Mastering Embedded System Online Diploma www.learn-in-depth.com

First Term (Final Project 2)
Eng.Mostafa Hamed Besher

My Profile:

www.learn-in-depth.com/online-diploma/mostafahamed241@gmail.com

Project 2 Student Mangement System

Abstract :

It is a system that could do different processes Like recording students data, search for students, Deleting students, show the number of students and update students data.

Implementation :

➤ You can find all project codes in my github Repositorty

https://github.com/mostafahamedbesher/Embedded Online Diploma

- ➤ This System implementation based on circular queue
- The System Main Functions are :

❖ Adding a Student

This function is simply adding each student Data which is his first name, last name, Student roll number, student GPA and Registered coures ID and insert these data in the circular queue.

```
>-----Welc
                                                        Enter Student First Name : mostafa
_____
                                                        Enter Student Last Name : besher
Choose The Task You Want To Perform :
                                                        Enter Student Roll Number ; 1
1. Add Student Data Manually
                                                        Enter Student GPA: 3.3
                                                        Enter Course ID : 2
2. Find Student Details By Roll Number
                                                        [info] Student Data Is Added Successfully...
3. Find Student Details By First Name
4. Find Student Details By Course ID
                                                        [info] The Total Number Of Students is 1
                                                        [info] You Can Add Up To 50 Students
5. Find The Total Number Of Students
                                                        [info] You Can Add 49 More Students
6. Delete Student Details By Roll Number
7. Update Student Details By Roll Number
8. Show All Information
                                                       Choose The Task You Want To Perform :
9. Exit
                                                        1. Add Student Data Manually
Enter option number: 1
                                                       2. Find Student Details By Roll Number
                                                       3. Find Student Details By First Name
                                                       4. Find Student Details By Course ID
_____
                                                       5. Find The Total Number Of Students
Enter Student First Name : mostafa
                                                       6. Delete Student Details By Roll Number
                                                       7. Update Student Details By Roll Number
Enter Student Last Name : besher
                                                       8. Show All Information
Enter Student Roll Number : 1
Enter Student GPA: 3.3
                                                       Enter option number : 8
Enter Course ID: 2
[info] Student Data Is Added Successfully...
                                                       All Students Details Are :
______
                                                        Student First Name : mostafa
                                                        Student Last Name : besher
[info] The Total Number Of Students is 1
                                                        Student ID : 1
[info] You Can Add Up To 50 Students
                                                       Student GPA: 3.30
[info] You Can Add 49 More Students
                                                       Course ID : 2
_____
```

```
______
_____
                                         _____
Choose The Task You Want To Perform :
                                         Choose The Task You Want To Perform :
1. Add Student Data Manually
                                         1. Add Student Data Manually
2. Find Student Details By Roll Number
                                         Find Student Details By Roll Number
3. Find Student Details By First Name
                                         3. Find Student Details By First Name
                                         4. Find Student Details By Course ID
4. Find Student Details By Course ID
                                         5. Find The Total Number Of Students
5. Find The Total Number Of Students
                                         6. Delete Student Details By Roll Number
6. Delete Student Details By Roll Number
                                         7. Update Student Details By Roll Number
7. Update Student Details By Roll Number
                                         8. Show All Information
8. Show All Information
                                         9. Exit
9. Exit
                                         Enter option number : 8
Enter option number: 1
                                         _____
                                         All Students Details Are :
_____
                                         Student First Name : mostafa
Enter Student First Name : mohammed
                                         Student Last Name : besher
Enter Student Last Name : hamed
                                         Student ID: 1
Enter Student Roll Number: 2
                                         Student GPA: 3.30
Enter Student GPA: 2.5
                                         Course ID: 2
Enter Course ID: 1
                                         Student First Name : mohammed
[info] Student Data Is Added Successfully...
                                         Student Last Name : hamed
-----
                                         Student ID: 2
[info] The Total Number Of Students is 2
                                         Student GPA: 2.50
[info] You Can Add Up To 50 Students
                                         Course ID : 1
[info] You Can Add 48 More Students
                                         -----
                                         ______
______
```

Search Functions:

- Find Student Details By Roll Number
- Find Student Details By First Name
- Find Student Details By course Number

I implemented all these functions depending on one search function and I switched between them using Macros.

