

Mastering Embedded System Online Diploma

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First Term (Final project 1)

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Student management using queue

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.

Software implementation:

Nine functions will be implemented and unified to build this system.

● **System User Interface:**

```
Choose the task that you want to perform
1. Add the student details manually
2. Add the student details from text file
3. Find the student details by roll number
4. Find the students details by first name
5. Find the students details by course ID
6. Find the total number of students
7. Delete the student details by roll number
8. Update the student details by roll number
9. Show all information
10. Exit
Enter your choice to perform the task:
```

1. Add a student manually.

Cases:

- A student with unique roll number:

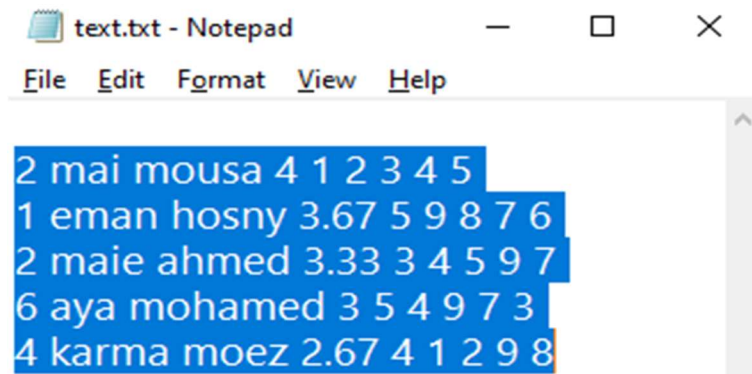
```
Enter your choice to perform the task: 1
-----
Enter the Roll Number: 5
Enter the first name of student: Keroles
Enter the last name of student: Shenouda
Enter the GPA you obtained: 2.33
Enter the course ID of each course
Course 1 id: 9
Course 2 id: 7
Course 3 id: 3
Course 4 id: 1
Course 5 id: 5
[INFO] Student's details are added successfully
-----
[INFO] The total number of students is 1
[INFO] You can add up to 55 students
[INFO] You can add 54 more students
```

- A student with repeated roll number:

```
Enter your choice to perform the task: 1
-----
Enter the Roll Number: 5
[ERROR] Roll Number 5 is already taken
```

2. Add students from text file.

- Text file: includes a repeated roll number.



```
text.txt - Notepad
File Edit Format View Help
2 mai mousa 4 1 2 3 4 5
1 eman hosny 3.67 5 9 8 7 6
2 maie ahmed 3.33 3 4 5 9 7
6 aya mohamed 3 5 4 9 7 3
4 karma moez 2.67 4 1 2 9 8
```

Enter your choice to perform the task: 2

```
-----  
[INFO] Roll number 2 saved successfully  
[INFO] Roll number 1 saved successfully  
[ERROR] Roll number 2 is already taken  
[INFO] Roll number 6 saved successfully  
[INFO] Roll number 4 saved successfully  
[INFO] Students details are saved successfully  
-----  
[INFO] The total number of students is 5  
[INFO] You can add up to 55 students  
[INFO] You can add 50 more students
```

- All students registered:

Enter your choice to perform the task: 9

```
-----  
Student first name: Keroles  
Student last name: Shenouda  
Student roll number: 5  
Student GPA number: 2.33  
The courses IDs are: 9 7 3 1 5  
-----
```

```
-----  
Student first name: mai  
Student last name: mousa  
Student roll number: 2  
Student GPA number: 4.00  
The courses IDs are: 1 2 3 4 5  
-----
```

```
-----  
Student first name: eman  
Student last name: hosny  
Student roll number: 1  
Student GPA number: 3.67  
The courses IDs are: 5 9 8 7 6  
-----
```

```
-----  
Student first name: aya  
Student last name: mohamed  
Student roll number: 6  
Student GPA number: 3.00  
The courses IDs are: 5 4 9 7 3  
-----
```

```
-----  
Student first name: karma  
Student last name: moez  
Student roll number: 4  
Student GPA number: 2.67  
The courses IDs are: 4 1 2 9 8  
-----
```

