Informatics College Pokhara

Application Development

CS6004NA

Coursework 1

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1. Introduction

This is an individual course work for the module “Application Development” for Student Information System which is developed using Visual Studio Platform using C# language. The coursework is released in the week 5 and it is supposed to be submitted in the week 11. The system is designed, developed and tested under various possible situations. The features and functions that are required by the student management system are almost fulfilled by the developed system. It consist of features like adding student`s entry and exit. In addition to that, details information of the student can be added such as their first name, email address, contact number and others. Other available features are well explained in other sections of the report.

a. Current Scenario

In present situation there are still many school and colleges which add information on the students by writing and making a note of it. Very few of the colleges and schools have implemented this system. Even though few colleges may have this system but still they are lacking the features which are required.

b. Proposed System

The proposed system is digitized system of Student Information System which is specially designed to overcome problem mentioned above which are being faced in schools.The system ensures security with the presence of login section. Entry of data and display of data have been made easy with the presence of easy user-interface.

2. User Manual

Image mention below is the UI of the login Screen. Only the valid username and password allows user to go in the project. This maintains the security if invalid credentials are given the user can't go to the system. As the user operates the system the initial screen will be the security screen. The username and password of the system are "**admin**" and "**admin**" .Only a valid username and password can provide access to the system.

- Login screen

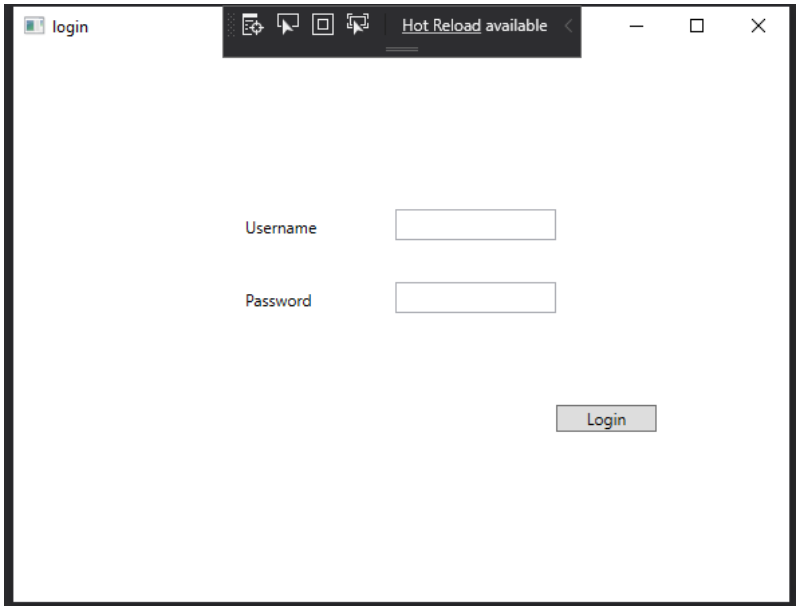


Figure 1-Login screen

This is the login screen of the application.

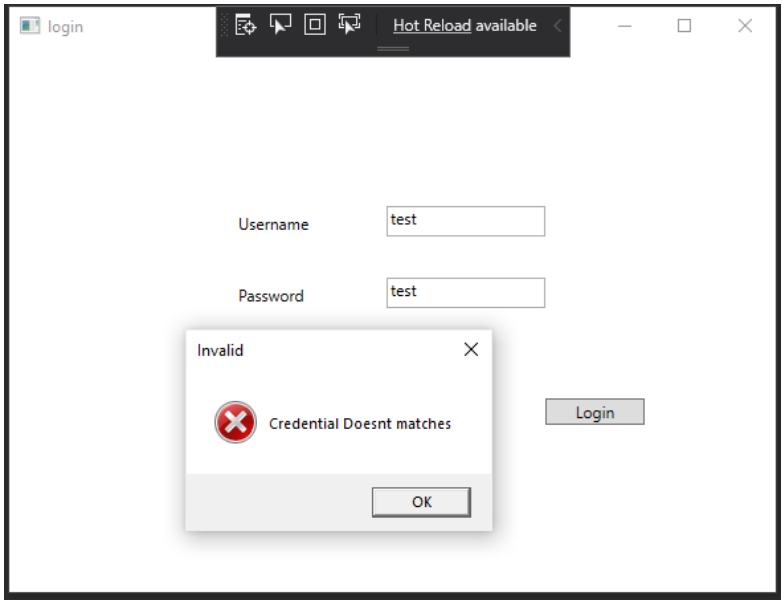


Figure 2-Invalid Login

If you give invalid credentials on login form pop up message is displayed to give the message.

