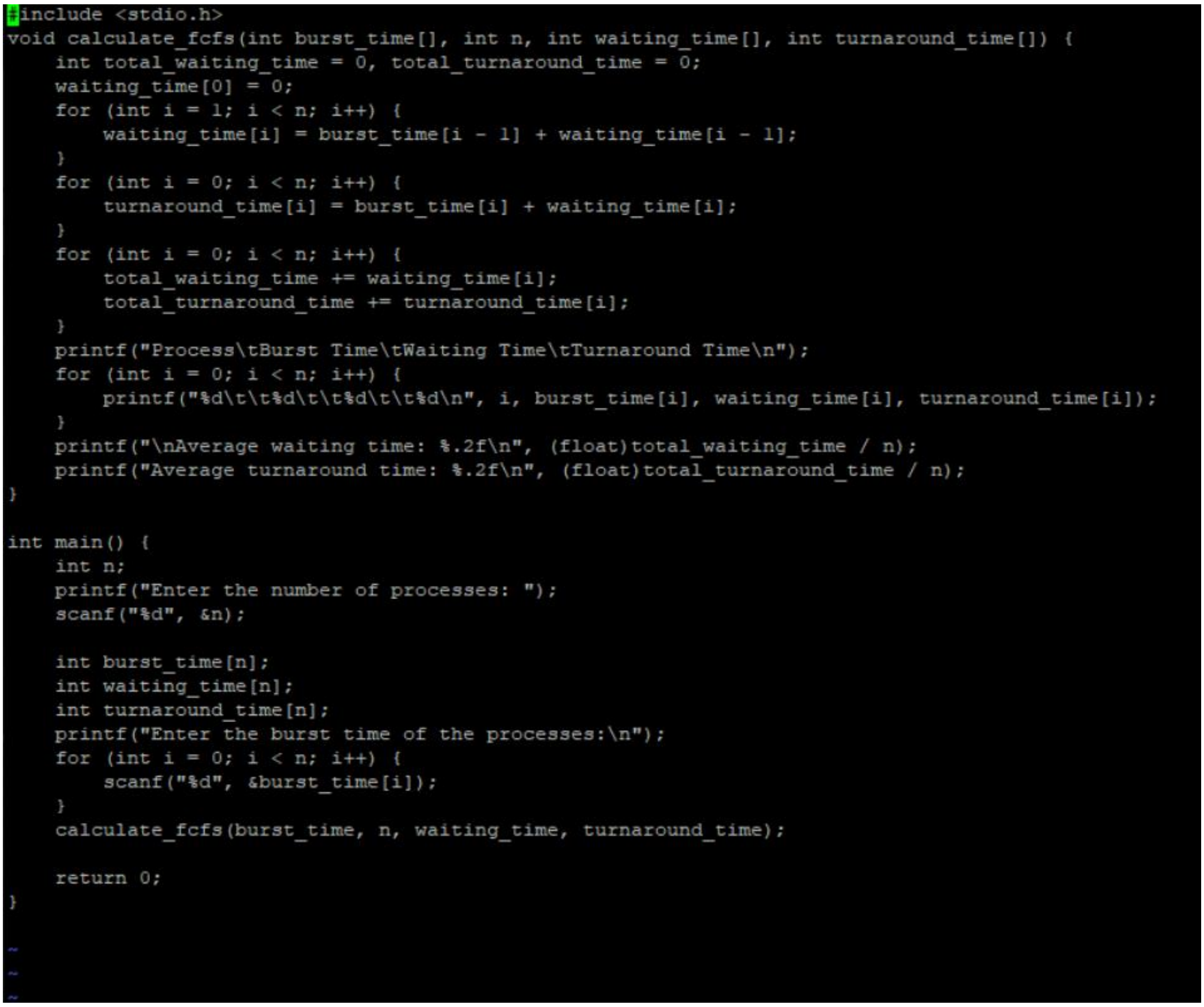
EXP 6

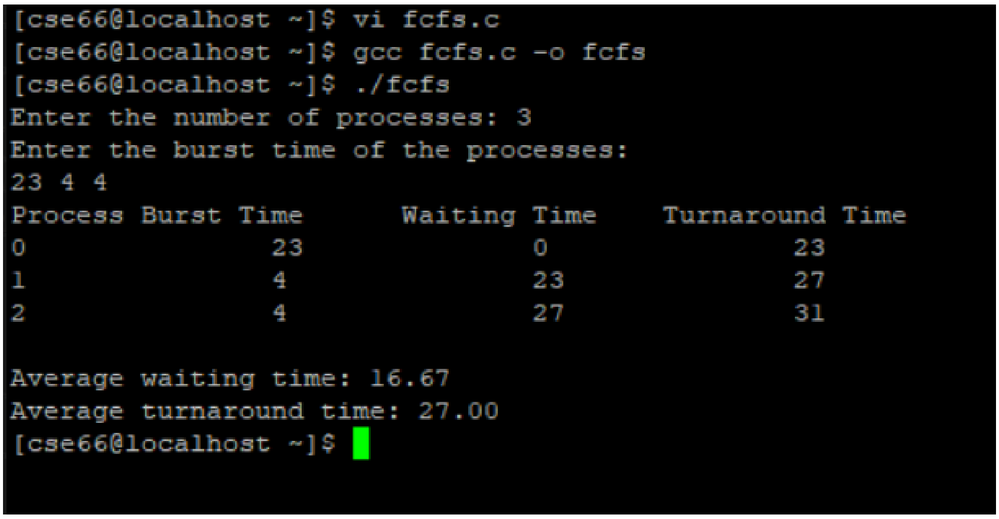
EXP 6A: FCFS

PROGRAM:



```
#include <stdio.h>
void calculate_fcfs(int burst_time[], int n, int waiting_time[], int turnaround_time[]) {
    int total_waiting_time = 0, total_turnaround_time = 0;
    waiting_time[0] = 0;
    for (int i = 1; i < n; i++) {
        waiting_time[i] = burst_time[i - 1] + waiting_time[i - 1];
    }
    for (int i = 0; i < n; i++) {
        turnaround_time[i] = burst_time[i] + waiting_time[i];
    }
    for (int i = 0; i < n; i++) {
        total_waiting_time += waiting_time[i];
        total_turnaround_time += turnaround_time[i];
    }
    printf("Process\tBurst Time\tWaiting Time\tTurnaround Time\n");
