

Student Managment

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Course title

Mastering Embedded System

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INSTRUCTIONS

In this project we aim to have a system where it adds students to a FIFO queue where it can hold up to 50 student.



THE PROCESS

Problem Statement

Write a program to build a simple software for student information management

system which can perform the following operations:

1. Store the first name of the student.
2. Store the Last name of the student.
3. Store the unique Roll number for every student.
4. Store the GPA of every student.
5. Store the courses registered by the student.

Approach

The idea is to form an individual functions for every operation. All the functions are unified together to form software.

1. Add Student Details From File
2. Add Student Details Manually
3. Find the student by the given roll number
4. Find the student by the given first name
5. Find the students registered in a course
6. Count of students
7. Delete a student
8. Update Student

Implementation

- **Add Student Details from File**

Get data from file and add a student to the list of students. While adding the students into the list check for the uniqueness of the roll number.

```
.42 void add_student_file() {
.43     printf("-----\nAdd student by file\n-----\n");
.44
.45     int i, flag = 0;
.46     element_type temp;
.47     element_type *temp2;
.48
.49     students_file = fopen("students.txt", "r");
.50
.51     if (students_file == NULL) {
.52         printf("\n [ERROR] students.txt file not found.");
.53         printf("\n [ERROR] adding students from file failed.");
.54         return;
.55     }
.56
.57     while (fscanf(students_file, "%d %s %s %f %d %d %d %d %d [^\n]", &temp.roll,
.58         &temp.f_name, &temp.l_name, &temp.gpa, &temp.cid[0], &temp.cid[1],
.59         &temp.cid[2], &temp.cid[3], &temp.cid[4]) != EOF)
.60     {
.61         temp2 = FIFO_UART.tail;
.62
.63         for (i = 0; i < FIFO_UART.count; i++) {
.64
.65             if (temp.roll == temp2->roll) {
.66                 printf("[ERROR] roll number %d is already taken\n", temp.roll);
.67                 flag = 1;
.68                 break;
.69             } else {
.70                 flag = 0;
.71                 temp2++;
.72             }
.73         }
.74
.75         if (flag == 0 && FIFO_enqueue(&FIFO_UART, temp) == FIFO_no_error) {
.76             printf("[INFO] Roll number %d is saved successfully.\n", temp.roll);
.77         } else {
.78             printf("[INFO] Error adding student %d details.\n", temp.roll);
.79         }
.80     }
```

```
fifo.c  fifo.h  main.c  students.txt ×
11 mohamed selim 3.6 1 2 3 4 5
22 nesma mohamed 4 5 6 7 8 9
33 omar moustafa 3.8 12 5 47 24 36
44 amgd yasser 3.2 25 41 13 32 11
```

```
Enter the Course ID for each Course.
Course 1 ID: 1
Course 2 ID: 2
Course 3 ID: 3
Course 4 ID: 4
Course 5 ID: 5
[INFO] Student details added successfully.
[INFO] The total number of students is 1.
[INFO] You can add up to 50 students.
[INFO] You can add 49 more students.
```

```
=====
Choose of the following Options
1: Add Student details manually
2: Add Student details from text file
3: Find the student details by Roll number
4: Find the student details by First name
5: Find the student details by Course ID
6: Find the total number of students
7: Delete student by roll number
8: Update student by roll number
9: Show all information
10: To exit
```

```
Enter option number: 2
```

```
-----
Add student by file
-----
```

```
[ERROR] roll number 1 is already taken
[INFO] Error adding student 1 details.
[INFO] Roll number 2 is saved successfully.
[INFO] Roll number 3 is saved successfully.
[INFO] Roll number 4 is saved successfully.
[INFO] The total number of students is 4.
[INFO] You can add up to 50 students.
[INFO] You can add 46 more students.
```


