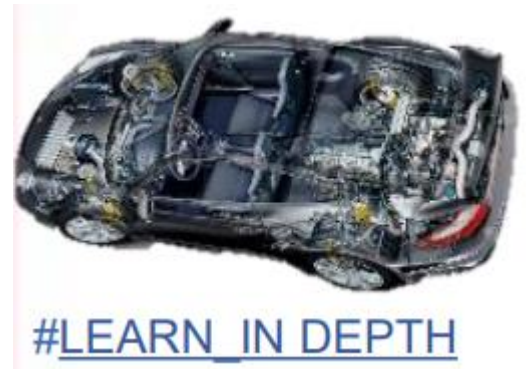


Ain Shams University

Faculty of Engineering

Mechatronics Engineering Department



# Mastering Embedded System Online Diploma

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## First Term (Final Project 2)

### “Student Information Management System”

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# 1 Introduction

- In this project we will Implement Student Information Management System that it has many features to become easy for users.

## 1.1 Features of each Student

- Store First Name of the student.
- Store Last Name of the student.
- Store Unique Roll Number of the student.
- Store GPA of the student.
- Store Courses ID of the student.

## 1.2 Features of All system

- Add Student Details from File.
- Add Student manually.
- Find the student by the given Roll Number.
- Find the student by the given First Name.
- Find Students registered in a course.
- Count of students.
- Delete a student.
- Update a student.
- Show all Information of students.
- Exit from the system.

## 2 Implementation

### 2.1 Add Student manually

```
void add_students_manually ()
{
    sinfo* New_Student=Create_Node ();

    if (head==NULL)
    {
        head= New_Student;
        tail= New_Student;
    }
    else
    {
        tail->next = New_Student;
        tail = New_Student;
    }
    New_Student->next=NULL;

    Dprintf("----Enter Information of the Student-----\n");
    Information:
    Dprintf ("Enter roll: ");
    scanf ("%d",&New_Student->roll);
    if (IS_RollExist (New_Student->roll)==1)
    {
        Dprintf("Roll Number %d is already taken\n",New_Student->roll);
        goto Information;
    }
    Dprintf ("Enter First Name: ");
    scanf ("%s",New_Student->fname);
    Dprintf ("Enter Last Name: ");
    scanf ("%s",New_Student->lname);
    Dprintf ("Enter GPA: ");
    scanf ("%f",&New_Student->GPA);
    Dprintf ("Enter Course ID of each course:\n");
    for (int i=0; i<5;i++){
        Dprintf ("Course %d ID: ",i+1);
        scanf ("%d",&New_Student->cid[i]);
    }
    Dprintf ("Student Information is added successfully\n");
}
```

## 2.2 Add students from file

```
void add_students_From_File ()
{
    FILE* fptr; int RollNum, CID[5]; //n, FileCount=0, line =0;
    float GPA; char FName[50], LName[50];

    fptr = fopen ("file.txt", "r");

    while (fscanf(fptr, "%d %s %s %f %d %d %d %d", &RollNum, FName, LName, &GPA, &CID[0], &CID[1], &CID[2], &CID[3], &CID[4]) != EOF)
    {
        if (IS_RollExist(RollNum))
        {
            Dprintf("[ERROR] Roll Number %d is already taken\n", RollNum);
            continue;
        }
        sinfo* New_Student = Create_Node ();

        if (head == NULL)
        {
            head = New_Student;
            tail = New_Student;
        }
        else
        {
            tail->next = New_Student;
            tail = New_Student;
        }
        New_Student->next = NULL;

        New_Student->roll = RollNum;
        New_Student->GPA = GPA;
        strcpy(New_Student->fname, FName);
        strcpy(New_Student->lname, LName);
        for (int i = 0; i < 5; i++)
        {
            New_Student->cid[i] = CID[i];
        }
        Dprintf("[INFO] Roll Number %d is saved Successfully\n", RollNum);
    }
}
```

## 2.3 Count of students

```
void Total_Number_of_Students ()
{
    int count = 0; sinfo* current = head;
    while (current != NULL)
    {
        count++;
        current = current->next;
    }
    Dprintf("Total Number of Students is %d\n", count);
}
```