    for (int i = 0; i < n; i++) {
        printf("%d\t\t%d\t\t%d\t\t%d\n", i, burst_time[i], waiting_time[i], turnaround_time[i]);
    }
    printf("\nAverage waiting time: %.2f\n", (float)total_waiting_time / n);
    printf("Average turnaround time: %.2f\n", (float)total_turnaround_time / n);
}

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

    int burst_time[n];
    int waiting_time[n];
    int turnaround_time[n];
    printf("Enter the burst time of the processes:\n");
    for (int i = 0; i < n; i++) {
        scanf("%d", &burst_time[i]);
    }
    calculate_fcfs(burst_time, n, waiting_time, turnaround_time);

    return 0;
}

~
~
~
```

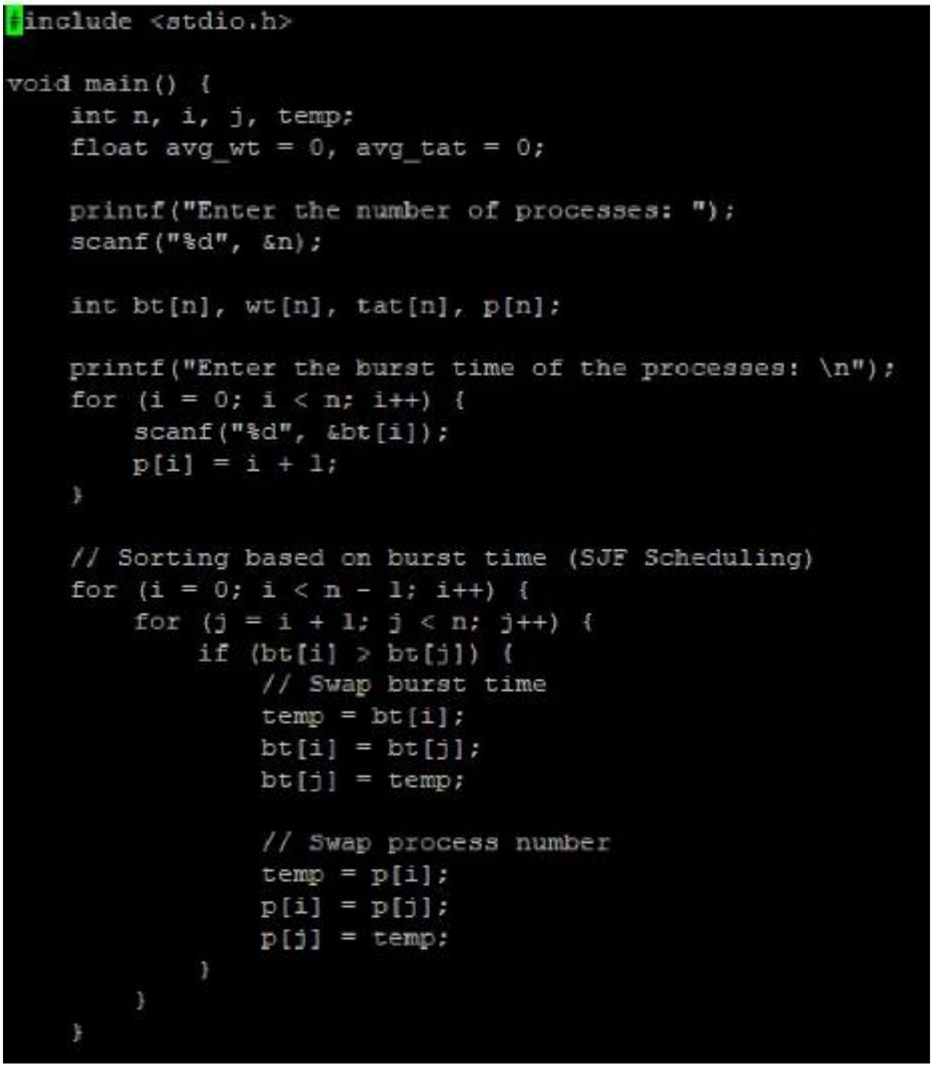
OUTPUT:



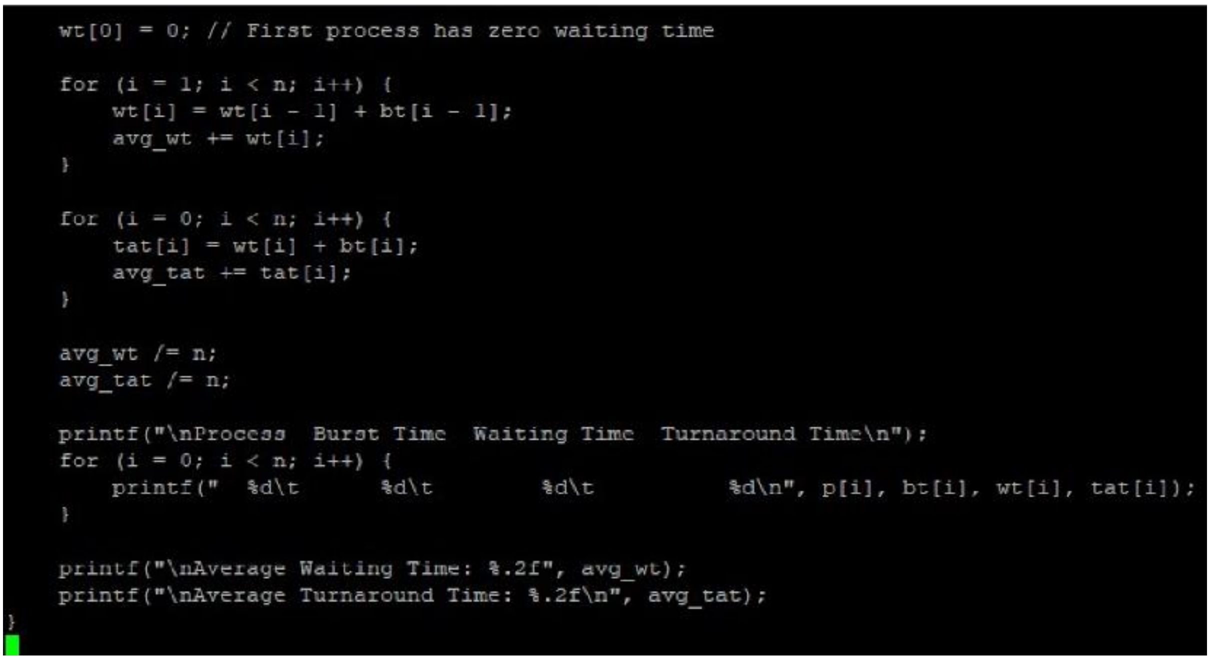
```
[cse66@localhost ~]$ vi fcfs.c
[cse66@localhost ~]$ gcc fcfs.c -o fcfs
[cse66@localhost ~]$ ./fcfs
Enter the number of processes: 3
Enter the burst time of the processes:
23 4 4
Process Burst Time       Waiting Time     Turnaround Time
0                23              0                23
1                4               23               27
2                4               27               31

Average waiting time: 16.67
Average turnaround time: 27.00
[cse66@localhost ~]$ 
```

EXP 6B: SJF

PROGRAM:

