SJF-preemtive-4

```
import java.util.*;

class SJFPreemptive {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);

        System.out.print("Enter number of processes: ");
        int n = sc.nextInt();

        int pid[] = new int[n], at[] = new int[n], bt[] = new int[n], rt[] = new int[n];
        int wt[] = new int[n], tat[] = new int[n];

        for(int i=0;i<n;i++){
            System.out.print("Process ID: ");
            pid[i]=sc.nextInt();
            System.out.print("Arrival Time: ");
            at[i]=sc.nextInt();
            System.out.print("Burst Time: ");
            bt[i]=sc.nextInt();
            rt[i]=bt[i];
            System.out.println();
        }

        int complete = 0, time = 0, minRemaining, shortest = -1;
        boolean found;
        ArrayList<Integer> order = new ArrayList<>();

        while(complete < n) {
            minRemaining = Integer.MAX_VALUE;
            found = false;
```

```
   for(int i=0; i<n; i++){
      if(at[i] <= time && rt[i] > 0 && rt[i] < minRemaining){
         minRemaining = rt[i];
         shortest = i;
         found = true;
      }
   }

   if(!found) { time++; continue; }

   order.add(pid[shortest]);  // record execution order
   rt[shortest]--;
   time++;

   if(rt[shortest] == 0){
      complete++;
      int finish = time;
      tat[shortest] = finish - at[shortest];
      wt[shortest] = tat[shortest] - bt[shortest];
      if(wt[shortest] < 0) wt[shortest] = 0;
   }
}

double avgWT = 0, avgTAT = 0;
System.out.println("\nPID\tAT\tBT\tWT\tTAT");
for(int i=0;i<n;i++){
   avgWT += wt[i];
   avgTAT += tat[i];
   System.out.println(pid[i]+"\t"+at[i]+"\t"+bt[i]+"\t"+wt[i]+"\t"+tat[i]);
}
```

```
        System.out.println("\nExecution Order:");
        for(int x : order) System.out.print("P"+x+" ");

        System.out.println("\n\nAverage Waiting Time: "+(avgWT/n));
        System.out.println("Average Turnaround Time: "+(avgTAT/n));
    }
}
```