1- Find Student Details by Roll Number

______ ______ Choose The Task You Want To Perform : Choose The Task You Want To Perform : 1. Add Student Data Manually 1. Add Student Data Manually 2. Find Student Details By Roll Number 2. Find Student Details By Roll Number 3. Find Student Details By First Name 4. Find Student Details By Course ID 3. Find Student Details By First Name 5. Find The Total Number Of Students 4. Find Student Details By Course ID 6. Delete Student Details By Roll Number 5. Find The Total Number Of Students 7. Update Student Details By Roll Number 6. Delete Student Details By Roll Number 8. Show All Information 7. Update Student Details By Roll Number 9. Exit Enter option number: 8 8. Show All Information 9. Fxit _____ Enter option number: 2 All Students Details Are : Student First Name : mostafa ______ Student Last Name : besher Student ID: 1 Enter Roll Number of Student : 2 Student GPA: 3.30 Student Details Are : Course ID : 2 Student First Name : mohammed Student Last Name : hamed Student First Name : mohammed Student ID: 2 Student Last Name : hamed Student ID: 2 Student GPA: 2.50 Student GPA: 2.50 Course ID: 1 Course ID : 1

2- Find Student Details By First Name

_____ All Students Details Are : Student First Name : mostafa Student Last Name : besher Student ID: 1 Student GPA: 3.30 Course ID : 2 _____ Student First Name : mohammed Student Last Name : hamed Student ID: 2 Student GPA: 2.50 Course ID: 1 Student First Name : mohammed Student Last Name : ahmed Student ID: 3 Student GPA: 4.00 Course ID: 2 _____

Choose The Task You Want To Perform : 1. Add Student Data Manually 2. Find Student Details By Roll Number 3. Find Student Details By First Name 4. Find Student Details By Course ID 5. Find The Total Number Of Students 6. Delete Student Details By Roll Number 7. Update Student Details By Roll Number 8. Show All Information 9. Exit Enter option number : 3 ------Enter Student First Name : mohammed Student Details Are : Student First Name : mohammed Student Last Name : hamed Student ID : 2 Student GPA: 2.50 Course ID : 1 Student Details Are : Student First Name : mohammed Student Last Name : ahmed Student ID : 3 Student GPA: 4.00 Course ID : 2

3- Find Student Details by Course ID

_____ All Students Details Are : Student First Name : mostafa Student Last Name : besher Student ID: 1 Student GPA: 3.30 Course ID: 2 _____ Student First Name : mohammed Student Last Name : hamed Student ID: 2 Student GPA: 2.50 Course ID: 1 _____ Student First Name : mohammed Student Last Name : ahmed Student ID: 3 Student GPA: 4.00 Course ID: 2

Choose The Task You Want To Perform : 1. Add Student Data Manually 2. Find Student Details By Roll Number 3. Find Student Details By First Name 4. Find Student Details By Course ID 5. Find The Total Number Of Students 6. Delete Student Details By Roll Number 7. Update Student Details By Roll Number 8. Show All Information 9. Exit Enter option number: 4 Enter Course ID: 2 Student Details Are : Student First Name : mostafa Student Last Name : besher Student ID : 1 Student GPA: 3.30 Course ID : 2 -----Student Details Are : Student First Name : mohammed Student Last Name : ahmed Student ID : 3 Student GPA: 4.00 Course ID : 2 -----

