SMALL SCALE ELECTION SYSTEM

Project submitted to the

SRM University – AP, Andhra Pradesh

for the partial fulfillment of the requirements to award the degree of

Bachelor of Technology

In

Computer Science and Engineering

School of Engineering and Sciences

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Certificate

Date: 05-Dec-22

This is to certify that the work present in this Project entitled “**SMALL SCALE ELECTION SYSTEM**” has been carried out by **Group 7 (Abdul Jawad khan, Subodh Amuru Kiliveti, Mahendra Kumar, Venkata Suprabath)** under my/our supervision. The work is genuine, original, and suitable for submission to the SRM University – AP for the award of Bachelor of Technology/Master of Technology in **School of Engineering and Sciences**.

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Acknowledgments

I would like to thank my teacher Rajiv Senapati who gave me the opportunity to work on this project. I got to learn a lot from this project about different core concepts of Object-Oriented Programming like data encapsulation and abstraction, inheritance, objects and classes, and static data members. I am very grateful to him for his support and guidance in completing this project. Finally, I want to thank all my dear teammates as well for being part of the team and for helping me complete this project.

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Abstract

The word “vote” means to choose from a list, to elect, or to determine. The goal of voting is to come up with leaders of the people’s choice. This program allows eligible voters to cast their vote secure and secret ballot electronically. Most countries, India not being an exception have problems when it comes to voting. Some of the problems are inadequate polling materials, insecure polling stations, and inexperienced polling staff. The voting/polling systems are used to tackle the above-mentioned problems. However, the users/citizens shall be given ample time during the voting period. They must also be introduced to the concept of This type of election beforehand.

Statement of Contributions

This was the work contributed by the team members:

Abdul Jawad Khan – Designing the Inheritance structure and coding

Subodh Amuru Kiliveti - Designing the Inheritance structure and coding

Mahendra Kumar – Debugging and Report

Venkata Suprabath Gangiredla - Debugging and Report

1. Introduction

EVM voting: EVM is a simple machine that can be operated easily by both polling personnel and voters. It is a stand-alone machine without any network connectivity hence nobody can interfere with its programming and manipulate the result. It mainly consists of two units: the Control unit and the Ballot unit. The control unit is the main unit that stores all the data and controls the functioning of EVM. The program which controls the functioning of the control unit is burnt into a microchip on a one-time programmable basis. Once read it can't be copied or altered. The EVMs use dynamic coding to enhance the security of data transmitted from the ballot unit to the control unit. The new EVMs are also able to record the exact time and date when the vote was cast. After voting is completed and the close button is pressed, the machine doesn't accept any data or record any vote. Through the press of the total button, the control unit can display the number of votes recorded till that instant of time which can be crossed checked with the register of voters. The display system of the control unit shows the number of votes polled in the polling station and candidate-wise votes polled in the machine.

Electronic Voting System:

The program on "Election system" provides us with a voting technique. It can also be referred to as an Electronic Voting System. In this system people who have citizenship in India and who age is above 18 years of age are eligible to vote irrespective of his/her caste, race, religion, or gender without going to a physical polling station. There is a database that is maintained in which all names of the voters with complete information are stored.

Functionalities of the project:

The functionality of this project is listed below:

It allows the voter to:

1. Register themselves

2. Cast to vote for any candidate of their choice

It allows the officer to:

1. Update the candidates contesting in the elections before the voters can start voting.

2. See the number of votes that were cast for each contesting candidate, after the voters have given their votes.

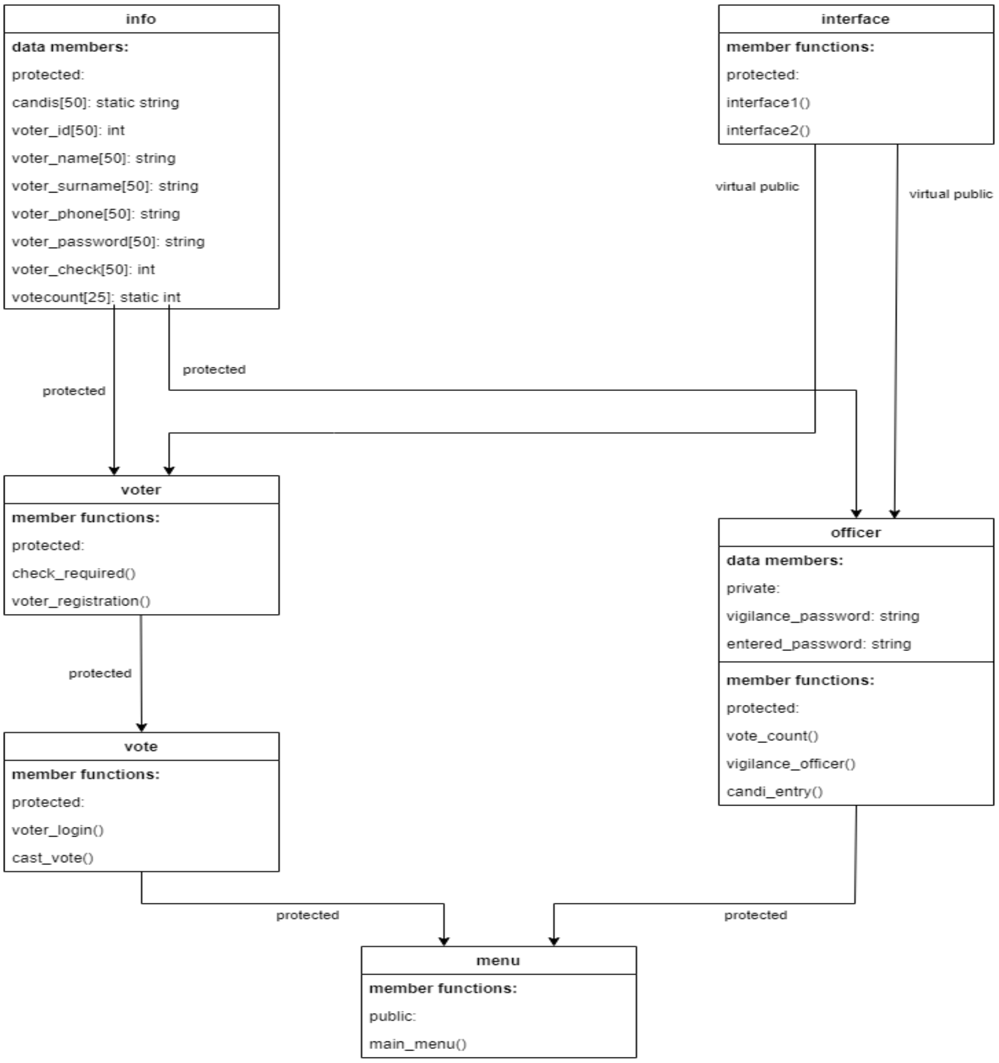
2. Methodology

2.1 Design:

The UML Class diagram is a graphical notation used to construct and visualize object-oriented systems. A class diagram in the Unified Modeling Language (UML) is a type of static structure diagram that describes the structure of a system by showing the system:

- Classes
- their data members
- member functions (or methods)
- and the relationships among objects.

Following is the class diagram of our Project:



We designed this project using the core concepts of object-oriented programming (OOP). Classes and objects, data encapsulation and abstraction, array data members, static data members, and inheritance are the Object-Oriented concepts that we used to design this project. We used C++ programming language to implement the concepts of OOP. We tried to keep data members as protected as possible because the data stored in this project is very sensitive. This program is designed in a way that it can store the info of a maximum of 25 candidates and also the info of 50 voters at a maximum. The concepts of protected inheritance or virtual public inheritance were used as portrayed by the diagram above.

