

Mastering Embedded Systems Online Diploma

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First-term (Final Project 2)

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Student Information Management System

- **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 manually.
2. Add student details from file.
3. Find the student by the given roll number.
4. Find the student by the given first name.
5. Find the student registered in a course.
6. Count of students.
7. Delete a student.
8. Update student.

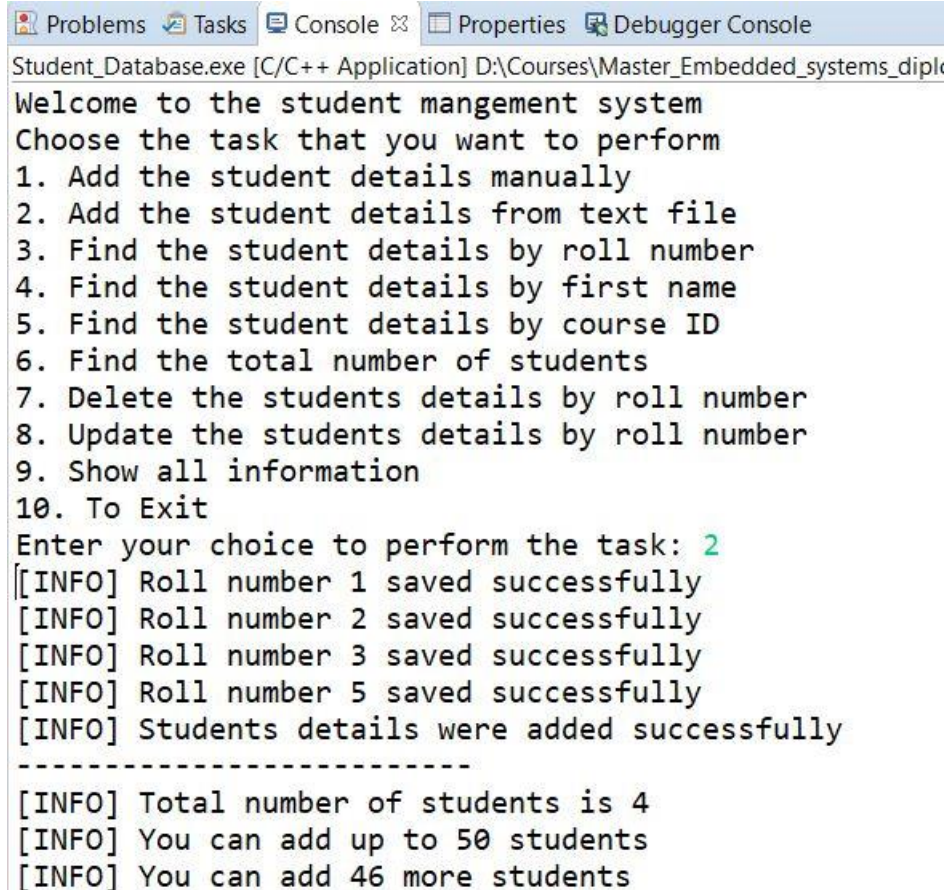
- Testing software functionality:

1. Add student details manually.

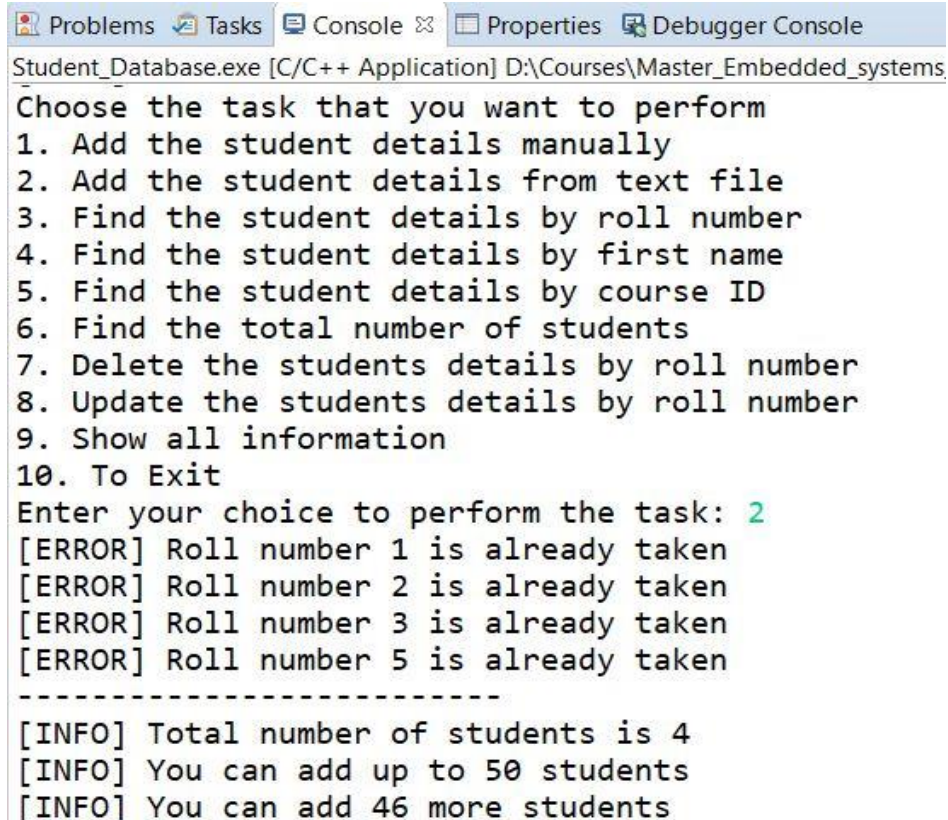
```
Problems Tasks Console Properties Debugger Console
Student_Database.exe [C/C++ Application] D:\Courses\Master_Embedded_systems_diploma\
Welcome to the student mangement system
Choose the task that you want to perform
1. Add the student details manually
2. Add the student details from text file
3. Find the student details by roll number
4. Find the student details by first name
5. Find the student details by course ID
6. Find the total number of students
7. Delete the students details by roll number
8. Update the students details by roll number
9. Show all information
10. To Exit
Enter your choice to perform the task: 1
-----
Add the student details
-----
Enter the roll number: 1
Enter the first name of student: ahmed
Enter the last name of student: ali
Enter the GPA: 3.4
Enter the course ID for each course
Course 1 ID: 101
Course 2 ID: 202
Course 3 ID: 303
Course 4 ID: 404
Course 5 ID: 501
[[INFO] Student details was added successfully
-----
[INFO] Total number of students is 1
[INFO] You can add up to 50 students
[INFO] You can add 49 more students

Problems Tasks Console Properties Debugger Console
Student_Database.exe [C/C++ Application] D:\Courses\Master_Embedded_systems
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 student details by first name
5. Find the student details by course ID
6. Find the total number of students
7. Delete the students details by roll number
8. Update the students details by roll number
9. Show all information
10. To Exit
Enter your choice to perform the task: 1
-----
Add the student details
-----
Enter the roll number: 1
Enter the first name of student: ibrahem
Enter the last name of student: awwad
Enter the GPA: 3.8
Enter the course ID for each course:
Course 1 ID: 102
Course 2 ID: 201
Course 3 ID: 301
Course 4 ID: 403
Course 5 ID: 501
[[ERROR] Roll number 1 is already taken
-----
[INFO] Total number of students is 1
[INFO] You can add up to 50 students
[INFO] You can add 49 more students
```

