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E-ELECTION (E-VOTING SYSTEM)

# Introduction

Using electronic voting systems is divisive as some countries used such systems and others did not. Electronic voting (e-voting) is relatively a new concept based on its application that aims at reducing errors and improving the convenience and integrity of election process.

There is a need to update voting technologies to improve trust, reliability, and convenience. This system ensures that encrypted votes on the block chain are reliably counted, while ensuring voter privacy. The primary way voters cast their ballots is by using electronic voting stations, which will send the encrypted ballots to the block chain. The system will be designed with the following criteria in mind.

• Privacy - Keeping an individual’s vote secret.

• Eligibility - Allowing only registered voters to vote, with each such voter voting only once.

• Hiding interim results - Partial results should not be released during the voting period.

• Verifiability - The ability to trust the vote tallying process.

• Receipt-Freeness - Voters should be unable to prove to a third party that they voted in a particular way. This is required to prevent coercion.

• Convenience - Voters must be able to register as voter and vote easily, and everyone who is eligible must be able to vote.

# Purpose:

The basic idea of Online voting system is a online voting technique In this system people who have citizenship of Pakistan and whose age is above 18 year of age can give his/her vote online without going any physical polling station. It consists of voter details, security system, status and exits. Administrator can enter the name and password and generate the reports and can perform operation like add citizens, search, delete the citizens in the database. In Online voting system we can get the result of the election based on polling.

# Why Use E-voting

Election voting machines have provided a number of benefits to the election process. For example, direct recording electronic machines can be equipped with audio or tactile devices that allow disable citizen to cast ballot independently, they also help conduct election in more efficient and effective manner, like reducing the cost associated with printing ballot and hiring extra polling staff. Voting machines can also spit out election tallies much quicker and more accurately than exhausted polling station staff; they reduce human errors in generating election result and also reduce the cost of conducting election. So the major benefits of e-voting could be summarizing in the following points: reduced costs, increased participation and voting options, greater speed and accuracy placing and tallying votes, greater accessibility and flexibility for the disable.

The main aim of the system is to provide a set of protocols that allow voters to cast secretly while a group of authorities collect votes and output final results. Since it stand alone application, one or more user may use it time and the system is available only at the Election time.

# Objectives:

1. Review the existing/current voting process and approach in Pakistan.

2. Coming up an automated voting system in Pakistan.

3. Implemented online voting system.

4. Validating the system to ensure that only eligible voter is allowed to vote.

# Key features and functionalities

Electronic voter lists and voter authentication

This includes electronic voter list, covering either a single polling station or the entire country. This list is to be used to authenticate eligible voters and to record that they have cast their vote.

Poll worker interface

Special functionalities that are only available to poll workers, for example, resetting the vote count at the opening of the polling station, closing polling, registration of pending voter and transmission of results.

Interface for casting votes.

A simple user friendly interfaces to login and cast your vote.

# Classes

Two main classes used in the project

1:- Voter

2:- Candidate

## Voter Class

Each instance of the Voter class represents a single Voter with same attributes of First Name, last Name, CNIC, Providence, Email, dob, Phone No, Constituency, address, password, Repeat password, Eligibility, Status, Vote, Picture path.

Every time a voter will apply for registration, a new instance of voter will be created, the entire data voter entered in the text boxes, will bound with the attributes of the object and the whole object is used every in the program where is required. The object sent to database query where it decomposed and its attributed value saved in the table.

## Candidate Class

Each instance of the Candidate class represents a single candidate with same attributes of first Name, last Name, CNIC, province, constituency, photo Path, party, Vote Count.

Every time a admin registered a candidate, a new instance of candidate class is created, the entire data voter entered in the text boxes, then bound with the attributes of the object and the whole object is used every in the program where is required. The object sent to database query where it decomposed and its attributed value saved in the table.

# GUI

E-Voting system is window based application and it certainly requires a GUI for user interaction. As it was project of CS Course name Visual programming and the GUI taught in the program was Windows Forms, so certainly the expectation of the instructor is that student must use Window form in the project, so keeping that in mind I too stick with Window from and made this program as window form based. User Control is also used the display the candidates to the voter as the number of the candidate vary in each constituency, so to user control will create in run time according to the number of candidate in a constituency.

# Database

Visual studio service based SQL database is used to store data of the program.