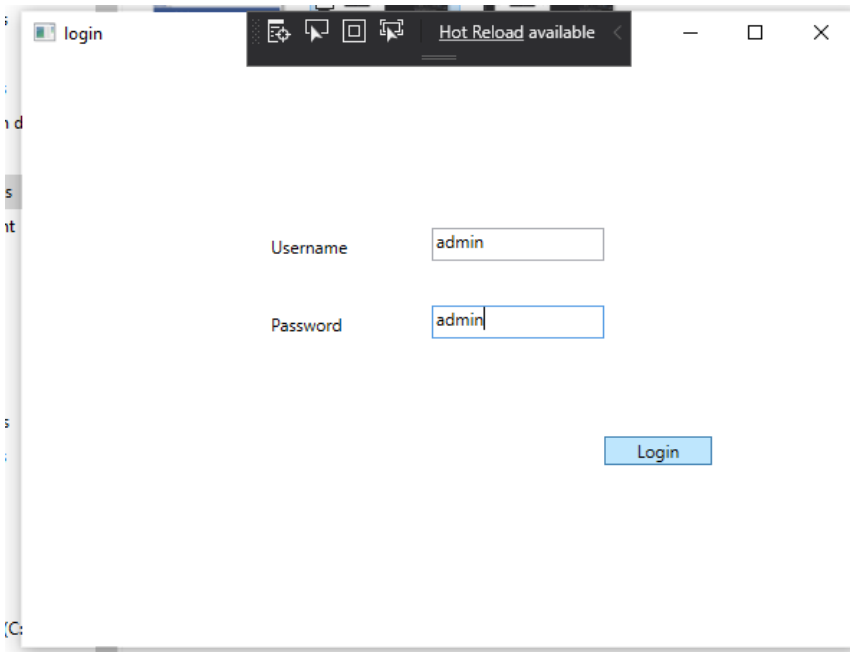


Figure 3-Correct username and password

These are the correct credentials after clicking on login home screen is displayed.

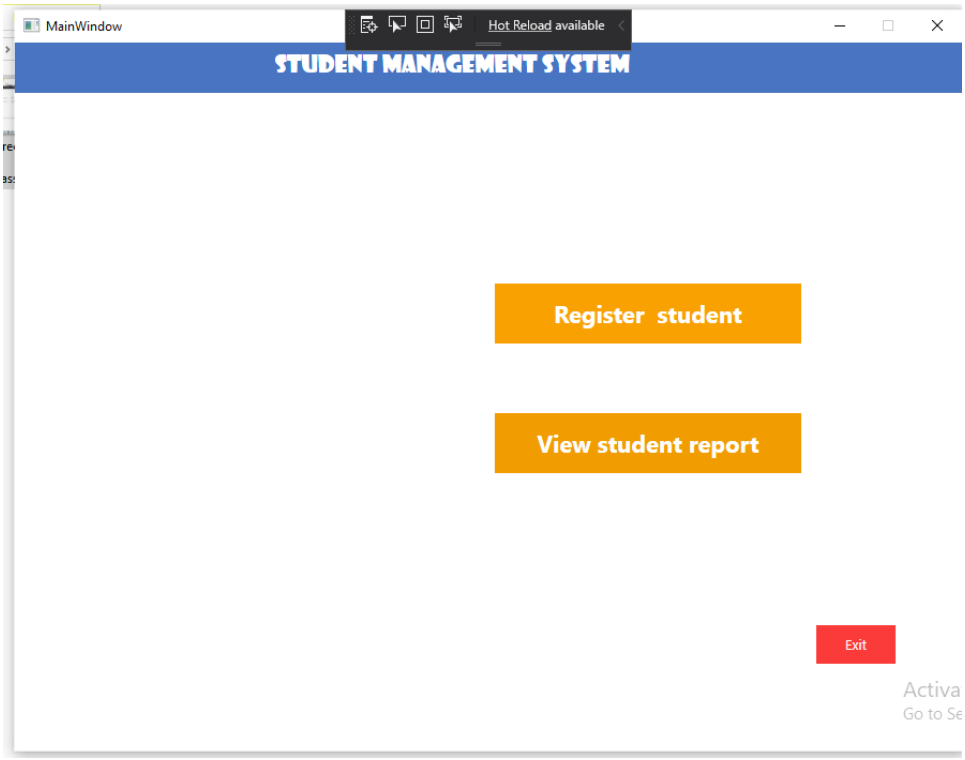


Figure 4-Home Screen

This is the home screen of the app which you can enter after providing correct username and password.