❖ Find Count

```
_____
All Students Details Are :
Student First Name : mostafa
Student Last Name : besher
Student ID : 1
Student GPA: 3.30
Course ID : 2
Student First Name : mohammed
Student Last Name : hamed
Student ID : 2
Student GPA: 2.50
Course ID : 1
-----
Student First Name : mohammed
Student Last Name : ahmed
Student ID : 3
Student GPA: 4.00
Course ID : 2
-----
_____
```

```
_____
Choose The Task You Want To Perform :
1. Add Student Data Manually
2. Find Student Details By Roll Number
3. Find Student Details By First Name
4. Find Student Details By Course ID
5. Find The Total Number Of Students
6. Delete Student Details By Roll Number
7. Update Student Details By Roll Number
8. Show All Information
9. Exit
Enter option number: 5
_____
[info] The Total Number Of Students is 3
[info] You Can Add Up To 50 Students
[info] You Can Add 47 More Students
_____
```

❖ Delete Student by id

_____ All Students Details Are : Choose The Task You Want To Perform : Student First Name : mostafa Student Last Name : besher 1. Add Student Data Manually Student ID: 1 2. Find Student Details By Roll Number Student GPA: 3.30 3. Find Student Details By First Name Course ID : 2 4. Find Student Details By Course ID Student First Name : mohammed 5. Find The Total Number Of Students Student Last Name : hamed 6. Delete Student Details By Roll Number Student ID: 2 7. Update Student Details By Roll Number Student GPA: 2.50 Course ID : 1 8. Show All Information 9. Exit Student First Name : mohammed Enter option number: 6 Student Last Name : ahmed Student ID: 3 Student GPA: 4.00 _____ Course ID : 2 Enter Roll Number of Student : 2 [info] Student Data Is Deleted Successfully... ______ _____ Choose The Task You Want To Perform : Add Student Data Manually 2. Find Student Details By Roll Number 3. Find Student Details By First Name 4. Find Student Details By Course ID 5. Find The Total Number Of Students 6. Delete Student Details By Roll Number 7. Update Student Details By Roll Number 8. Show All Information 9. Exit Enter option number: 8 _____ All Students Details Are : Student First Name : mostafa Student Last Name : besher Student ID: 1 Student GPA : 3.30 Course ID : 2 Student First Name : mohammed Student Last Name : ahmed Student ID : 3 Student GPA: 4.00 Course ID : 2

❖ Update Student Data

- ➤ In this function you can update one field of data like Updating student first name or id
 - Update first name

```
All Students Details Are :
Student First Name : mostafa
Student ID : 1
Student GPA : 3.30
Course ID : 2

Student First Name : mohammed
Student Last Name : ahmed
Student ID : 3
Student GPA : 4.00
Course ID : 2
```

Choose The Task You Want To Perform : 1. Add Student Data Manually 2. Find Student Details By Roll Number 3. Find Student Details By First Name 4. Find Student Details By Course ID 5. Find The Total Number Of Students 6. Delete Student Details By Roll Number 7. Update Student Details By Roll Number 8. Show All Information 9. Exit Enter option number: 7 Choose Data You Want To Update: 1. First Name 2. Last Name 3. Roll Number 4. GPA 5. Course ID Enter Roll Number of Student : 3 Enter Option Number: 1 Enter New First Name : mahmoud [info] Student Data Updated Successfully _____

______ Choose The Task You Want To Perform : 1. Add Student Data Manually 2. Find Student Details By Roll Number 3. Find Student Details By First Name 4. Find Student Details By Course ID 5. Find The Total Number Of Students 6. Delete Student Details By Roll Number 7. Update Student Details By Roll Number 8. Show All Information 9. Exit Enter option number : 8 ______ All Students Details Are : Student First Name : mostafa Student Last Name : besher Student ID: 1 Student GPA: 3.30 Course ID : 2 Student First Name : mahmoud Student Last Name : ahmed Student ID: 3 Student GPA: 4.00 Course ID : 2 ______