## Tables in Database

There are four tables in the project database:

### 1:- Voter

Voter table will store the data of voter, which will use in pooling, results and for future use. CNIC of Voter is primary key of the table. And Vote is Foreign key to CNIC column of candidate table.

|  |  |  |
| --- | --- | --- |
| Table name | Data type | Description |
| CNIC(Pk) | nvarchar(15) | This Column will store CNIC No of the voter. It is also Primary key. |
| First name | nvarchar(15) | This Column will store First Name of the voter. |
| Last Name | nvarchar(15) | This Column will store Last Name of the voter. |
| D.O.B | nvarchar(Max) | This Column will store D.O.B of the voter. |
| Email | nvarchar(Max) | This Column will store Email ID of the voter |
| Phone No | nvarchar(15) | This Column will store Phone no of the voter |
| Address | nvarchar(100) | This Column will store Address of the voter |
| Province | nvarchar(15) | This Column will store Province of the voter from where he/she belong. |
| Password | nvarchar(15) | This Column will store Password of the voter |
| Eligibility | nvarchar(15) | This Column will store Eligibility status i.e. Pending/Eligible/Ineligible of voter |
| Constituency | nvarchar(15) | This Column will store Constituency of the voter where he belongs and it will set by admin. |
| Status | nvarchar(15) | This Column will store voting status either voter has voted his vote or he/she still have to vote, so nobody can vote twice of the voter. This column value will also indicates for what POOL voter has casted his Vote. |
| Vote(Fk) | nvarchar(15) | This Column will store the CNIC no of the candidate to whom voter has casted his vote of the voter. It is also foreign key to the primary key of candidate table. |
| Image Path | nvarchar(Max) | This Column will store the file path where his/her image is store in local folder |
|  |  |  |

### 2:- Candidate

Voter table will store the data of Candidate, which will use in pooling, results and for future use. CNIC of candidate is primary key of the table.

|  |  |  |
| --- | --- | --- |
| Table name | Data type | Description |
| CNIC(Pk) | nvarchar(15) | This Column will store CNIC No of the candidate. It is also Primary key. |
| First Name | nvarchar(15) | This Column will store First Name of the candidate. |
| Last Name | nvarchar(15) | This Column will store First Name of the candidate. |
| Constituency | nvarchar(15) | This Column will store Constituency of the candidate where he belongs and it will set by admin. |
| Political Party | nvarchar(15) | This Column will store the political party name of candidate. |
| Province | nvarchar(15) | This Column will store Province of the candidate from where he/she belong. |
| Vote Count | int | This Column will the initial and than the final and incremented values of vote count casted to particular candidate. |
| Image Path | nvarchar(150) | This Column will store the file path where his/her image is store in folder. |

### 3:- Admin

Admin table will store the data of Admin, which will use for Login purpose. Username of Admin is primary key of the table.

|  |  |  |
| --- | --- | --- |
| Table name | Data type | Description |
| Username |  | This Column will store the usernames of admin. |
| Password |  | This Column will store the Password of particular admin account. |
| Old Password |  | This Column will store the Old Password of particular admin Account. |

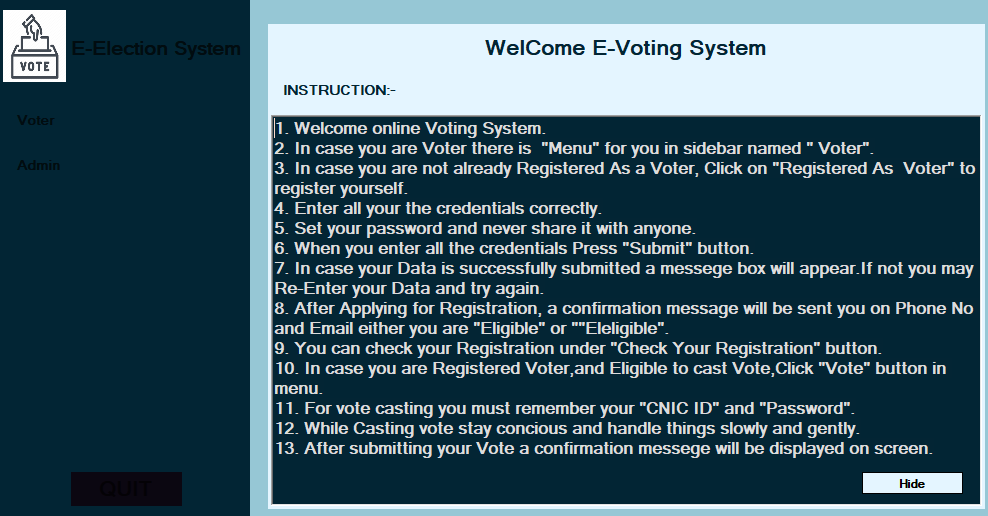
### 4:- Pool

Pool table will store the data of POOL created by admin, which will use for POOLING. Pool name will be stored in place of voter status for in future we can find for which pool voter has casted this vote. POOL NAME is primary key of the table.

|  |  |  |
| --- | --- | --- |
| Table name | Data type | Description |
| Pool Name(Pk) |  | This column will store the name of Pool Admin will register. |
| Registration date |  | This column will store the date on which a Pool is registered by Admin. |
| Start Date |  | This Column will store the date on which particular POOLING is started. |
| End Date |  | This Column will store the date on which particular POOLING is ended. |
| Status |  | This Column will store the status of POOL, either it is Active or De-Active. |

# User manual

## Main Page



Upon landing on main page the user will be force to read the instruction so, he or she can learn, how to handle the voting portal. The menu sidebar will stay lock until the user hit the hide bottom at button of the instruction panel.