2. Add student details from file:



```
Problems Tasks Console Properties Debugger Console
Student_Database.exe [C/C++ Application] D:\Courses\Master_Embedded_systems_dipl
Welcome to the student mangement system
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 student details by first name
5. Find the student details by course ID
6. Find the total number of students
7. Delete the students details by roll number
8. Update the students details by roll number
9. Show all information
10. To Exit
Enter your choice to perform the task: 2
[INFO] Roll number 1 saved successfully
[INFO] Roll number 2 saved successfully
[INFO] Roll number 3 saved successfully
[INFO] Roll number 5 saved successfully
[INFO] Students details were added successfully
-----
[INFO] Total number of students is 4
[INFO] You can add up to 50 students
[INFO] You can add 46 more students
```



```
Problems Tasks Console Properties Debugger Console
Student_Database.exe [C/C++ Application] D:\Courses\Master_Embedded_systems
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 student details by first name
5. Find the student details by course ID
6. Find the total number of students
7. Delete the students details by roll number
8. Update the students details by roll number
9. Show all information
10. To Exit
Enter your choice to perform the task: 2
[ERROR] Roll number 1 is already taken
[ERROR] Roll number 2 is already taken
[ERROR] Roll number 3 is already taken
[ERROR] Roll number 5 is already taken
-----
[INFO] Total number of students is 4
[INFO] You can add up to 50 students
[INFO] You can add 46 more students
```


3. Find the student by the given roll number:

```
Problems Tasks Console Properties Debugger Console
Student_Database.exe [C/C++ Application] D:\Courses\Master_Embedded_systems
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 student details by first name
5. Find the student details by course ID
6. Find the total number of students
7. Delete the students details by roll number
8. Update the students details by roll number
9. Show all information
10. To Exit
Enter your choice to perform the task: 3
Enter the roll number of the student: 2
The student's details are
The first name is marwan
The last name is mohsen
The GPA is 3.70
The course ID of each course
The course ID is: 101
The course ID is: 203
The course ID is: 102
The course ID is: 99
The course ID is: 108
```

```
Problems Tasks Console Properties Debugger Console
Student_Database.exe [C/C++ Application] D:\Courses\Master_Embedded_systems
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 student details by first name
5. Find the student details by course ID
6. Find the total number of students
7. Delete the students details by roll number
8. Update the students details by roll number
9. Show all information
10. To Exit
Enter your choice to perform the task: 3
Enter the roll number of the student: 7
[ERROR] Roll number 7 was not found
```

4. Find the student by the given first name:

```
Problems Tasks Console Properties Debugger Console
Student_Database.exe [C/C++ Application] D:\Courses\Master_Embedded_systems.
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 student details by first name
5. Find the student details by course ID
6. Find the total number of students
7. Delete the students details by roll number
8. Update the students details by roll number
9. Show all information
10. To Exit
Enter your choice to perform the task: 4
Enter the first name of the student: mostafa
The student's details are
The first name is mostafa
The last name is mahmoud
The roll number is 1
The GPA is 3.90
The course ID of each course
The course ID is: 101
The course ID is: 201
The course ID is: 103
The course ID is: 94
The course ID is: 105
The student's details are
The first name is mostafa
The last name is mahmoud
The roll number is 5
The GPA is 3.90
The course ID of each course
The course ID is: 101
The course ID is: 201
The course ID is: 103
The course ID is: 94
The course ID is: 105
Problems Tasks Console Properties Debugger Console
Student_Database.exe [C/C++ Application] D:\Courses\Master_Embedded_systems.
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 student details by first name
5. Find the student details by course ID
6. Find the total number of students
7. Delete the students details by roll number
8. Update the students details by roll number
9. Show all information
10. To Exit
Enter your choice to perform the task: 4
Enter the first name of the student: ahmed
[ERROR] First name ahmed was not found
```