- **Add Student Details Manually:**

Get data from user and add a student to the list of students. While adding the students into the list check for the uniqueness of the roll number.

```

91 void add_student_manually() {
92     element_type temp;
93     element_type *temp2 = FIFO_UART.tail;
94
95     int i;
96
97     printf("-----\nAdd student manually\n-----\n");
98
99     printf("Enter the Roll Number: ");
100    scanf("%d", &temp.roll);
101    getchar();
102
103    //-----check if roll number is taken-----
104
105    for (i = 0; i < FIFO_UART.count; i++) {
106        if (temp.roll == temp2->roll) {
107            printf("[ERROR] roll number %d is already taken\n", temp.roll);
108            return;
109        } else {
110            temp2++;
111        }
112    }
113
114    printf("[INFO] roll number %d is saved successfully\n", temp.roll);
115    printf("Enter the First Name: ");
116    gets(temp.f_name);
117    printf("Enter the Last Name: ");
118    gets(temp.l_name);
119    printf("Enter the GPA: ");
120    scanf("%f", &temp.gpa);
121    getchar();
122    printf("Enter the Course ID for each Course.\n");
123    for (i = 0; i < 5; i++) {
124        printf("Course %d ID: ", i + 1);
125        scanf("%d", &temp.cid[i]);
126        getchar();
127    }
128

```

```

fifo init ====done====
Welcome to student management system

=====
Choose of the following Options
1: Add Student details manually
2: Add Student details from text file
3: Find the student details by Roll number
4: Find the student details by First name
5: Find the student details by Course ID
6: Find the total number of students
7: Delete student by roll number
8: Update student by roll number
9: Show all information
10: To exit

Enter option number: 1
-----
Add student manually
-----
Enter the Roll Number: 1
[INFO] roll number 1 is saved successfully
Enter the First Name: mohamed
Enter the Last Name: selim
Enter the GPA: 3.7
Enter the Course ID for each Course.
Course 1 ID: 1
Course 2 ID: 2
Course 3 ID: 3
Course 4 ID: 4
Course 5 ID: 5
[INFO] Student details added successfully.
[INFO] The total number of students is 1.
[INFO] You can add up to 50 students.
[INFO] You can add 49 more students.

```

- **Find the student by the given roll number:**

This function is to find the student record for the given roll number and print details.

```

188 void find_r1() //find student by roll number
189 {
190     int srchroll, i;
191     element_type *temp2 = FIFO_UART.tail;
192
193     printf("-----\nFind student by roll number.\n-----\n");
194     printf("Enter Student roll number:");
195     scanf("%d", &srchroll);
196     getchar();
197
198     for (i = 0; i < FIFO_UART.count; i++) {
199         if (srchroll == temp2->roll) {
200             printf("The student details are:-\n ");
201
202             printf("First Name: %s\n", temp2->f_name);
203             printf("Last Name: %s\n", temp2->l_name);
204             printf("GPA: %.2f\n", temp2->gpa);
205             printf("Courses registered:-\n");
206             for (i = 0; i < 5; i++) {
207                 printf("Course %d ID: %d\n", i + 1, temp2->cid[i]);
208             }
209             return;
210         }
211         temp2++;
212     }
213
214     printf("[ERROR] Roll number %d not found.", srchroll);
215
216 }

```

Choose of the following Options

- 1: Add Student details manually
- 2: Add Student details from text file
- 3: Find the student details by Roll number
- 4: Find the student details by First name
- 5: Find the student details by Course ID
- 6: Find the total number of students
- 7: Delete student by roll number
- 8: Update student by roll number
- 9: Show all information
- 10: To exit

Enter option number: 3

Find student by roll number.