- protected inheritance makes the public and protected members of the base class protected in the derived class.
- Virtual public inheritance is a C++ technique that ensures that only one copy of a class's member variables is inherited by the second-level derivates (i.e., grandchild-derived classes)

2.2 Implementation

class info:

```
#include<iostream>
#include <string>
using namespace std;
static int i=0;
static int n;

class info
{
    protected:
    static string candis[25];
    int voter_id[50];
    string voter_name[50];
    string voter_surname[50];
    string voter_phone[50];
    string voter_password[50];
    int voter_check[50];
    static int votecount[25];
};

string info::candis[25];
int info::votecount[25];
```

This is one of the base classes used in our program. The data members of this class are all protected so that they can only be accessed by the class inheriting it. The purpose of this class is to store all the data that will be used throughout the execution of the program. This class stores the voter ID, name, surname, phone number, and password of all the voters. It also has a variable voter_check which checks if the voter has previously voted. Apart from this, this class also has two static variables namely static string candis and static int votecount which store the names of candidates that are contesting in the elections and also the number of votes that were cast for them.

<u>class interface:</u>

```
class interface
{
    protected:
    void interface1();
    void interface2();
};
```

This is another base class that is used in our program. It has two member functions namely interface1() and interface2() both of which are protected.

void interface1() and void interface2():

```
void interface::interface1()
{
    cout<<"\n\t\t\t|===============================================|";
    cout<<"\n\t\t\t|=====       ONLINE ELECTION SYSTEM       ======|";
    cout<<"\n\t\t\t|=====            C++ PROJECT             ======|";
    cout<<"\n\t\t\t|===============================================|";
    cout<<"\n";
}

void interface::interface2()
{
    cout<<"\n\t\t\t|===============================================|";
    cout<<"\n\t\t\t|=====    WELCOME TO ELECTIONS - 2022     ======|";
    cout<<"\n\t\t\t|===============================================|";
    cout<<"\n";
}
```

These two functions are used to give good readability and look to the output.

class voter:

```
class voter:protected info,virtual public interface
{
    protected:
    void check_required();
    void voter_registration();
};
```

This class is protectively inherited from the base class info and virtually inherited from the base class interface. This class has two member functions namely check_required() and voter_registration() both of which are declared under the access specifier ‘protected’.

void check_required():

```
void voter::check_required()
{
    int noo=0;
    for(noo=0;noo<n;noo++)
    {
        voter_check[noo]=0;
    }
    getc;
}
```

This function is basically to check if the voter has voted before or not.

void voter_registration():

```
void voter::voter_registration()
{
    system("cls");
    interface1();
    interface2();
    static int x=0;
    static int id=3458889;

    check_required();
    cout<<"\n\t\t Your voter id is "<<id;
    cout<<"\n\t\t Please enter the voter id allotted to you: ";
    cin>>voter_id[i];
    cout<<"\n\t\t Enter your first name: ";
    cin>>voter_name[i];
    cout<<"\n\t\t Enter your last name: ";
    cin>>voter_surname[i];
    cout<<"\n\t\t Enter your phone number: ";
    cin>>voter_phone[i];
    cout<<"\n\t\t Enter your password: ";
    cin>>voter_password[i];
    cout<<"\n\t\t You have successfully completed the registration!!!";
    voter_check[i] = 1;
    i++;
    id++;

    fflush(stdin);
    getchar();
}
```

This function is used to register the voter. It is called by void_voterlogin(). A voter must always register before casting the vote. It gives a unique voter Id to each voter. Then it takes the inputs from the user such as name, surname, and phone number, and finally allows the user to set a password. Following all the steps the message ‘You have successfully completed the registration is displayed.

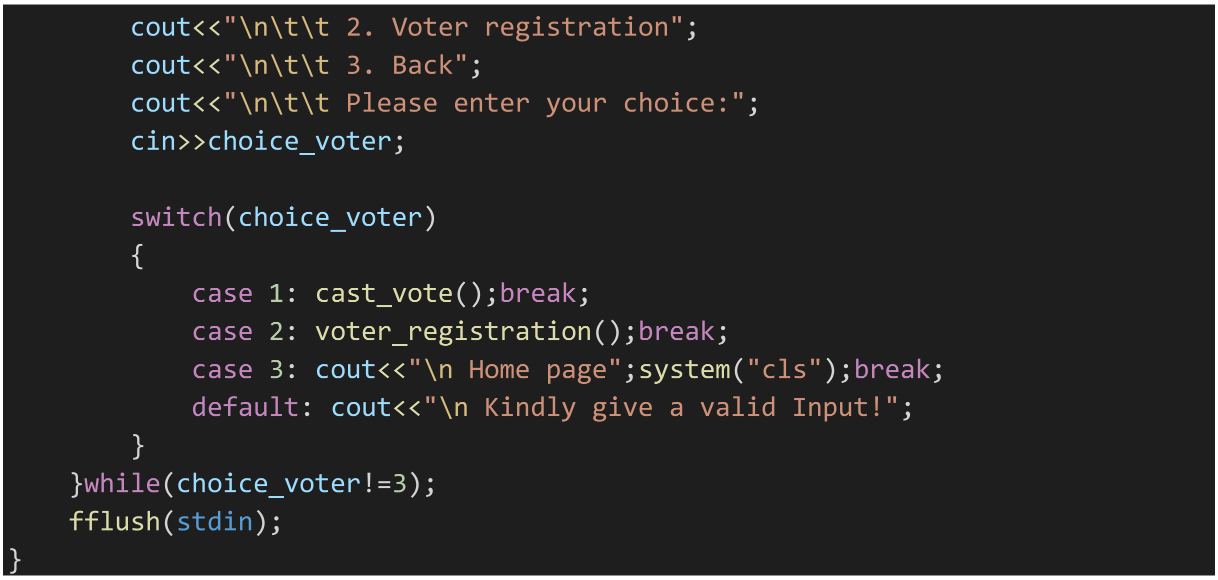
<u>class vote:</u>

```
class vote:protected voter
{
    protected:
    void voter_login();
    void cast_vote();

};
```

This class is protectively inherited from the class voter. It has two member functions namely voter_login() and cast_vote() both of which are protected.

void voter_login():

