Ex. No.: 6a)

FIRST COME FIRST SERVE

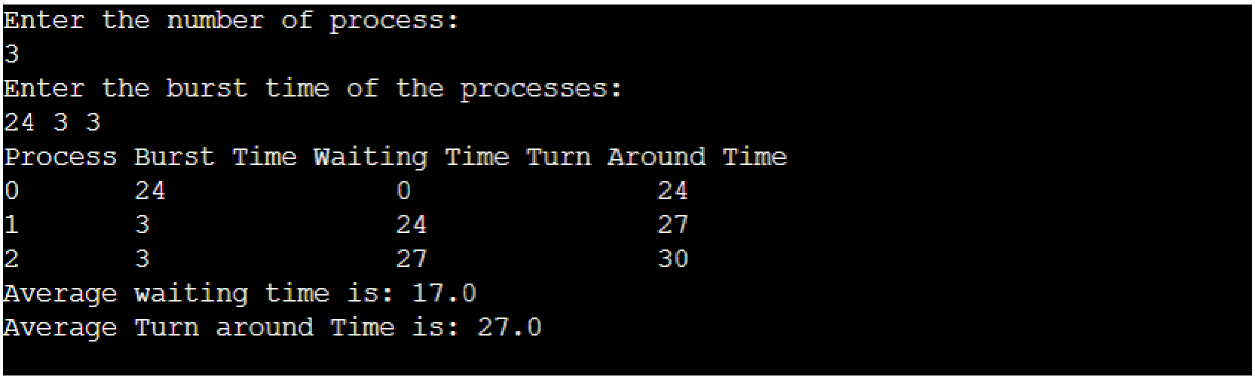
Aim:

To implement First-come First- serve (FCFS) scheduling technique.

PROGRAM :

```
#include <stdio.h>
int main() {
    int n, i;
    int bt[20], wt[20], tat[20];
    float avg_wt = 0, avg_tat = 0;
    printf("Enter the number of process:\n");
    scanf("%d", &n);
    printf("Enter the burst time of the processes:\n");
    for (i = 0; i < n; i++) {
        scanf("%d", &bt[i]);
    }
    wt[0] = 0;
    tat[0] = bt[0];
    for (i = 1; i < n; i++) {
        wt[i] = wt[i - 1] + bt[i - 1];
        tat[i] = wt[i] + bt[i];
    }
    printf("Process Burst Time Waiting Time Turn Around Time\n");
    for (i = 0; i < n; i++) {
        printf("%d\t%d\t\t%d\t\t%d\n", i, bt[i], wt[i], tat[i]);
        avg_wt += wt[i];
        avg_tat += tat[i];
    }
    avg_wt /= n;
    avg_tat /= n;
    printf("Average waiting time is: %.1f\n", avg_wt);
    printf("Average Turn around Time is: %.1f\n", avg_tat);

    return 0;
}
```

OUTPUT :



```
Enter the number of process:
3
Enter the burst time of the processes:
24 3 3
Process Burst Time Waiting Time Turn Around Time
0       24              0               24
1       3               24              27
2       3               27              30
Average waiting time is: 17.0
Average Turn around Time is: 27.0
```

Ex. No.: 6b)

SHORTEST JOB FIRST

Aim:

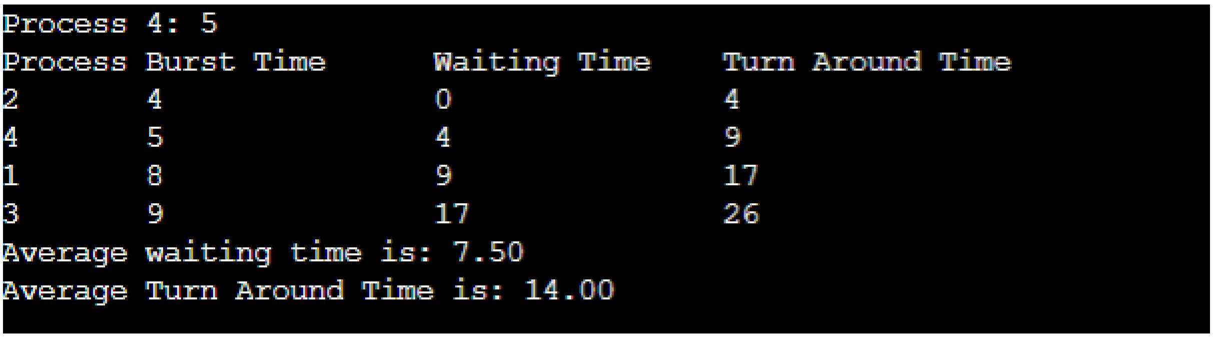
To implement the Shortest Job First (SJF) scheduling technique.

