University database management

Submitted as Mini Project for Special Topics: Programming with C++
Semester III

BACHELOR OF TECHNOLOGY

in

Computer Science and Engineering

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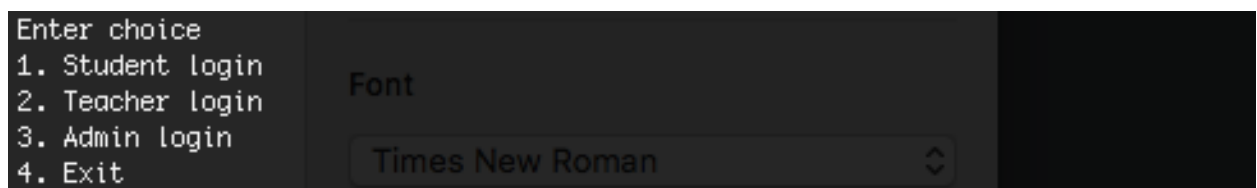
Abstract :

The following project , university database management system using c++ with file handling is a simple , yet clean code for the efficient management of student records containing their registration number along with marks in 2 particular subjects stored in a .dat extension file. The code is completely editable as per user requirements and for future enhancements.
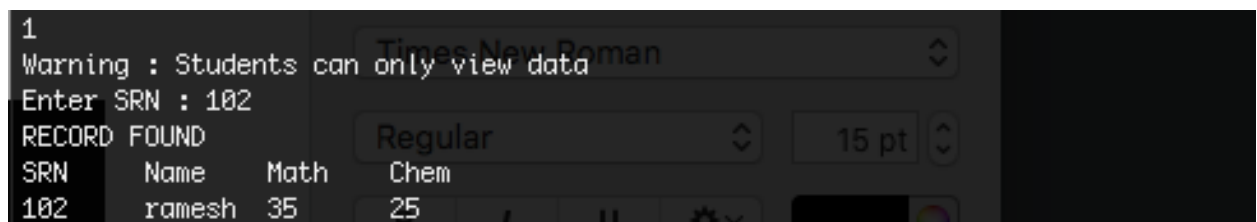
Overview :

Following is a detailed explanation of the code with snippets of the running code.

1. **Landing page**

The landing page provides different login options in which each have different privileges. Considering it as a common platform for the accessibility of the students , faculty as well as the administrator or the office in charge. For the students or the faculty to access initially , few records have to added before hand as the .dat file is created once records are added.
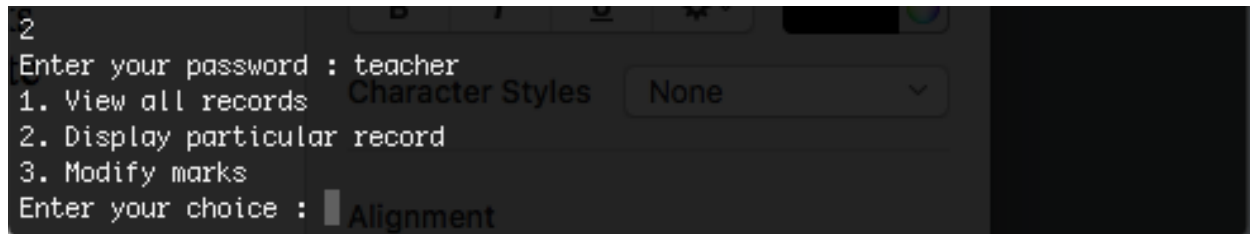
2. Student Login

Under the student login , the student is expected to give their registration number as the login credentials. The student can only view his/her marks in the 2 predefined subjects. It's serves as a functionality to communicate the marks of the student in due short notice.
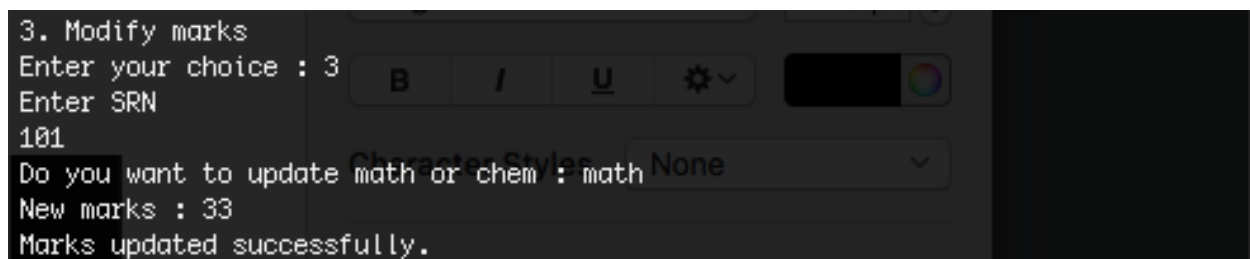
3. Teacher Login

