

Mastering Embedded System Online Diploma

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First Term (Final Project 2)

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1. Problem Statement

Writing 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.

```
//Student Details Structure
struct sinfo
{
    char fname[50];
    char lname[50];
    int roll;
    float GPA;
    int cid[5];
};
```

2. Approach

The idea is to form individual functions for every operation.

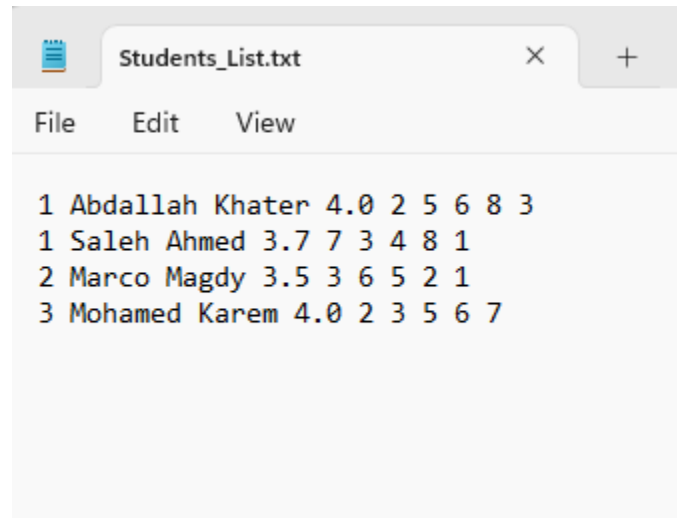
All the functions are unified to form a software.

1. Add the Student Details from Text File.
2. Add the Student Details Manually.
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 a Student's Details by Roll Number.
8. Update a Student's Details by Roll Number.
9. Show all the information.

```
//APIs
void add_student_file();
void add_student_manually();
void find_rl();
void find_fn();
void find_c();
void tot_s();
void del_s();
void up_s();
void show_s();
```

2.1 Add the Student Details from Text File

- Get data from a 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.



```
Students_List.txt
File Edit View

1 Abdallah Khater 4.0 2 5 6 8 3
1 Saleh Ahmed 3.7 7 3 4 8 1
2 Marco Magdy 3.5 3 6 5 2 1
3 Mohamed Kareem 4.0 2 3 5 6 7
```

```
Welcome to the Student Management System
-----
Choose The Task that you want to perform
1. Add the Student Details from Text File
2. Add the Student Details Manually
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 a Student's Details by Roll Number
8. Update a Student's Details by Roll Number
9. Show all the information
10. To Exit
Enter your choice to perform the task: 1
-----
[INFO] Roll Number 1 saved successfully
[ERROR] Roll Number 1 is already taken
[INFO] Roll Number 2 saved successfully
[INFO] Roll Number 3 saved successfully
-----
[INFO] The total number of students is 3
[INFO] You can add up to 55 students
[INFO] You can add 52 more students
-----
```

Enter your choice to perform the task: 9

The Student's Details are:

The Roll Number is 1

The First name is Abdallah

The Last name is Khater

The GPA is 4.000000

ID of each course

Course 1 ID: 2

Course 2 ID: 5

Course 3 ID: 6

Course 4 ID: 8

Course 5 ID: 3

The Student's Details are:

The Roll Number is 2

The First name is Marco

The Last name is Magdy

The GPA is 3.500000

ID of each course

Course 1 ID: 3

Course 2 ID: 6

Course 3 ID: 5

Course 4 ID: 2

Course 5 ID: 1

The Student's Details are:

The Roll Number is 3

The First name is Mohamed

The Last name is Kareem

The GPA is 4.000000

ID of each course

Course 1 ID: 2

Course 2 ID: 3

Course 3 ID: 5

Course 4 ID: 6

Course 5 ID: 7

2.2 Add the Student Details Manually

- Get data from the 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.

```
Enter your choice to perform the task: 2
-----
Add the Students Details
-----
Enter the Roll Number: 6
Enter the first name of the student: Ali
Enter the last name of the student: Ibrahim
Enter obtained GPA of student: 3.7
Enter the course ID of each course
Course 1 ID: 4
Course 2 ID: 6
Course 3 ID: 3
Course 4 ID: 5
Course 5 ID: 8
[INFO] Student Details is added successfully
-----
[INFO] The total number of students is 4
[INFO] You can add up to 55 students
[INFO] You can add 51 more students
-----
```

```
Enter your choice to perform the task: 2
-----
Add the Students Details
-----
Enter the Roll Number: 9
Enter the first name of the student: Abdallah
Enter the last name of the student: Gamal
Enter obtained GPA of student: 3.8
Enter the course ID of each course
Course 1 ID: 2
Course 2 ID: 5
Course 3 ID: 6
Course 4 ID: 8
Course 5 ID: 4
[INFO] Student Details is added successfully
-----
[INFO] The total number of students is 5
[INFO] You can add up to 55 students
[INFO] You can add 50 more students
-----
```

```
Enter your choice to perform the task: 2
-----
Add the Students Details
-----
Enter the Roll Number: 56
[ERROR] Roll number out of bounds! Roll number has to be from [1 - 55]
-----
```