Program Code:

```
#include <stdio.h>

struct Process {
    int pid;  // Process ID
    int burst_time;  // Burst Time
    int waiting_time;  // Waiting Time
    int turn_around_time;  // Turnaround Time
};

void calculate_times(struct Process proc[], int n) {
    int total_waiting_time = 0, total_turn_around_time = 0;

    // Calculating Waiting Time and Turnaround Time
    proc[0].waiting_time = 0;
    proc[0].turn_around_time = proc[0].burst_time;

    for (int i = 1; i < n; i++) {
        proc[i].waiting_time = proc[i - 1].waiting_time + proc[i - 1].burst_time;
        proc[i].turn_around_time = proc[i].waiting_time + proc[i].burst_time;
    }

    // Calculate total waiting time and total turnaround time
    for (int i = 0; i < n; i++) {
        total_waiting_time += proc[i].waiting_time;
        total_turn_around_time += proc[i].turn_around_time;
    }

    // Calculate average waiting time and average turnaround time
    float avg_waiting_time = (float)total_waiting_time / n;
    float avg_turn_around_time = (float)total_turn_around_time / n;

    // Displaying the results
    printf("Process\tBurst Time\tWaiting Time\tTurn Around Time\n");
    for (int i = 0; i < n; i++) {
        printf("%d\t%d\t\t%d\t\t%d\n", proc[i].pid, proc[i].burst_time, proc[i].waiting_time,
proc[i].turn_around_time);
    }
    printf("Average waiting time is: %.2f\n", avg_waiting_time);
    printf("Average Turn Around Time is: %.2f\n", avg_turn_around_time);
}
```

```
int main() {
    int n;

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

    struct Process proc[n];

    // Taking burst time as input for each process
    printf("Enter the burst time of the processes:\n");
    for (int i = 0; i < n; i++) {
        proc[i].pid = i + 1;  // Process ID
        printf("Process %d: ", proc[i].pid);
        scanf("%d", &proc[i].burst_time);
    }

    // Sorting the processes based on burst time in ascending order
    for (int i = 0; i < n - 1; i++) {
        for (int j = i + 1; j < n; j++) {
            if (proc[i].burst_time > proc[j].burst_time) {
                // Swap the processes
                struct Process temp = proc[i];
                proc[i] = proc[j];
                proc[j] = temp;
            }
        }
    }

    // Calculate and display the results
    calculate_times(proc, n);

    return 0;

}
```

Output :



```
Process 4: 5
Process Burst Time      Waiting Time    Turn Around Time
2       4               0               4
4       5               4               9
1       8               9               17
3       9               17              26
Average waiting time is: 7.50
Average Turn Around Time is: 14.00
```

Ex. No.: 6c)

