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OOP Lab Report

Title: C++Genie(File storage System)

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Submission Date: 04/03/2020

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Acknowledgement

We express our sincere gratitude to all those who have helped us imagine this idea. We would like to thank our Object Oriented Programming teacher, Mr. Daya Sagar Baral sir for providing us this opportunity to do a project using C++.

We sincerely thank Department of Electronics and Computer Engineering, Pulchowk Campus for giving us an opportunity to work on this project to expand our knowledge on Object Oriented Programming and work on team. The project has given us first-hand experience on how a real project that is done in a collaborative environment is completed. The struggles and challenges that we have faced while doing this project has improve our understanding of programming and how it is done in the professional world.

Abstract

A local storage drive is a space for a given user to store, add, display and edit their personal documents. Our project utilizes C++ programming language along with its GUI library OpenGL (i.e. glut), the users' files are in the .txt format. As a bonus we have included a to-do list for each individual user.

The features of login, signup, to-do list, synonyms and even storage of files is done by utilizing file handling and directory handling features of C++. The project depicts the use of object oriented programming along with the glut library.

Table of Contents

Objectives	4
Introduction	4
Application	5
Literature Survey	5
Existing Systems	5
Methodology	6
Implementation	
a. Description	7
b. System Block Diagram	8
Result	9
Problems faced and Solution	9
Limitations and Enhancement	9
Conclusion and Recommendation	10
References	10

OBJECTIVES

The following were our objectives in making this project:-

- To learn the necessary skills and tools for running projects as a team
- To accommodate major portions of C++ programming and convert them into a creative platform
- To understand and make proper use of object oriented programming
- To build an attractive UI for the users to help them select different options
- To learn how to make effective codes efficiently
- To be familiarized with graphics programming using special libraries in C++
- To be familiar with resource reusability by making user defined header files

Introduction

In this project, we are going to develop a local file storage system, **C++ Genie**, with built-in search engine able to return results on the basis of entered keywords. In today's heaving world remembering every little piece of information or everything we ought to do in our hectic lives can be a very difficult task so, we have come up with additional functionalities in **C++ Genie** to solve all such problems. With **C++ Genie**, you can store your files and set deadlines for the submission of your to-do tasks.

Application

C++ Genie, is primarily a file storage system which creates a personalized environment for each user and stores their files, which can be edited, deleted and new ones can also be created by the user when required.

There is also the additional feature of a personalized to-do list that has a due date attached to each task which can be utilized to remember tasks that the user has to finish before an allocated date.

Literature Survey

There are many researches in the cloud storage field, which is the enhanced filed of local storage. Since the local storage system is an old storage of system but is still utilized when data privacy is of the utmost importance. The use of local storage is the best method when data storage.

Our project, C++ Genie has a very good data privacy for the given user as other users are unable to use other users' files through the program.

Existing Systems

At present, there are many similar applications at various online platforms with different names that are based on the same basic concept but are an extended and modified versions of this basic application we have proposed to develop.

Some of the most widely used application of such type are “Google Drive” by *Google*, “OneDrive” by *Microsoft*, etc.

Methodology

This project is based on C++ programming language utilizing “Object Oriented Programming” concept. Hence, different classes will be created with required number of private and public member data and member functions for smooth running of the program preserving the concept of data hiding. The concept of “code reusability”, is used has been utilized. The events for each object will have been handled by the different member functions so that they form a final outlook working together simultaneously

We will go through various books and online resources of C++ and Object Oriented Approach. As such real-world level programming is new for us, we will learn the basic logic by surfing through related resources and forums and consulting related books.

The application will be developed using compiler, IDE and Operating System, we will be using Code::Blocks as IDE and GCC (GNU Compiler Collection) as compiler in Microsoft Windows Environment. The application will be probably be cross platform and users can use it on any platform. For graphics and other layout-design related works, we will be using the OpenGL, glut library. After collecting necessary materials, we developed the algorithm for our project and worked as per it. Since the main motto of the project is to learn OOP, the coding will be done utilizing all the features of C++ like objects, classes, data abstraction and encapsulation, polymorphism, dynamic binding, message passing etc. In order to store the user’s data we will use a database management system.

Initially, the codes for different segments of the application has been written adopting the concept of object oriented programming and layout designs have been drawn separately. After each part of the application is completed, they will be merged together and the final working application has been produced.

Implementation

Description

Upon starting the application, the user is presented with a welcome screen, which has information about the developers and has an option to go to the login or signup screen, the login screen for returning users and signup screen for new users. After successful entry of the login credentials, specific data based upon the user's login information is retrieved from the validating system and then presented to the user is the file storage screen, in which options for different actions such as adding new file, deleting a saved file, accessing specific file can be done by the right-click mouse button.