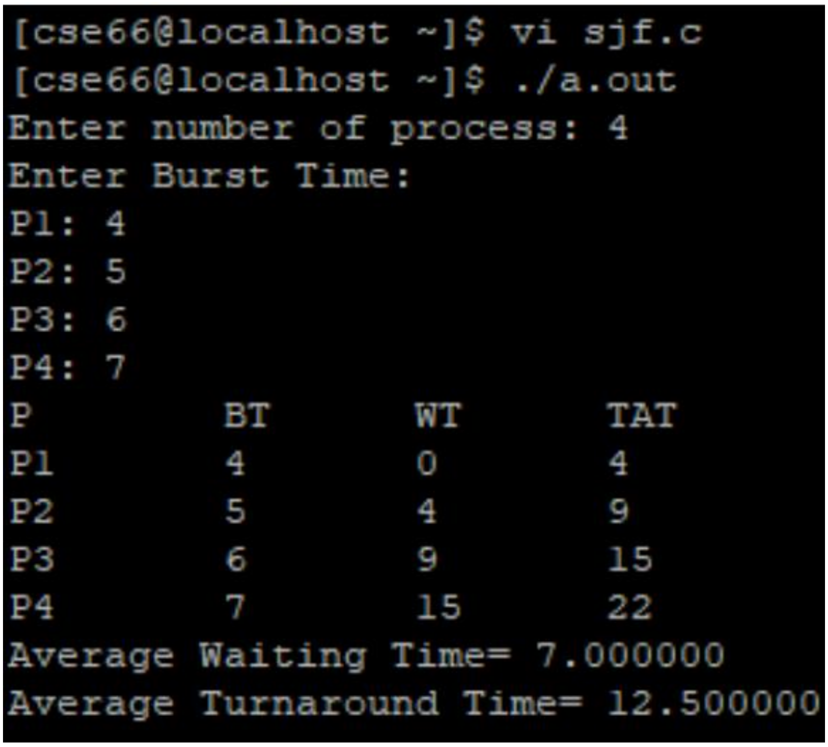


```
#include <stdio.h>

void main() {
    int n, i, j, temp;
    float avg_wt = 0, avg_tat = 0;

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

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

    printf("Enter the burst time of the processes: \n");
    for (i = 0; i < n; i++) {
        scanf("%d", &bt[i]);
        p[i] = i + 1;
    }

    // Sorting based on burst time (SJF Scheduling)
    for (i = 0; i < n - 1; i++) {
        for (j = i + 1; j < n; j++) {
            if (bt[i] > bt[j]) {
                // Swap burst time
                temp = bt[i];
                bt[i] = bt[j];
                bt[j] = temp;

                // Swap process number
                temp = p[i];
                p[i] = p[j];
                p[j] = temp;
            }
        }
    }
```



```
    wt[0] = 0; // First process has zero waiting time

    for (i = 1; i < n; i++) {
        wt[i] = wt[i - 1] + bt[i - 1];
        avg_wt += wt[i];
    }

    for (i = 0; i < n; i++) {
        tat[i] = wt[i] + bt[i];
        avg_tat += tat[i];
    }

    avg_wt /= n;
    avg_tat /= n;

    printf("\nProcess  Burst Time  Waiting Time  Turnaround Time\n");
    for (i = 0; i < n; i++) {
        printf("  %d\t      %d\t         %d\t           %d\n", p[i], bt[i], wt[i], tat[i]);
    }

    printf("\nAverage Waiting Time: %.2f", avg_wt);
    printf("\nAverage Turnaround Time: %.2f\n", avg_tat);
}
```

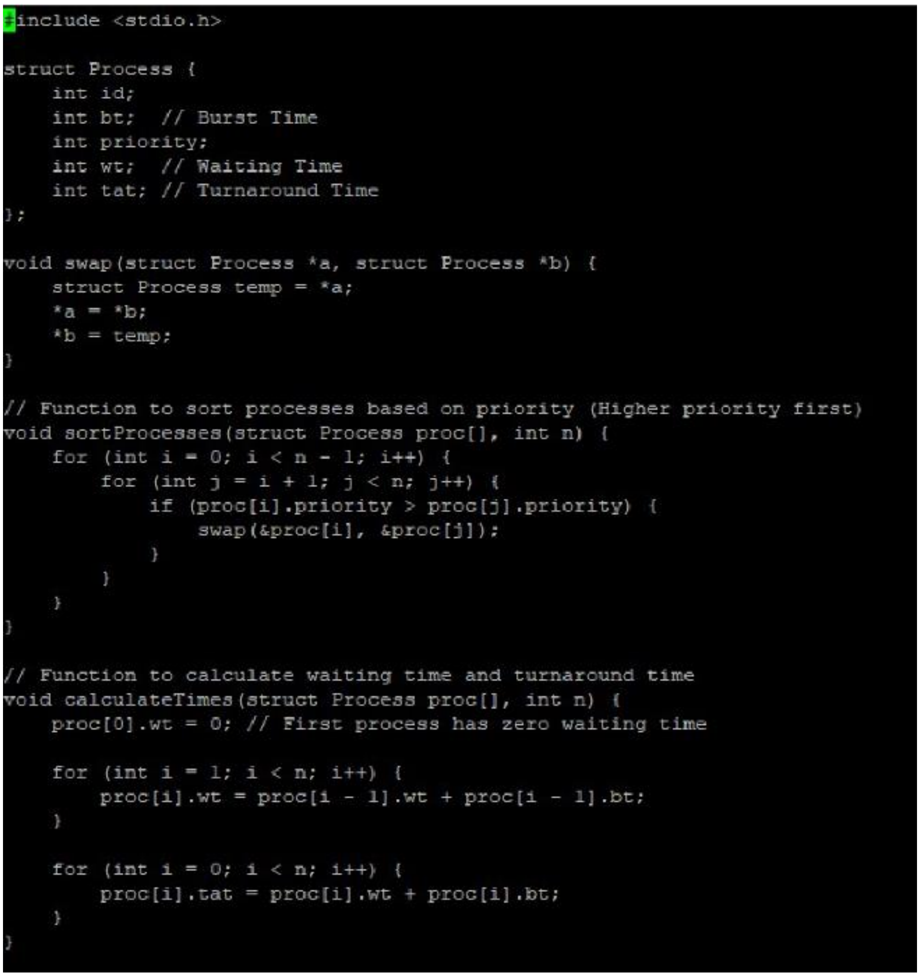
OUTPUT:



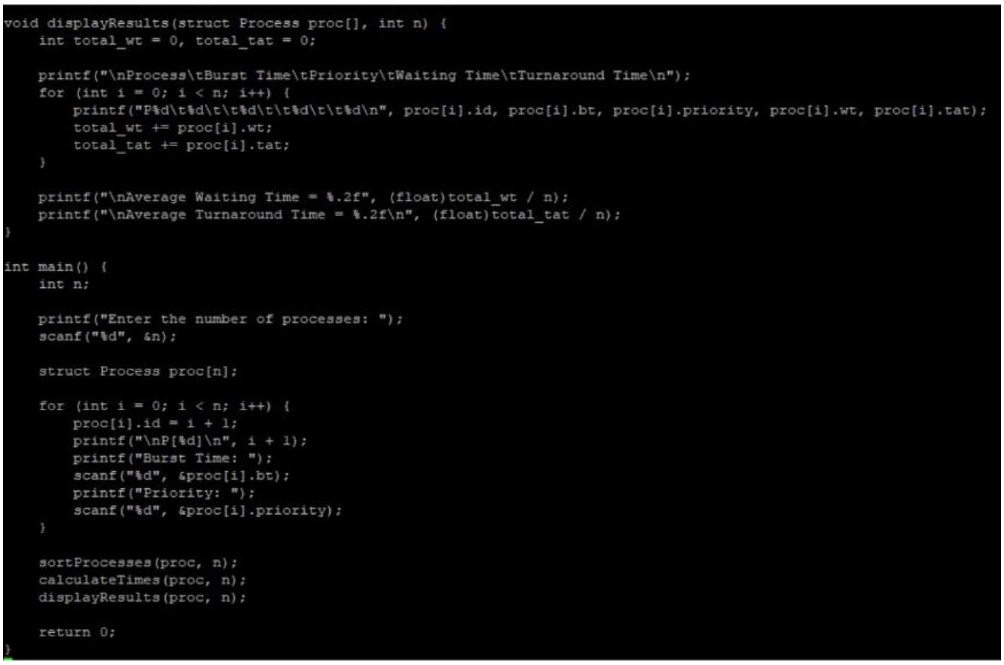
```
[cse66@localhost ~]$ vi sjf.c
[cse66@localhost ~]$ ./a.out
Enter number of process: 4
Enter Burst Time:
P1: 4
P2: 5
P3: 6
P4: 7
P         BT       WT       TAT
P1        4        0        4
P2        5        4        9
P3        6        9        15
P4        7        15       22
Average Waiting Time= 7.000000
Average Turnaround Time= 12.500000
```