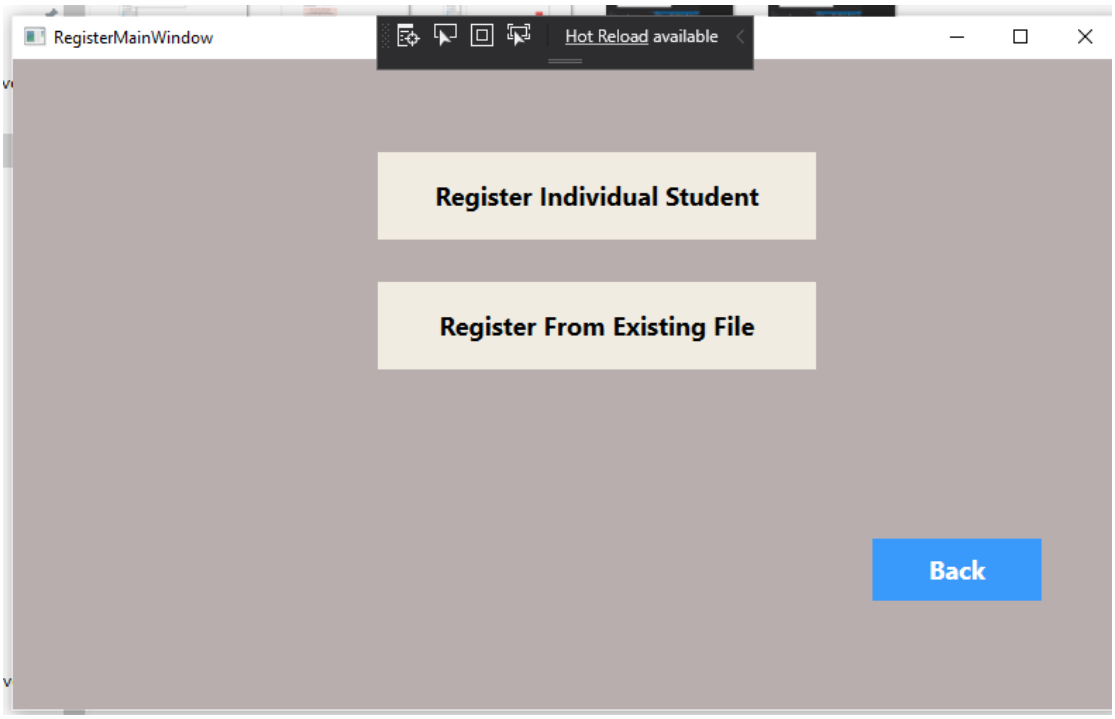


Figure 5-Register Students

These are the two options to register students one from filling the individual form and another giving the file.

