End Term Project

On

Design Principles of Operating System (CSE 3249)

Submittedby

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PROJECT 1

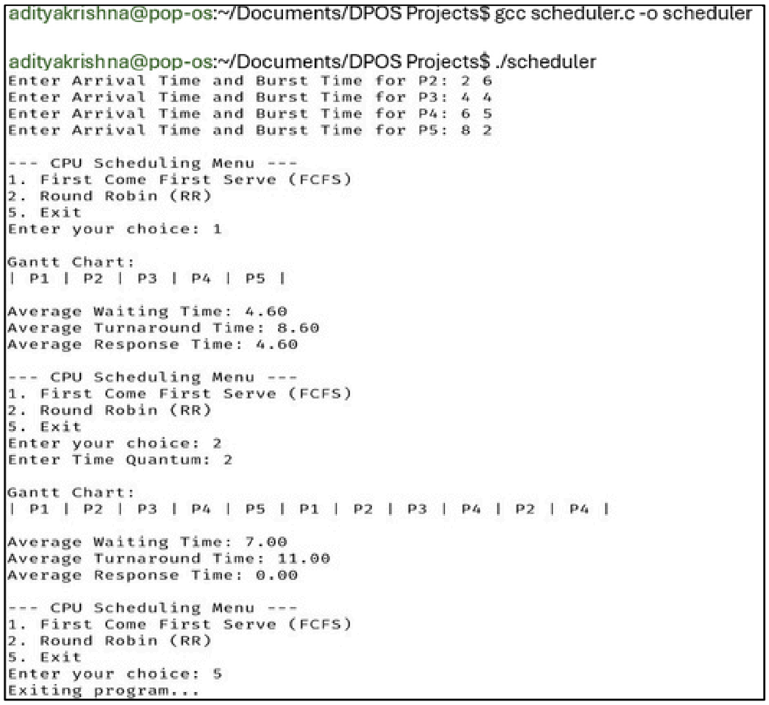
Code-

```
#include <stdio.h>

#define MAX 10

typedef struct {
    int pid;
    int arrival;
    int burst;
    int remaining;
    int start;
    int completion;
    int waiting;
    int turnaround;
    int response;
} Process;
void fcfs(Process p[], int n) {
    int time = 0;
    float avgWT = 0, avgTAT = 0, avgRT = 0;
    printf("\nGantt Chart:\n|");
    for (int i = 0; i < n; i++) {
        if (time < p[i].arrival)
            time = p[i].arrival;
        p[i].start = time;
        p[i].response = p[i].start - p[i].arrival;
        time += p[i].burst;
        p[i].completion = time;
        p[i].turnaround = p[i].completion - p[i].arrival;
        p[i].waiting = p[i].turnaround - p[i].burst;
        printf(" P%d |", p[i].pid);
        avgWT += p[i].waiting;
        avgTAT += p[i].turnaround;
        avgRT += p[i].response;
    }
    printf("\n");
    printf("\nAverage Waiting Time: %.2f", avgWT / n);
    printf("\nAverage Turnaround Time: %.2f", avgTAT / n);
    printf("\nAverage Response Time: %.2f\n", avgRT / n);
}
void roundRobin(Process p[], int n, int tq) {
    int time = 0, completed = 0;
    float avgWT = 0, avgTAT = 0, avgRT = 0;
    for (int i = 0; i < n; i++) {
        p[i].remaining = p[i].burst;
```

```
      p[i].start = -1;
   }
   printf("\nGantt Chart:\n|");
   while (completed < n) {
      int done = 1;
      for (int i = 0; i < n; i++) {
         if (p[i].arrival <= time && p[i].remaining > 0) {
            done = 0;
            if (p[i].start == -1) {
               p[i].start = time;
               p[i].response = p[i].start - p[i].arrival;
            }
            printf(" P%d |", p[i].pid);
            if (p[i].remaining > tq) {
               time += tq;
               p[i].remaining -= tq;
            } else {
               time += p[i].remaining;
               p[i].remaining = 0;
               p[i].completion = time;
               p[i].turnaround = p[i].completion - p[i].arrival;
               p[i].waiting = p[i].turnaround - p[i].burst;
               avgWT += p[i].waiting;
               avgTAT += p[i].turnaround;
               avgRT += p[i].response;
               completed++;
            }
         }
      }
      if (done)
         time++;
   }
   printf("\n");
   printf("\nAverage Waiting Time: %.2f", avgWT / n);
   printf("\nAverage Turnaround Time: %.2f", avgTAT / n);
   printf("\nAverage Response Time: %.2f\n", avgRT / n);
}
int main() {
   int n, choice, tq;
   Process p[MAX];
   printf("Enter number of processes: ");
   scanf("%d", &n);
   for (int i = 0; i < n; i++) {
      printf("Enter Arrival Time and Burst Time for P%d: ", i + 1);
      p[i].pid = i + 1;
      scanf("%d %d", &p[i].arrival, &p[i].burst);
```

```
  }
  do{
    printf("\n--- CPU Scheduling Menu ---");
    printf("\n1. First Come First Serve (FCFS)");
    printf("\n2. Round Robin (RR)");
    printf("\n5. Exit");
    printf("\nEnter your choice: ");
    scanf("%d", &choice);
    switch (choice) {
      case 1:
        fcfs(p, n);
        break;
      case 2:
        printf("Enter Time Quantum: ");
        scanf("%d", &tq);
        roundRobin(p, n, tq);
        break;
      case 5:
        printf("Exiting program...\n");
        break;
      default:
        printf("Invalid choice!\n");
    }
  }while(choice != 5);
  return0;
}
```

OUTPUT



```
adityakrishna@pop-os:~/Documents/DPOS Projects$ gcc scheduler.c -o scheduler

adityakrishna@pop-os:~/Documents/DPOS Projects$ ./scheduler
Enter Arrival Time and Burst Time for P2: 2 6
Enter Arrival Time and Burst Time for P3: 4 4
Enter Arrival Time and Burst Time for P4: 6 5
Enter Arrival Time and Burst Time for P5: 8 2

--- CPU Scheduling Menu ---
1. First Come First Serve (FCFS)
2. Round Robin (RR)
5. Exit
Enter your choice: 1

Gantt Chart:
| P1 | P2 | P3 | P4 | P5 |

Average Waiting Time: 4.60
Average Turnaround Time: 8.60
Average Response Time: 4.60

--- CPU Scheduling Menu ---
1. First Come First Serve (FCFS)
2. Round Robin (RR)
5. Exit
Enter your choice: 2
Enter Time Quantum: 2

Gantt Chart:
| P1 | P2 | P3 | P4 | P5 | P1 | P2 | P3 | P4 | P2 | P4 |

Average Waiting Time: 7.00
Average Turnaround Time: 11.00
Average Response Time: 0.00

--- CPU Scheduling Menu ---
1. First Come First Serve (FCFS)
2. Round Robin (RR)
5. Exit
Enter your choice: 5
Exiting program...
```