PROGRAM NUMBER : 07

PROGRAM:

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#include <stdio.h>


int main() {
   int at[10], bt[10], pr[10]; // Arrays for arrival time, burst time, and process IDs
   int n, i, j, temp, time = 0, count, over = 0;
   int sum_wait = 0, sum_turnaround = 0, start;
   float avgwait, avgturn;

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

   // Input arrival time and burst time for each process
   for (i = 0; i < n; i++) {
      printf("Enter the arrival time and execution time for process %d: ", i + 1);
      scanf("%d %d", &at[i], &bt[i]);
      pr[i] = i + 1; // Assign process ID
   }

   // Sort processes by arrival time
   for (i = 0; i < n - 1; i++) {
      for (j = i + 1; j < n; j++) {
         if (at[i] > at[j]) {
            // Swap arrival time
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            temp = at[i];
            at[i] = at[j];
            at[j] = temp;

            // Swap burst time
            temp = bt[i];
            bt[i] = bt[j];
            bt[j] = temp;

            // Swap process ID
            temp = pr[i];
            pr[i] = pr[j];
            pr[j] = temp;
        }
      }
   }

   printf("\n\nProcess\t| Arrival Time\t| Execution Time\t| Start Time\t| End
Time\t| Waiting
Time\t| Turnaround Time\n\n");

   // Execute all processes
   while (over < n) {
      count = 0;

      // Count processes that have arrived by the current time
      for (i = over; i < n; i++) {
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    if (at[i] <= time) {
        count++;
    } else {
        break;
    }
}

// Sort the arrived processes by burst time
if (count > 1) {
    for (i = over; i < over + count - 1; i++) {
        for (j = i + 1; j < over + count; j++) {
            if (bt[i] > bt[j]) {
                // Swap arrival time
                temp = at[i];
                at[i] = at[j];
                at[j] = temp;

                // Swap burst time
                temp = bt[i];
                bt[i] = bt[j];
                bt[j] = temp;

                // Swap process ID
                temp = pr[i];
                pr[i] = pr[j];
                pr[j] = temp;
```

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            }
        }
    }
}

// Process execution
start = time;
time += bt[over];

// Print process details
printf("P[%d]\t|\t%d\t|\t%d\t\t|\t%d\t\t|\t%d\t|\t%d\t\t|\t%d\n",
pr[over],
        at[over], bt[over], start, time, time - at[over] - bt[over], time -
at[over]);

// Update total waiting time and turnaround time
sum_wait += time - at[over] - bt[over];
sum_turnaround += time - at[over];
over++;
}
// Calculate averages
avgwait = (float)sum_wait / (float)n;
avgturn = (float)sum_turnaround / (float)n;
// Print averages
printf("\nAverage Waiting Time: %.2f", avgwait);
printf("\nAverage Turnaround Time: %.2f\n", avgturn);
return 0;
```
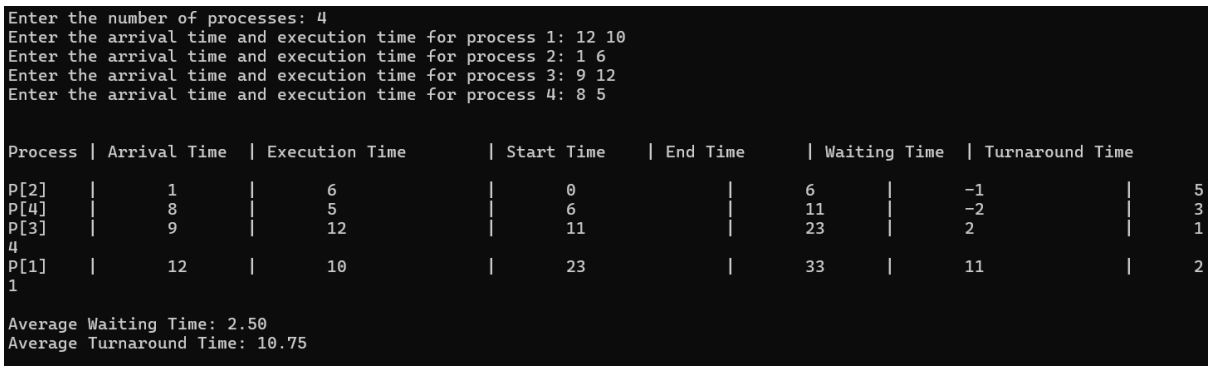

}

OUTPUT:


Enter the number of processes: 4
Enter the arrival time and execution time for process 1: 12 10
Enter the arrival time and execution time for process 2: 1 6
Enter the arrival time and execution time for process 3: 9 12
Enter the arrival time and execution time for process 4: 8 5
Process | Arrival Time | Execution Time | Start Time | End Time | Waiting Time | Turnaround Time
P[2] | 1 | 6 | 0 | 6 | -1 | 5
P[4] | 8 | 5 | 6 | 11 | -2 | 3
P[3] | 9 | 12 | 11 | 23 | 2 | 1
4
P[1] | 12 | 10 | 23 | 33 | 11 | 2
1
Average Waiting Time: 2.50
Average Turnaround Time: 10.75