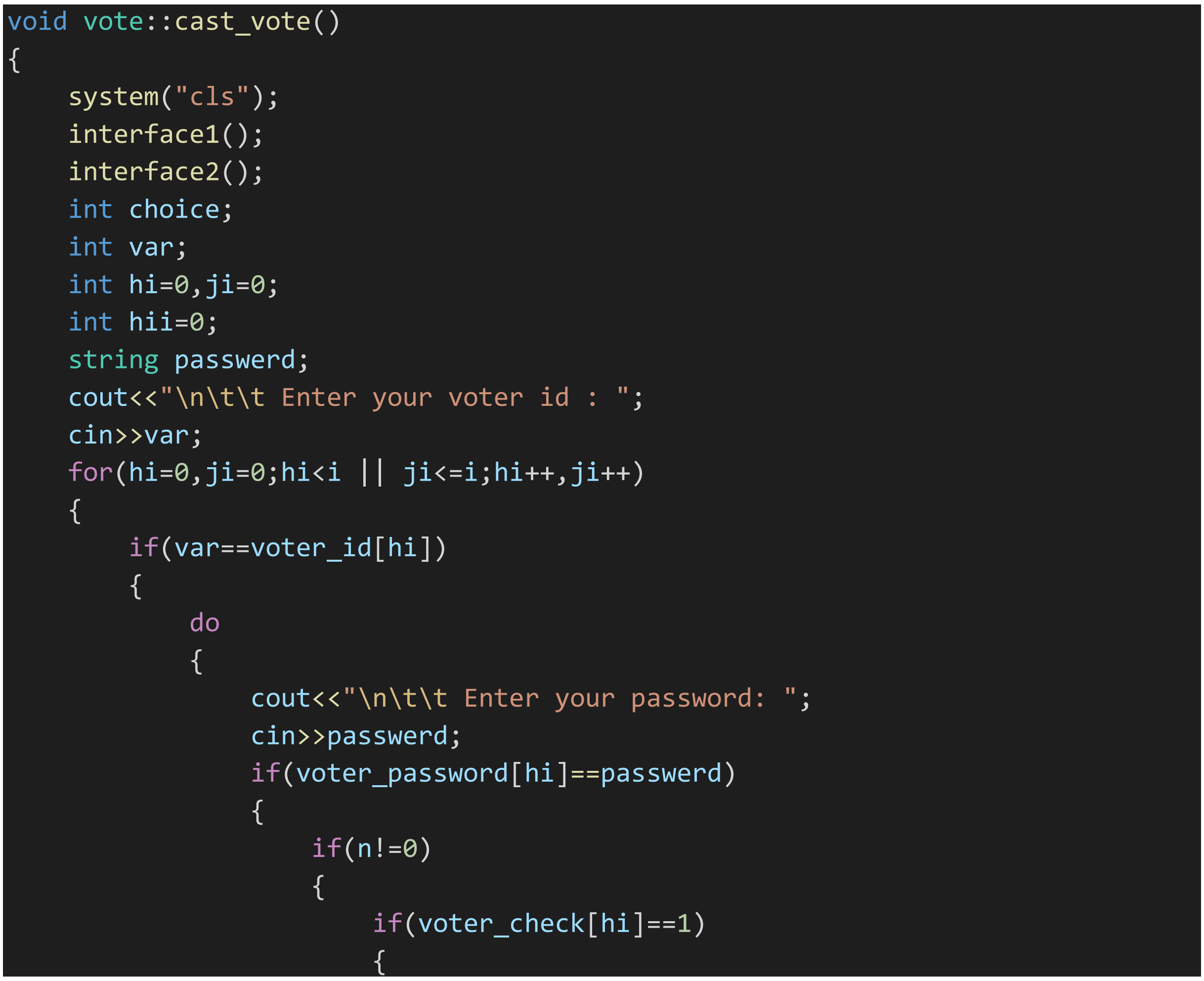
```
void vote::voter_login()
{
    system("cls");
    int choice_voter;
    do
    {
        system("cls");
        interface1();
        interface2();
        cout<<"\n\t\t\t|===============================================|";
        cout<<"\n\t\t\t|=====            |VOTER MENU|            ======|";
        cout<<"\n\t\t\t|===============================================|";
        cout<<"\n";
        cout<<"\n\t\t If you are a new voter please register yourself first by selecting choice 2";
        cout<<"\n\t\t 1. Cast your vote";
```



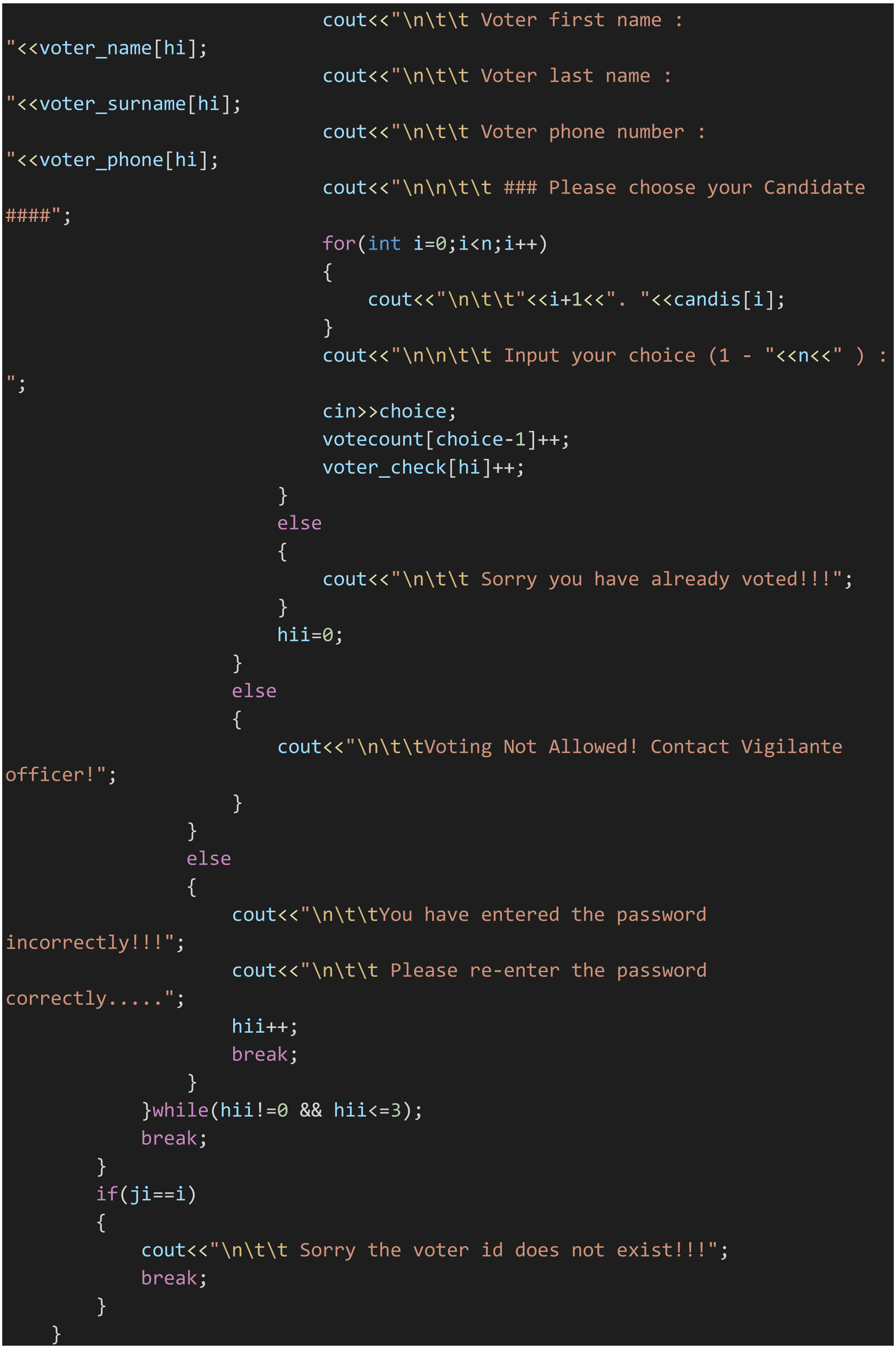
```
        cout<<"\n\t\t 2. Voter registration";
        cout<<"\n\t\t 3. Back";
        cout<<"\n\t\t Please enter your choice:";
        cin>>choice_voter;

        switch(choice_voter)
        {
            case 1: cast_vote();break;
            case 2: voter_registration();break;
            case 3: cout<<"\n Home page";system("cls");break;
            default: cout<<"\n Kindly give a valid Input!";
        }
    }while(choice_voter!=3);
    fflush(stdin);
}
```

This function is used to log the voter in. The sub-function used here is cast_vote(), voter_registration(). Depending on the input from the user the control flows into any one of these subfunctions or the user is directed back to the home page.

void cast_vote():



```
void vote::cast_vote()
{
    system("cls");
    interface1();
    interface2();
    int choice;
    int var;
    int hi=0,ji=0;
    int hii=0;
    string passwerd;
    cout<<"\n\t\t Enter your voter id : ";
    cin>>var;
    for(hi=0,ji=0;hi<i || ji<=i;hi++,ji++)
    {
        if(var==voter_id[hi])
        {
            do
            {
                cout<<"\n\t\t Enter your password: ";
                cin>>passwerd;
                if(voter_password[hi]==passwerd)
                {
                    if(n!=0)
                    {
                        if(voter_check[hi]==1)
                        {
```



```
                            cout<<"\n\t\t Voter first name :
"<<voter_name[hi];
                            cout<<"\n\t\t Voter last name :
"<<voter_surname[hi];
                            cout<<"\n\t\t Voter phone number :
"<<voter_phone[hi];
                            cout<<"\n\n\t\t ### Please choose your Candidate
####";
                            for(int i=0;i<n;i++)
                            {
                                cout<<"\n\t\t"<<i+1<<". "<<candis[i];
                            }
                            cout<<"\n\n\t\t Input your choice (1 - "<<n<<" ) :
";
                            cin>>choice;
                            votecount[choice-1]++;
                            voter_check[hi]++;
                        }
                        else
                        {
                            cout<<"\n\t\t Sorry you have already voted!!!";
                        }
                        hii=0;
                    }
                    else
                    {
                        cout<<"\n\t\tVoting Not Allowed! Contact Vigilante
officer!";
                    }
                }
                else
                {
                    cout<<"\n\t\tYou have entered the password
incorrectly!!!";
                    cout<<"\n\t\t Please re-enter the password
correctly.....";
                    hii++;
                    break;
                }
            }while(hii!=0 && hii<=3);
            break;
        }
        if(ji==i)
        {
            cout<<"\n\t\t Sorry the voter id does not exist!!!";
            break;
        }
    }
    cout<<"\n\t\tThank you for your Participation!";
    fflush(stdin);
    getchar();
}
```