EXP NO: 6C PRIORITY

PROGRAM

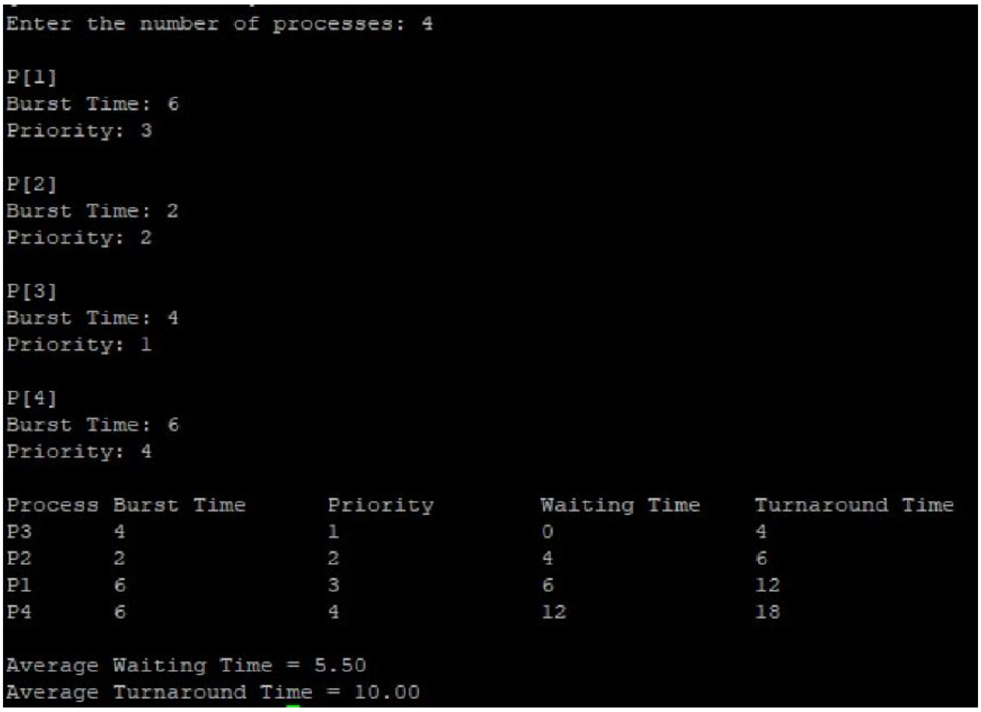


```
#include <stdio.h>

struct Process {
    int id;
    int bt;  // Burst Time
    int priority;
    int wt;  // Waiting Time
    int tat; // Turnaround Time
};

void swap(struct Process *a, struct Process *b) {
    struct Process temp = *a;
    *a = *b;
    *b = temp;
}

// Function to sort processes based on priority (Higher priority first)
void sortProcesses(struct Process proc[], int n) {
    for (int i = 0; i < n - 1; i++) {
        for (int j = i + 1; j < n; j++) {
            if (proc[i].priority > proc[j].priority) {
                swap(&proc[i], &proc[j]);
            }
        }
    }
}

// Function to calculate waiting time and turnaround time
void calculateTimes(struct Process proc[], int n) {
    proc[0].wt = 0; // First process has zero waiting time

    for (int i = 1; i < n; i++) {
        proc[i].wt = proc[i - 1].wt + proc[i - 1].bt;
    }

    for (int i = 0; i < n; i++) {
        proc[i].tat = proc[i].wt + proc[i].bt;
    }
}
```



```
void displayResults(struct Process proc[], int n) {
    int total_wt = 0, total_tat = 0;

    printf("\nProcess\tBurst Time\tPriority\tWaiting Time\tTurnaround Time\n");
    for (int i = 0; i < n; i++) {
        printf("P%d\t%d\t\t%d\t\t%d\t\t%d\n", proc[i].id, proc[i].bt, proc[i].priority, proc[i].wt, proc[i].tat);
        total_wt += proc[i].wt;
        total_tat += proc[i].tat;
    }

    printf("\nAverage Waiting Time = %.2f", (float)total_wt / n);
    printf("\nAverage Turnaround Time = %.2f\n", (float)total_tat / n);
}

int main() {
    int n;

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

    struct Process proc[n];

    for (int i = 0; i < n; i++) {
        proc[i].id = i + 1;
        printf("\nP[%d]\n", i + 1);
        printf("Burst Time: ");
        scanf("%d", &proc[i].bt);
        printf("Priority: ");
        scanf("%d", &proc[i].priority);
    }

    sortProcesses(proc, n);
    calculateTimes(proc, n);
    displayResults(proc, n);

    return 0;
}
```