Update ID

```
_____
Choose The Task You Want To Perform :
1. Add Student Data Manually
2. Find Student Details By Roll Number
3. Find Student Details By First Name
4. Find Student Details By Course ID
5. Find The Total Number Of Students
6. Delete Student Details By Roll Number
7. Update Student Details By Roll Number
8. Show All Information
9. Exit
Enter option number: 7
Choose Data You Want To Update :
1. First Name
2. Last Name
3. Roll Number
4. GPA
5. Course ID
Enter Roll Number of Student : 3
Enter Option Number : 3
Enter New Student ID: 2
[info] Student Data Updated Successfully
_____
_____
Choose The Task You Want To Perform :
1. Add Student Data Manually
2. Find Student Details By Roll Number
3. Find Student Details By First Name
4. Find Student Details By Course ID
5. Find The Total Number Of Students
6. Delete Student Details By Roll Number
7. Update Student Details By Roll Number
8. Show All Information
9. Exit
Enter option number: 8
_____
All Students Details Are :
Student First Name : mostafa
Student Last Name : besher
Student ID : 1
Student GPA: 3.30
Course ID : 2
Student First Name : mahmoud
Student Last Name : ahmed
Student ID : 2
Student GPA: 4.00
Course ID : 2
```

Update last name

_____ Choose The Task You Want To Perform : 1. Add Student Data Manually 2. Find Student Details By Roll Number 3. Find Student Details By First Name 4. Find Student Details By Course ID 5. Find The Total Number Of Students 6. Delete Student Details By Roll Number 7. Update Student Details By Roll Number 8. Show All Information 9. Exit Enter option number: 7 _____ Choose Data You Want To Update : 1. First Name 2. Last Name 3. Roll Number 4. GPA 5. Course ID Enter Roll Number of Student : 2 Enter Option Number : 2 Enter New Last Name : sami [info] Student Data Updated Successfully -----

```
Choose The Task You Want To Perform :
1. Add Student Data Manually
2. Find Student Details By Roll Number
3. Find Student Details By First Name
4. Find Student Details By Course ID
5. Find The Total Number Of Students
6. Delete Student Details By Roll Number
7. Update Student Details By Roll Number
8. Show All Information
9. Exit
Enter option number : 8
-----
All Students Details Are :
Student First Name : mostafa
Student Last Name : besher
Student ID: 1
Student GPA: 3.30
Course ID : 1
Student First Name : mohammed
Student Last Name : sami
Student ID: 2
Student GPA: 2.50
Course ID: 2
```

Update GPA

_____ _____ Choose The Task You Want To Perform : Choose The Task You Want To Perform : 1. Add Student Data Manually 1. Add Student Data Manually 2. Find Student Details By Roll Number 2. Find Student Details By Roll Number 3. Find Student Details By First Name 3. Find Student Details By First Name 4. Find Student Details By Course ID 4. Find Student Details By Course ID 5. Find The Total Number Of Students 5. Find The Total Number Of Students 6. Delete Student Details By Roll Number 6. Delete Student Details By Roll Number 7. Update Student Details By Roll Number 7. Update Student Details By Roll Number 8. Show All Information 9. Exit 8. Show All Information Enter option number: 8 9. Exit Enter option number: 7 _____ All Students Details Are : Student First Name : mostafa Choose Data You Want To Update: Student Last Name : besher 1. First Name Student ID: 1 2. Last Name Student GPA: 3.30 3. Roll Number Course ID : 1 4. GPA Student First Name : mohammed 5. Course ID Student Last Name : sami Enter Roll Number of Student : 2 Student ID: 2 Enter Option Number: 4 Student GPA: 4.00 Enter New GPA: 4 Course ID : 2 [info] Student Data Updated Successfully ______ ______

Update course ID

```
_____
Choose The Task You Want To Perform :
1. Add Student Data Manually
2. Find Student Details By Roll Number
3. Find Student Details By First Name
4. Find Student Details By Course ID
5. Find The Total Number Of Students
6. Delete Student Details By Roll Number
7. Update Student Details By Roll Number
8. Show All Information
9. Exit
Enter option number: 7
Choose Data You Want To Update :
1. First Name
2. Last Name
3. Roll Number
4. GPA
5. Course ID
Enter Roll Number of Student : 1
Enter Option Number : 5
Enter New Student Course ID : 2
[info] Student Data Updated Successfully
_____
```

```
Choose The Task You Want To Perform :
1. Add Student Data Manually
2. Find Student Details By Roll Number
3. Find Student Details By First Name
4. Find Student Details By Course ID
5. Find The Total Number Of Students
6. Delete Student Details By Roll Number
7. Update Student Details By Roll Number
8. Show All Information
9. Exit
Enter option number : 8
 ______
All Students Details Are :
Student First Name : mostafa
Student Last Name : besher
Student ID : 1
Student GPA: 3.30
Course ID : 2
Student First Name : mohammed
Student Last Name : sami
Student ID : 2
Student GPA: 4.00
Course ID : 2
 ______
```