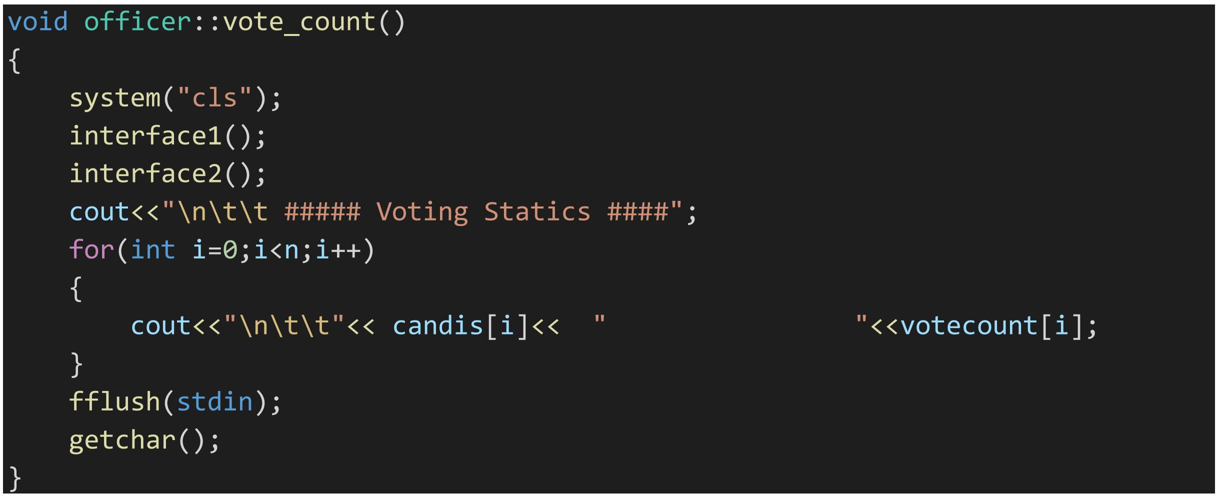
This function can only be called through 'void voterlogin( )'. Before casting the vote, the voter must log in using the voter Id. If the candidates contesting in the elections are updated and if the voter Id exists then the voter can enter the password else a message appears stating 'Sorry the voter Id doesn't exist!!'. If the password is correct and the voter has not voted before then he/she is allowed to cast vote for any candidate of their choice. Then, as you can see the respective vote count is updated. Also, the voter check is updated so that the voter shouldn't be able to vote again. However, if the password entered was wrong then a message 'Please re-enter the password correctly….' is printed. The voter is given 3 tries to enter the correct password.

<u>class officer:</u>

```
class officer:protected info,virtual public interface
{
    private:
    string vigilance_password="#Good@Officer";
    string entered_password="";
    protected:
    void vote_count();
    void vigilance_officer();
    void candi_entry();
};
```

This class is protectively inherited from the class info and virtually inherited from the class interface. It has two private data members. The first one is, vigilance_password which is a pre-set password hard-coded into the program. This is the password through which the officer can log in and check the vote counts. The other private data member is entered_password which is used to take the input from the user. If the entered_password becomes equal to the pre-set vigilance_password only then the user is taken to the Officer menu. This class also has three member functions namely, void vote_count(), void vigilance_officer(), void candi_entry() which are all protected.

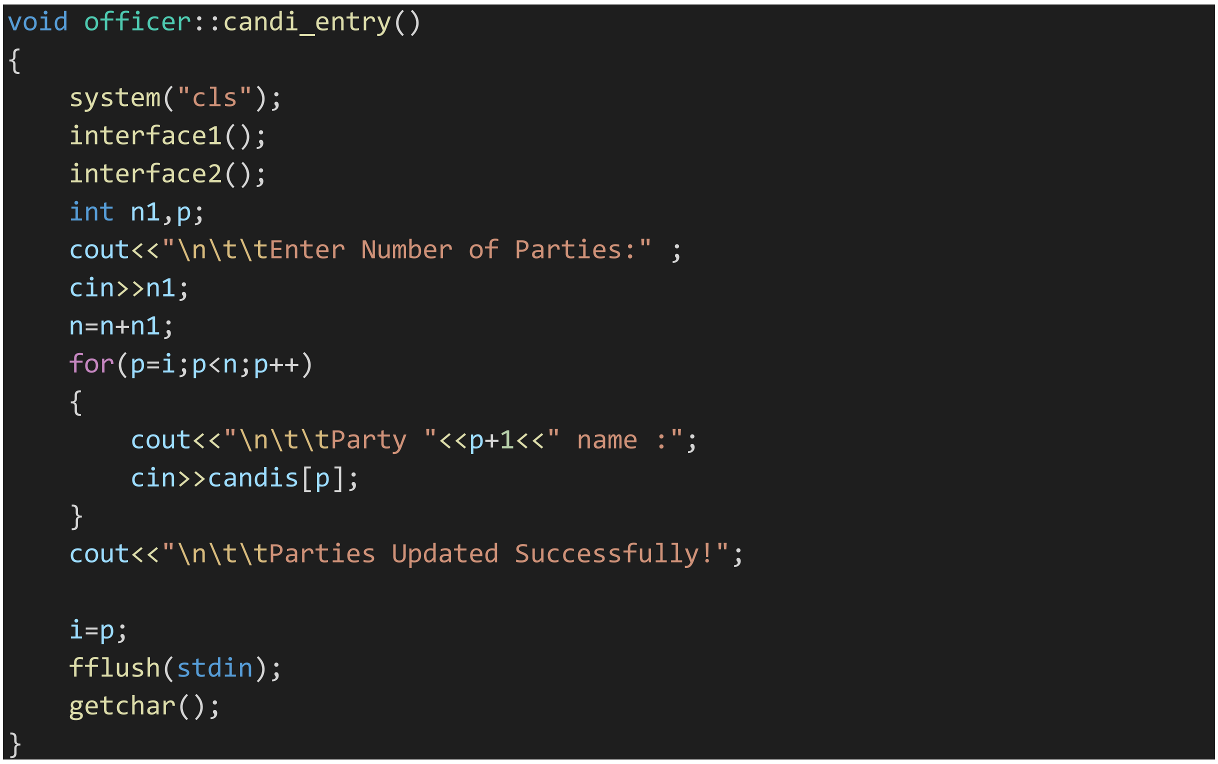
void vote_count():



```
void officer::vote_count()
{
    system("cls");
    interface1();
    interface2();
    cout<<"\n\t\t ##### Voting Statics ####";
    for(int i=0;i<n;i++)
    {
        cout<<"\n\t\t"<< candis[i]<<  "                "<<votecount[i];
    }
    fflush(stdin);
    getchar();
}
```

This function is used to know the votes obtained by each candidate. It is called by the function ‘void vigilanceofficer( )’.

