

Online Election System

OOPS Project

By

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1. Introduction

- This project aims to make voting process easily. In my project voting and counting is done with the help of computer so it saves time. There will be no invalid votes. It will avoid error in counting votes. It will make election process easy.
- In the existing system there is compulsory need of physical presence. So sometimes we have to travel long distance and for voting we have to wait a long time in queue to vote.
- In this project voters can register themselves easily. They can login by their userid and password. After that they can vote. They can vote only once. So there will be no duplicate votes. Voter will be able to vote only after admin approve the details of voter.
- Admin can login with their username and password. They are able to add election,add candidate,view voters,approve voter details,view result,view voting statistics.
- At the end of election all data will be stored in CSV files.

2. Implementation

In order to make this Voting System, I have made 2 modules in my project. First is admin module, another is Voter Module.

1. In Voter Module:

- One can register himself/herself. When Voter register, I store all details of voter in object of Voter class. For every voter different object is created.
- After successfully log in we can see our personal details and cast our vote for different – different election. When voter cast vote to particular candidate I am incrementing Vote Count for that candidate. To keep record of votes, I used ArrayList of Integer.
- In every election Voter is allowed to vote only once. For implementing this, I used ArrayList of boolean type.
- And also if election end date is yesterday's date or any other previous date then that election is not accepting votes now. For Implementing this I used inbuilt function of java.time.LocalDate.isafter(enddate).

2. In Admin Module:

- Admin can add election by entering details(Election name,enddate). To take enddate I used inbuilt date formatter of java DateTimeFormatter class. And I am Storing all this details in ArrayList of String[] type.
- In same way I am storing all details of candidate in ArrayList of String[] type. For delete a particular candidate I am using remove method of ArrayList class.
- In order to approve voter, Each Voter Object has property named approved of boolean type. Initially it is initialized with false. Admin can make it true after seeing details of each voter. Only after admin approval voter can login.
- Admin can view result of each election. This function prints all candidates names and their votes count. And then whose vote count is maximum is declared as winner. If there is tie between two or more candidates then admin has to cast vote to decide the winner.
- Admin can view statistics of each election. First I am counting total approved voters. And after that for each election I am counting total voters who has marked true in hasVoted ArrayList. So that we can get statistics. And there is also an ArrayList of NOTA vote counts. From that I am printing total NOTA votes for that particular election.

3. Storing Details in CSV files:

- In order to store details of admin,candidates,voters I am creating 3 different CSV files. For making CSV file I am using File handling.

3. Output

- There are two modules in my project:
 1. Admin Module
 2. Voter Module
- First admin has to login using his username and password. If admin enters wrong detail then message will be printed to re-enter details.If he enters correct details then admin will be logged in.After login he can do following things.
- In order to log in for admin you have to use:
username: admin
password: admin

----- Welcome to Online Election System -----

1. Admin Module
2. Voter Module
3. Exit

Enter Your Choice: 1

Enter your username: admin
Enter your password: yuasqw

--- Invalid username or password. Please try again. ---

Enter your username: admin
Enter your password: admin

---Login successful!---

-----Welcome to Admin Module-----

1. Add Election
2. View Election
3. Add Candidate
4. Remove Candidate
5. View Candidates
6. View Voters
7. Approve Voter
8. View Result
9. Voting Statistics
10. Log Out

- In add election menu , admin can add new election by entering election details(election name , end date).
- In view election menu , admin can see all election details.

- If user enters wrong date which is, date is greater than 31 or month is greater than 12 then error message will be printed. I used exception handling to catch this exception.

```

Enter Your Choice: 1

Enter election name: Class Representative
Enter the end date of the election (dd-mm-yyyy):32-10-2024
---- Invalid date format. Please enter date in dd-mm-yyyy format ----
--> Exception: java.time.format.DateTimeParseException: Text '32-10-2024' could not be parsed: Invalid value for DayOfMonth (valid values 1 - 28/31): 32

Enter the end date of the election (dd-mm-yyyy):21-16-2024
---- Invalid date format. Please enter date in dd-mm-yyyy format ----
--> Exception: java.time.format.DateTimeParseException: Text '21-16-2024' could not be parsed: Invalid value for MonthOfYear (valid values 1 - 12): 16

Enter the end date of the election (dd-mm-yyyy):21-10-2024
--- Class Representative Election added successfully ---

-----Welcome to Admin Module-----
1. Add Election
2. View Election
3. Add Candidate
4. Remove Candidate
5. View Candidates
6. View Voters
7. Approve Voter
8. View Result
9. Voting Statistics
10. Log Out

Enter Your Choice: 1

Enter election name: College President
Enter the end date of the election (dd-mm-yyyy):26-05-2024
--- College President Election added successfully ---

```

Add election

- Now we will see all election details.

```
Enter Your Choice: 2

----Election 1 details----
Name: Class Representative
End Date: 21-10-2024

----Election 2 details----
Name: College President
End Date: 26-05-2024

----- End -----
```