## 2.4 Find the student by the given Roll Number

```
void Find_Student_by_Roll_Number ()
{
    int roll,flag=1;
    sinfo* current=head;
    Dprintf("Enter Roll Number: ");
    scanf ("%d",&roll);

    while (current!=NULL)
    {
        if (roll==current->roll)
        {
            flag=0;
            Dprintf ("-----Student Details-----\n");
            Dprintf ("Student First Name: %s\n",current->fname);
            Dprintf ("Student Last Name: %s\n",current->lname);
            Dprintf ("Student GPA: %.2f\n",current->GPA);
            Dprintf ("-----Courses-----\n");
            for (int i=0; i<5;i++){
                Dprintf ("Course %d ID is %d\n",i+1,current->cid[i]);}
            break;
        }
        else
            current=current->next;
    }
    if (flag){
        Dprintf ("Roll Number %d is not found\n",roll);}
}
```

## 2.5 Find the student by the given First Name

```
void Find_Student_by_First_Name ()
{
    int flag=1;char name[50];
    sinfo* current = head;
    Dprintf ("Enter the First Name of Student:");
    scanf("%s",name);
    while (current!=NULL)
    {
        if (strcmp(current->fname,name)==0)
        {
            flag=0;
            Dprintf ("-----Student Details-----\n");
            Dprintf ("Student First Name: %s\n",current->fname);
            Dprintf ("Student Last Name: %s\n",current->lname);
            Dprintf ("Student GPA: %.2f\n",current->GPA);
            Dprintf ("-----Courses-----\n");
            for (int i=0; i<5;i++){
                Dprintf ("Course %d ID is %d\n",i+1,current->cid[i]);}

            }
            current=current->next;
        }
        if (flag)
        {Dprintf ("First Name %s is not found\n",name);}
    }
}
```

## 2.6 Find Students registered in a course

```
void Students_In_Same_Course ()
{
    int id,flag=1,count=0; sinfo* current=head;
    Dprintf("Enter the course ID: ")
    scanf ("%d",&id);

    while (current!=NULL)
    {
        for (int i=0;i<5;i++)
        {
            if (id==current->cid[i])
            {
                count++;
                flag=0;
                Dprintf ("-----Student Details-----\n");
                Dprintf ("Student First Name: %s\n",current->fname);
                Dprintf ("Student Last Name: %s\n",current->lname);
                Dprintf ("Student GPA: %.2f\n",current->GPA);
            }
        }
        current=current->next;
    }
    if (flag)
    {Dprintf("[ERRORR] Course ID %d is not found\n",id);}
    else
    {Dprintf("[INFO] Total Number of students Enrolled is %d\n",count);}
}
```

## 2.7 Show all Information of students

```
void Print_AllStudents ()
{
    sinfo* current =head;
    if (current==NULL){
        Dprintf ("Empty List\n");}
    else
    {
        while (current!= NULL)
        {
            Dprintf ("Student First Name: %s\n",current->fname);
            Dprintf ("Student Last Name: %s\n",current->lname);
            Dprintf ("Student Roll Number: %d\n",current->roll);
            Dprintf ("Student GPA: %.2f\n",current->GPA);
            for (int i=0; i<5;i++){
                Dprintf ("Course %d ID is %d\n",i+1,current->cid[i]);}
            current=current->next;
            Dprintf ("-----\n");
        }
    }
}
```

## 2.8 Delete a student

```
void Delete_Student_by_Roll_Number ()
{
    sinfo* current=head; sinfo* prev=NULL; int roll,flag=1;
    Dprintf("Enter the Roll Number which you want to delete: ");
    scanf ("%d",&roll);

    while (current!=NULL)
    {
        if (roll==current->roll)
        {
            flag=0;
            if (head==current)
            {
                head=current->next;
                free(current);
                Dprintf("Roll Number is removed successfully\n");
                break;
            }
            else if (current->next==NULL)
            {
                prev->next=NULL;
                free(current);
                Dprintf("Roll Number is removed successfully\n");
                break;
            }
            else
            {
                prev->next =current->next;
                free(current);
                Dprintf("Roll Number is removed successfully\n");
                break;
            }
        }
        prev=current;
        current=current->next;
    }
    if (flag)
    {Dprintf("Roll Number %d is not found\n",roll);}
}
```