The initial login for the teachers/faculty are required to type out the predefined password which navigates them to a secondary menu displaying the various privileges available to them. They can either search for particular records or view them all and can also modify records to change a particular students marks.
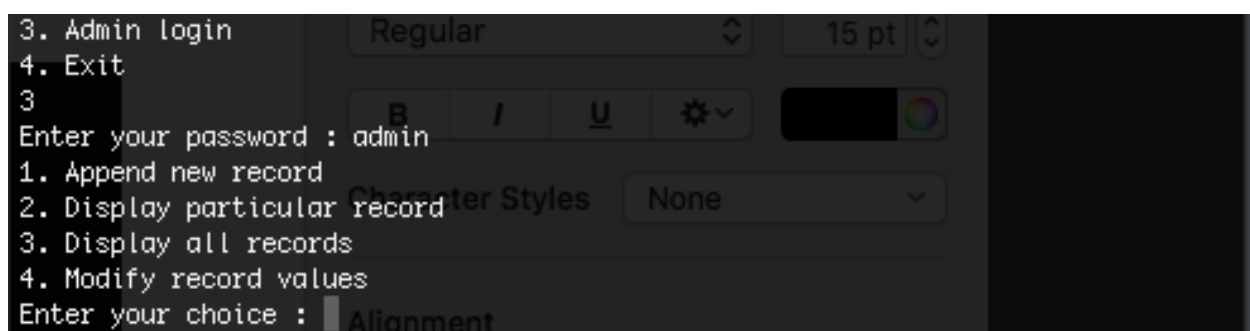The view all options just displays the list of all the students details currently in the database whereas the the display particular record performs a search in the .dat file and returns a result if found.

The modify records option further branches out wherein the faculty member can choose between which subject and student they want to modify the marks for.

4. Admin Login

This is the login path for the administrator or the office of control which provides total control and absolute modifiable properties for the database. The user is required to provide the basic password for authentication upon which they are redirected to privileges menu on successful login.

The administrator has the sole privilege of adding new records. They are also entitled to modify values if and when necessary.

The following is a snippet to add a new record.

```
Enter your choice : 1
Enter student SRN : 104
Enter name : mahesh
Enter mathematics marks : 78
Enter chemistry marks : 90
Record added sucessfully.
Do you want to continue in admin mode?(y/n) :
```

5.Exception Handling

If not a whole lot , there has been a few exception handling criteria taken care of which even though are basic , like , for example the case of a wrong number entered in the option selection or in case of wrong password so that the program doesn't crash.

```
Enter choice
1. Student login
2. Teacher login
3. Admin login
4. Exit
6
Enter choice
1. Student login
2. Teacher login
3. Admin login
4. Exit
```

```
Enter choice
1. Student login
2. Teacher login
3. Admin login
4. Exit
3
Enter your password : wrong_password
You have entered the wrong password! :(
Enter choice
1. Student login
2. Teacher login
3. Admin login
4. Exit
```

Limitations :

- The database cannot be viewed before records are inserted because the .dat file is not created unless the first record has been successfully inserted. No functionalities will work if we try to view , it throws an error saying file not found(Which has also been taken care of in exception handling).
- The first time we create a student record in admin mode , the marks have to be initialised to a default 0 because it cannot be appended later.
- One of the major and foremost limitation is the inability to delete records.
- The passwords are predefined and cannot be changed during runtime unless we edit the source code.

Future Enhancements :

- The passwords while typing out during runtime are the letter as it is. It could be changed to asterisks , hash or any other unidentifiable symbol.
- Provision can be made for the student registration number to be a assortment of characters and numbers.
- Functionality can be further enhanced by adding other fields in the database such as attendance , average grade point , scoring records to make it much more robust and powerful.
- Each faculty member can have their discrete passwords for their particular subject. Upon verification they are redirected to that particular subject editing option only.
- In case of 'forgot password' or 'reset password' functionality can be added to collect the users email ID and mail a verification link to reset or change their password.

References :

For a thorough understanding of the concept of file handling in C++
- https://www.includehelp.com/code-snippets/employee-management-program-cpp-binary-file-stream-handling.aspx

Thanking the following :

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