Enter Student roll number:3

The student details are:-

First Name: omar

Last Name: moustafa

GPA: 3.80

Courses registered:-

Course 1 ID: 12

Course 2 ID: 5

Course 3 ID: 47

Course 4 ID: 24

Course 5 ID: 36

- **Find the student by the given first name.**

This function is to find all the students with the given first name and print their details for the given roll number and print details.

```
7 void find_fn() //find student by first name
8 {
9     int i, flag = 0;
10    char srchname[40];
11    element_type *temp2 = FIFO_UART.tail;
12
13    printf("-----\nFind students by first name.\n-----\n");
14    printf("Enter Student First name:");
15    gets(srchname);
16
17    for (i = 0; i < FIFO_UART.count; i++) {
18        if (strcmp(srchname, temp2->f_name) == 0) {
19            flag = 1;
20            printf("The student details are:-\n ");
21
22            printf("Roll number: %d\n", temp2->roll);
23            printf("First Name: %s\n", temp2->f_name);
24            printf("Last Name: %s\n", temp2->l_name);
25            printf("GPA: %.2f\n", temp2->gpa);
26            printf("Courses registered:-\n");
27            for (i = 0; i < 5; i++) {
28                printf("Course %d ID: %d\n", i + 1, temp2->cid[i]);
29            }
30            temp2++;
31        }
32    }
33    if (flag == 0) {
34        printf("[ERROR] First name %s not found.", srchname);
35    }
36}
```

=====

Choose of the following Options

- 1: Add Student details manually
- 2: Add Student details from text file
- 3: Find the student details by Roll number
- 4: Find the student details by First name
- 5: Find the student details by Course ID
- 6: Find the total number of students
- 7: Delete student by roll number
- 8: Update student by roll number
- 9: Show all information
- 10: To exit

Enter option number: 4

Find students by first name.

Enter Student First name:amgd

The student details are:-

Roll number: 4

First Name: amgd

Last Name: yasser

GPA: 3.20

Courses registered:-

Course 1 ID: 25

Course 2 ID: 41

Course 3 ID: 13

Course 4 ID: 32

Course 5 ID: 11

Choose of the following Options

- 1: Add Student details manually
- 2: Add Student details from text file
- 3: Find the student details by Roll number
- 4: Find the student details by First name
- 5: Find the student details by Course ID
- 6: Find the total number of students
- 7: Delete student by roll number
- 8: Update student by roll number
- 9: Show all information
- 10: To exit

Enter option number: 4

Find students by first name.

Enter Student First name:sally

[ERROR] First name sally not found.

=====

- **Find the students registered in a course**

This function is to find all the students who have registered for a given course.

```

1
2 void find_c() //find students by registered course
3 {
4     int srchCID, i, j, flag = 0;
5     element_type *temp2 = FIFO_UART.tail;
6
7     printf("-----\nFind students by registered course.\n-----\n");
8
9     printf("Enter course ID:");
10    scanf("%d", &srchCID);
11    getchar();
12
13    for (i = 0; i < FIFO_UART.count; i++) {
14        for (j = 0; j < 5; j++) {
15            if (srchCID == temp2->cid[j]) {
16                flag = 1;
17                printf("The student details are:-\n ");
18
19                printf("Roll number: %d\n", temp2->roll);
20                printf("First Name: %s\n", temp2->f_name);
21                printf("Last Name: %s\n", temp2->l_name);
22                printf("GPA: %.2f\n", temp2->gpa);
23                break;
24            }
25        }
26        temp2++;
27    }
28    if (flag == 0) {
29        printf("[ERROR] Course ID %d not found.", srchCID);
30    }
31 }

```

```

-----
Choose of the following Options
1: Add Student details manually
2: Add Student details from text file
3: Find the student details by Roll number
4: Find the student details by First name
5: Find the student details by Course ID
6: Find the total number of students
7: Delete student by roll number
8: Update student by roll number
9: Show all information
10: To exit

```

Enter option number: 5

Find students by registered course.

Enter course ID:5

The student details are:-

Roll number: 1

First Name: mohamed

Last Name: selim

GPA: 4.00

The student details are:-

Roll number: 2

First Name: nesma

Last Name: mohamed

GPA: 4.00

The student details are:-

Roll number: 3

First Name: omar

Last Name: moustafa

GPA: 3.80

Choose of the following Options

1: Add Student details manually

2: Add Student details from text file

3: Find the student details by Roll number

4: Find the student details by First name

5: Find the student details by Course ID

6: Find the total number of students

7: Delete student by roll number

8: Update student by roll number

9: Show all information

10: To exit

Enter option number: 5

Find students by registered course.

Enter course ID:66

[ERROR] Course ID 66 not found.