## 2.9 Update a student

```
void Update_Student ()
{
    int roll,rollNew,choice,flag=1; sinfo* current=head;

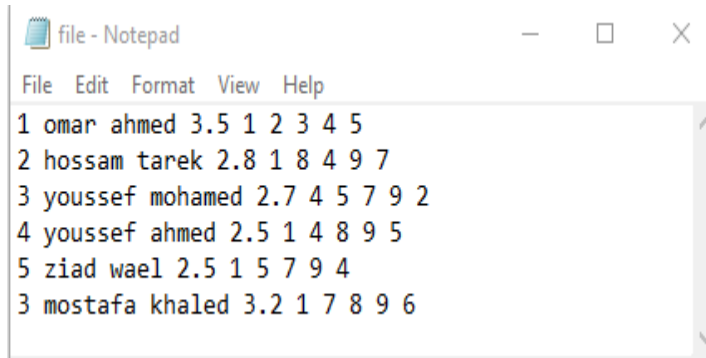
    Dprintf("Enter Roll Number of the student whom you want to update: ");
    scanf("%d",&roll);

    while (current!=NULL)
    {
        if (roll == current->roll)
        {
            flag=0;
            Dprintf("1- First Name\n2- Last Name\n3- Roll Number\n4- GPA\n5- Courses\n");
            scanf ("%d",&choice);

            switch (choice)
            {
                case 1:
                    Dprintf("Enter New First Name: ");
                    scanf ("%s",current->fname);
                    Dprintf("[INFO] UPDATED SUCCESSFULLY\n");
                    break;
                case 2:
                    Dprintf("Enter New Last Name: ");
                    scanf ("%s",current->lname);
                    Dprintf("[INFO] UPDATED SUCCESSFULLY\n");
                    break;
                case 3:
                    Dprintf("Enter New Roll Number: ");
                    scanf ("%d",&rollNew);
                    if (IS_RollExist (rollNew)==1)
                    {
                        Dprintf("Roll Number %d is already taken\n",current->roll);
                        Dprintf("[ERROR] UPDATED FAILED\n");
                    }
                    else
                    {
                        current->roll=rollNew;
                    }
                }
            }
        }
    }
}
```

## 3 Test Cases

### 3.1 Add Students from File



```
file - Notepad
File Edit Format View Help
1 omar ahmed 3.5 1 2 3 4 5
2 hossam tarek 2.8 1 8 4 9 7
3 youssef mohamed 2.7 4 5 7 9 2
4 youssef ahmed 2.5 1 4 8 9 5
5 ziad wael 2.5 1 5 7 9 4
3 mostafa khaled 3.2 1 7 8 9 6
```

File.txt

```
---Welcome to Student Management System---
---Choose the Task that you want to perform---
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 from Course ID
6- Find the total Number of students
7- Delete Students Details by Roll Number
8- Update Student Details by Roll Number
9- Show All Information
10- to Exit
Enter your choice to perform the task: 2
[INFO] Roll Number 1 is saved Successfully
[INFO] Roll Number 2 is saved Successfully
[INFO] Roll Number 3 is saved Successfully
[INFO] Roll Number 4 is saved Successfully
[INFO] Roll Number 5 is saved Successfully
[ERROR] Roll Number 3 is already taken
```

*Running*

```
Student First Name: omar
Student Last Name: ahmed
Student Roll Number: 1
Student GPA: 3.50
Course 1 ID is 1
Course 2 ID is 2
Course 3 ID is 3
Course 4 ID is 4
Course 5 ID is 5
```

```
-----
Student First Name: hossam
Student Last Name: tarek
Student Roll Number: 2
Student GPA: 2.80
Course 1 ID is 1
Course 2 ID is 8
Course 3 ID is 4
Course 4 ID is 9
Course 5 ID is 7
```

```
-----
Student First Name: youssef
Student Last Name: mohamed
Student Roll Number: 3
Student GPA: 2.70
Course 1 ID is 4
Course 2 ID is 5
Course 3 ID is 7
Course 4 ID is 9
Course 5 ID is 2
```

```
-----
Student First Name: youssef
Student Last Name: ahmed
Student Roll Number: 4
Student GPA: 2.50
Course 1 ID is 1
Course 2 ID is 4
Course 3 ID is 8
Course 4 ID is 9
Course 5 ID is 5
```

```
-----
Student First Name: ziad
Student Last Name: wael
Student Roll Number: 5
Student GPA: 2.50
Course 1 ID is 1
Course 2 ID is 5
Course 3 ID is 7
Course 4 ID is 9
Course 5 ID is 4
```

