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ROLL NO.:- 46

CLASS/BATCH:- TE-B-2

Practical No:- 04

// Write a program to simulate CPU Scheduling Algorithms: FCFS, SJF (Preemptive), Priority (Non-Preemptive) and Round Robin (Preemptive).

SJF (Preemptive) CODE

```
import java.util.Scanner; class Process {
int pid;    // Process ID int at; // Arrival Time int bt;    // Burst
Time
int ct;    // Completion Time int tat; // Turnaround Time int wt;
// Waiting Time
boolean done; // To mark if process is completed
}

public class SJF {
public static void main(String[] args) { Scanner sc = new
Scanner(System.in);
System.out.print("Enter number of processes: "); int n = sc.nextInt();

Process[] p = new Process[n];

for (int i = 0; i < n; i++) { p[i] = new Process(); p[i].pid = i + 1;
System.out.print("Enter Arrival Time of P" + (i + 1) + ": "); p[i].at
= sc.nextInt();
System.out.print("Enter Burst Time of P" + (i + 1) + ": "); p[i].bt =
sc.nextInt();
}
int completed = 0, currentTime = 0; float totalTAT = 0, totalWT = 0;

// SJF scheduling (non-preemptive) while (completed < n) {
int idx = -1;
int minBT = Integer.MAX_VALUE;

// Find process with minimum BT among arrived & not done for (int i =
0; i < n; i++) {
if (!p[i].done && p[i].at <= currentTime) { if (p[i].bt < minBT) {
minBT = p[i].bt; idx = i;
}
}
}

if (idx == -1) {
// No process arrived yet, increment time currentTime++;
} else {
// Execute selected process p[idx].ct = currentTime + p[idx].bt;
p[idx].tat = p[idx].ct - p[idx].at;
```

```

p[idx].wt = p[idx].tat - p[idx].bt; p[idx].done = true;

currentTime = p[idx].ct; completed++;

totalTAT += p[idx].tat; totalWT += p[idx].wt;
}
}
// Print Table System.out.println("\nPID\tAT\tBT\tCT\tTAT\tWT"); for
(int i = 0; i < n; i++) {
System.out.println("P" + p[i].pid + "\t" + p[i].at + "\t" + p[i].bt +
"\t" +
p[i].ct + "\t" + p[i].tat + "\t" + p[i].wt);
}

System.out.println("\nAverage Turnaround Time = " + (totalTAT / n));
System.out.println("Average Waiting Time = " + (totalWT / n));
}
}

```

OUTPUT :

```

gescoe@gescoe-OptiPlex-3010:~/Desktop/TE_B[46]/LP-1$ javac SJF.java
gescoe@gescoe-OptiPlex-3010:~/Desktop/TE_B[46]/LP-1$ java SJF Enter
number of processes: 3

```

```

Enter Arrival Time of P1: 0

```

```

Enter Burst Time of P1: 5 0

```

```

Enter Arrival Time of P2:

```

```

Enter Burst Time of P2: 3 0

```

```

Enter Arrival Time of P3:

```

```

Enter Burst Time of P3: 8

```

PID	AT	BT	CT	TAT	WT
-----	----	----	----	-----	----

P1	0	5	8	8	3
----	---	---	---	---	---

P2	0	3	3	3	0
----	---	---	---	---	---

P3	0	8	16	16	8
----	---	---	----	----	---

Average Turnaround Time = 9.0 Average Waiting Time = 3.6666667

```

gescoe@gescoe-OptiPlex-3010:~/Desktop/TE_B[46]/LP-1$

```