3. Find a student by the given roll number.

Cases:

- Roll number is registered.

```
Enter your choice to perform the task: 3
-----
Enter the roll number of the student: 1
The student details are:
The first name is eman
The last name is hosny
The GPA is 3.67
The courses IDs are:5 9 8 7 6
```

- Roll number is not registered.

```
Enter your choice to perform the task: 3
-----
Enter the roll number of the student: 15
[ERROR] Roll number 15 not found
```

4. Find a student by the given first name.

- First name is registered.

```
Enter your choice to perform the task: 4
-----
Enter the first name of the student: mai
The student's details are:
The first name is mai
The last name is mousa
The roll number is 2
The GPA is 4.00
The courses IDs are:1 2 3 4 5
```

- First name is not registered.

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


5. Find the students registered in a course by the given course ID.

- Course ID is registered.

```
Enter your choice to perform the task: 5
-----
Enter the course ID: 5
The student's details are:
The first name is Keroles
The last name is Shenouda
The roll number is 5
The GPA is 2.33
The student's details are:
The first name is mai
The last name is mousa
The roll number is 2
The GPA is 4.00
The student's details are:
The first name is eman
The last name is hosny
The roll number is 1
The GPA is 3.67
The student's details are:
The first name is aya
The last name is mohamed
The roll number is 6
The GPA is 3.00
[INFO] Total number of students enrolled: 4
```

- Course ID is not registered.

```
Enter your choice to perform the task: 5
-----
Enter the course ID: 18
[ERROR] course id 18 not found
```

6. Find the total number of registered students.

```
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
```

7. Delete a student by the given roll number.

Cases:

- Roll number is registered.

```
Enter your choice to perform the task: 7
-----
Enter the roll number which you want to delete: 5
[INFO] The roll number 5 is removed successfully

Enter your choice to perform the task: 6
-----
[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: 9
-----

Student first name: mai
Student last name: mousa
Student roll number: 2
Student GPA number: 4.00
The courses IDs are: 1 2 3 4 5
-----

Student first name: eman
Student last name: hosny
Student roll number: 1
Student GPA number: 3.67
The courses IDs are: 5 9 8 7 6
-----

Student first name: aya
Student last name: mohamed
Student roll number: 6
Student GPA number: 3.00
The courses IDs are: 5 4 9 7 3
-----

Student first name: karma
Student last name: moez
Student roll number: 4
Student GPA number: 2.67
The courses IDs are: 4 1 2 9 8
-----
```

- Roll number is not registered.

```
Enter your choice to perform the task: 7
```

```
-----  
Enter the roll number which you want to delete: 9  
[ERROR] This roll number 9 not found
```

```
Enter your choice to perform the task: 6
```

```
-----  
[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: 9
```

```
-----  
Student first name: mai  
Student last name: mousa  
Student roll number: 2  
Student GPA number: 4.00  
The courses IDs are: 1 2 3 4 5
```

```
-----  
Student first name: eman  
Student last name: hosny  
Student roll number: 1  
Student GPA number: 3.67  
The courses IDs are: 5 9 8 7 6
```

```
-----  
Student first name: aya  
Student last name: mohamed  
Student roll number: 6  
Student GPA number: 3.00  
The courses IDs are: 5 4 9 7 3
```

```
-----  
Student first name: karma  
Student last name: moez  
Student roll number: 4  
Student GPA number: 2.67  
The courses IDs are: 4 1 2 9 8
```


8. Update a student information by the given roll number.

Cases:

- Roll number is registered.
 - * Update first name.

```
Student first name: karma
Student last name: moez
Student roll number: 4
Student GPA number: 2.67
The courses IDs are: 4 1 2 9 8
```

```
Enter your choice to perform the task: 8
```

```
-----
Enter the roll number to update the entry: 4
```