*Students*

## 3.2 Add student Manually

```
---Choose the Task that you want to perform---
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 from Course ID
6- Find the total Number of students
7- Delete Students Details by Roll Number
8- Update Student Details by Roll Number
9- Show All Information
10- to Exit
Enter your choice to perform the task: 1
----Enter Information of the Student-----
Enter roll: 7
Enter First Name: Abdelrahman
Enter Last Name: Tarek
Enter GPA: 2.7
Enter Course ID of each course:
Course 1 ID: 1
Course 2 ID: 4
Course 3 ID: 5
Course 4 ID: 6
Course 5 ID: 7
Student Information is added successfully
```

```
---Choose the Task that you want to perform---
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 from Course ID
6- Find the total Number of students
7- Delete Students Details by Roll Number
8- Update Student Details by Roll Number
9- Show All Information
10- to Exit
Enter your choice to perform the task: 1
----Enter Information of the Student-----
Enter roll: 9
Enter First Name: Wael
Enter Last Name: mohamed
Enter GPA: 3.12
Enter Course ID of each course:
Course 1 ID: 8
Course 2 ID: 7
Course 3 ID: 4
Course 4 ID: 5
Course 5 ID: 2
Student Information is added successfully
```

```
Student First Name: Abdelrahman
Student Last Name: Tarek
Student Roll Number: 7
Student GPA: 2.70
Course 1 ID is 1
Course 2 ID is 4
Course 3 ID is 5
Course 4 ID is 6
Course 5 ID is 7
-----
Student First Name: Wael
Student Last Name: mohamed
Student Roll Number: 9
Student GPA: 3.12
Course 1 ID is 8
Course 2 ID is 7
Course 3 ID is 4
Course 4 ID is 5
Course 5 ID is 2
-----
```

Students

### 3.3 Find student by Roll Number

```
Enter your choice to perform the task: 3
Enter Roll Number: 7
-----Student Details-----
Student First Name: Abdelrahman
Student Last Name: Tarek
Student GPA: 2.70
-----Courses-----
Course 1 ID is 1
Course 2 ID is 4
Course 3 ID is 5
Course 4 ID is 6
Course 5 ID is 7
```

```
Enter your choice to perform the task: 3
Enter Roll Number: 10
Roll Number 10 is not found
```

### 3.4 Find student by First Name

```
Enter your choice to perform the task: 4
Enter the First Name of Student:youssef
-----Student Details-----
Student First Name: youssef
Student Last Name: mohamed
Student GPA: 2.70
-----Courses-----
Course 1 ID is 4
Course 2 ID is 5
Course 3 ID is 7
Course 4 ID is 9
Course 5 ID is 2
-----Student Details-----
Student First Name: youssef
Student Last Name: ahmed
Student GPA: 2.50
-----Courses-----
Course 1 ID is 1
Course 2 ID is 4
Course 3 ID is 8
Course 4 ID is 9
Course 5 ID is 5
```

```
Enter your choice to perform the task: 4
Enter the First Name of Student:ibrahim
First Name ibrahim is not found
```

### 3.5 Find Students registered in a course

```
Enter your choice to perform the task: 5
Enter the course ID: 4
-----Student Details-----
Student First Name: omar
Student Last Name: ahmed
Student GPA: 3.50
-----Student Details-----
Student First Name: hossam
Student Last Name: tarek
Student GPA: 2.80
-----Student Details-----
Student First Name: youssef
Student Last Name: mohamed
Student GPA: 2.70
-----Student Details-----
Student First Name: youssef
Student Last Name: ahmed
Student GPA: 2.50
-----Student Details-----
Student First Name: ziad
Student Last Name: wael
Student GPA: 2.50
-----Student Details-----
Student First Name: Abdelrahman
Student Last Name: Tarek
Student GPA: 2.70
-----Student Details-----
Student First Name: Wael
Student Last Name: mohamed
Student GPA: 3.12
[INFO] Total Number of students Enrolled is 7
```

```
Enter your choice to perform the task: 5
Enter the course ID: 100
[ERROR] Course ID 100 is not found
```