View election

- In add candidate menu, we have to first choose election, then we have to enter other details.
- If admin want to delete some candidate than he could do that also with candidate index.
- Admin can see all candidate details.
- I have set input condition while taking gender input and mobile number.

```
Enter Your Choice: 3

---> Choose in which election candidate want to stand?

----Election 1 details----
Name: Class Representative
End Date: 21-10-2024

----Election 2 details----
Name: College President
End Date: 26-05-2024

----- End -----
```



```
Enter Your Choice: 1

Enter candidate name: Kalp
Enter party name: Visionary Party
Enter your Gender(M/m/F/f): M
Enter Mobile Number: 6354840406
Enter city: Valsad
Enter state: Gujarat

--- Candidate Kalp added successfully ---
```

Add candidate with correct details

```
Enter Your Choice: 3
```

```
---> Choose in which election candidate want to stand?
```

```
----Election 1 details----
```

```
Name: Class Representative
```

```
End Date: 21-10-2024
```

```
----Election 2 details----
```

```
Name: College President
```

```
End Date: 26-05-2024
```

```
----- End -----
```

```
Enter Your Choice: 2
```

```
Enter candidate name: Ramesh
```

```
Enter party name: Progress Alliance
```

```
Enter your Gender(M/m/F/f): sdwe
```

```
Invalid input. Please enter 'M' or 'm' or 'F' or 'f'.
```

```
Enter your Gender(M/m/F/f): M
```

```
Enter Mobile Number: 569741
```

```
--> Invalid input! Please enter a valid 10-digit mobile number.
```

```
Enter Mobile Number: 9429141963
```

```
Enter city: Surat
```

```
Enter state: Gujarat
```

```
--- Candidate Ramesh added successfully ---
```

Add Candidate with correct details only

- Now, If we want to delete second candidate we can do it as below.

```
Enter Your Choice: 4
```

```
---- Candidate 1 details----  
Election: Class Representative  
Candidate Name: Kalp  
Party Name: Visionary Party  
Gender: M  
Mobile Number: 6354840406  
City: Valsad  
State: Gujarat
```

```
---- Candidate 2 details----  
Election: College President  
Candidate Name: Ramesh  
Party Name: Progress Alliance  
Gender: M  
Mobile Number: 9429141963  
City: Surat  
State: Gujarat
```

```
----- End -----
```

```
Enter Your Choice: 2
```

```
--- Candidate removed successfully ---
```

Remove Candidate

- Now, you can see the updated candidate list.

```
Enter Your Choice: 5
```

```
---- Candidate 1 details----  
Election: Class Representative  
Candidate Name: Kalp  
Party Name: Visionary Party  
Gender: M  
Mobile Number: 6354840406  
City: Valsad  
State: Gujarat
```

```
----- End -----
```

View Candidates

In Voter Module

- Voter can Register First. After that they can log in.
- In Voter Registration if Voter's age is under 18 then voter's registration cannot be done.
- I have set restriction in Password setting, Username, Mobile Number, Gender input.
- Successful registration of candidate:

```
----- Welcome to Voter Module -----  
  
1. Register Yourself  
2. Log in  
3. Go back to main menu  
  
Enter Your Choice: 1  
  
-----Kindly Fill the correct details-----  
  
Enter your username: Utsav  
Enter your password: Utsav@2110  
Enter your First Name: Utsav  
Enter your Middle Name: Dharmeshkumar  
Enter your Last Name: Solanki  
Please enter your birthdate (dd-mm-yyyy): 21-10-2005  
Enter your Mobile Number: 6354840409  
Enter your Gender(M/m/F/f): M  
Enter your City: Valsad  
Enter your State: Gujarat  
  
----- Voter registered successfully -----
```

Successful Registration

- Now, if voter age is under 18 then registration will stop immediately after entering his birthdate.

-----Kindly Fill the correct details-----

Enter your username: Hetvi

Enter your password: Hetvi2901

Enter your First Name: Hetvi

Enter your Middle Name: Dharmeshkumar

Enter your Last Name: Solanki

Please enter your birthdate (dd-mm-yyyy): 29-01-2015

---- Registration failed because you are below 18 ----

Unsuccessful Registration

- Now, we will check our restriction are properly working or not.

-----Kindly Fill the correct details-----

Enter your username: Utsav

--> Username already taken. Please choose a different username.

Enter your username: Dhruvil

Enter your password: dhruvil

--->Invalid password! Password must be at least 8 characters long.

--->And it should contain at least one uppercase letter, one lowercase letter, and one digit.

Enter your password: Dhruvil9198

Enter your First Name: Dhruvil

Enter your Middle Name: Karansinh

Enter your Last Name: Mahida

Please enter your birthdate (dd-mm-yyyy): 21/09/2005

---- Invalid date format. Please enter date in dd-mm-yyyy format ----

---> Exception: java.time.format.DateTimeParseException: Text '21/09/2005' could not be parsed at index 2

Please enter your birthdate (dd-mm-yyyy): 21-09-2005

Enter your Mobile Number: 456

--> Invalid input! Please enter a valid 10-digit mobile number.

Enter your Mobile Number: 6354419419

Enter your Gender(M/m/F/f): gh

Invalid input. Please enter 'M' or 'm' or 'F' or 'f'.

