Acknowledgement

First of all, we express our gratitude to our teacher, Daya Sagar Baral for his valuable guidance, suggestions and teachings that has motivated us to accomplish this project. It also becomes our moral duty to vote our thanks to our classmates and seniors for their help and suggestions to give this idea a shape.

We would like to thank everyone who has and will help us with this project in any way. We are very thankful to the department of Electronics and Computer Engineering for providing this wonderful opportunity to create this project that will help us to apply the knowledge gained through lectures into our project.

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Introduction

We aim to develop a peer to peer collaborative whiteboard based on windows. As the name suggests, we will make a program that allows us to draw though keyboard and mouse inputs and the board will be shared among multiple users, who can view the updates from other users and collaborate in the board. We plan to limit the this up to 2 users for convenience as of now.

The project will be developed on the basis of various features of C++. It will use the object oriented programming features of the language. The basic feature of OOP, objects and classes will be excessively used in the project. We will use the IDE, Visual Studio for the project.

The project will use the library GLFW with Dear ImGui for graphics. The information and updates form one user will be transported to the other using client/server model.

Objectives

The main aim of this project is to familiarize ourselves with the basic concepts and features of object oriented programming in C++ and its implementation for solving real-life programming based problems to achieve the targeted results more easily.

This Collaborative Whiteboard will be designed using the most common features of OOP. The objectives of the project are summarized as follows:

1. To familiarize ourselves with the Object Oriented Programming (OOP) with respect to C++ language.
2. To be able to use various features of this language.
3. To implement the knowledge gained through the lectures of our C++ lecturer into real life programming.
4. To develop a logic of good programming practice.
5. To learn to use external libraries in projects.
6. To develop the skill of working in group projects.

Existing Systems

The are many similar applications already made such as Live board for android, Inko for iOS, web-based applications like Ziteboard, Realtimeboard etc.

We plan to make simpler versions of these established applications(two users for now) that would give us a good learning experience.

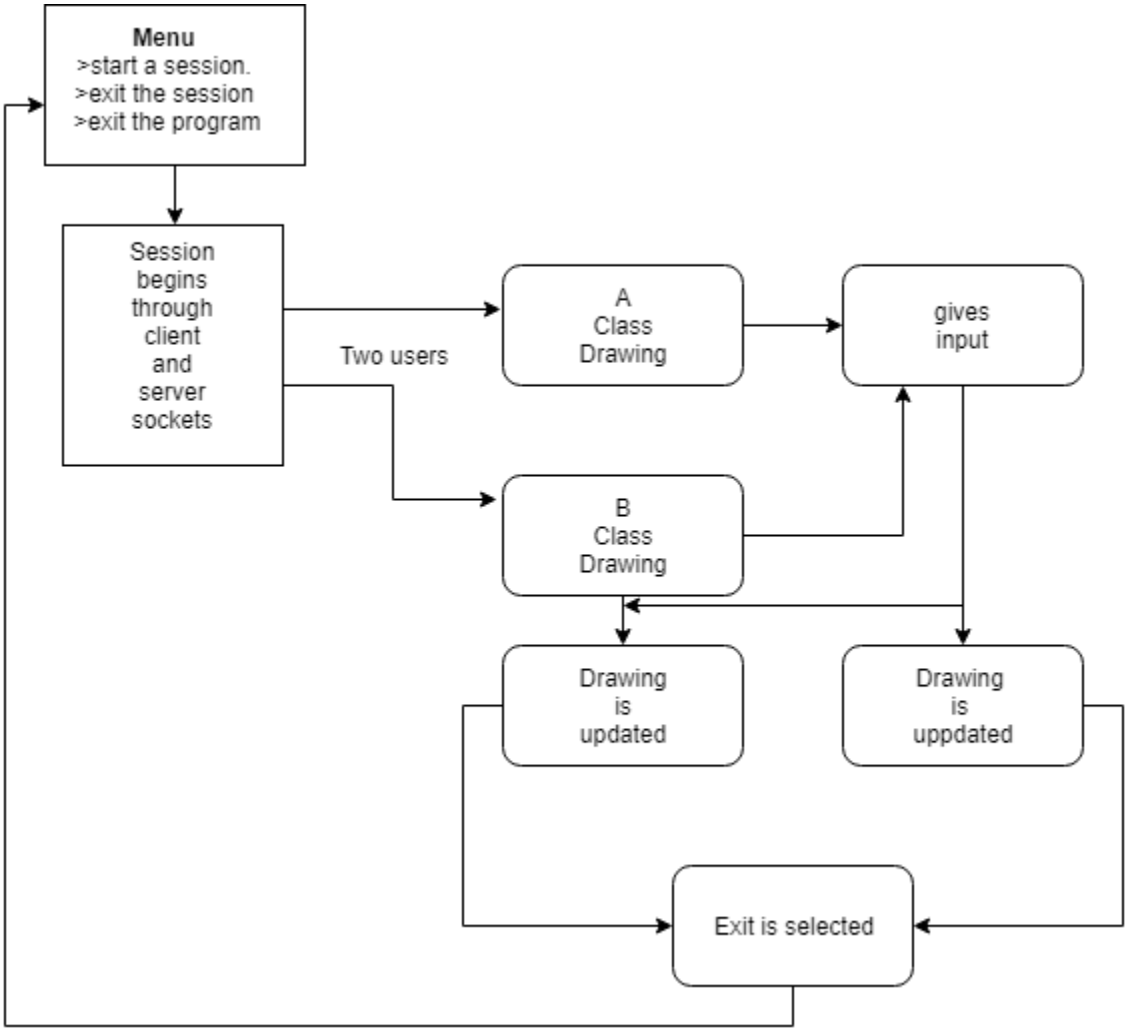
Proposed System

Description:

Basically, we want to create a multi-user application that would allow real time collaboration through a drawing board. But due to time limitations, we plan to limit it to two users (two windows in same PC).

As the application starts, two windows (two users) will be opened simultaneously.There will be a class called drawing that would store all the inputs. Whatever inputs one user gives will be updated to the second too. And so both boards will be updated.

Block Diagram


Menu
>start a session.
>exit the session
>exit the program
Session begins through client and server sockets
Two users
A Class Drawing
gives input
B Class Drawing
Drawing is updated
Drawing is uppdated
Exit is selected

Methodology

As our project is heavily based on GUI, we will use the GLFW library with ImGui for the board and interface part and use client/server architecture for the networking part.

The basic programming methodology we plan to follow is given below:

1. Project analysis
    - Objective Clarification
    - Output Specification
    - Input Requirements
    - Logic Development
2. Working on algorithms And creation of Rough flowcharts.
3. Division of work into modules
4. Writing Source codes.
5. Execution of codes after completion of each small module.
6. Testing and Debugging the codes.
7. Adding extra features to enhance the project.
8. Program Documentation
9. Presentation

Project Scope

The proposed idea has application in many areas and can be extended further too. It can be developed as a cross-platform multi-purpose application. It can be extended as an online teaching tool. It can be very useful in online meetings and conferences. It could also be developed for simple discussions and playing paper games in group.

Project Schedule

- **Analysis and Research- 3 days**
- **Develop a working algorithm- 2 days**
- **Develop the simple board that allows free hand drawing- 1 week**
- **Develop the network model-1 week**
- **Integrate the board into network- 4 days**

- **Add additional features to the board- 3 days**
- **Code Testing , Debugging –3 days**