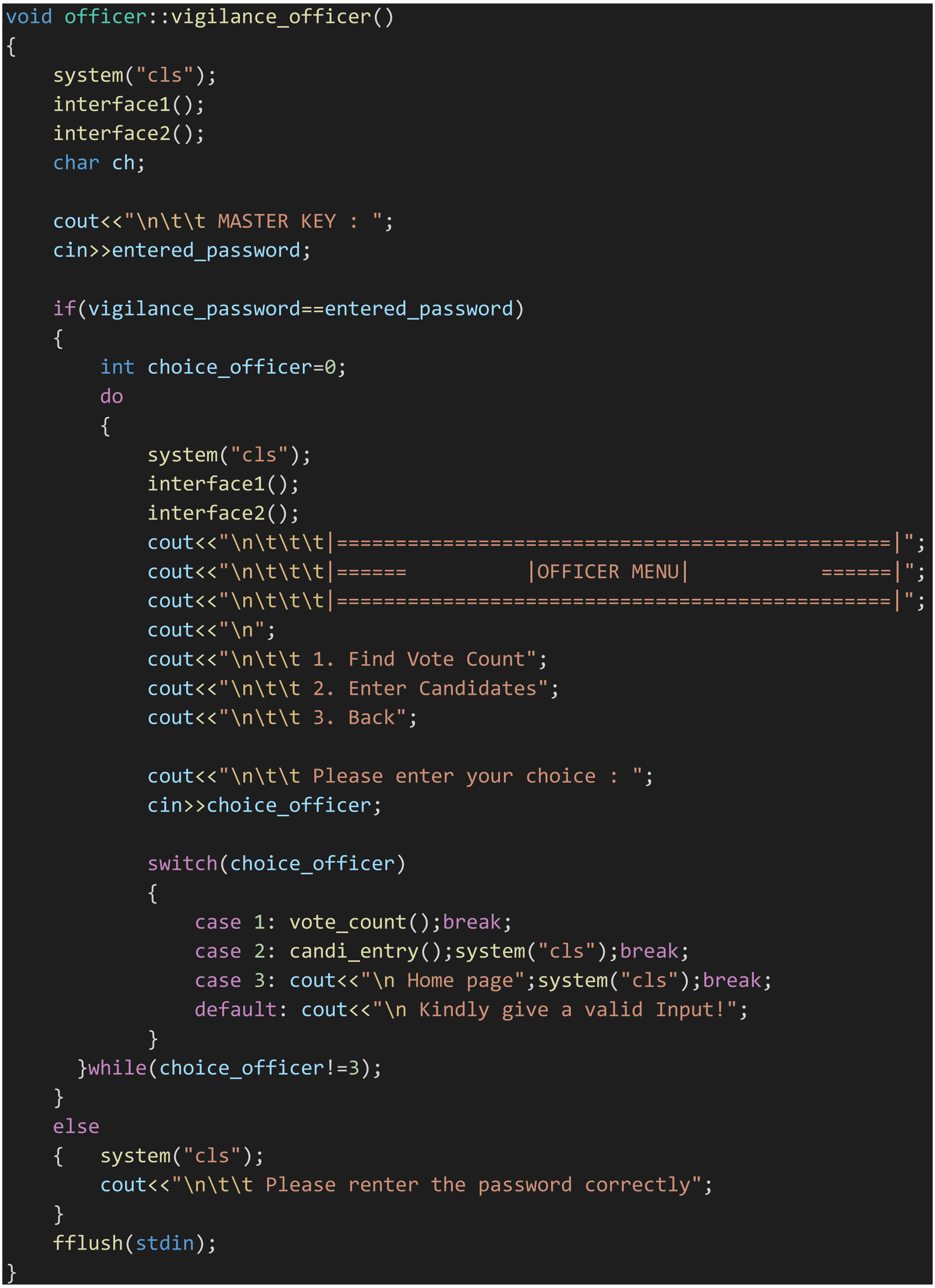
void candi_entry():



```
void officer::candi_entry()
{
    system("cls");
    interface1();
    interface2();
    int n1,p;
    cout<<"\n\t\tEnter Number of Parties:" ;
    cin>>n1;
    n=n+n1;
    for(p=i;p<n;p++)
    {
        cout<<"\n\t\tParty "<<p+1<<" name :";
        cin>>candis[p];
    }
    cout<<"\n\t\tParties Updated Successfully!";

    i=p;
    fflush(stdin);
    getchar();
}
```

This function is used by the officer to add the number of candidates contesting in the elections. Once the number of candidates are entered only then the voters are allowed to cast their votes.

void vigilance_officer():



```
void officer::vigilance_officer()
{
    system("cls");
    interface1();
    interface2();
    char ch;

    cout<<"\n\t\t MASTER KEY : ";
    cin>>entered_password;

    if(vigilance_password==entered_password)
    {
        int choice_officer=0;
        do
        {
            system("cls");
            interface1();
            interface2();
            cout<<"\n\t\t\t|===============================================|";
            cout<<"\n\t\t\t|======          |OFFICER MENU|           ======|";
            cout<<"\n\t\t\t|===============================================|";
            cout<<"\n";
            cout<<"\n\t\t 1. Find Vote Count";
            cout<<"\n\t\t 2. Enter Candidates";
            cout<<"\n\t\t 3. Back";

            cout<<"\n\t\t Please enter your choice : ";
            cin>>choice_officer;

            switch(choice_officer)
            {
                case 1: vote_count();break;
                case 2: candi_entry();system("cls");break;
                case 3: cout<<"\n Home page";system("cls");break;
                default: cout<<"\n Kindly give a valid Input!";
            }
      }while(choice_officer!=3);
    }
    else
    {   system("cls");
        cout<<"\n\t\t Please renter the password correctly";
    }
    fflush(stdin);
}
```

This function is used to log the Vigilance Officer in. There is a pre-set password which is known by the officer. If the password is correct, then the officer is logged in.

The sub-functions used here are votes_count( ) and candi_entry() Depending on the input from the user the control flows into any one of these functions.

class menu:

```
class menu:protected vote,protected officer
{
    public:
    void main_menu();
};
```

This class is used to display the main menu of the program. It is protectively inherited from the class vote and officer. This class only has one member function main_menu() which is public.

void main_menu():

```
void menu::main_menu()
{
    system("cls");
    int i;
    int choice;
    while(1)
    {
        interface1();
        interface2();
        cout<<"\n\t\t\t--------------------------------------------------";
        cout<<"\n\t\t\t--------              LOGIN               --------";
        cout<<"\n\t\t\t--------------------------------------------------";
        cout<<"\n\t\t\t-------        1. Vigilance officer        -------";
        cout<<"\n\t\t\t-------             2. Voter               -------";
        cout<<"\n\t\t\t-------             3. Exit                -------";
        cout<<"\n\t\t\t--------------------------------------------------";
        cout<<"\n\t\t\tPlease enter your choice : ";
        cin>>choice;
        switch(choice)
        {
            case 1: vigilance_officer();break;
            case 2: voter_login();break;
            case 3: cout<<"\n Session ended";exit(0);break;
            default: system("cls");cout<<" Kindly give a valid Input!\n
";break;
        }
    }
    fflush(stdin);
    getchar();
}
```

This is the only public member function in our entire program. It was declared publicly so that it can be called by using the object of the menu class in the main() function.