Enter your Gender(M/m/F/f): M

Enter your City: Bharuch

Enter your State: Gujarat

----- Voter registered successfully -----

Successful Registration With Warnings

- After successful registration Voter can log in.
- But he can cast vote only after Admin approval.

```
----- Welcome to Voter Module -----  
  
1. Register Yourself  
2. Log in  
3. Go back to main menu  
  
Enter Your Choice: 2  
  
Enter your username: Utsav  
Enter your password: khjs  
  
--- Invalid username or password. Please try again ---  
  
----- Welcome to Voter Module -----  
  
1. Register Yourself  
2. Log in  
3. Go back to main menu  
  
Enter Your Choice: 2  
  
Enter your username: Utsav  
Enter your password: Utsav@2110  
  
---- Login Successful ----  
  
--> Your registration process is under verification.  
--> Kindly wait for approval.  
--> Have a nice day.
```

Voter Login

- In admin Module, now Admin can approve Voter Details and show all voter details.

```
Enter Your Choice: 7

-----Voter 1 details-----

-----
Username: Utsav
Name: Utsav Dharmeshkumar Solanki
Date of Birth: 21-10-2005
Mobile Number: 6354840409
Gender: M
City: Valsad
State: Gujarat
Approved: No
-----

--- Enter 1 to approve ---
--- Enter 2 to disapprove ---

Enter Your Choice: 1

----- Voter 1 approved -----

-----Voter 2 details-----

-----
Username: Dhruvil
Name: Dhruvil Karansinh Mahida
Date of Birth: 21-09-2005
Mobile Number: 6354419419
Gender: M
City: Bharuch
State: Gujarat
Approved: No
-----

--- Enter 1 to approve ---
--- Enter 2 to disapprove ---

Enter Your Choice: 1

----- Voter 2 approved -----
```

Approve Voter

```
-----Voter 3 details-----  
  
Username: Dh<ADBK.  
Name: hjdfs rth hnrh5t  
Date of Birth: 01-01-1914  
Mobile Number: 1234567980  
Gender: F  
City: bhrj  
State: rtyzw  
Approved: No  
  
--- Enter 1 to approve ---  
--- Enter 2 to disapprove ---  
  
Enter Your Choice: 2  
  
--- Voter 3 is not approved due to incorrect details ---
```

Disapprove Voter

- Now, we can see the details of all the Voters.

```
Enter Your Choice: 6  
  
----- Voter 1 details -----  
  
Username: Utsav  
Name: Utsav Dharmeshkumar Solanki  
Date of Birth: 21-10-2005  
Mobile Number: 6354840409  
Gender: M  
City: Valsad  
State: Gujarat  
Approved: Yes  
  
----- Voter 2 details -----  
  
-----  
Username: Dhruvil  
Name: Dhruvil Karansinh Mahida  
Date of Birth: 21-09-2005  
Mobile Number: 6354419419  
Gender: M  
City: Bharuch  
State: Gujarat  
Approved: Yes  
-----
```

```
----- Voter 3 details -----
```

```
-----  
Username: Dh<ADBK.  
Name: hjdfs rth hnrh5t  
Date of Birth: 01-01-1914  
Mobile Number: 1234567980  
Gender: F  
City: bhrj  
State: rtyzw  
Approved: No  
-----
```

```
----- End -----
```

View Voter Detail

- Now, we have to vote for candidates . So, I will add some more Candidates to verify our other functions, because currently we have only 1 candidate and 3 voters(2 approved,1 disqualified). So I will add some voters also. And I will add one election also whose end date is yesterday's or any previous date.
- Firstly , we will login and see our personal details.

```
----- Welcome to Voter Module -----
```

```
1. Register Yourself  
2. Log in  
3. Go back to main menu
```

```
Enter Your Choice: 2
```

```
Enter your username: Utsav  
Enter your password: Utsav@2110
```

```
----- Login successful -----
```

```
----- Welcome to Voter Module -----
```

```
1. View Detail  
2. Cast Vote  
3. Log Out
```

```
Enter Your Choice: 1
```

```
-----  
Username: Utsav  
Name: Utsav Dharmeshkumar Solanki  
Date of Birth: 21-10-2005  
Mobile Number: 6354840409  
Gender: M  
City: Valsad  
State: Gujarat  
Approved: Yes  
-----
```

- Now, we will vote one candidate.

```
----- Welcome to Voter Module -----  
  
1. Register Yourself  
2. Log in  
3. Go back to main menu  
  
Enter Your Choice: 2  
  
Enter your username: Utsav  
Enter your password: Utsav@2110  
  
----- Login successful -----  
  
----- Welcome to Voter Module -----  
  
1. View Detail  
2. Cast Vote  
3. Log Out  
  
Enter Your Choice: 2  
  
----Election 1 details----  
Name: Class Representative  
End Date: 21-10-2024  
  
----Election 2 details----  
Name: College President  
End Date: 26-05-2024  
  
----Election 3 details----  
Name: CM  
End Date: 15-06-2023  
  
----- End -----  
  
Choose election:1  
  
---> Enter 0 to vote for NOTA  
  
----- Candidates -----  
  
----Candidate 1 details----  
Name : Kalp  
Party : Visionary Party  
  
----Candidate 2 details----  
Name : Param  
Party : Progress Alliance Party  
  
----- End -----  
  
Enter candidate number to vote: 1  
  
---- Vote registered successfully for Kalp ----
```