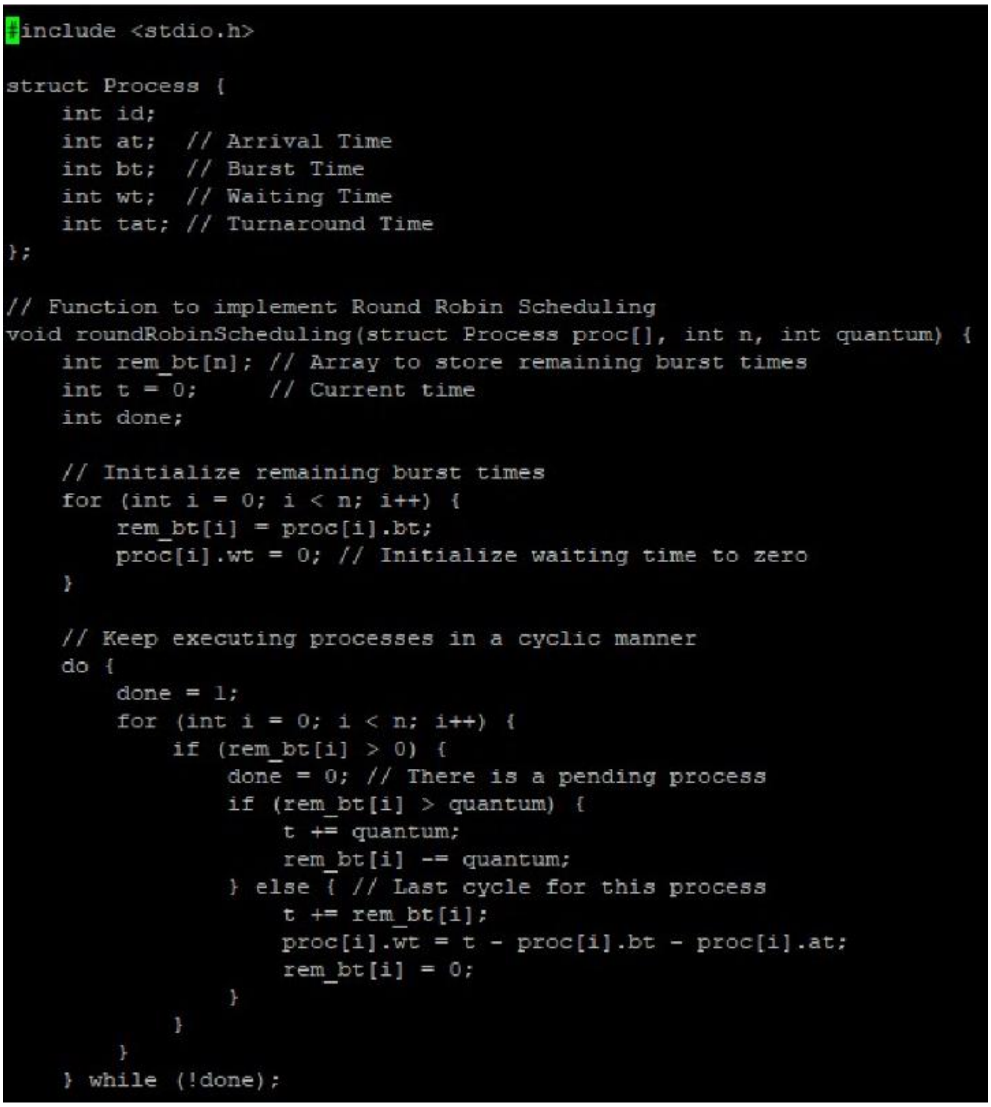
OUTPUT



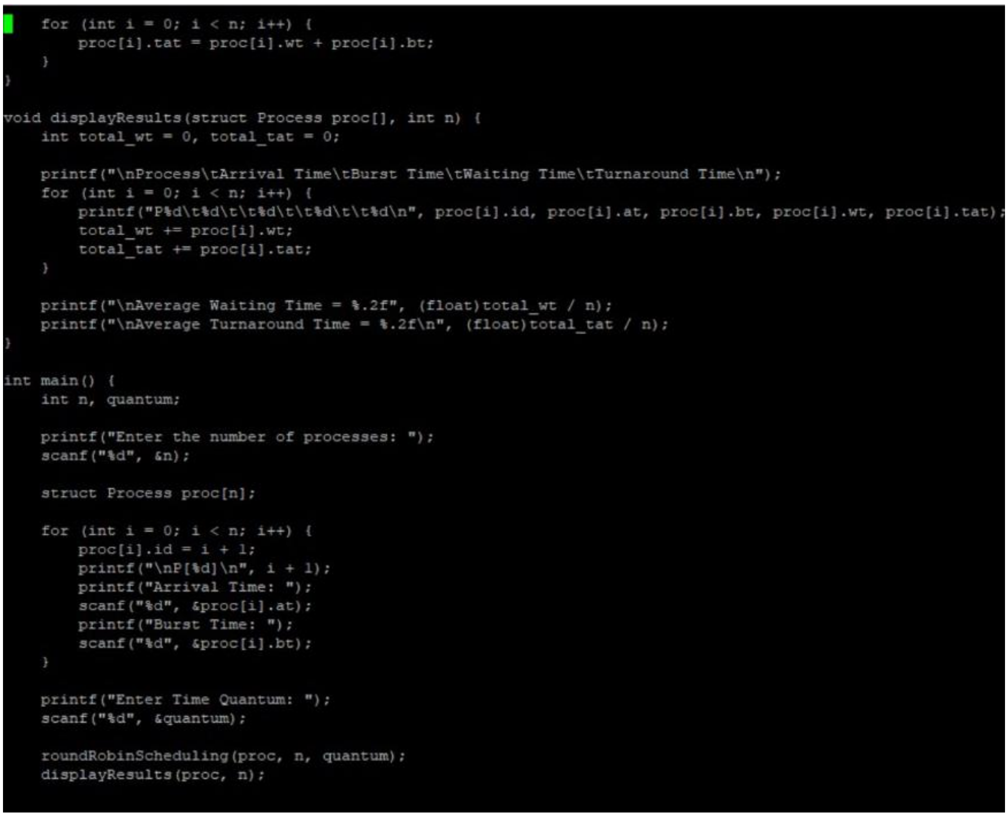
```
Enter the number of processes: 4

P[1]
Burst Time: 6
Priority: 3

P[2]
Burst Time: 2
Priority: 2

P[3]
Burst Time: 4
Priority: 1

P[4]
Burst Time: 6
Priority: 4

Process Burst Time      Priority        Waiting Time    Turnaround Time
P3      4               1               0               4
P2      2               2               4               6
P1      6               3               6               12
P4      6               4               12              18

Average Waiting Time = 5.50
Average Turnaround Time = 10.00
```

