Name: Sahin Nayak **Enrollment Number : 12023006015086**

ASSIGNMENT-4

1. Write a C program to simulate a multi-level queue scheduling algorithm considering the following scenario. All the processes in the system are divided into two categories – system processes and user processes. System processes are to be given higher priority than user processes. Use FCFS scheduling for the processes in each queue.

```
#include <stdio.h>
#include <stdlib.h>
#define MAX 10

typedef struct {
   int id;
   int arrival_time;
   int burst_time;
} Process;

void sortByArrivalTime(Process queue[], int n) {
   for (int i = 0; i < n - 1; i++) {
      for (int j = 0; j < n - i - 1; j++) {
         if (queue[j].arrival_time > queue[j + 1].arrival_time) {
            Process temp = queue[j];
            queue[j] = queue[j + 1];
            queue[j + 1] = temp;
         }}}}

void executeQueue(Process queue[], int n, const char* queueName) {
   printf("Executing %s queue (FCFS Scheduling):\n", queueName);
   int time = 0;
   for (int i = 0; i < n; i++) {
      if (time < queue[i].arrival_time) {
         time = queue[i].arrival_time;}
      printf("Process %d executed from time %d to %d\n", queue[i].id, time, time + queue[i].burst_time);
      time += queue[i].burst_time;
   }printf("\n");}

int main() {
   Process systemQueue[MAX], userQueue[MAX];
   int systemCount = 0, userCount = 0, n;
   printf("Enter the number of processes: ");
   scanf("%d", &n);
   for (int i = 0; i < n; i++) {
      int type;
      Process p;
      printf("\nEnter details for Process %d\n", i + 1);
      p.id = i + 1;
      printf("Enter Arrival Time: ");
      scanf("%d", &p.arrival_time);
      printf("Enter Burst Time: ");
      scanf("%d", &p.burst_time);
      printf("Enter Type (0 for System, 1 for User): ");
      scanf("%d", &type);
      if (type == 0) {
         systemQueue[systemCount++] = p;
      }
      else {
         userQueue[userCount++] = p;}}
   sortByArrivalTime(systemQueue, systemCount);
   sortByArrivalTime(userQueue, userCount);
   executeQueue(systemQueue, systemCount, "System");
   executeQueue(userQueue, userCount, "User");
   return 0;
}
```

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```
sahin@sahin-VirtualBox:~/MCA_ASSIGNMENT2$ gedit assign4.c
sahin@sahin-VirtualBox:~/MCA_ASSIGNMENT2$ gcc assign4.c -o assign4
sahin@sahin-VirtualBox:~/MCA_ASSIGNMENT2$ ./assign4
Enter the number of processes: 5

Enter details for Process 1
Enter Arrival Time: 0
Enter Burst Time: 4
Enter Type (0 for System, 1 for User): 0

Enter details for Process 2
Enter Arrival Time: 1
Enter Burst Time: 3
Enter Type (0 for System, 1 for User): 1

Enter details for Process 3
Enter Arrival Time: 2
Enter Burst Time: 1
Enter Type (0 for System, 1 for User): 0

Enter details for Process 4
Enter Arrival Time: 3
Enter Burst Time: 2
Enter Type (0 for System, 1 for User): 1

Enter details for Process 5
Enter Arrival Time: 4
Enter Burst Time: 5
Enter Type (0 for System, 1 for User): 0
Executing System queue (FCFS Scheduling):
Process 1 executed from time 0 to 4
Process 3 executed from time 4 to 5
Process 5 executed from time 5 to 10

Executing User queue (FCFS Scheduling):
Process 2 executed from time 1 to 4
Process 4 executed from time 4 to 6
```