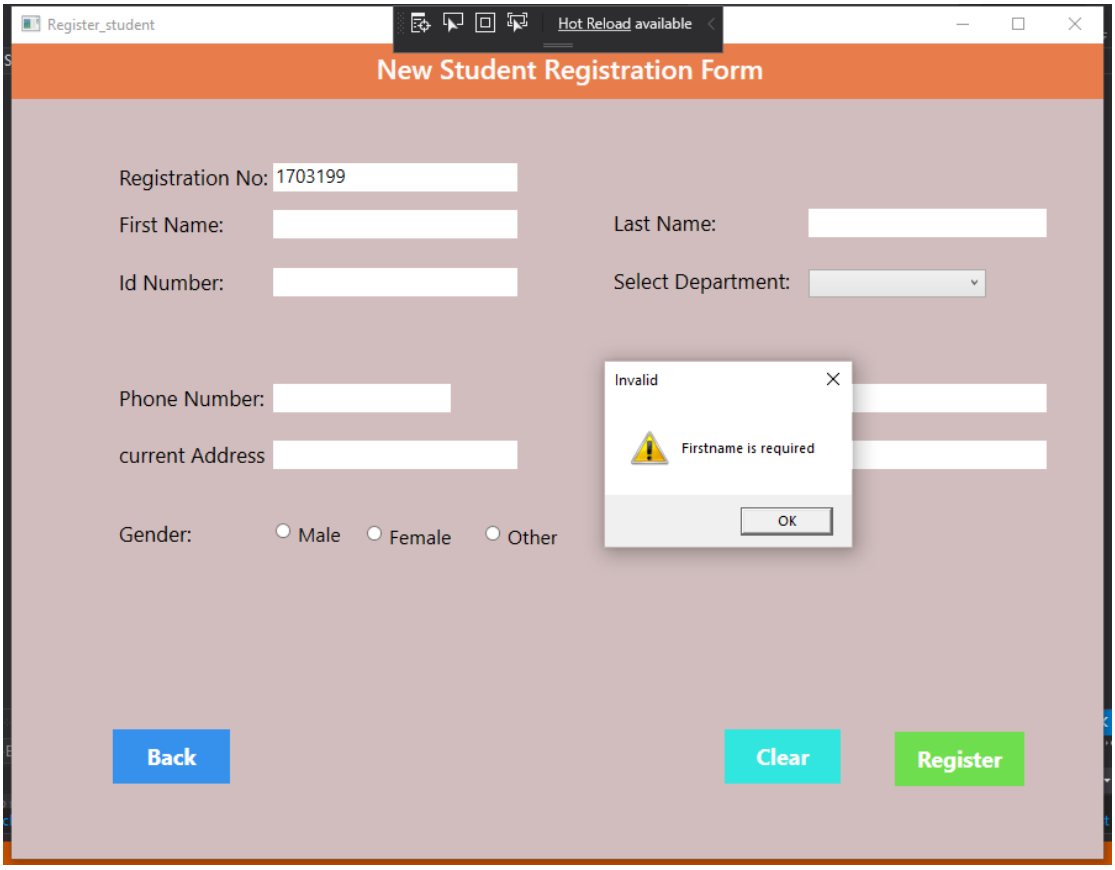


Figure 6-Register individual data form

This is the form to register individual data of students along with the message when we submit with the input field empty.

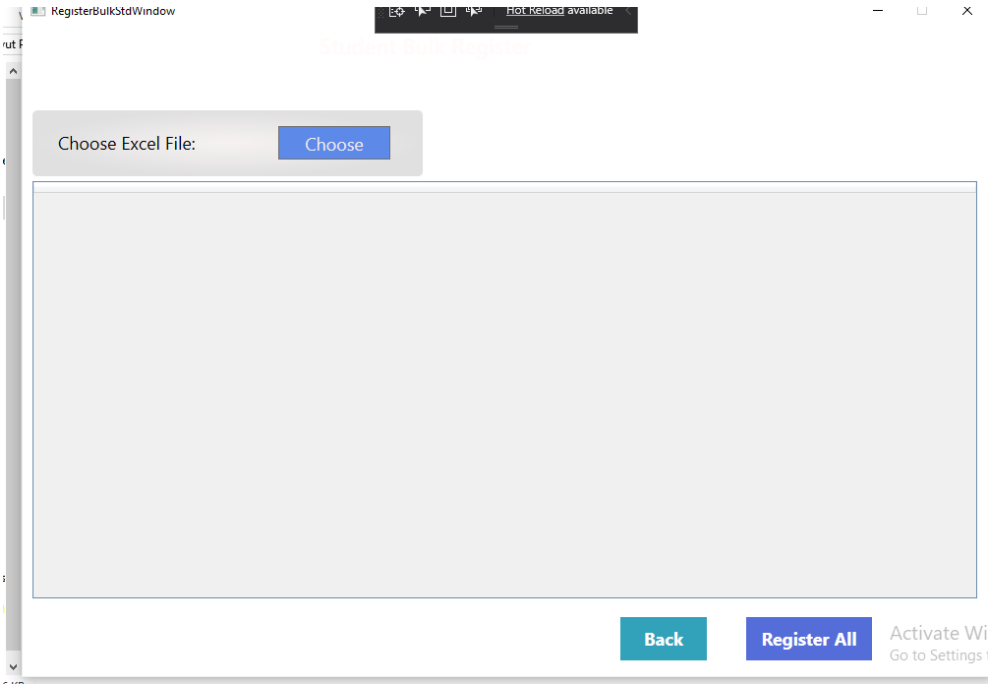


Figure 7-Register from existing file

3. Journal Articles

- Every decade brings with itself new technological changes and new inventions that are changing the way the workforce functions. One of the strongest new mantras that are redefining the present-day world is workforce management.

Today, not just the corporate world but even schools and colleges across the world are opting to take their processes online and automate their key functions. Student registration and admission management system is one such function of schools and colleges that is fast getting automated and processed online.

Let us know more about this system that is changing the way schools are functioning across the world

What is a student registration and admission management system?

Student registration and admission management software allow the school to manage the admission process with ease with the help of a school management software. This software helps you to automate the admission process making it more efficient and more effective.

Why choose a student registration and admission management system?

Automates the Process

The use of student registration and admission management system helps to automate the process for the school.

Schools no longer have to spend time collecting, sorting and documenting the forms. The student registration and admission management system can sort out the forms and store them in a digital format for easy access when needed.

The system also automates the process by sending out automated acknowledgments, payment receipts, and reminder emails when needed.

Reduces Error

An important function of a student registration system is that it reduces the chances of errors – both in filling the form as well as in the processing stage. If students were to miss out on filling information or fill out incorrect information, the system immediately alerts them of the errors.

For schools too, the systems no longer have to go through the thousands of registration forms and verify the accuracy of the information as incorrect forms are highlighted in the system.

No long queues

With the help of student registration and admission management system students no longer need to wait in long queues to collect and submit forms. They can do the same online, submitting all the relevant documents with the click of the mouse.

