

# OPERATING SYSTEM (CT-353)

## LAB 2

**NAME: MUHAMMAD SAIM NOMANI**

**ROLL NO: DT-22030**

**3) Implement the Round Robin code and paste the output below.**

```
#include <stdio.h>
// #include <conio.h> // Commented as it's outdated

int main() {
    int i, j, n, bu[10], wa[10], tat[10], t, ct[10], max;
    float awt = 0, att = 0, temp = 0;

    // clrscr(); // Removed or replace with system("cls") if needed

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

    for (i = 0; i < n; i++) {
        printf("\nEnter Burst Time for process %d -- ", i + 1);
        scanf("%d", &bu[i]);
        ct[i] = bu[i]; // Copy burst time for turnaround time calculations
    }

    printf("\nEnter time quantum -- ");
    scanf("%d", &t);

    // Find the maximum burst time
    max = bu[0];
    for (i = 1; i < n; i++) {
        if (max < bu[i]) {
            max = bu[i];
        }
    }

    // Perform round-robin scheduling
    for (j = 0; j < (max / t) + 1; j++) {
        for (i = 0; i < n; i++) {
            if (bu[i] != 0) {
                if (bu[i] <= t) {
                    tat[i] = temp + bu[i];
                    temp = temp + bu[i];
                    bu[i] = 0;
                } else {
                    bu[i] = bu[i] - t;
                    temp = temp + t;
                }
            }
        }
    }
}
```

```

    }

}

// Calculate waiting time and average times
for (i = 0; i < n; i++) {
    wa[i] = tat[i] - ct[i];
    att += tat[i];
    awt += wa[i];
}

// Display results
printf("\nThe Average Turnaround time is -- %f", att / n);
printf("\nThe Average Waiting time is -- %f", awt / n);

printf("\n\tPROCESS\tBURST TIME\tWAITING TIME\tTURNAROUND TIME\n");
for (i = 0; i < n; i++) {
    printf("\t%d\t%d\t\t\t%d\t\t\t%d\n", i + 1, ct[i], wa[i], tat[i]);
}

// getch(); // Removed or replace with system("pause") if needed
return 0;
}

```

Enter the number of processes -- 4

Enter Burst Time for process 1 -- 3

Enter Burst Time for process 2 -- 2

Enter Burst Time for process 3 -- 4

Enter Burst Time for process 4 -- 5

Enter time quantum -- 2

The Average Turnaround time is -- 9.500000

The Average Waiting time is -- 6.000000

PROCESS	BURST TIME	WAITING TIME	TURNAROUND TIME
1	3	6	9
2	2	2	4
3	4	7	11
4	5	9	14

#### 4) Implement the Priority Based Scheduling code and paste the output below.

```
#include <stdio.h>
// #include <conio.h> // Commented as it's outdated

int main() {
    int p[20], bt[20], pri[20], wt[20], tat[20], i, k, n, temp;
    float wtavg, tatavg;

    // clrscr(); // Removed or replace with system("cls") if needed

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

    for (i = 0; i < n; i++) {
        p[i] = i; // Assign process number
        printf("Enter the Burst Time & Priority of Process %d --- ", i);
        scanf("%d %d", &bt[i], &pri[i]);
    }

    // Sorting processes by priority
    for (i = 0; i < n; i++) {
        for (k = i + 1; k < n; k++) {
            if (pri[i] > pri[k]) {
                // Swap process numbers
                temp = p[i];
                p[i] = p[k];
                p[k] = temp;

                // Swap burst times
                temp = bt[i];
                bt[i] = bt[k];
                bt[k] = temp;

                // Swap priorities
                temp = pri[i];
                pri[i] = pri[k];
                pri[k] = temp;
            }
        }
    }

    // Initialize waiting and turnaround times
    wtavg = wt[0] = 0;
    tatavg = tat[0] = bt[0];

    for (i = 1; i < n; i++) {
        wt[i] = wt[i - 1] + bt[i - 1];
        tat[i] = tat[i - 1] + bt[i];

        wtavg += wt[i];
    }
}
```



### a) FCFS CPU SCHEDULING ALGORITHM

```
Enter the number of processes -- 3
Enter Burst Time for Process 0 -- 2
Enter Burst Time for Process 1 -- 6
Enter Burst Time for Process 2 -- 4
```

	PROCESS	BURST TIME	WAITING TIME	TURNAROUND TIME
	P0	2	0	2
	P1	6	2	8
	P2	4	8	12

```
Average Waiting Time -- 3.333333
Average Turnaround Time -- 7.333333
```

### b) SJF CPU SCHEDULING ALGORITHM

```
Enter the number of processes -- 3
Enter Burst Time for Process 0 -- 2
Enter Burst Time for Process 1 -- 6
Enter Burst Time for Process 2 -- 4
```

	PROCESS	BURST TIME	WAITING TIME	TURNAROUND TIME
	P0	2	0	2
	P2	4	2	6
	P1	6	6	12

```
Average Waiting Time -- 2.666667
Average Turnaround Time -- 6.000000
```

### c) ROUND ROBIN CPU SCHEDULING ALGORITHM

```
Enter the number of processes -- 3
Enter Burst Time for process 1 -- 2
Enter Burst Time for process 2 -- 6
Enter Burst Time for process 3 -- 4
Enter time quantum -- 3
```

```
The Average Turnaround time is -- 8.333333
The Average Waiting time is -- 4.333333
```

	PROCESS	BURST TIME	WAITING TIME	TURNAROUND TIME
	1	2	0	2
	2	6	5	11
	3	4	8	12

#### d) PRIORITY CPU SCHEDULING ALGORITHM

Enter the number of processes --- 3

Enter the Burst Time & Priority of Process 0 --- 2

3

Enter the Burst Time & Priority of Process 1 --- 6

1

Enter the Burst Time & Priority of Process 2 --- 4

2

PROCESS	PRIORITY	BURST TIME	WAITING TIME	TURNAROUND TIME
1	1	6	0	6
2	2	4	6	10
0	3	2	10	12

Average Waiting Time is --- 5.333333

Average Turnaround Time is --- 9.333333

#### Comments:

SJF has the lowest average waiting time and average turnaround time whereas Priority has the highest average waiting time and average turnaround time.