- Handling Exceptions Scenarios :
 In this section I show how I could handle different
 User exception inputs
- ➤ When user enters an option number not in the range of option number(from 0 to 9) or user enters a character or any something else

_____ ______ Choose The Task You Want To Perform : Choose The Task You Want To Perform : 1. Add Student Data Manually 1. Add Student Data Manually 2. Find Student Details By Roll Number 2. Find Student Details By Roll Number 3. Find Student Details By First Name 3. Find Student Details By First Name 4. Find Student Details By Course ID 4. Find Student Details By Course ID 5. Find The Total Number Of Students 5. Find The Total Number Of Students 6. Delete Student Details By Roll Number 6. Delete Student Details By Roll Number 7. Update Student Details By Roll Number 7. Update Student Details By Roll Number 8. Show All Information 8. Show All Information 9. Exit Enter option number: %ff Enter option number: 12 ______ _____ Incorrect Option Number Incorrect Option Number _____ _____ Choose The Task You Want To Perform : Choose The Task You Want To Perform : 1. Add Student Data Manually 1. Add Student Data Manually 2. Find Student Details By Roll Number 2. Find Student Details By Roll Number 3. Find Student Details By First Name 3. Find Student Details By First Name 4. Find Student Details By Course ID 4. Find Student Details By Course ID 5. Find The Total Number Of Students 5. Find The Total Number Of Students 6. Delete Student Details By Roll Number 6. Delete Student Details By Roll Number 7. Update Student Details By Roll Number 7. Update Student Details By Roll Number 8. Show All Information 8. Show All Information 9. Exit 9 Fxit Enter option number : m Enter option number : -1 _____ _____ Incorrect Option Number Incorrect Option Number ______ _____

➤ When user try to add new student and the entered id was already exists in FIFO That is forbidden because student id is unique

Choose The Task You Want To Perform : 1. Add Student Data Manually 2. Find Student Details By Roll Number 3. Find Student Details By First Name 4. Find Student Details By Course ID 5. Find The Total Number Of Students 6. Delete Student Details By Roll Number 7. Update Student Details By Roll Number 8. Show All Information Enter option number: 8 ______ All Students Details Are : Student First Name : mostafa Student Last Name : besher Student ID: 1 Student GPA: 3.30 Course ID : 2 Student First Name : mohammed Student Last Name : hamed Student ID: 2 Student GPA: 2.50 Course ID : 1 ______

```
Choose The Task You Want To Perform :
1. Add Student Data Manually
2. Find Student Details By Roll Number
3. Find Student Details By First Name
4. Find Student Details By Course ID
5. Find The Total Number Of Students
6. Delete Student Details By Roll Number
7. Update Student Details By Roll Number
8. Show All Information
Enter option number : 1
 Enter Student First Name : ahmed
 Enter Student Last Name : kamal
 Enter Student Roll Number: 1
 [Error]This ID Is Already Exist
 Enter Student Roll Number: 2
 [Error]This ID Is Already Exist
 Enter Student Roll Number : 3
 Enter Student GPA: 3
 Enter Course ID: 2
 [info] Student Data Is Added Successfully...
 [info] The Total Number Of Students is 3
 [info] You Can Add Up To 50 Students
 [info] You Can Add 47 More Students
 _____
```