### 3.6 Count of students

```
Enter your choice to perform the task: 6
Total Number of Students is 7
```

### 3.7 Delete a student by Roll Number

Student Last Name: ahmed  
Student Roll Number: 1  
Student GPA: 3.50  
Course 1 ID is 1  
Course 2 ID is 2  
Course 3 ID is 3  
Course 4 ID is 4  
Course 5 ID is 5

-----  
Student First Name: hossam  
Student Last Name: tarek  
Student Roll Number: 2  
Student GPA: 2.80  
Course 1 ID is 1  
Course 2 ID is 8  
Course 3 ID is 4  
Course 4 ID is 9  
Course 5 ID is 7

-----  
Student First Name: youssef  
Student Last Name: mohamed  
Student Roll Number: 3  
Student GPA: 2.70  
Course 1 ID is 4  
Course 2 ID is 5  
Course 3 ID is 7  
Course 4 ID is 9  
Course 5 ID is 2

-----  
Student First Name: ziad  
Student Last Name: wael  
Student Roll Number: 5  
Student GPA: 2.50  
Course 1 ID is 1  
Course 2 ID is 5  
Course 3 ID is 7  
Course 4 ID is 9  
Course 5 ID is 4

-----  
Student First Name: Abdelrahman  
Student Last Name: Tarek  
Student Roll Number: 7  
Student GPA: 2.70  
Course 1 ID is 1  
Course 2 ID is 4  
Course 3 ID is 5  
Course 4 ID is 6  
Course 5 ID is 7

-----  
Student First Name: Wael  
Student Last Name: mohamed  
Student Roll Number: 9  
Student GPA: 3.12  
Course 1 ID is 8  
Course 2 ID is 7  
Course 3 ID is 4  
Course 4 ID is 5  
Course 5 ID is 2

Enter your choice to perform the task: 7  
Enter the Roll Number which you want to delete: 4  
Roll Number is removed successfully

Enter your choice to perform the task: 7  
Enter the Roll Number which you want to delete: 6  
Roll Number 6 is not found

### 3.8 Update a student

```
Enter your choice to perform the task: 8
Enter Roll Number of the student whom you want to update: 2
1- First Name
2- Last Name
3- Roll Number
4- GPA
5- Courses
1
Enter New First Name: Mohamed
[INFO] UPDATED SUCCESSFULLY

Enter your choice to perform the task: 8
Enter Roll Number of the student whom you want to update: 10
Roll Number 10 is not found
```

```
Student First Name: omar
Student Last Name: ahmed
Student Roll Number: 1
Student GPA: 3.50
Course 1 ID is 1
Course 2 ID is 2
Course 3 ID is 3
Course 4 ID is 4
Course 5 ID is 5
-----
Student First Name: Mohamed
Student Last Name: tarek
Student Roll Number: 2
Student GPA: 2.80
Course 1 ID is 1
Course 2 ID is 8
Course 3 ID is 4
Course 4 ID is 9
Course 5 ID is 7
-----
Student First Name: youssef
Student Last Name: mohamed
Student Roll Number: 3
Student GPA: 2.70
Course 1 ID is 4
Course 2 ID is 5
Course 3 ID is 7
Course 4 ID is 9
Course 5 ID is 2
-----
Student First Name: ziad
Student Last Name: wael
Student Roll Number: 5
Student GPA: 2.50
Course 1 ID is 1
Course 2 ID is 5
Course 3 ID is 7
Course 4 ID is 9
Course 5 ID is 4
-----
Student First Name: Abdelrahman
Student Last Name: Tarek
Student Roll Number: 7
Student GPA: 2.70
Course 1 ID is 1
Course 2 ID is 4
Course 3 ID is 5
Course 4 ID is 6
Course 5 ID is 7
-----
Student First Name: Wael
Student Last Name: mohamed
Student Roll Number: 9
Student GPA: 3.12
Course 1 ID is 8
Course 2 ID is 7
Course 3 ID is 4
Course 4 ID is 5
Course 5 ID is 2
-----
```