- In this voting process if you want to vote for NOTA you have to enter 0.

```
----- Welcome to Voter Module -----  
  
1. View Detail  
2. Cast Vote  
3. Log Out  
  
Enter Your Choice: 2  
  
----Election 1 details----  
Name: Class Representative  
End Date: 21-10-2024  
  
----Election 2 details----  
Name: College President  
End Date: 26-05-2024  
  
----Election 3 details----  
Name: CM  
End Date: 15-06-2023  
  
----- End -----  
  
Choose election:2  
  
---> Enter 0 to vote for NOTA  
  
----- Candidates -----  
  
----Candidate 3 details----  
Name : Foram  
Party : Unity Party  
  
----Candidate 4 details----  
Name : Mayank  
Party : Empowerment Party  
  
----- End -----  
  
Enter candidate number to vote: 0  
--> Vote casted for NOTA successfully.
```

- If you enter to cast vote again then Message will be printed on console.

```
----- Welcome to Voter Module -----  
  
1. View Detail  
2. Cast Vote  
3. Log Out  
  
Enter Your Choice: 2  
  
----Election 1 details----  
Name: Class Representative  
End Date: 21-10-2024  
  
----Election 2 details----  
Name: College President  
End Date: 26-05-2024  
  
----Election 3 details----  
Name: CM  
End Date: 15-06-2023  
  
----- End -----  
  
Choose election:1  
  
---> Voting is allowed only once.  
---> You have already voted.
```

- If election is ended then Message will be printed on console.

```
----- Welcome to Voter Module -----  
  
1. View Detail  
2. Cast Vote  
3. Log Out  
  
Enter Your Choice: 2  
  
----Election 1 details----  
Name: Class Representative  
End Date: 21-10-2024  
  
----Election 2 details----  
Name: College President  
End Date: 26-05-2024  
  
----Election 3 details----  
Name: CM  
End Date: 15-06-2023  
  
----- End -----  
  
Choose election:3  
  
--- Sorry, the election has ended. You can't vote now. ---
```

- If you choose wrong candidate , then Message will be printed on console.

```
----- Welcome to Voter Module -----  
1. View Detail  
2. Cast Vote  
3. Log Out  
  
Enter Your Choice: 2  
  
----Election 1 details----  
Name: Class Representative  
End Date: 21-10-2024  
  
----Election 2 details----  
Name: College President  
End Date: 26-05-2024  
  
----Election 3 details----  
Name: CM  
End Date: 15-06-2023  
  
----- End -----  
  
Choose election:1  
  
---> Enter 0 to vote for NOTA  
  
----- Candidates -----  
  
----Candidate 1 details----  
Name : Kalp  
Party : Visionary Party  
  
----Candidate 2 details----  
Name : Param  
Party : Progress Alliance Party  
  
----- End -----  
  
Enter candidate number to vote: 3  
  
----- Candidate not associated with the chosen election -----
```

- This way all candidate has voted.

- Now we will see results.
- In admin module, we can see results.

```
Enter Your Choice: 8

----Election 1 details----
Name: Class Representative
End Date: 21-10-2024

----Election 2 details----
Name: College President
End Date: 26-05-2024

----Election 3 details----
Name: CM
End Date: 15-06-2023

----- End -----


Choose election:1

----- Election Results for Class Representative -----


-----Candidate 1 details-----
Name : Kalp
Party : Visionary Party
Votes : 2

-----Candidate 2 details-----
Name : Param
Party : Progress Alliance Party
Votes : 1

-----


-----|      Winner      |-----


| Name: Kalp          | |
| Party: Visionary Party | |
| Votes: 2            | |
-----
```

- If there is tie between two candidates, then admin has to vote.

```
Enter Your Choice: 8

----Election 1 details----
Name: Class Representative
End Date: 21-10-2024

----Election 2 details----
Name: College President
End Date: 26-05-2024

----Election 3 details----
Name: CM
End Date: 15-06-2023

----- End -----

Choose election:2

----- Election Results for College President -----


-----Candidate 3 details-----
Name : Foram
Party : Unity Party
Votes : 1

-----Candidate 4 details-----
Name : Mayank
Party : Empowerment Party
Votes : 1

----- There is a tie between the following candidates -----
--> 1. Name: Foram, Party: Unity Party
--> 2. Name: Mayank, Party: Empowerment Party

----- Admin, please vote to break the tie.
----- Enter the index of the candidate you want to vote for: 2

-----|      Winner      |-----
| Name: Mayank          | |
| Party: Empowerment Party | |
| Votes: 2               | |
-----
```