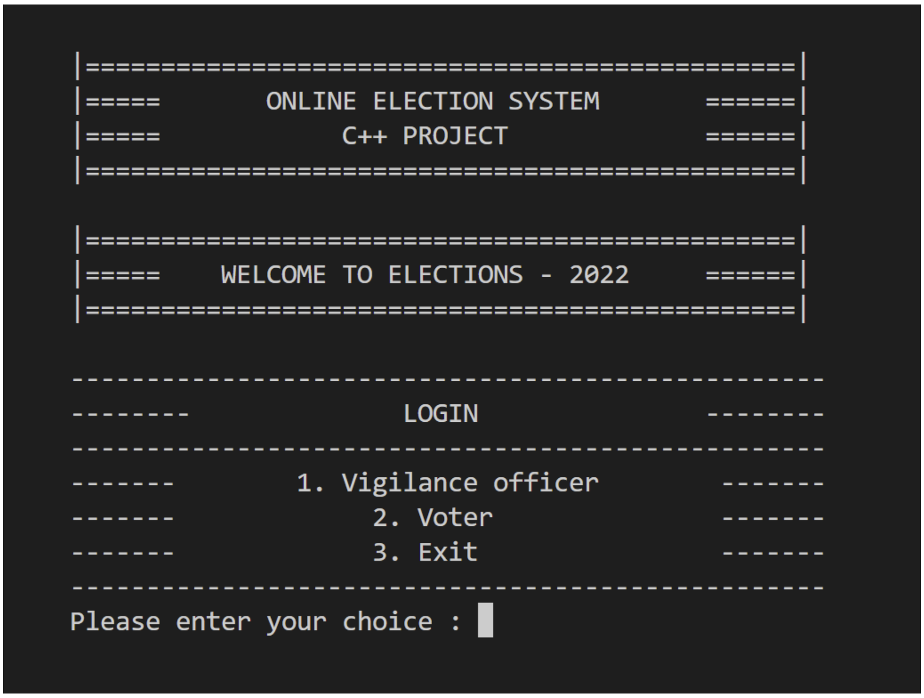
int main():

```
int main()
{
    menu m;
    m.main_menu();
    return 0;
}
```

This is the main function of the program. From here the execution of the program begins. Here the object of the class menu is declared as m. Using this object, we access the main_menu() member function of the menu class.

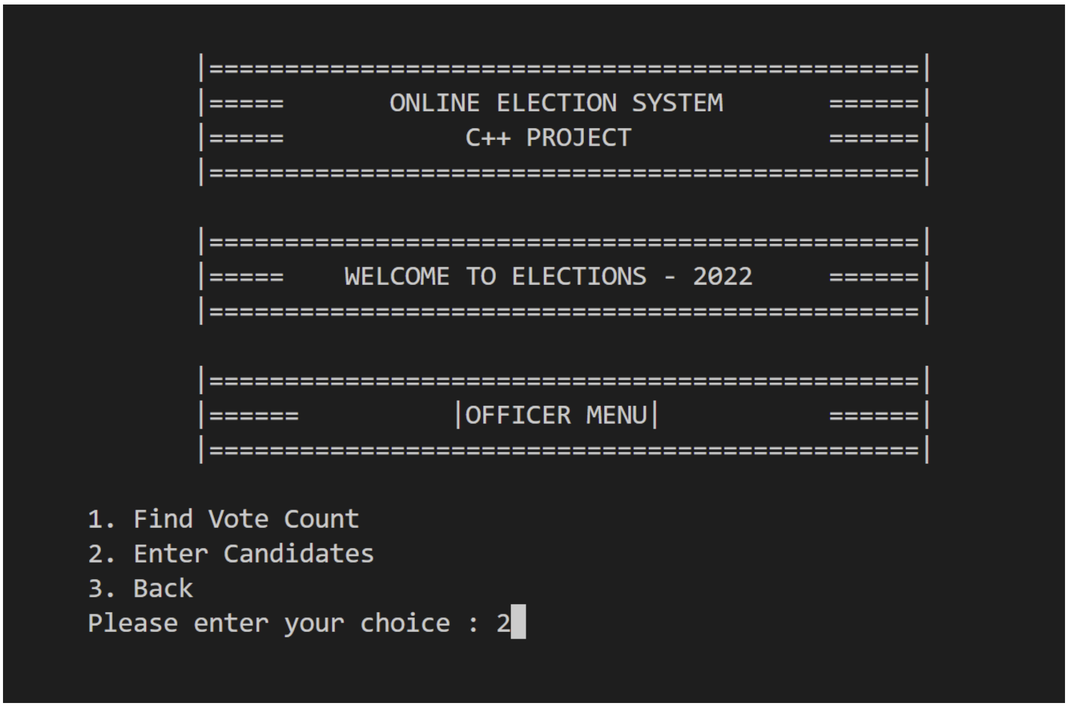
3. Results

Main menu:



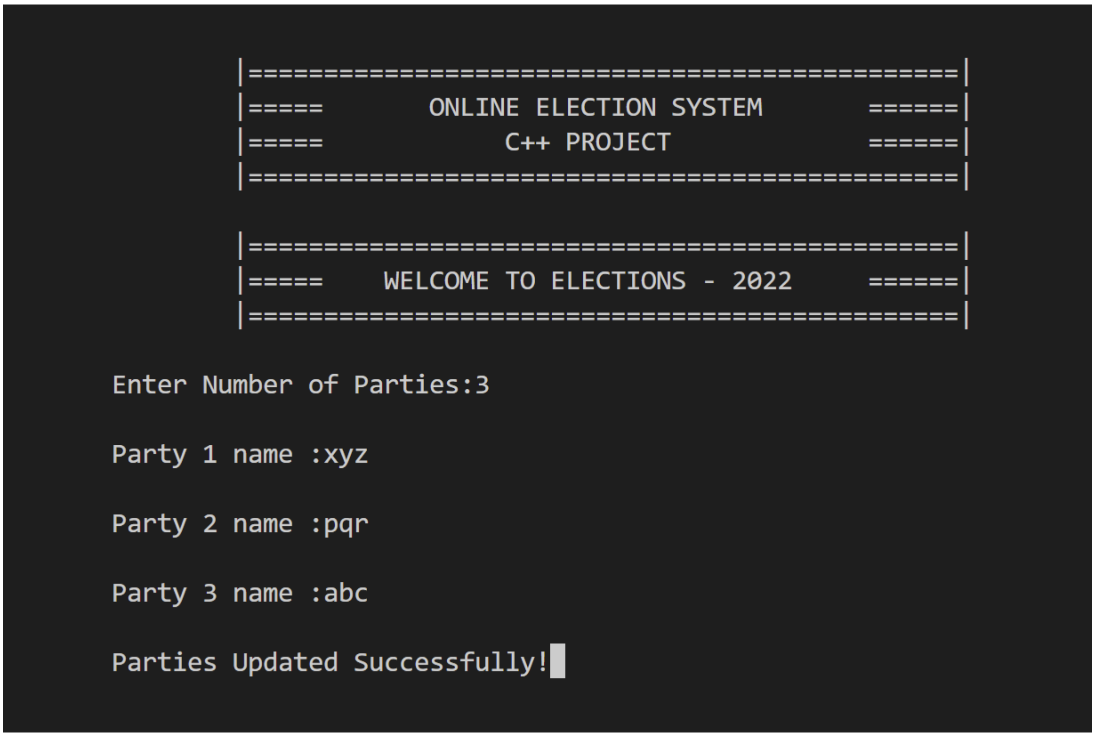
```
|===============================================|
|=====       ONLINE ELECTION SYSTEM       ======|
|=====            C++ PROJECT             ======|
|===============================================|

|===============================================|
|=====    WELCOME TO ELECTIONS - 2022     ======|
|===============================================|

--------------------------------------------------
--------              LOGIN               --------
--------------------------------------------------
-------        1. Vigilance officer        -------
-------             2. Voter               -------
-------             3. Exit                -------
--------------------------------------------------
Please enter your choice : 
```

Officer Menu:



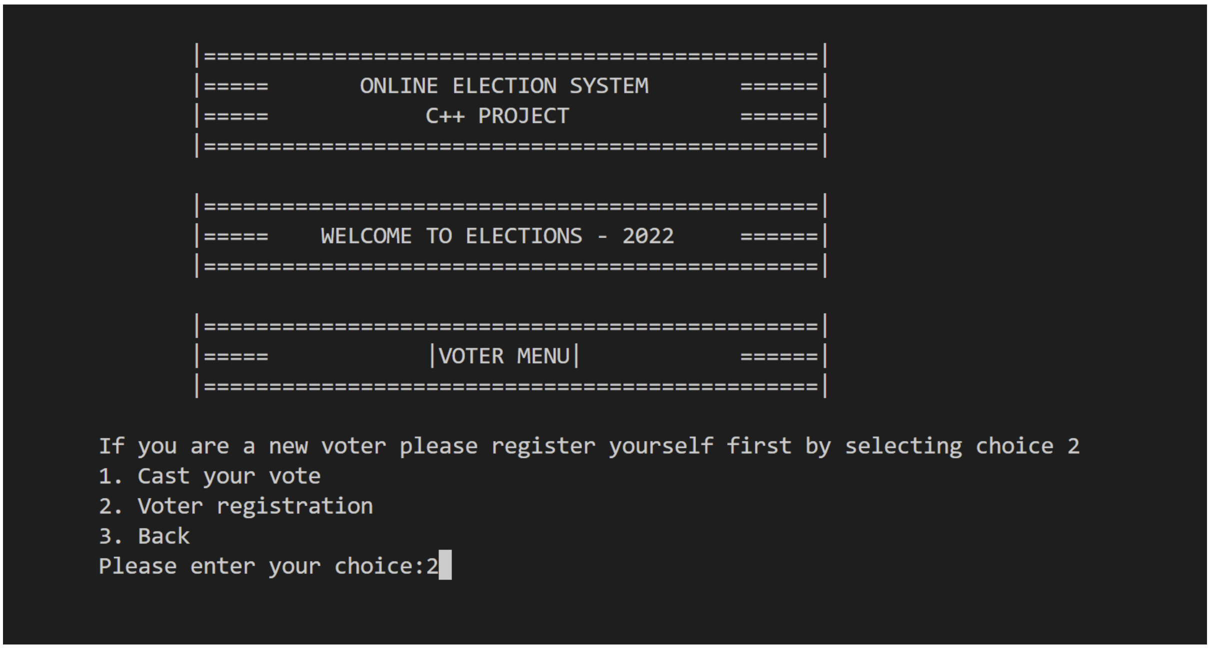
```
        |===============================================|
        |=====       ONLINE ELECTION SYSTEM       ======|
        |=====            C++ PROJECT             ======|
        |===============================================|

        |===============================================|
        |=====    WELCOME TO ELECTIONS - 2022     ======|
        |===============================================|

        |===============================================|
        |======          |OFFICER MENU|          ======|
        |===============================================|

1. Find Vote Count
2. Enter Candidates
3. Back
Please enter your choice : 2
```

Officer logging in before the start of elections and entering the candidates:



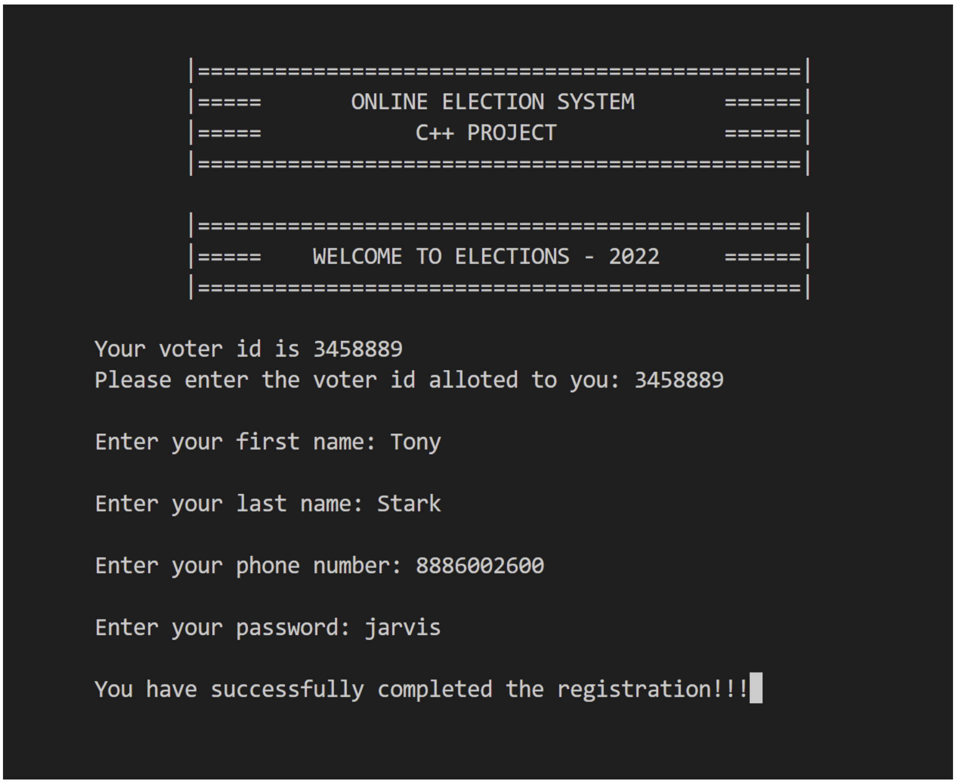
```
          |===============================================|
          |=====       ONLINE ELECTION SYSTEM       ======|
          |=====              C++ PROJECT           ======|
          |===============================================|

          |===============================================|
          |=====    WELCOME TO ELECTIONS - 2022     ======|
          |===============================================|

    Enter Number of Parties:3

    Party 1 name :xyz

    Party 2 name :pqr

    Party 3 name :abc

    Parties Updated Successfully!
```

Voter menu:



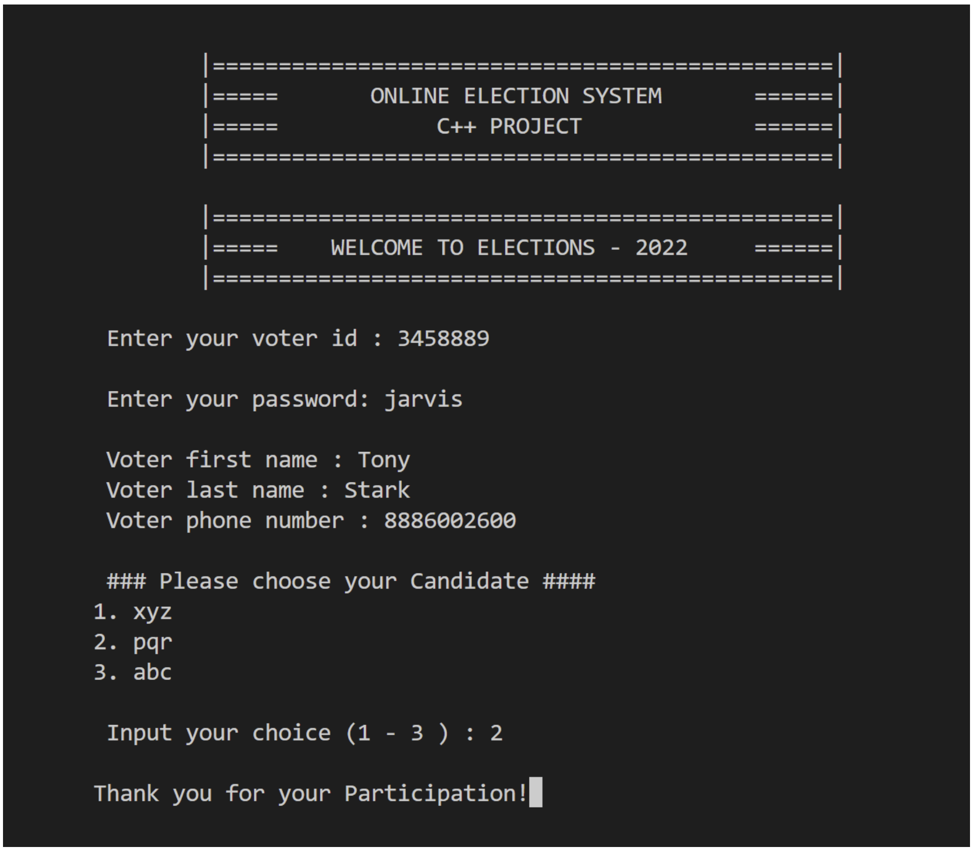
```
          |===============================================|
          |=====       ONLINE ELECTION SYSTEM       ======|
          |=====              C++ PROJECT           ======|
          |===============================================|

          |===============================================|
          |=====    WELCOME TO ELECTIONS - 2022     ======|
          |===============================================|

          |===============================================|
          |=====             |VOTER MENU|           ======|
          |===============================================|

    If you are a new voter please register yourself first by selecting choice 2
    1. Cast your vote
    2. Voter registration
    3. Back
    Please enter your choice:2
```