PRIORITY SCHEDULING

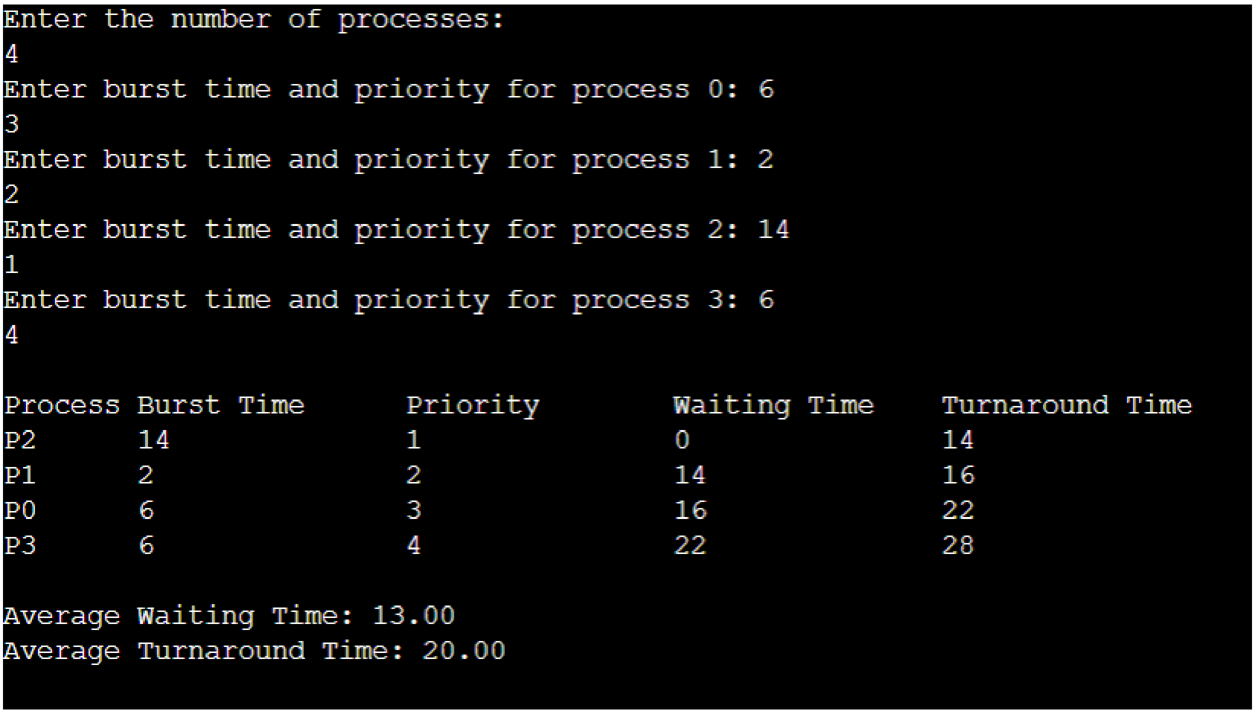
Aim:

To implement priority scheduling technique.

PROGRAM:

```
#include <stdio.h>
struct Process {
    int id;
    int bt;
    int priority;
    int wt;
    int tat;
int main() {
    int n, i, j;
    struct Process p[20];
    float total_wt = 0, total_tat = 0;
    printf("Enter the number of processes:\n");
    scanf("%d", &n);

    for (i = 0; i < n; i++) {
        p[i].id = i;
        printf("Enter burst time and priority for process %d: ", i);
        scanf("%d %d", &p[i].bt, &p[i].priority);
    }
    struct Process temp;
    for (i = 0; i < n - 1; i++) {
        for (j = i + 1; j < n; j++) {
            if (p[i].priority > p[j].priority) {
                temp = p[i];
                p[i] = p[j];
                p[j] = temp;
            }}}
    p[0].wt = 0;
    p[0].tat = p[0].bt;
    for (i = 1; i < n; i++) {
        p[i].wt = p[i - 1].wt + p[i - 1].bt;
        p[i].tat = p[i].wt + p[i].bt;
    }
    printf("\nProcess\tBurst Time\tPriority\tWaiting Time\tTurnaround Time\n");
    for (i = 0; i < n; i++) {
        printf("P%d\t%d\t\t%d\t\t%d\t\t%d\n", p[i].id, p[i].bt, p[i].priority, p[i].wt, p[i].tat);
        total_wt += p[i].wt;
        total_tat += p[i].tat;
    }
    printf("\nAverage Waiting Time: %.2f", total_wt / n);
    printf("\nAverage Turnaround Time: %.2f\n", total_tat / n);

    return 0;
}
```

OUTPUT :



```
Enter the number of processes:
4
Enter burst time and priority for process 0: 6
3
Enter burst time and priority for process 1: 2
2
Enter burst time and priority for process 2: 14
1
Enter burst time and priority for process 3: 6
4

Process Burst Time      Priority        Waiting Time    Turnaround Time
P2      14              1               0               14
P1      2               2               14              16
P0      6               3               16              22
P3      6               4               22              28

Average Waiting Time: 13.00
Average Turnaround Time: 20.00
```

Ex. No.: 6d)