- Now, we will see voting Statistics.

```
Enter Your Choice: 9

----Election 1 details----
Name: Class Representative
End Date: 21-10-2024

----Election 2 details----
Name: College President
End Date: 26-05-2024

----Election 3 details----
Name: CM
End Date: 15-06-2023

----- End -----

Choose election:1

---- Percentage of voting done for Class Representative: 75.00% ----

Number of NOTA votes for Class Representative is: 0
```

```
----Election 2 details----
Name: College President
End Date: 26-05-2024

----Election 3 details----
Name: CM
End Date: 15-06-2023

----- End -----

Choose election:2

---- Percentage of voting done for College President: 75.00% ----

Number of NOTA votes for College President is: 1
```

```
----Election 3 details----
Name: CM
End Date: 15-06-2023

----- End -----

Choose election:3

---- Percentage of voting done for CM: 0.00% ----

Number of NOTA votes for CM is: 0
```

- Whenever there is input from user, Console is demanding integer type of data and if user enters string then program will be terminated and all data will be lost. To insure ,this should not happen with our program so I used exception handling in my program and now my program is not terminating , instead it is asking to re enter that data.

```
----- Welcome to Online Election System -----  
  
1. Admin Module  
2. Voter Module  
3. Exit  
  
Enter Your Choice: usaHJD  
  
--> Invalid input. Please enter an integer.  
-->Exception: java.util.InputMismatchException  
  
----- Welcome to Online Election System -----  
  
1. Admin Module  
2. Voter Module  
3. Exit  
  
Enter Your Choice: 2  
  
----- Welcome to Voter Module -----  
  
1. Register Yourself  
2. Log in  
3. Go back to main menu
```

→ Now,it's all done and we will exit. When we exit CSV files will be generated.

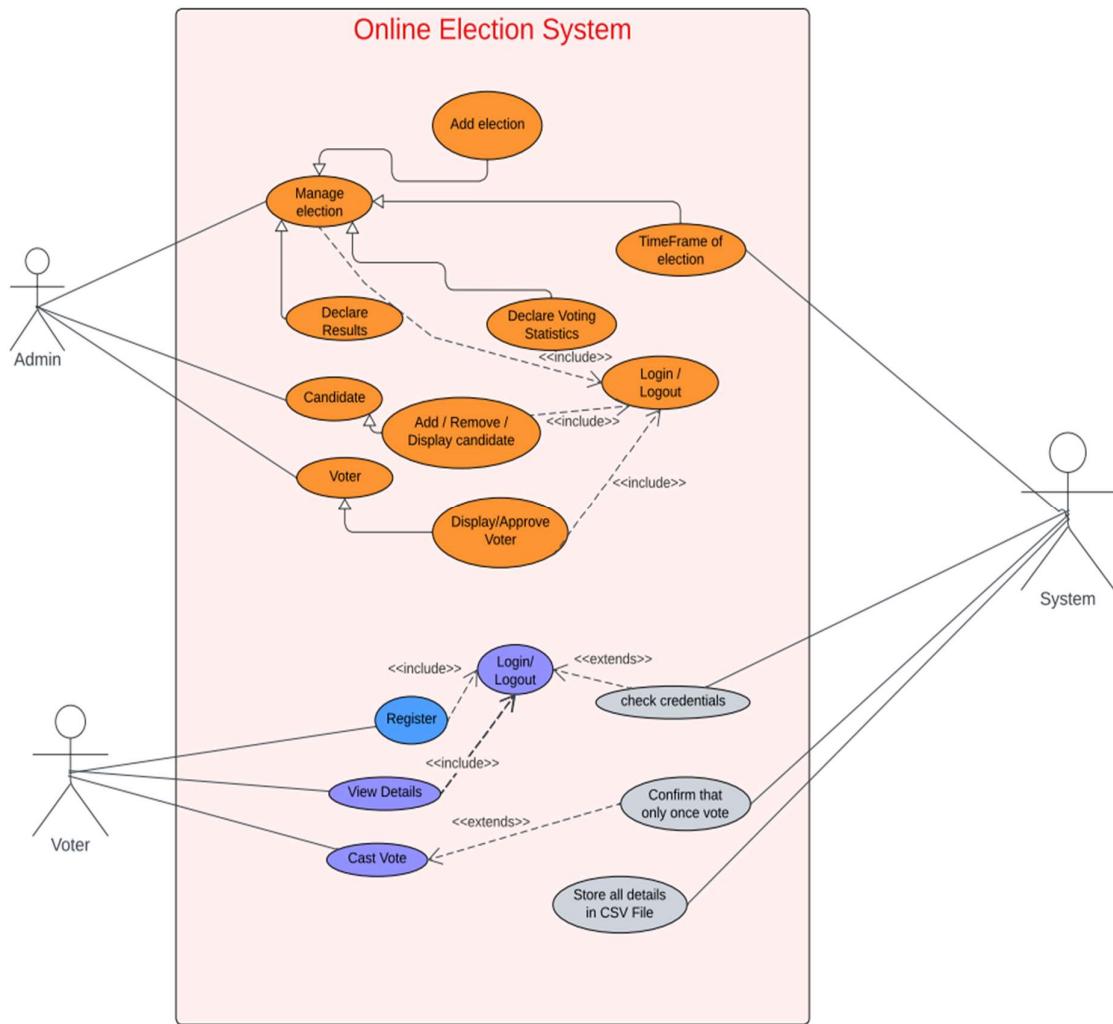
```
----- Welcome to Online Election System -----  
1. Admin Module  
2. Voter Module  
3. Exit  
  
Enter Your Choice: 3  
  
--> Do you confirm that you want to exit ? Please enter 'y' for yes or 'n' for no.  
--> Write here: y  
  
----- Exiting -----  
  
---> Elections.csv file saved successfully!  
---> Candidates.csv file saved successfully!  
---> Voters.csv file saved successfully!  
  
----- End -----
```

