Ahsanullah University of Science and Technology

Department of Computer Science and Engineering

Program: Bachelor of Science in Computer Science and Engineering

Course No: CSE 3214

Course Title: Operating System Lab

Assignment No: 01

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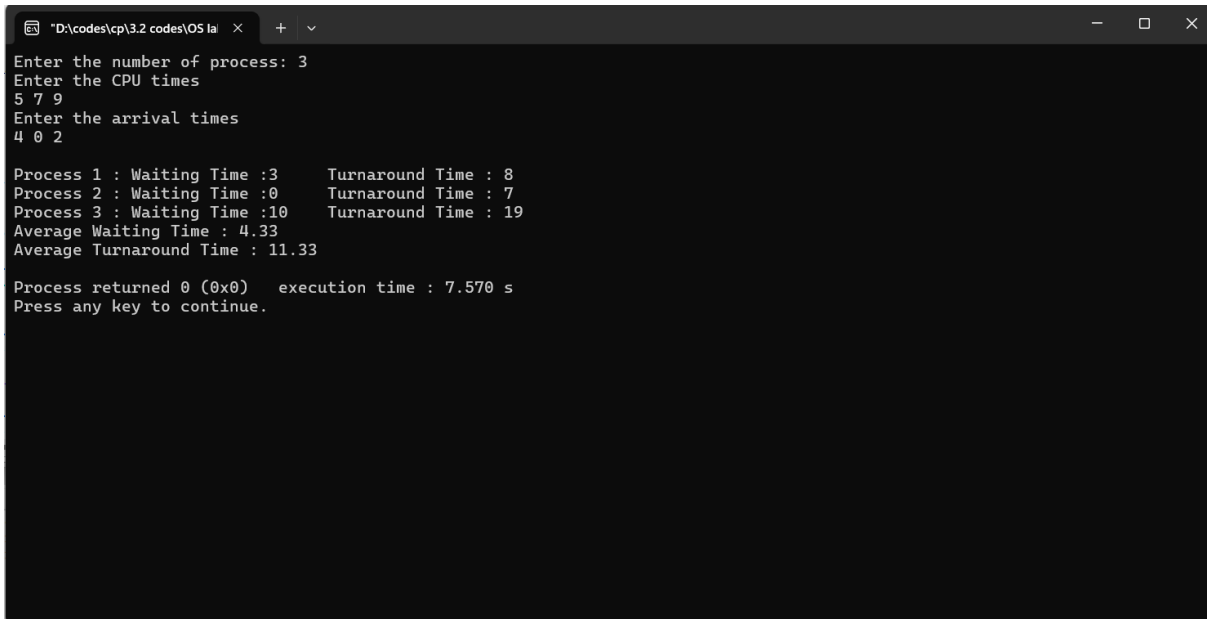
Section: A2

i)Implementation Code:

```
#include<bits/stdc++.h>
using namespace std;


void srtn(vector<int> arrivalTime, vector<int> cpuTime) {
   int n = arrivalTime.size();
   vector<int> waitingTime(n);
   vector<int> turnaroundTime(n);

   vector<int> remainingTime(cpuTime.begin(), cpuTime.end());

   int currentTime = 0;
   int completed = 0;
   int shortest;
   double awt = 0;
   double att = 0;

   while (completed != n) {
      shortest = -1;
      int shortestTime = INT_MAX;

      for (int i = 0; i < n; i++) {
         if (arrivalTime[i] <= currentTime && remainingTime[i] < shortestTime &&
remainingTime[i] > 0) {
            shortestTime = remainingTime[i];
            shortest = i;
         }
      }

      if (shortest == -1) {
         currentTime++;
         continue;
      }

      remainingTime[shortest]--;
      if (remainingTime[shortest] == 0) {
         completed++;
         int endTime = currentTime + 1;
         turnaroundTime[shortest] = endTime - arrivalTime[shortest];
         waitingTime[shortest] = turnaroundTime[shortest] - cpuTime[shortest];
      }
      currentTime++;
   }
```

```
   // Displaying results
   for (int i = 0; i < n; i++) {
      cout <<"Process "<< i + 1 <<" : "<<"Waiting Time :"<< waitingTime[i]
<<"\t"<<"Turnaround Time : "<< turnaroundTime[i] << endl;
   }

   for (int i = 0; i < n; i++) {
      awt += waitingTime[i];
   }
   cout<<"Average Waiting Time : "<<fixed<<setprecision(2)<<(awt/n)<<endl;

   for (int i = 0; i < n; i++) {
      att += turnaroundTime[i];
   }
   cout<<"Average Turnaround Time : "<<fixed<<setprecision(2)<<(att/n)<<endl;
}



int main() {
   int n;
   cout << "Enter the number of process: ";
   cin >> n;

   vector<int> arrivalTime(n);
   vector<int> cpuTime(n);

   cout << "Enter the CPU times"<<endl;
   for (int i = 0; i < n; i++) {
      cin >> cpuTime[i];
   }

   cout << "Enter the arrival times"<<endl;
   for (int i = 0; i < n; i++) {
      cin >> arrivalTime[i];
   }

   cout<<endl;
   srtn(arrivalTime, cpuTime);

   return 0;
}
```

ii)Output:


"D:\codes\cp\3.2 codes\OS la
Enter the number of process: 3
Enter the CPU times
5 7 9
Enter the arrival times
4 0 2
Process 1 : Waiting Time :3 Turnaround Time : 8
Process 2 : Waiting Time :0 Turnaround Time : 7
Process 3 : Waiting Time :10 Turnaround Time : 19
Average Waiting Time : 4.33
Average Turnaround Time : 11.33
Process returned 0 (0x0) execution time : 7.570 s
Press any key to continue.