Reduce Manpower

The admission season can be a chaotic season for schools, as all the manpower gets involved in the various functions related to admissions such as form distribution, collection, information verification, payment verification etc.

However, automating the process is a great way to save on your precious manpower while ensuring that all the tasks related to the admission season get completed with speed and efficiency – and without errors.

Reduces Paperwork

Admissions in the school usually translate into plenty of paperwork from admission forms, acknowledgment slips, reminder emails, payment receipts, student data forms, the list can be endless.

Using a digital system to manage this information and store in an online cloud that can be easily accessed by authorized individuals from any location.

Additionally, this information is secure and can be updated in real time, thus avoiding the need for tedious emails and file changes for an update in the student registration related information.

This reduction in paperwork is also relevant to the students as they no longer have to keep track of multiple print documents, making numerous copies of the same because they can complete the entire end-to-end registration process within minutes with the help of student registration and admission management system.

User and Environment-Friendly

Lastly, with all these features, it can be concluded that using an online system to manage student registration and admission is a user-friendly practice that saves effort, manpower, reduces error etc.

It also saves paper making it an environment-friendly option for schools who want to reduce their carbon footprint. (fedena, 2012)

- Considering the Switch to an Online Student Registration System Student registration is one of the most important processes a school conducts each year. The stakes can be high; parents may be anxious to ensure that all the documents required for their children to register at their desired school are in order and submitted as promptly as possible. For schools that don't have an online registration system, the process can be extremely laborious and time-consuming. Printing out scores of forms to be filled out for each child, sending or distributing them to the parents, and getting them all back in a timely manner is a massive undertaking for any school. From there, making sure someone accurately enters the received data into the student information system (SIS) consumes additional staff time and can lead to unintended errors. Meanwhile, parents can only patiently wait for confirmation that their child has successfully been registered. A school can remedy these pain points for its staff and parents by switching to an online enrollment system that allows parents to submit all of these forms via a mobile app or online. This will clear the way to a better, more efficient process that empowers parents and eases the burden on staff. As with any major technology rollout, it's always wise to engage in some careful and

prudent planning beforehand to ensure success with online registration. Here are some tips to help your school and parents get the most out of the transition.

Create and Seek Input into Your Plan for Success A major process change like this requires close coordination with a technology partner. Before beginning the project, identify a project manager within the school, perhaps someone from the registration staff, who will have chief responsibility for planning the launch of the online registration system. Together with the technology partner, the project manager should map out both how the school's current registration process works and then what it will look like in the online system. There will likely be some differences in the way it works in the new system, so the project manager should run those changes by school registration staff to get their input on how they will affect the registration workflow. Actively soliciting regular feedback from registration staff is key, for it will ensure both that the new process is designed as efficiently as possible and that the project itself has buy-in from the people who will be tasked with using the online registration system.

Communicate with Parents Early and Often Start communicating early with parents via text or email to let them know the school is moving to an online registration system and when it will happen. This gives parents an opportunity to learn more about the new system, download the mobile app on their device if they will be using it, and ask questions before they will have to create an account and begin filling out registration forms. Let them know how they can contact the school for assistance via phone or email if they get stuck. As the registration deadline approaches, don't be afraid to send parents multiple reminder emails. There's almost no such thing as over-communication when it comes to keeping parents informed, and they will appreciate the trouble you've taken to keep them in the loop.

Find Out How Parents Access the Internet When planning for your online registration, it's important to have a sense of parents' comfort level with technology and the type of Internet access they tend to have — whether it's smartphone-only or mobile devices and broadband at home. Find out what type of device and method of Internet access they're using via an online questionnaire or survey so you can plan how best to support their needs as they learn the new system. If they're primarily smartphone users, then you'll want to include instructions for signing up via smartphone in your roll-out plan. If they have a mix of smartphone access via a cellular or WiFi connection and broadband access via a laptop or desktop at home, then you'll want to be sure that instructions for creating an account from a home computer with broadband connectivity are included as well.

Offer Student Registration Forms in Other Languages If you have a large non-English speaking parent population, try to create online forms for them in the language that they speak. By making those forms available in your online registration system, you're improving non-English speaking parents' ability to participate in registration. As a result, they can be more involved in their children's education, which is shown to increase educational outcomes for students. If you have staff that can speak the languages of your non-English speaking parents, consider offering them as a resource to those parents should they have questions or need assistance during the transition to online enrollment.

Guide Parents Through the Registration Process As you're designing the online registration forms, think about where you can include helpful instructions to guide parents through the process. For example, SchoolMint enables this through custom messages, in which the school can write messages or instructions, warnings, and advice to parents at different stages throughout the application flow. Such messages can go on the sign-in or sign-up page, on the parent's account, or even on the application itself. With helpful tips embedded in the online

registration system, parents can more easily navigate their way through registration on their own.