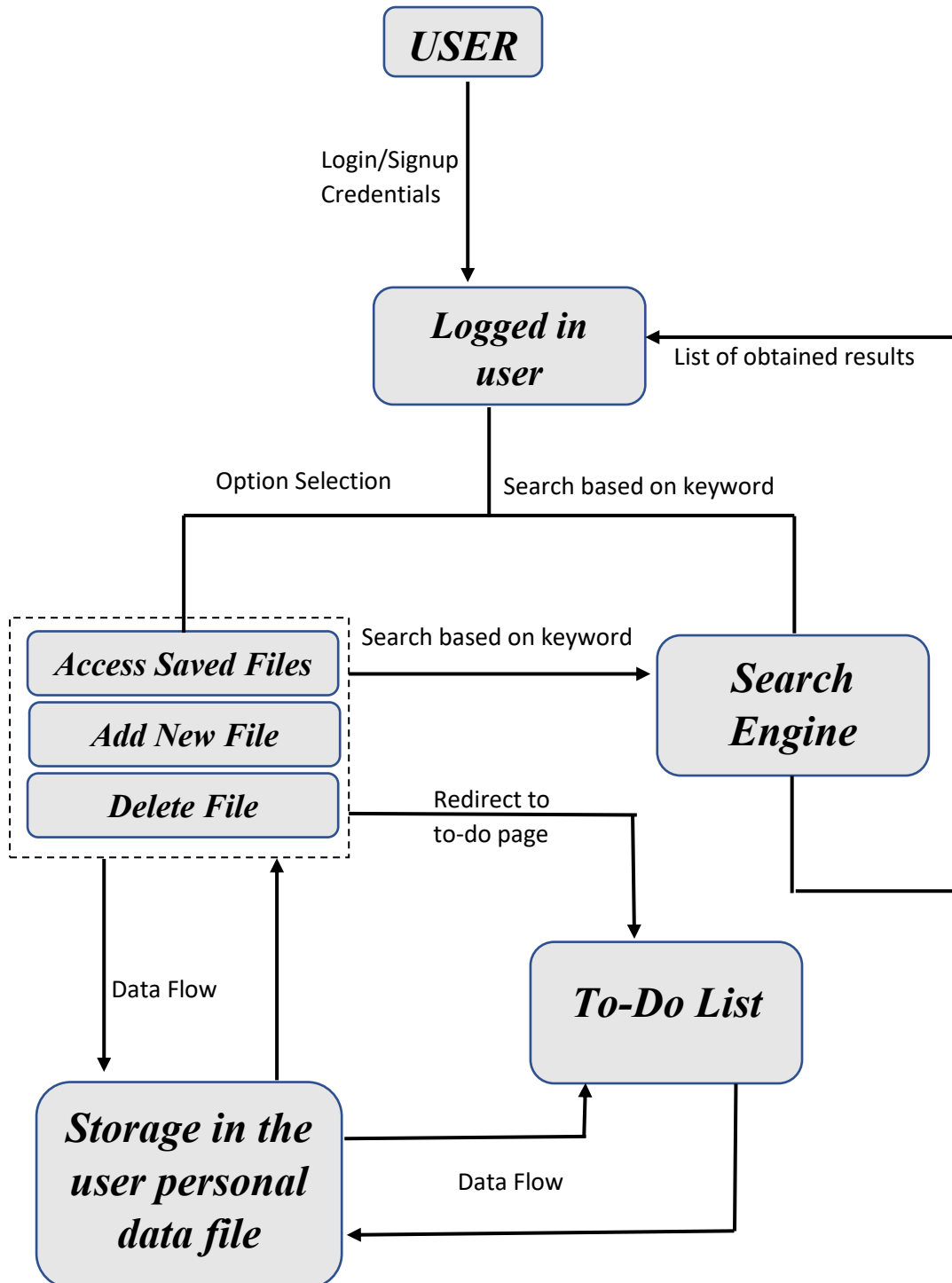
A search box appears at the top of the window in which allows the user to search for files and the content of the files on the basis of the keyword entered by the user. The search results are displayed to the user in a list form. Results can be opened from the same list.

There is also synonym boxes that can be utilized by user to create synonyms for a given word that is utilized when the search engine operates. There is also a to-do button which redirects to the to-do list.

In the to-do page, the adding tasks and due date is given at the top and previous to-do tasks are listed below them with an individual delete button that can be utilized to delete the completed task.

The user is able to navigate between pages by use of the back button , and logout button on the file storage page. Another user may login after one user has logged out. There is an exit button on the login page for when the user wants to shut down the program.

System Block Diagram



Result

The result of our hard labor has resulted in the creation of the C++Genie Storage System. C++Genie utilizes the object oriented programming concepts along with the use of OpenGL (i.e. glut) library.

Problems Faced and Solutions

The most noticeable problem we faced while developing C++Genie was the use of OpenGL library as it was all new to us , also utilizing features such as directory handling of C++ also required a great deal of study of various books available online as well as the creator of C++(Stroustrup)'s book.

Limitations and Further Enhancements

The files are stored as hidden directories which can be accessed through the windows; we did not perform any encryptions.

As for further enhancements, the encryption can be done that will make data secure. Also expanding our knowledge and making C++Genie able to store all types of files would make is very much more powerful and utilized in more ways. Then as the trend of cloud storage is becoming more main stream, C++Genie could also be integrated as a cloud security system in its more improved stages.

Conclusion and Recommendation

While C++Genie is not on par with Google drive or one drive , but as a simple local storage system that stores .txt files it is very good and usable. This project has taught us so many new capabilities of C++ and how we can use C++ for the creation of main stream programs that can be made in the real world, rather than just as a student project. C++ is a very powerful language and can be used in so many fields.

The main object of the project was to make us, students able to utilize C++ to create our own project and as the completion of C++Genie we can say that our objective has been fulfilled. The programs developed in C++ are much faster than those done on a interpreter language such as python, thus when requirements call for a very fast program from now on we will be utilizing C++.

References

1. The C++ Programming Language by Bjarne Stroustrup
2. Various online sites such as geek for geeks, stack overflow, etc.
3. Online tutorials and books on the OpenGL (GLUT) library