EXP NO: 6D ROUND ROBIN

PROGRAM

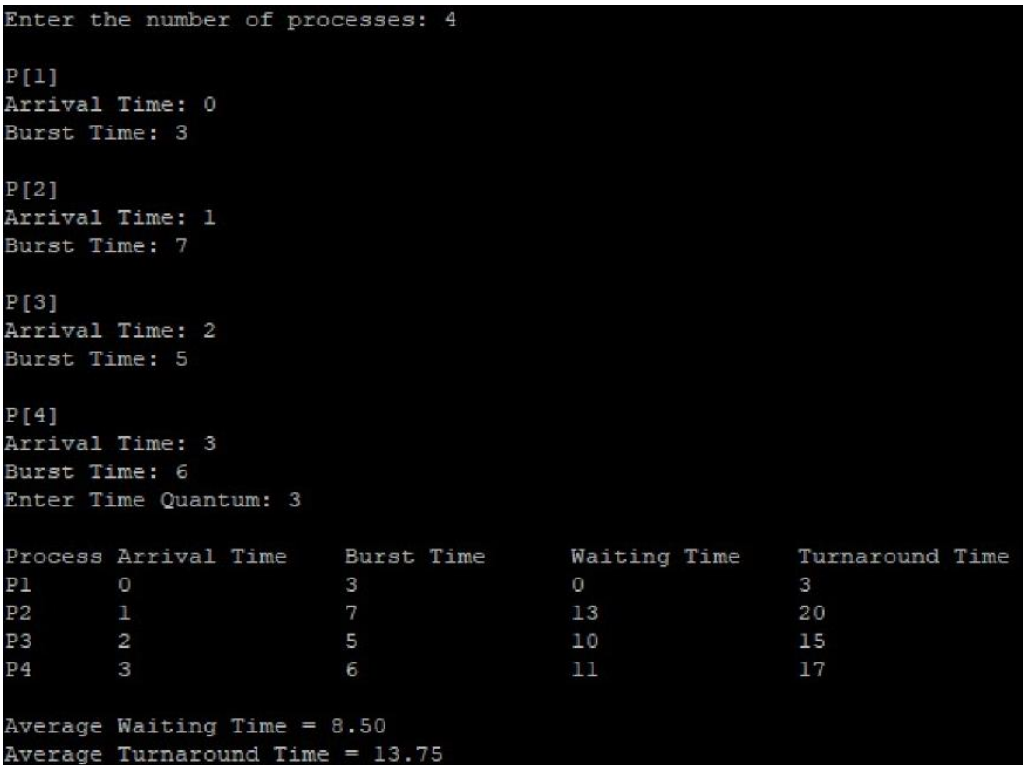


```
#include <stdio.h>

struct Process {
    int id;
    int at;  // Arrival Time
    int bt;  // Burst Time
    int wt;  // Waiting Time
    int tat; // Turnaround Time
};

// Function to implement Round Robin Scheduling
void roundRobinScheduling(struct Process proc[], int n, int quantum) {
    int rem_bt[n]; // Array to store remaining burst times
    int t = 0;     // Current time
    int done;

    // Initialize remaining burst times
    for (int i = 0; i < n; i++) {
        rem_bt[i] = proc[i].bt;
        proc[i].wt = 0; // Initialize waiting time to zero
    }

    // Keep executing processes in a cyclic manner
    do {
        done = 1;
        for (int i = 0; i < n; i++) {
            if (rem_bt[i] > 0) {
                done = 0; // There is a pending process
                if (rem_bt[i] > quantum) {
                    t += quantum;
                    rem_bt[i] -= quantum;
                } else { // Last cycle for this process
                    t += rem_bt[i];
                    proc[i].wt = t - proc[i].bt - proc[i].at;
                    rem_bt[i] = 0;
                }
            }
        }
    } while (!done);
```



```c
    for (int i = 0; i < n; i++) {
        proc[i].tat = proc[i].wt + proc[i].bt;
    }
}

void displayResults(struct Process proc[], int n) {
    int total_wt = 0, total_tat = 0;

    printf("\nProcess\tArrival Time\tBurst Time\tWaiting Time\tTurnaround Time\n");
    for (int i = 0; i < n; i++) {
        printf("P%d\t%d\t\t%d\t\t%d\t\t%d\n", proc[i].id, proc[i].at, proc[i].bt, proc[i].wt, proc[i].tat);
        total_wt += proc[i].wt;
        total_tat += proc[i].tat;
    }

    printf("\nAverage Waiting Time = %.2f", (float)total_wt / n);
    printf("\nAverage Turnaround Time = %.2f\n", (float)total_tat / n);
}

int main() {
    int n, quantum;

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

    struct Process proc[n];

    for (int i = 0; i < n; i++) {
        proc[i].id = i + 1;
        printf("\nP[%d]\n", i + 1);
        printf("Arrival Time: ");
        scanf("%d", &proc[i].at);
        printf("Burst Time: ");
        scanf("%d", &proc[i].bt);
    }

    printf("Enter Time Quantum: ");
    scanf("%d", &quantum);

    roundRobinScheduling(proc, n, quantum);
    displayResults(proc, n);
```

OUTPUT



```
Enter the number of processes: 4

P[1]
Arrival Time: 0
Burst Time: 3

P[2]
Arrival Time: 1
Burst Time: 7

P[3]
Arrival Time: 2
Burst Time: 5

P[4]
Arrival Time: 3
Burst Time: 6
Enter Time Quantum: 3

Process Arrival Time    Burst Time      Waiting Time    Turnaround Time
P1      0               3               0               3
P2      1               7               13              20
P3      2               5               10              15
P4      3               6               11              17

Average Waiting Time = 8.50
Average Turnaround Time = 13.75
```