The image shows three Microsoft Excel windows side-by-side, each displaying a table of data:

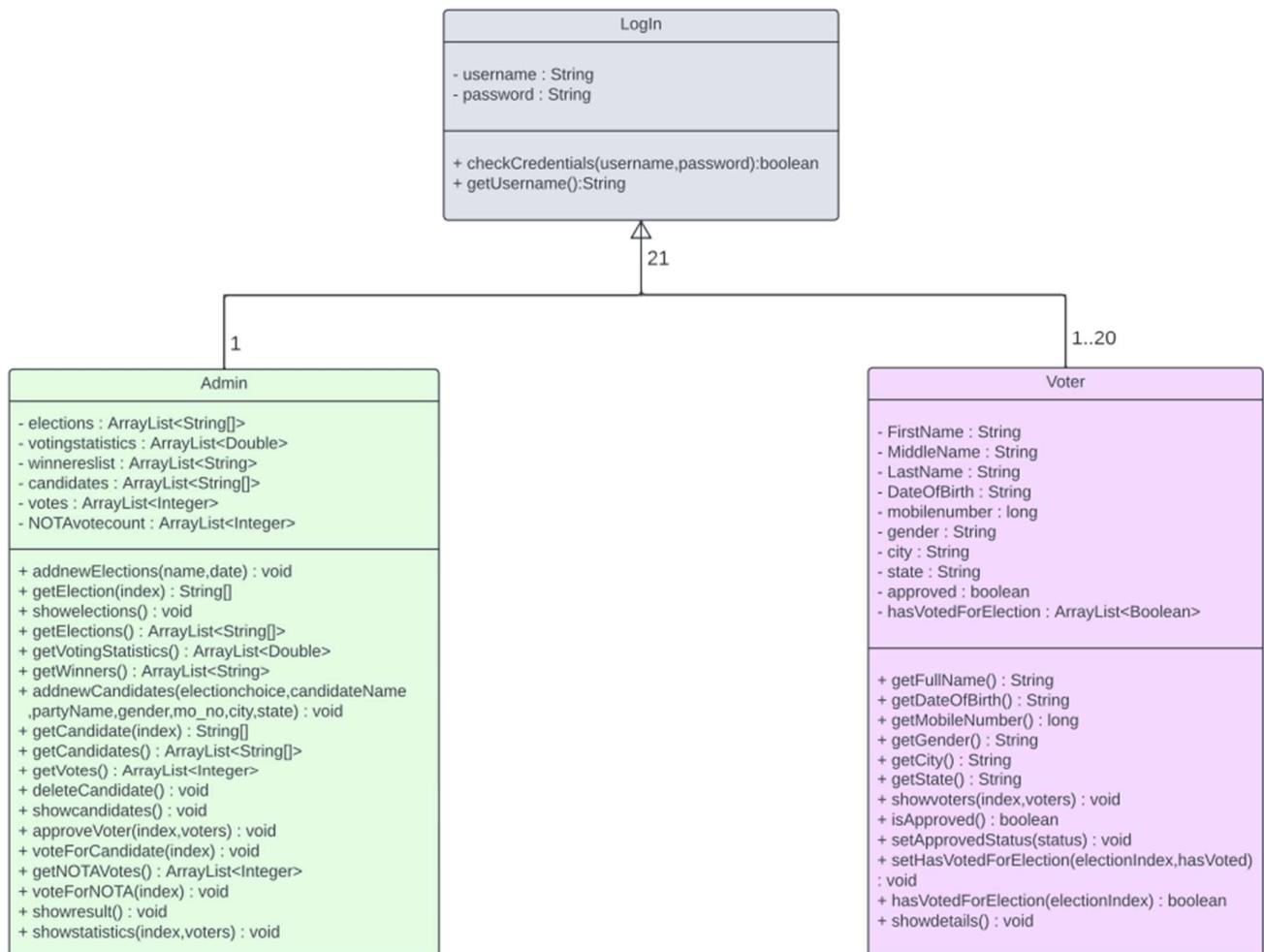
- Voters - Excel**: A table with columns: A (Username), B (Name), C (Date of Birth), D (Mobile Number), E (Gender), F (City), G (State), H (Approved). The data includes entries for Utsav, Dhruvil, Dhayev, and Chirag.
- Candidates - Excel**: A table with columns: A (Election Name), B (Candidate Name), C (Party Name), D (Gender), E (Mobile Number), F (City), G (State), H (Earned Votes). The data includes entries for Class Representative, College President, and CM.
- Elections - Excel**: A table with columns: A (Election Name), B (End Date), C (Winner), D (Voting Statistics), E (NOTA Votes). The data includes entries for Class Representative, College President, and CM.

