Ex. No: 7b
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SHORTEST JOB FIRST

Aim:

To implement the Shortest Job First(SJF) scheduling technique

Algorithm:

1. Declare the structure and its elements.
2. Get number of processes as input from the user.
3. Read the process name, arrival time and burst time
4. Initialize waiting time, turnaround time & flag of read processes to zero.
5. Sort based on burst time of all processes in ascending order 6. Calculate the waiting time and turnaround time for each process.
7. Calculate the average waiting time and average turnaround time.
8. Display the results.

Program Code:

```
#include <stdio.h>

int main()
{
   int A[100][5];
   int i, j, n, total = 0, index, temp;
   float avg_wt, avg_tat;
   printf("Enter number of processes: ");
   scanf("%d", &n);
   printf("Enter Burst Time and Arrival Time:\n");
   for (i = 0; i < n; i++) {
      printf("P%d: ", i + 1);
      scanf("%d %d", &A[i][1], &A[i][4]);
      A[i][0] = i + 1;
   }
   for (i = 0; i < n; i++) {
      index = i;
      for (j = i + 1; j < n; j++) {
         if (A[j][4] < A[index][4])
            index = j;
         else if (A[j][4] == A[index][4] && A[j][1] < A[index][1])
            index = j;
      }
      temp = A[i][1];
      A[i][1] = A[index][1];
      A[index][1] = temp;

      temp = A[i][4];
      A[i][4] = A[index][4];
      A[index][4] = temp;
```

```
        temp = A[i][0];
        A[i][0] = A[index][0];
        A[index][0] = temp;
    }

    A[0][2] = A[0][4];
    total = A[0][2];

    for (i = 1; i < n; i++) {
        A[i][2] = total - A[i][4];
        if (A[i][2] < 0)
            A[i][2] = 0;
        total += A[i][1];
    }

    avg_wt = (float)total / n;
    total = 0;
    printf("P     BT     AT     WT     TAT\n");

    for (i = 0; i < n; i++) {
        A[i][3] = A[i][1] + A[i][2];
        total += A[i][3];
        printf("P%d     %d     %d     %d     %d\n", A[i][0],
            A[i][1], A[i][4], A[i][2], A[i][3]);
    }
    avg_tat = (float)total / n;
    printf("Average Waiting Time= %f", avg_wt);
    printf("\nAverage Turnaround Time= %f", avg_tat);
    return 0;
}
```

Output:

```
Enter number of processes: 4
Enter Burst Time and Arrival Time:
P1: 3 1
P2: 4 2
P3: 2 4
P4: 5 6
P       BT      AT      WT      TAT
P1       3      1       1       4
P2       4      2       0       4
P3       2      4       1       3
P4       5      6       1       6
Average Waiting Time= 3.000000
Average Turnaround Time= 4.250000
```

Result:

Hence the C program to implement the Shortest-Job First (SJF) scheduling technique has been successfully completed and executed.