- **Count of students**

This function to print the total number of students in the system.

```
void tot_s() //count students
{
    printf("-----\nCount the students.\n-----\n");

    printf("[INFO] The total number of students is %d.\n", FIFO_UART.count);
    printf("[INFO] You can add up to %d students.\n", FIFO_UART.length);
    printf("[INFO] You can add %d more students.\n",
           (FIFO_UART.length - FIFO_UART.count));
}
```

=====

Choose of the following Options

- 1: Add Student details manually
- 2: Add Student details from text file
- 3: Find the student details by Roll number
- 4: Find the student details by First name
- 5: Find the student details by Course ID
- 6: Find the total number of students
- 7: Delete student by roll number
- 8: Update student by roll number
- 9: Show all information
- 10: To exit

Enter option number: 6

Count the students.

[INFO] The total number of students is 4.
 [INFO] You can add up to 50 students.
 [INFO] You can add 46 more students.

- **Delete a student**

This function to delete the student record for the given roll number.

```

}
void del_s() //delete a student
{
    printf("-----\nDelete a student.\n-----\n");
    int delroll,i;

    element_type *temp2 = FIFO_UART.base;

    printf("Enter the roll number of the student to be deleted: ");
    scanf("%d",&delroll);
    getchar();

    for (i = 0; i < FIFO_UART.count; i++) {
        if (delroll == temp2->roll) {

            if(FIFO_dequeue(&FIFO_UART,temp2) == FIFO_no_error){
                printf("[INFO] Student %d Removed successfully.",temp2->roll);
            }else{
                printf("[ERROR] The Roll number %d is not found.",delroll);
            }
            return;
        }
        temp2++;
    }
}
void up_s() //update an entry

```

Choose of the following Options

- 1: Add Student details manually
- 2: Add Student details from text file
- 3: Find the student details by Roll number
- 4: Find the student details by First name
- 5: Find the student details by Course ID
- 6: Find the total number of students
- 7: Delete student by roll number
- 8: Update student by roll number
- 9: Show all information
- 10: To exit

Enter option number: 7

Delete a student.

Enter the roll number of the student to be deleted: 3

[INFO] Student 3 Removed successfully.

- **Update Student**

This function is to update the student records. This function does not ask for new details for all fields but the user should be able to pick and choose what he wants to update.

```

8 void up_s() //update an entry
9 {
10     printf("-----\nUpdate an entry.\n-----\n");
11     int uproll,i,choice,course_no;
12     element_type *temp2 = FIFO_UART.tail;
13     char temp[40];
14
15
16     printf("Enter the roll number of student to be updated: ");
17     scanf("%d",&uproll);
18     getchar();
19
20     for (i = 0; i < FIFO_UART.count; i++) {
21         if (uproll == temp2->roll) {
22             printf("1.First name\n"
23                 "2.Last name\n"
24                 "3.Roll no.\n"
25                 "4.GPA\n"
26                 "5.Courses\n");
27             scanf("%d",&choice);
28             getchar();
29             switch (choice) {
30                 case 1:
31                     printf("Enter new first name: ");
32                     gets(temp2->f_name);
33                     break;
34                 case 2:
35                     printf("Enter new last name: ");
36                     gets(temp2->l_name);
37                     break;
38                 case 3:
39                     printf("Enter new roll number: ");
40                     gets(temp);
41                     temp2->roll = atoi(temp);
42                     break;
43             }
44         }
45     }
46 }

```

=====

Choose of the following Options

- 1: Add Student details manually
- 2: Add Student details from text file
- 3: Find the student details by Roll number
- 4: Find the student details by First name
- 5: Find the student details by Course ID
- 6: Find the total number of students
- 7: Delete student by roll number
- 8: Update student by roll number
- 9: Show all information
- 10: To exit

Enter option number: 8

Update an entry.

Enter the roll number of student to be updated: 2

- 1.First name
- 2.Last name
- 3.Roll no.
- 4.GPA
- 5.Courses

1

Enter new first name: sally

[[INFO] UPDATED SUCCESSFULLY.

Find student by roll number.

Enter Student roll number:2

[The student details are:-

First Name: sally

Last Name: mohamed

GPA: 4.00

Courses registered:-

Course 1 ID: 5

Course 2 ID: 6

Course 3 ID: 7

Course 4 ID: 8

Course 5 ID: 9