→ All Three files are here.

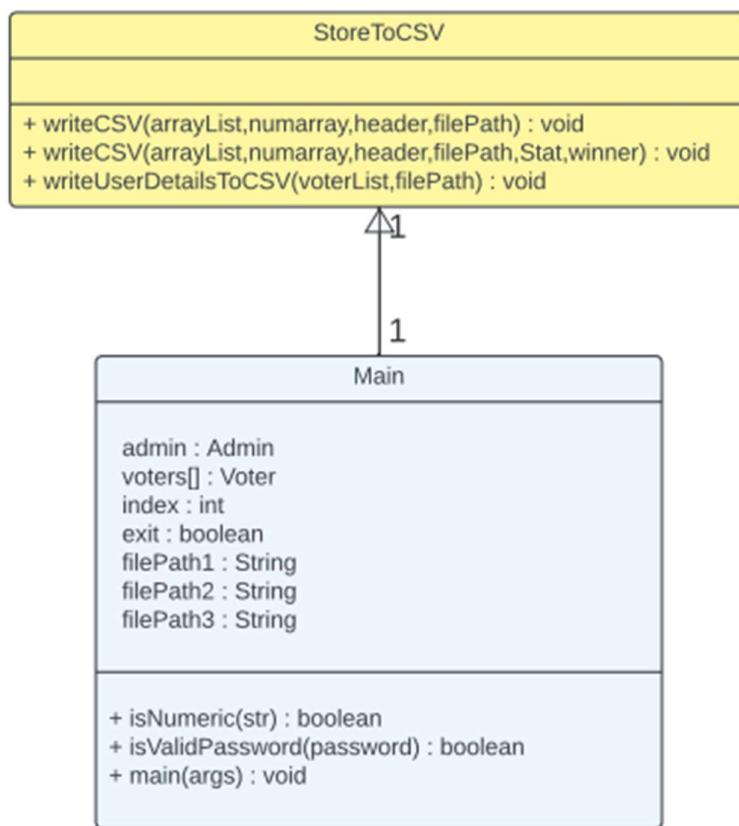
4. Use Case Diagram



5. Class Diagram

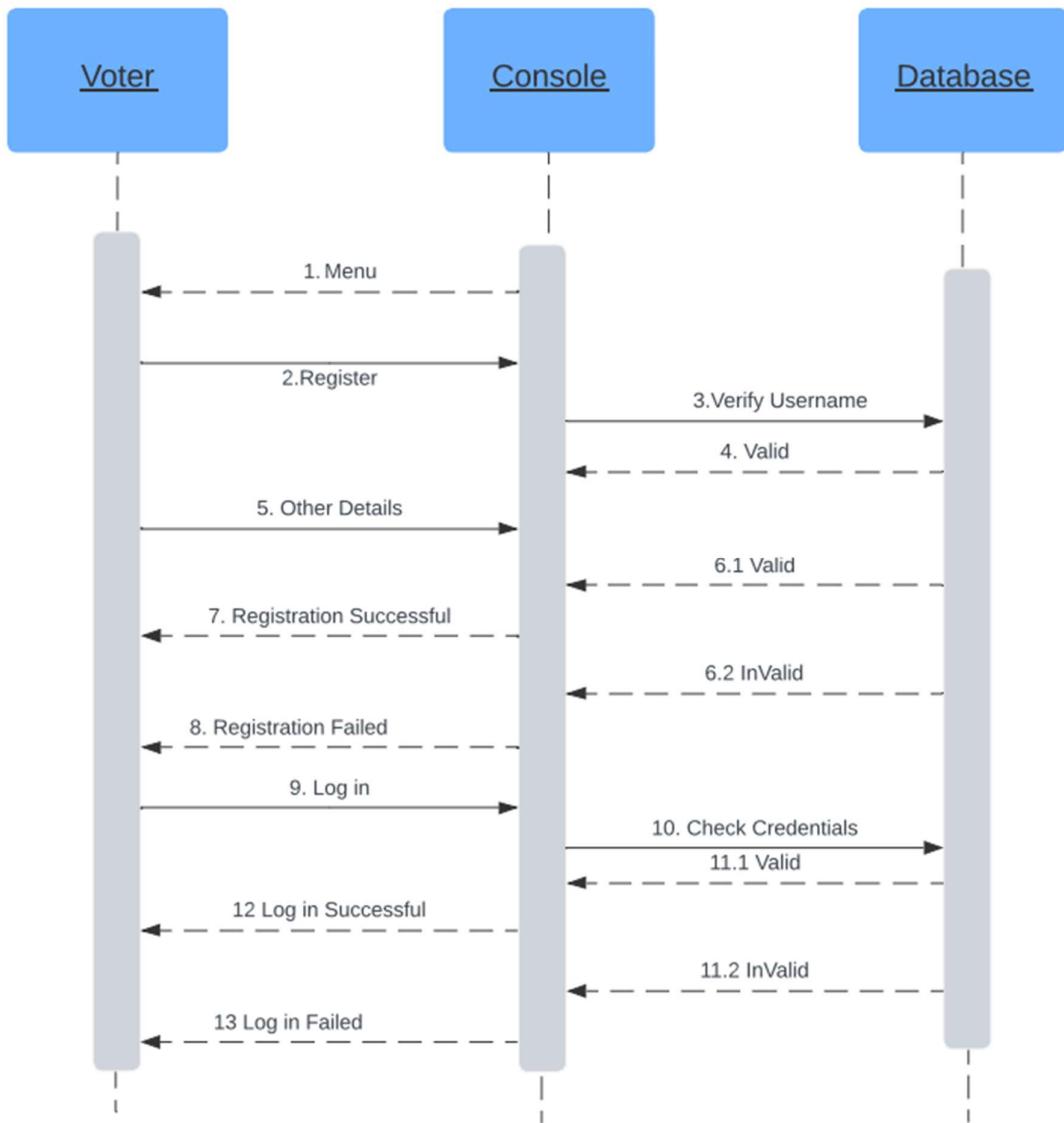


Class Diagram 1