1. First name
2. Last name
3. Roll number
4. GPA
5. Courses

```
1
```

```
Enter the first name: razan
[INFO] UPDATED SUCCESSFULLY.
```

```
Student first name: razan
Student last name: moez
Student roll number: 4
Student GPA number: 2.67
The courses IDs are: 4 1 2 9 8
```

- * Update last name.

```
Student first name: mai
Student last name: mousa
Student roll number: 2
Student GPA number: 4.00
The courses IDs are: 1 2 3 4 5
```

```
Enter your choice to perform the task: 8
```

```
-----
Enter the roll number to update the entry: 2
```

1. First name
2. Last name
3. Roll number
4. GPA
5. Courses

```
2
```

```
Enter the last name: mahmoud
[INFO] UPDATED SUCCESSFULLY.
```

```
Student first name: mai
Student last name: mahmoud
Student roll number: 2
Student GPA number: 4.00
The courses IDs are: 1 2 3 4 5
```

* Update roll number.

```
Student first name: eman
Student last name: hosny
Student roll number: 1
Student GPA number: 3.67
The courses IDs are: 5 9 8 7 6
```

Enter your choice to perform the task: 8

Enter the roll number to update the entry: 1

1. First name
2. Last name
3. Roll number
4. GPA
5. Courses

3

Enter the roll number: 8
[INFO] UPDATED SUCCESSFULLY.

```
Student first name: eman
Student last name: hosny
Student roll number: 8
Student GPA number: 3.67
The courses IDs are: 5 9 8 7 6
```

* Update GPA.

```
Student first name: mai
Student last name: mahmoud
Student roll number: 2
Student GPA number: 4.00
The courses IDs are: 1 2 3 4 5
```

Enter your choice to perform the task: 8

Enter the roll number to update the entry: 2

1. First name
2. Last name
3. Roll number
4. GPA
5. Courses

4

Enter the GPA: 1
[INFO] UPDATED SUCCESSFULLY.

```
Student first name: mai
Student last name: mahmoud
Student roll number: 2
Student GPA number: 1.00
The courses IDs are: 1 2 3 4 5
```

* Update Courses' IDs.

```
Student first name: aya
Student last name: mohamed
Student roll number: 6
Student GPA number: 3.00
The courses IDs are: 5 4 9 7 3
```

```
Enter your choice to perform the task: 8
```

```
-----
Enter the roll number to update the entry: 6
```

1. First name
2. Last name
3. Roll number
4. GPA
5. Courses

```
5
Enter the courses' IDs:
```

```
Course 1 ID is : 9
```

```
Course 2 ID is : 1
```

```
Course 3 ID is : 4
```

```
Course 4 ID is : 3
```

```
Course 5 ID is : 6
```

```
[INFO] UPDATED SUCCESSFULLY.
```

```
Student first name: aya
Student last name: mohamed
Student roll number: 6
Student GPA number: 3.00
The courses IDs are: 9 1 4 3 6
```

- Roll number is not registered.

```
Enter your choice to perform the task: 8
```

```
-----
Enter the roll number to update the entry: 17
```

```
[ERROR] This roll number 17 not found
```

9. Show all the information of the registered students.

Enter your choice to perform the task: 9

```
-----  
Student first name: mai  
Student last name: mahmoud  
Student roll number: 2  
Student GPA number: 1.00  
The courses IDs are: 1 2 3 4 5  
-----
```

```
Student first name: eman  
Student last name: hosny  
Student roll number: 8  
Student GPA number: 3.67  
The courses IDs are: 5 9 8 7 6  
-----
```

```
Student first name: aya  
Student last name: mohamed  
Student roll number: 6  
Student GPA number: 3.00  
The courses IDs are: 9 1 4 3 6  
-----
```

```
Student first name: razan  
Student last name: moez  
Student roll number: 4  
Student GPA number: 2.67  
The courses IDs are: 4 1 2 9 8  
-----
```

10. Exit the software.

Enter your choice to perform the task: 10

```
-----  
Exiting ...
```