2.3 Find the Student Details by Roll Number

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

```
Enter your choice to perform the task: 3
-----
Enter the Roll number of the student: 3
-----
The Student's Details are:
The First name is Mohamed
The Last name is Kareem
The GPA is 4.000000
ID of each course
Course 1 ID: 2
Course 2 ID: 3
Course 3 ID: 5
Course 4 ID: 6
Course 5 ID: 7
-----
```

```
Enter your choice to perform the task: 3
-----
Enter the Roll number of the student: 5
-----
[ERROR] Roll Number 5 not found!
-----
```


2.4 Find the Student Details by First Name

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

```
Enter your choice to perform the task: 4
-----
Enter the First name of the student: Abdallah
-----
The Student's Details are:
The First name is Abdallah
The Last name is Khater
The GPA is 4.000000
ID of each course
Course 1 ID: 2
Course 2 ID: 5
Course 3 ID: 6
Course 4 ID: 8
Course 5 ID: 3
The Student's Details are:
The First name is Abdallah
The Last name is Gamal
The GPA is 3.800000
ID of each course
Course 1 ID: 2
Course 2 ID: 5
Course 3 ID: 6
Course 4 ID: 8
Course 5 ID: 4
-----
```

```
Enter your choice to perform the task: 4
-----
Enter the First name of the student: Ahmed
-----
[ERROR] First name Ahmed not found!
-----
```

2.5 Find the Student Details by Course ID

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

```
Enter your choice to perform the task: 5
-----
Enter the course ID: 3
-----
The Student's Details are:
The First name is Abdallah
The Last name is Khater
The GPA is 4.000000
-----
The Student's Details are:
The First name is Marco
The Last name is Magdy
The GPA is 3.500000
-----
The Student's Details are:
The First name is Mohamed
The Last name is Karem
The GPA is 4.000000
-----
The Student's Details are:
The First name is Ali
The Last name is Ibrahim
The GPA is 3.700000
-----
```

```
Enter your choice to perform the task: 5
-----
Enter the course ID: 10
-----
[ERROR] Course ID 10 not found!
-----
```

2.6 Find the Total number of Students

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

```
Enter your choice to perform the task: 6
-----
[INFO] The total number of students is 5
[INFO] You can add up to 55 students
[INFO] You can add 50 more students
-----
```

2.7 Delete a Student's Details by Roll Number

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

```
Enter your choice to perform the task: 7
-----
Enter the Roll Number which you want to delete: 9
-----
[INFO] STUDENT DELETED!
-----
```

```
Enter your choice to perform the task: 7
-----
Enter the Roll Number which you want to delete: 8
-----
[ERROR] This Roll Number 8 is not found!
-----
```

2.8 Update a Student's Details by Roll Number

- 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.

```
Enter your choice to perform the task: 8
-----
Enter the Roll Number to update the entry: 6
-----
which info do you want to update?
1. First Name
2. Last Name
3. Roll Number
4. GPA
5. Course IDs
choose from [1 - 5]: 1
Enter the new first name: Khalid
[INFO] UPDATED SUCCESSFULLY!
-----
```

```
Enter your choice to perform the task: 8
-----
Enter the Roll Number to update the entry: 6
-----
which info do you want to update?
1. First Name
2. Last Name
3. Roll Number
4. GPA
5. Course IDs
choose from [1 - 5]: 3
Enter the new roll number: 10
[INFO] UPDATED SUCCESSFULLY!
-----
```

```
Enter your choice to perform the task: 3
-----
Enter the Roll number of the student: 10
-----
The Student's Details are:
The First name is Khalid
The Last name is Ibrahim
The GPA is 3.700000
ID of each course
Course 1 ID: 4
Course 2 ID: 6
Course 3 ID: 3
Course 4 ID: 5
Course 5 ID: 8
-----
```

2.9 Show all the information

- This function is to print all the student records registered in the system.

```
Enter your choice to perform the task: 9
```

```
-----
```

```
The Student's Details are:
```

```
The Roll Number is 1
```

```
The First name is Abdallah
```

```
The Last name is Khater
```

```
The GPA is 4.000000
```

```
ID of each course
```

```
Course 1 ID: 2
```

```
Course 2 ID: 5
```

```
Course 3 ID: 6
```

```
Course 4 ID: 8
```

```
Course 5 ID: 3
```

```
-----
```

```
The Student's Details are:
```

```
The Roll Number is 2
```

```
The First name is Marco
```

```
The Last name is Magdy
```

```
The GPA is 3.500000
```

```
ID of each course
```

```
Course 1 ID: 3
```

```
Course 2 ID: 6
```

```
Course 3 ID: 5
```

```
Course 4 ID: 2
```

```
Course 5 ID: 1
```

```
-----
```

```
The Student's Details are:
```

```
The Roll Number is 3
```

```
The First name is Mohamed
```

```
The Last name is Kareem
```

```
The GPA is 4.000000
```

```
ID of each course
```

```
Course 1 ID: 2
```

```
Course 2 ID: 3
```

```
Course 3 ID: 5
```

```
Course 4 ID: 6
```

```
Course 5 ID: 7
```

```
-----
```

```
The Student's Details are:
```

```
The Roll Number is 10
```

```
The First name is Khalid
```

```
The Last name is Ibrahim
```

```
The GPA is 3.700000
```

```
ID of each course
```

```
Course 1 ID: 4
```

```
Course 2 ID: 6
```

```
Course 3 ID: 3
```

```
Course 4 ID: 5
```

```
Course 5 ID: 8
```

```
-----
```