Make Time for Staff Training Since your staff will be learning how to use the online registration system for the first time, allow them some time for training. If they have an adequate opportunity to familiarize themselves with how the software works before registration kicks off, they'll be better able to manage the process and answer questions that parents may have. Staff that develop strong expertise in the tool can then easily train colleagues in how to use it so that there is always a backup if someone is out of the office.

Ensure Data Integrity with SIS Integration As you're creating your online registration forms, be mindful of where the information you receive is ultimately going to end up. If you choose to integrate your online registration system with your SIS, consider how you're formatting your questions in the registration forms and how you're collecting the data you receive. Since it will be used to create student records in the SIS, make sure that data is in the best format possible before you begin transferring it over. That way, you will have clean, reliable data available for analysis at the end of the year. By taking some thoughtful steps to prepare both parents and staff for the switch to an online registration system, you can ensure that everyone is well equipped to navigate the change as easily and painlessly as possible. Staff will appreciate the time savings and streamlined process, while parents will feel empowered by being able to check on the status of their child's registration with a simple tap or click. With the benefits an online registration system has to offer, your school can devote more resources toward its mission of delivering a quality education. (schoolmint, 2008)

- As we inch closer to March and the spring months, K-12 institutions everywhere are gearing up for student registration season—where parents of new and returning students complete registration requirements to enroll their children for the upcoming school year. For many of these institutions, this is a tedious process that involves a lot of detailed paperwork. Schools are required to collect and maintain large amounts of personal data on students—from basic identifying information to emergency contact details to medical history. Without an organized, efficient system in place, this process can be extremely difficult to manage. And the difficulties are not exclusive to the school administrative personnel. The stacks of paperwork can be a nightmare for parents as well (especially those with multiple children to enroll). If you're institution trudges through a cumbersome student registration system year after year, it's time for a new approach. With a few simple steps, you can revamp your student registration process and give staff and parents a much better experience.

  Digitize your enrollment packet. The first step toward a more efficient student enrollment process is to eliminate paper forms and move the process online. Chances are, your enrollment packet includes a number of forms designed to gather important information like this: Student identification details Emergency contact information Immunization records Recent physical exam data Medical authorizations With a digital enrollment packet, parents can view and complete the necessary forms on their own time using a computer, tablet, or mobile device. They can also upload required documents (such as birth certificate, photo identification, and proof of residence) directly to any online student registration form before submitting. And the data they submit can be protected by advanced online security features. Creating customized online enrollment packets eliminates mounds of paper and hours of manual data entry, saving a tremendous amount of time for parents and staff alike. (formstack, 2015)

4. System Architecture

The purpose of system architecture activities is to define a comprehensive solution based on principles, concepts, and properties logically related and consistent with each other. The solution architecture has features, properties, and characteristics satisfying, as far as possible, the problem or opportunity expressed by a set of system requirements (traceable to mission/business and stakeholder requirements) and life cycle concepts (e.g., operational, support) and are implementable through technologies (e.g., mechanics, electronics, hydraulics, software, services, procedures, human activity). System Architecture is abstract, conceptualization-oriented, global, and focused to achieve the mission and life cycle concepts of the system. It also focuses on high-level structure in systems and system elements. It addresses the architectural principles, concepts, properties, and characteristics of the system-of-interest. It may also be applied to more than one system, in some cases forming the common structure, pattern, and set of requirements for classes or families of similar or related systems. (sebokwiki, 2017)