Registration of voters:



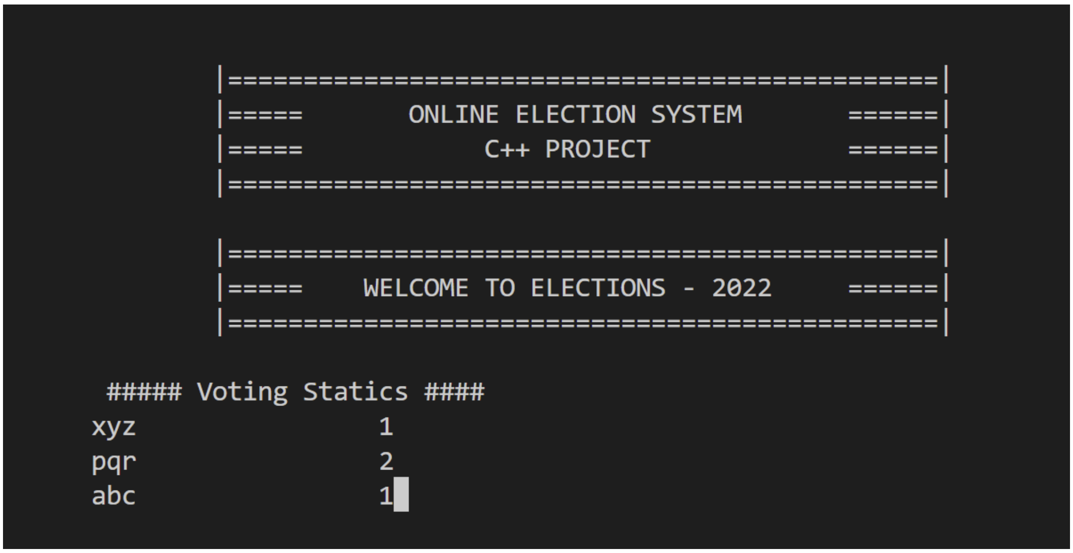
```
              |===============================================|
              |=====       ONLINE ELECTION SYSTEM       ======|
              |=====              C++ PROJECT          ======|
              |===============================================|

              |===============================================|
              |=====    WELCOME TO ELECTIONS - 2022     ======|
              |===============================================|

       Your voter id is 3458889
       Please enter the voter id alloted to you: 3458889

       Enter your first name: Tony

       Enter your last name: Stark

       Enter your phone number: 8886002600

       Enter your password: jarvis

       You have successfully completed the registration!!!
```

Voter login and casting of vote:



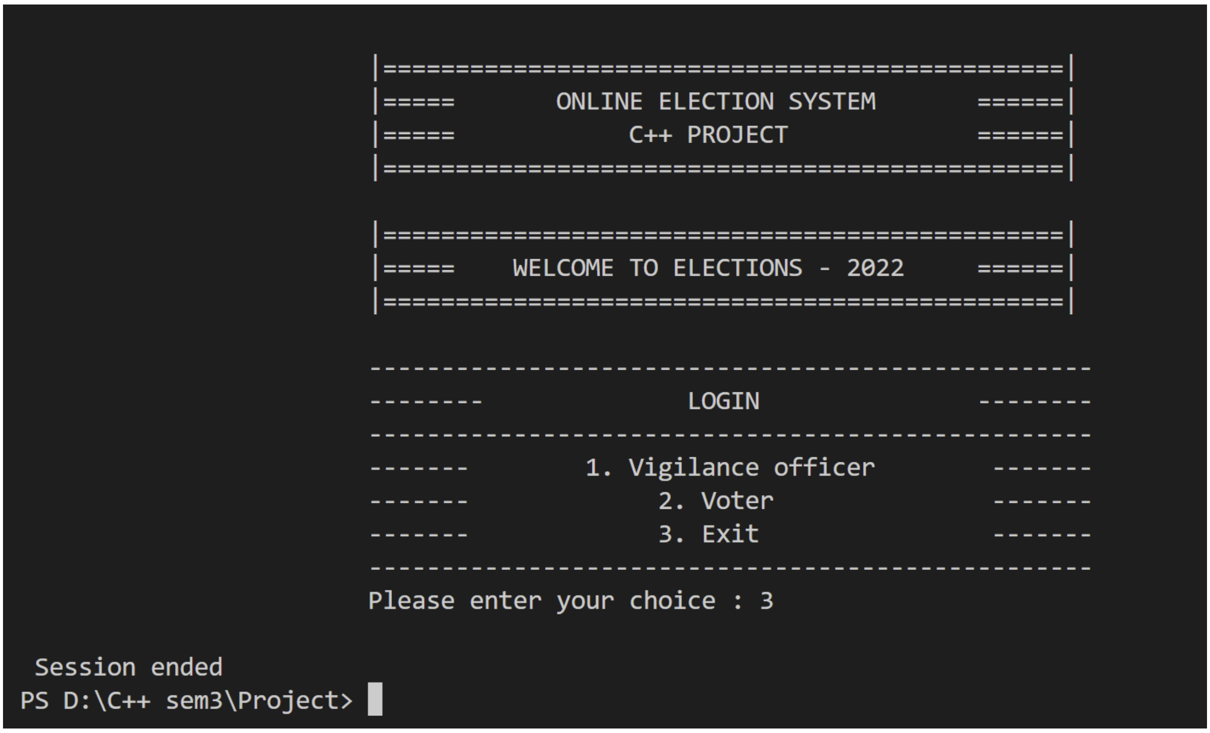
```
              |===============================================|
              |=====       ONLINE ELECTION SYSTEM       ======|
              |=====              C++ PROJECT          ======|
              |===============================================|

              |===============================================|
              |=====    WELCOME TO ELECTIONS - 2022     ======|
              |===============================================|

        Enter your voter id : 3458889

        Enter your password: jarvis

        Voter first name : Tony
        Voter last name : Stark
        Voter phone number : 8886002600

        ### Please choose your Candidate ####
       1. xyz
       2. pqr
       3. abc

        Input your choice (1 - 3 ) : 2

       Thank you for your Participation!
```

Officer logging in after the completion of the election and seeing the results:



```
              |==============================================|
              |=====       ONLINE ELECTION SYSTEM       ======|
              |=====             C++ PROJECT            ======|
              |==============================================|

              |==============================================|
              |=====    WELCOME TO ELECTIONS - 2022     ======|
              |==============================================|

 ##### Voting Statics ####
xyz                  1
pqr                  2
abc                  1
```

Ending the program from the main menu:



```
                          |==============================================|
                          |=====       ONLINE ELECTION SYSTEM       ======|
                          |=====             C++ PROJECT            ======|
                          |==============================================|

                          |==============================================|
                          |=====    WELCOME TO ELECTIONS - 2022     ======|
                          |==============================================|

                          -------------------------------------------------
                          --------              LOGIN             --------
                          -------------------------------------------------
                          -------        1. Vigilance officer       -------
                          -------             2. Voter              -------
                          -------             3. Exit               -------
                          -------------------------------------------------
                          Please enter your choice : 3

 Session ended
PS D:\C++ sem3\Project>
```

4. Concluding Remarks

In the process of making this project, we have understood the object-oriented concepts of C ++ and how to implement them. This project can be used for small-scale election systems like electing the CR of a class or the best employee or manager in a company.