5. Find the students registered in a course:

```
Problems Tasks Console Properties Debugger Console
Student_Database.exe [C/C++ Application] D:\Courses\Master_Embedded_systems_
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 student details by first name
5. Find the student details by course ID
6. Find the total number of students
7. Delete the students details by roll number
8. Update the students details by roll number
9. Show all information
10. To Exit
Enter your choice to perform the task: 5
Enter the course ID: 99
The student's details are
The first name is marwan
The last name is mohsen
The roll number is 2
The GPA is 3.70
The student's details are
The first name is amr
The last name is helmy
The roll number is 3
The GPA is 3.60
[INFO] Total number of students enrolled: 2
```

```
Problems Tasks Console Properties Debugger Console
Student_Database.exe [C/C++ Application] D:\Courses\Master_Embedded_systems_
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 student details by first name
5. Find the student details by course ID
6. Find the total number of students
7. Delete the students details by roll number
8. Update the students details by roll number
9. Show all information
10. To Exit
Enter your choice to perform the task: 5
Enter the course ID: 100
[ERROR] Course ID 100 was not found
```

6. Count of students:

```
Problems Tasks Console Properties Debugger Console
Student_Database.exe [C/C++ Application] D:\Courses\Master_Embedded_systems_
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 student details by first name
5. Find the student details by course ID
6. Find the total number of students
7. Delete the students details by roll number
8. Update the students details by roll number
9. Show all information
10. To Exit
Enter your choice to perform the task: 6
-----
[INFO] Total number of students is 4
[INFO] You can add up to 50 students
[INFO] You can add 46 more students
```

7. Delete a student:

```
Problems Tasks Console Properties Debugger Console
Student_Database.exe [C/C++ Application] D:\Courses\Master_Embedded_systems_
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 student details by first name
5. Find the student details by course ID
6. Find the total number of students
7. Delete the students details by roll number
8. Update the students details by roll number
9. Show all information
10. To Exit
Enter your choice to perform the task: 7
Enter the roll number which you want to delete: 5
[INFO] Roll number 5 was deleted successfully
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 student details by first name
5. Find the student details by course ID
6. Find the total number of students
7. Delete the students details by roll number
8. Update the students details by roll number
9. Show all information
10. To Exit
Enter your choice to perform the task: 6
-----
[INFO] Total number of students is 3
[INFO] You can add up to 50 students
[INFO] You can add 47 more students
```


8. Update student:

```
Problems Tasks Console Properties Debugger Console
Student_Database.exe [C/C++ Application] D:\Courses\Master_Embedded_systems_
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 student details by first name
5. Find the student details by course ID
6. Find the total number of students
7. Delete the students details by roll number
8. Update the students details by roll number
9. Show all information
10. To Exit
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 no.
4.GPA
5.Courses ID
2
Enter new last name: hamdy
[INFO] Updated successfully

Problems Tasks Console Properties Debugger Console
Student_Database.exe [C/C++ Application] D:\Courses\Master_Embedded_systems_
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 student details by first name
5. Find the student details by course ID
6. Find the total number of students
7. Delete the students details by roll number
8. Update the students details by roll number
9. Show all information
10. To Exit
Enter your choice to perform the task: 8
Enter the roll number to update the entry: 10
[ERROR] Roll number 10 was not found
```

9. Show all information:

```
Problems Tasks Console Properties Debugger Console
Student_Database.exe [C/C++ Application] D:\Courses\Master_Embedded_systems
Enter your choice to perform the task: 9
-----
Student first name: mostafa
Student last name: mahmoud
Student roll number: 1
Student GPA: 3.90
  The course ID is: 101
  The course ID is: 201
  The course ID is: 103
  The course ID is: 94
  The course ID is: 105
-----
Student first name: marwan
Student last name: hamdy
Student roll number: 2
Student GPA: 3.70
  The course ID is: 101
  The course ID is: 203
  The course ID is: 102
  The course ID is: 99
  The course ID is: 108
-----
Student first name: amr
Student last name: helmy
Student roll number: 3
Student GPA: 3.60
  The course ID is: 102
  The course ID is: 207
  The course ID is: 103
  The course ID is: 99
  The course ID is: 101
-----
```