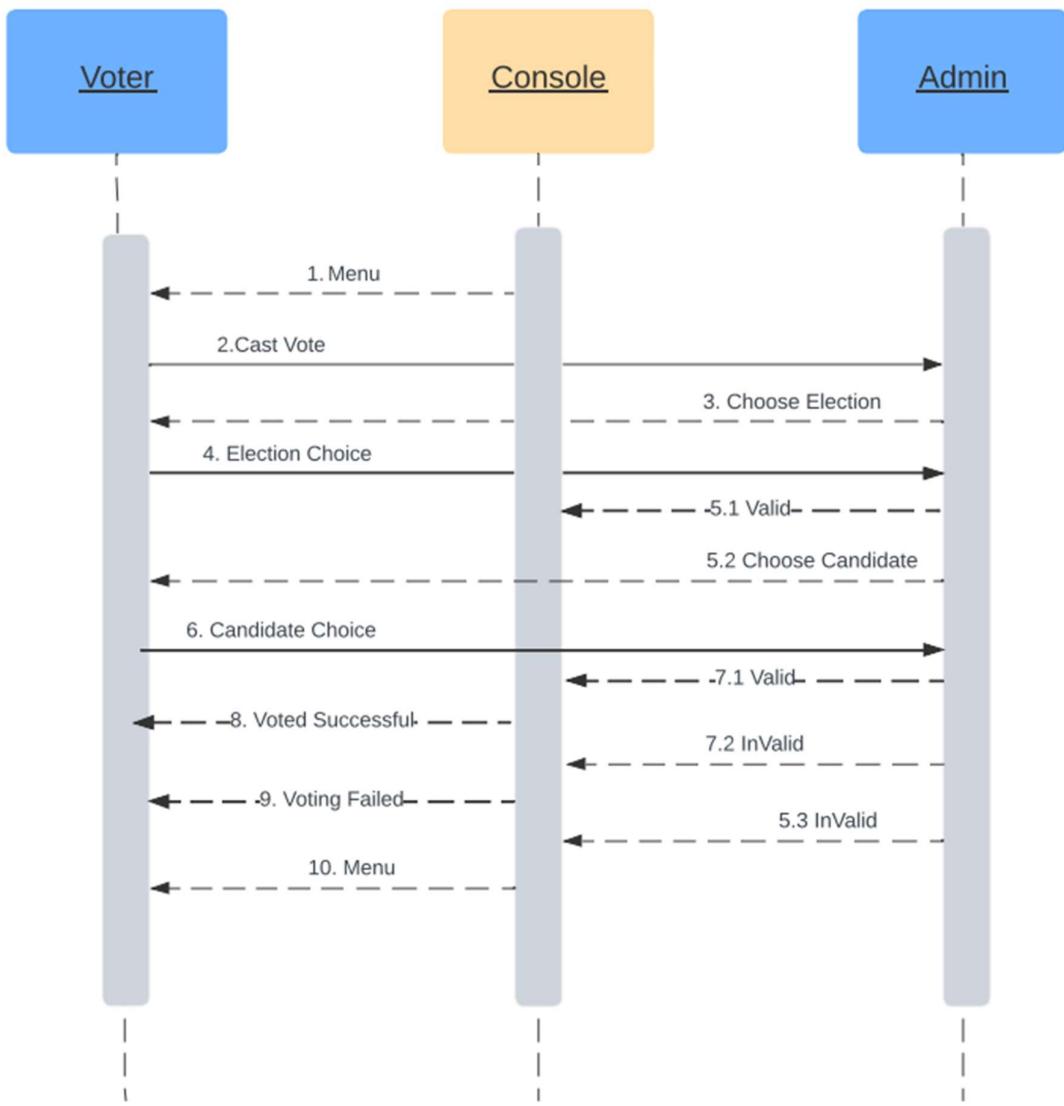


Class Diagram 2

6. Sequence Diagram



Sequence Diagram For Register / Login



If Successfully Login then sequence diagram for Vote Casting

Thank You