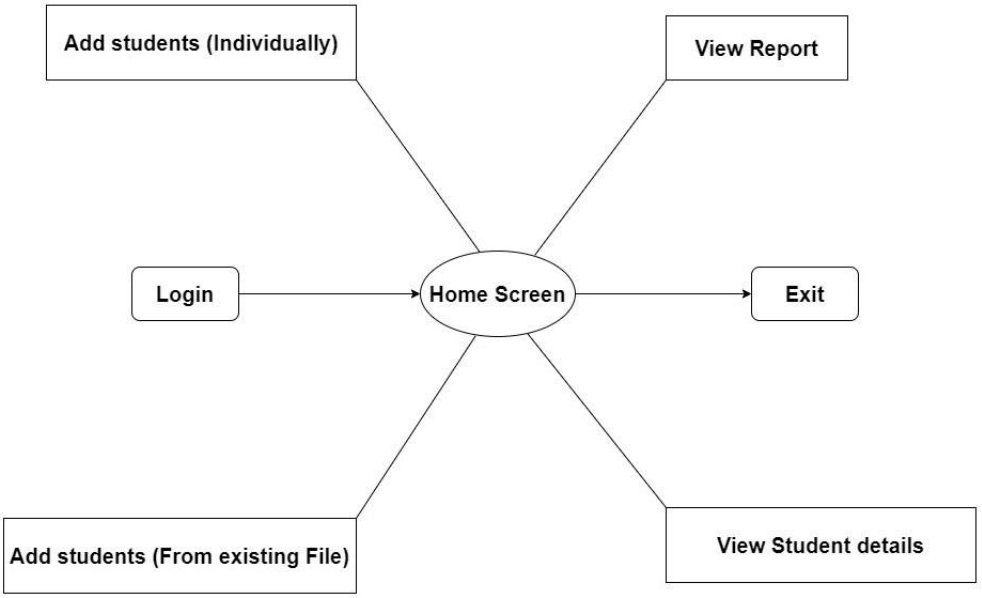


Figure 8-Artichecture Diagram

5. Data Structure

Data Structure is a way of collecting and organizing data in such a way that we can perform operations on these data in an effective way. Data Structures is about rendering data elements in terms of some relationship, for better organization and storage. For example, we have some data which has player's name "paras" and age 26. Here "paras" is of String data type and 26 is of integer data type.

We can organize this data as a record like Player record, which will have both player's name and age in it. Now we can collect and store player's records in a file or database as a data structure. For example: "Paras" 30, "Karan" 31, "Gyanendra" 33

If you are aware of Object Oriented programming concepts, then a class also does the same thing, it collects different type of data under one single entity. The only difference being, data structures provides for techniques to access and manipulate data efficiently.

In simple language, Data Structures are structures programmed to store ordered data, so that various operations can be performed on it easily. It represents the knowledge of data to be organized in memory. It should be designed and implemented in such a way that it reduces the complexity and increases the efficiency. (studytonight)

6. Sorting Algorithm

Bubble Sort

Bubble sort is a simple sorting algorithm. This sorting algorithm is comparison-based algorithm in which each pair of adjacent elements is compared and the elements are swapped if they are not in order. This algorithm is not suitable for large data sets as its average and worst case complexity are of $O(n^2)$ where **n** is the number of items.

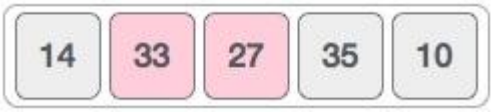
How Bubble Sort Works?

We take an unsorted array for our example. Bubble sort takes $O(n^2)$ time so we're keeping it short and precise.

Bubble sort starts with very first two elements, comparing them to check which one is greater.

In this case, value 33 is greater than 14, so it is already in sorted locations. Next, we compare 33 with 27.

We find that 27 is smaller than 33 and these two values must be swapped.



The new array should look like this −

Next we compare 33 and 35. We find that both are in already sorted positions.

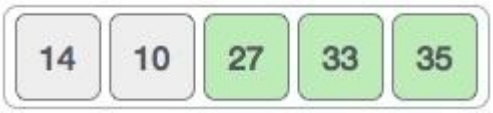
Then we move to the next two values, 35 and 10.

We know then that 10 is smaller 35. Hence they are not sorted.

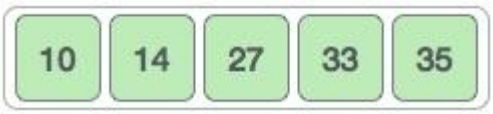
We swap these values. We find that we have reached the end of the array. After one iteration, the array should look like this −

To be precise, we are now showing how an array should look like after each iteration. After the second iteration, it should look like this −

Notice that after each iteration, at least one value moves at the end.



And when there's no swap required, bubble sorts learns that an array is completely sorted.



Now we should look into some practical aspects of bubble sort. (tutorialspoint, 2006)

Example:

First Pass:

(**5 1** 4 2 8) –> (**1 5** 4 2 8), Here, algorithm compares the first two elements, and swaps since 5 > 1.

(1 **5 4** 2 8) –> (1 **4 5** 2 8), Swap since 5 > 4

(1 4 **5 2** 8) –> (1 4 **2 5** 8), Swap since 5 > 2

(1 4 2 **5 8**) –> (1 4 2 **5 8**), Now, since these elements are already in order (8 > 5), algorithm does not swap them.

Second Pass:

(**1 4** 2 5 8) –> (**1 4** 2 5 8)

(1 **4 2** 5 8) –> (1 **2 4** 5 8), Swap since 4 > 2

(1 2 **4 5** 8) –> (1 2 **4 5** 8)

(1 2 4 **5 8**) –> (1 2 4 **5 8**)

Now, the array is already sorted, but our algorithm does not know if it is completed. The algorithm needs one **whole** pass without **any** swap to know it is sorted.