ROUND ROBIN SCHEDULING

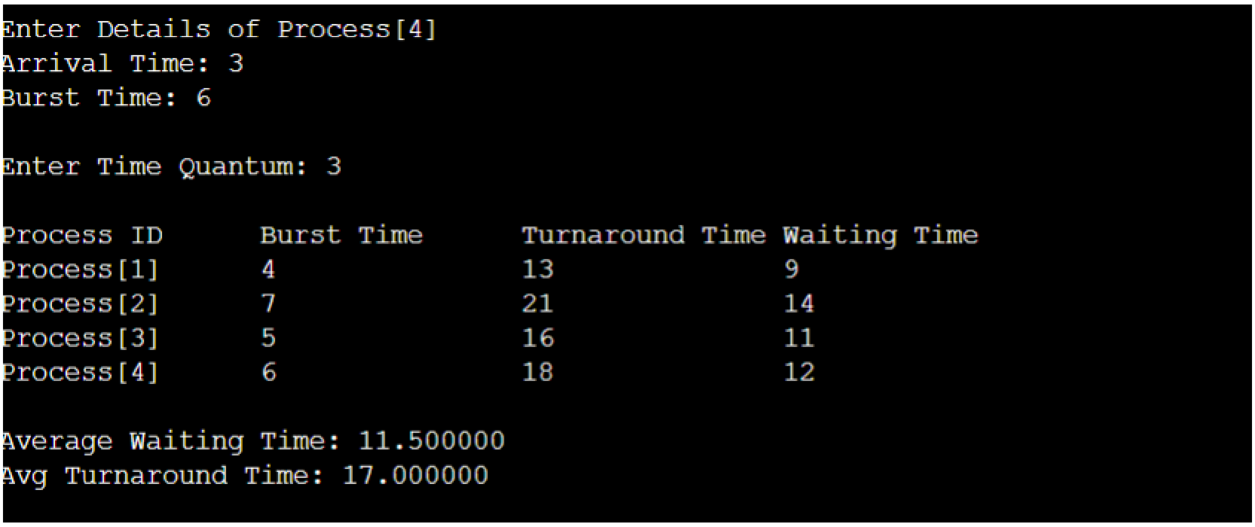
Aim:
To implement the Round Robin (RR) scheduling technique.

PROGRAM:

```
#include <stdio.h>
struct Process {
    int id;
    int arrivalTime;
    int burstTime;
    int remainingTime;
    int waitingTime;
    int turnaroundTime;
};

int main() {
    int n, timeQuantum, time = 0, done;
    printf("Enter Total Number of Processes: ");
    scanf("%d", &n);
    struct Process p[n];
    for (int i = 0; i < n; i++) {
        p[i].id = i + 1;
        printf("\nEnter Details of Process[%d]\n", i + 1);
        printf("Arrival Time: ");
        scanf("%d", &p[i].arrivalTime);
        printf("Burst Time: ");
        scanf("%d", &p[i].burstTime);
        p[i].remainingTime = p[i].burstTime;
        p[i].waitingTime = 0;
        p[i].turnaroundTime = 0;
    }

    printf("\nEnter Time Quantum: ");
    scanf("%d", &timeQuantum);

    int completed = 0;
    while (completed != n) {
        done = 1;
        for (int i = 0; i < n; i++) {
            if (p[i].arrivalTime <= time && p[i].remainingTime > 0) {
                done = 0;
                if (p[i].remainingTime > timeQuantum) {
                    time += timeQuantum;
```

```
          p[i].remainingTime -= timeQuantum;
        } else {
          time += p[i].remainingTime;
          p[i].waitingTime = time - p[i].burstTime - p[i].arrivalTime;
          p[i].turnaroundTime = time - p[i].arrivalTime;
          p[i].remainingTime = 0;
          completed++;
        }}}
    if (done) {time++; } }
  float totalWT = 0, totalTAT = 0;
  printf("\nProcess ID\tBurst Time\tTurnaround Time\tWaiting Time\n");
  for (int i = 0; i < n; i++) {
    printf("Process[%d]\t%d\t\t%d\t\t%d\n", p[i].id, p[i].burstTime, p[i].turnaroundTime,
p[i].waitingTime);
    totalWT += p[i].waitingTime;
    totalTAT += p[i].turnaroundTime;
  }
  printf("\nAverage Waiting Time: %.6f", totalWT / n);
  printf("\nAvg Turnaround Time: %.6f\n", totalTAT / n);

  return 0;}
```

OUTPUT:



```
Enter Details of Process[4]
Arrival Time: 3
Burst Time: 6

Enter Time Quantum: 3

Process ID      Burst Time      Turnaround Time Waiting Time
Process[1]      4               13              9
Process[2]      7               21              14
Process[3]      5               16              11
Process[4]      6               18              12

Average Waiting Time: 11.500000
Avg Turnaround Time: 17.000000
```