➤ When user tries to insert student GPA > 4

```
_____
Choose The Task You Want To Perform :
1. Add Student Data Manually
2. Find Student Details By Roll Number
3. Find Student Details By First Name
4. Find Student Details By Course ID
5. Find The Total Number Of Students
6. Delete Student Details By Roll Number
7. Update Student Details By Roll Number
8. Show All Information
9. Exit
Enter option number : 1
_____
Enter Student First Name : karim
Enter Student Last Name : ahmed
Enter Student Roll Number : 4
Enter Student GPA : 5
[Error]GPA Should Not Exceed (4)
Enter Student GPA: 2
Enter Course ID : 1
[info] Student Data Is Added Successfully...
-----
[info] The Total Number Of Students is 4
[info] You Can Add Up To 50 Students
[info] You Can Add 46 More Students
_____
```

➤ When user searches for a student using roll number And user enters a roll number not found in FIFO

```
3. Find Student Details By First Name
4. Find Student Details By Course ID
5. Find The Total Number Of Students
6. Delete Student Details By Roll Number
7. Update Student Details By Roll Number
8. Show All Information
9. Exit
Enter option number: 8
All Students Details Are :
Student First Name : mostafa
Student Last Name : besher
Student ID : 1
Student GPA: 3.30
Course ID : 2
Student First Name : mohammed
Student Last Name : hamed
Student ID: 2
Student GPA: 2.50
Course ID : 1
_____
Choose The Task You Want To Perform :
1. Add Student Data Manually
2. Find Student Details By Roll Number
3. Find Student Details By First Name
4. Find Student Details By Course ID
5. Find The Total Number Of Students
6. Delete Student Details By Roll Number
7. Update Student Details By Roll Number
8. Show All Information
9. Exit
Enter option number: 2
_____
Enter Roll Number of Student : 3
[Error] Roll Number (3) Not Found
_____
```

Choose The Task You Want To Perform :

2. Find Student Details By Roll Number

1. Add Student Data Manually

> When user try to delete student but FIFO is empty

```
Choose The Task You Want To Perform:

1. Add Student Data Manually

2. Find Student Details By Roll Number

3. Find Student Details By First Name

4. Find Student Details By Course ID

5. Find The Total Number Of Students

6. Delete Student Details By Roll Number

7. Update Student Details By Roll Number

8. Show All Information

9. Exit

Enter option number: 6

Students List Is Empty
```

When user tries to show all Students data in FIFO But FIFO is empty

➤ When user tries to update student data and entres option number not in range or any thing else

```
Choose The Task You Want To Perform :
1. Add Student Data Manually
2. Find Student Details By Roll Number
3. Find Student Details By First Name
4. Find Student Details By Course ID
5. Find The Total Number Of Students
6. Delete Student Details By Roll Number
7. Update Student Details By Roll Number
8. Show All Information
9. Exit
Enter option number: 7
_____
Choose Data You Want To Update :
1. First Name
2. Last Name
3. Roll Number
4. GPA
5. Course ID
Enter Roll Number of Student : 1
Enter Option Number: 7
[Error] Incorrect Option Number
_____
```

➤ When user tries to update student data and enters roll number which not found in FIFO

------Choose The Task You Want To Perform : 1. Add Student Data Manually 2. Find Student Details By Roll Number 3. Find Student Details By First Name 4. Find Student Details By Course ID 5. Find The Total Number Of Students 6. Delete Student Details By Roll Number 7. Update Student Details By Roll Number 8. Show All Information 9. Exit Enter option number: 8 _____ All Students Details Are : Student First Name : mostafa Student Last Name : besher Student ID: 1 Student GPA: 3.30 Course ID : 2 Student First Name : mohammed Student Last Name : hamed Student ID : 2 Student GPA: 2.50 Course ID : 1

Choose The Task You Want To Perform : 1. Add Student Data Manually 2. Find Student Details By Roll Number 3. Find Student Details By First Name 4. Find Student Details By Course ID 5. Find The Total Number Of Students 6. Delete Student Details By Roll Number 7. Update Student Details By Roll Number 8. Show All Information 9. Exit Enter option number: 7 ______ Choose Data You Want To Update : 1. First Name 2. Last Name 3. Roll Number 4. GPA 5. Course ID Enter Roll Number of Student : 3 [Error] Roll Number (3) Not Found er bilni certi