Third Pass:

(**1 2** 4 5 8) –> (**1 2** 4 5 8)

(1 **2 4** 5 8) –> (1 **2 4** 5 8)

(1 2 **4 5** 8) –> (1 2 **4 5** 8)

(1 2 4 **5 8**) –> (1 2 4 **5 8**) (geeksforgeeks, 2010)

Pseudo code

We observe in algorithm that Bubble Sort compares each pair of array element unless the whole array is completely sorted in an ascending order. This may cause a few complexity issues like what if the array needs no more swapping as all the elements are already ascending.

To ease-out the issue, we use one flag variable **swapped** which will help us see if any swap has happened or not. If no swap has occurred, i.e. the array requires no more processing to be sorted, it will come out of the loop.

Pseudocode of BubbleSort algorithm can be written as follows –

```
procedure bubbleSort( list : array of items )

   loop = list.count;

   for i = 0 to loop-1 do:
      swapped = false

      for j = 0 to loop-1 do:

         /* compare the adjacent elements */
         if list[j] > list[j+1] then
            /* swap them */
            swap( list[j], list[j+1] )
            swapped = true
         end if

      end for

      /*if no number was swapped that means
```

```
      array is sorted now, break the loop.*/

      if(not swapped) then
         break
      end if

   end for

end procedure return list
```

7. Flowchart

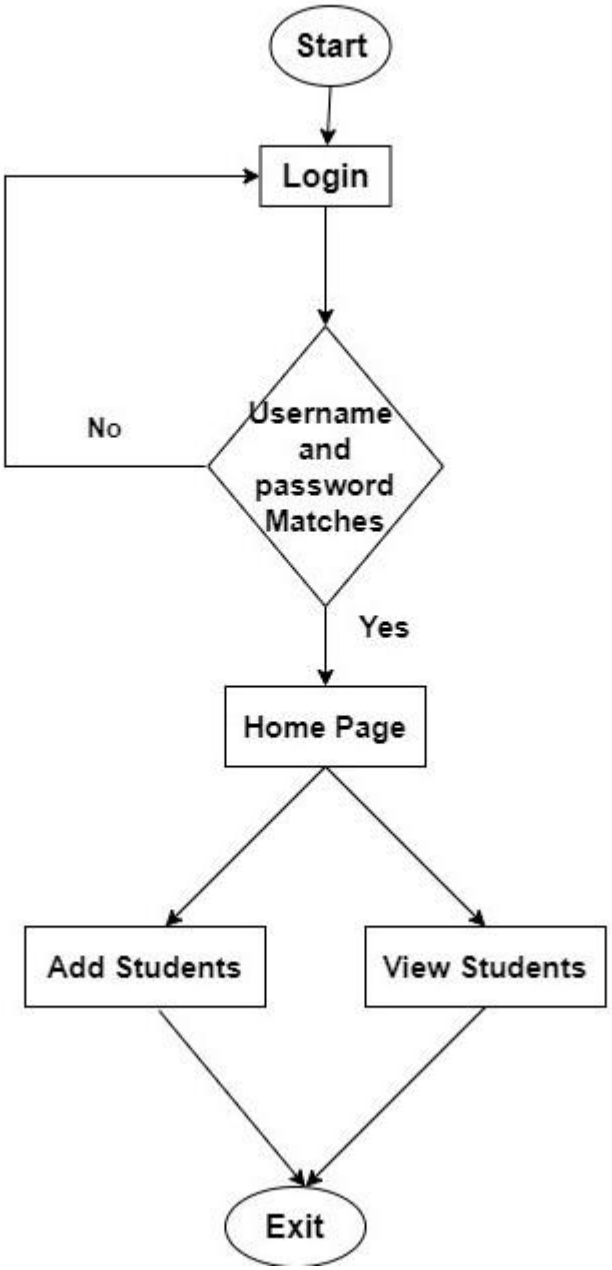


Figure 9-Flow Chart

8. Algorithm

Step 1- Start

Step 2-Login

Step 3- credentials matches if yes go to home screen

Else login again

Step 4-Add students or view students

Step 5- Exit

9. Reflection

The developed system is Digitalized Students Information System. It is developed using Visual Studio 2019 with the C# language version 7.3. The logic used in the system reflects the real working environment of the schools or colleges. In this application adding student information and viewing their details is available.

If this sort of applications is implemented in every schools as well as college, it will be easier for the staff to get the details of the student and add their details.I had little previous experience with Visual Studio. With this experience I had got some plus point while doing this coursework. I came to get more working and experience with the language Overall; I had a great experience with the Application Development.

10. Conclusion

The initial coursework for the module CS6004NA Application Development was to build up framework for an student information system. It required a long time to build up the task in Visual Studio Enterprise 2019 utilizing C# programming. The framework has login screen to add security to the task. After login, the framework shows a home screen where adding and displaying functionalities are found.

I would like to thank my Module leader Mr. Ishwor Sapkota as well as Mr. Sachin Subedi for guiding me throughout the project.

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