On clicking the hide button the instruction panel will hide and side bar will be unlocked and user now can interact with the sidebar menu.

There are two buttons Voter and Admin. Upon clicking each of them a sub-menu will drop. 

## Voter

On clicking voter button a sub-menu will be visible, comprises of other three more buttons.

Vote here

This button will take the voter to login page and after giving correct information voter will proceed further and cast his/her vote.

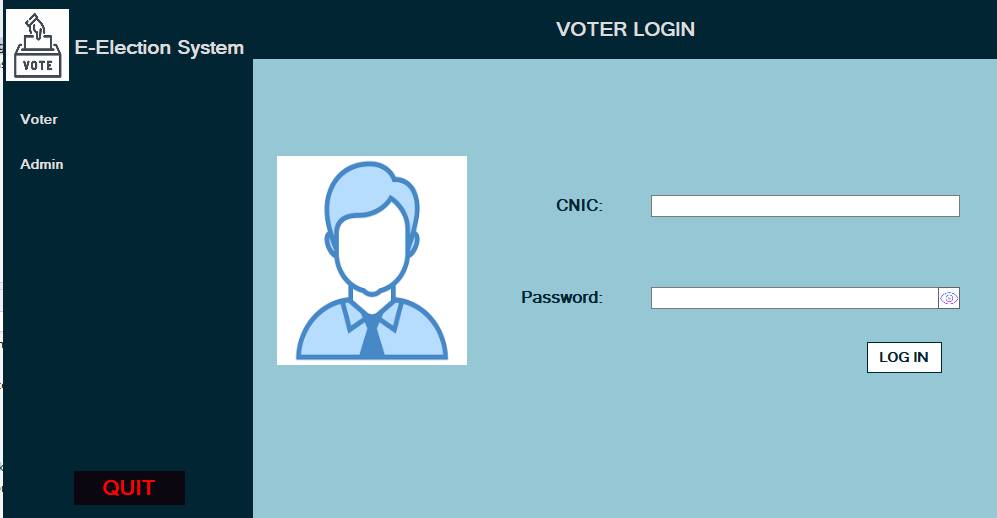
Register as Voter

This button will display a form where voter will fill his credentials and send his information for further authentication to admin.

Check your registration

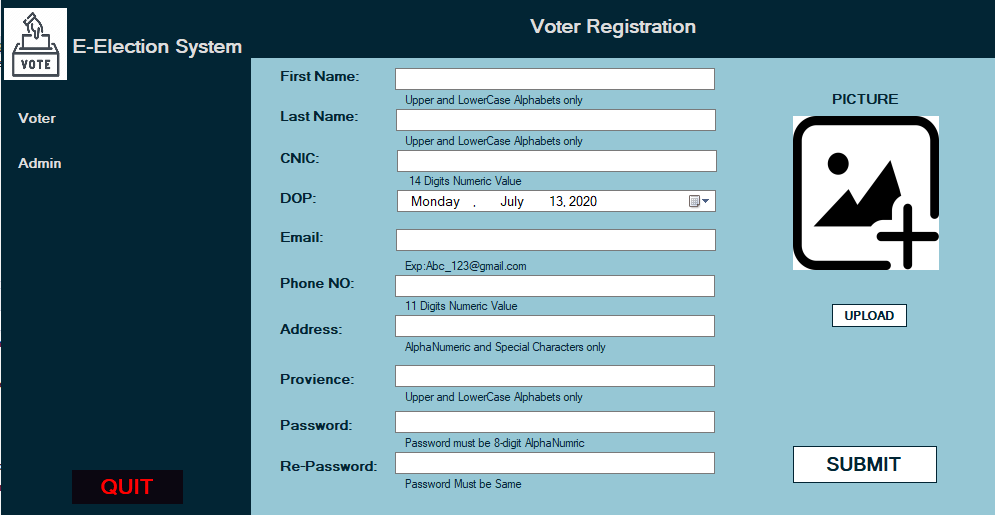
After applying for his Registration voter can check his voting status here, either his is eligible or ineligible, and the third possibility is his/her registration is still in pending status.

### Vote Login

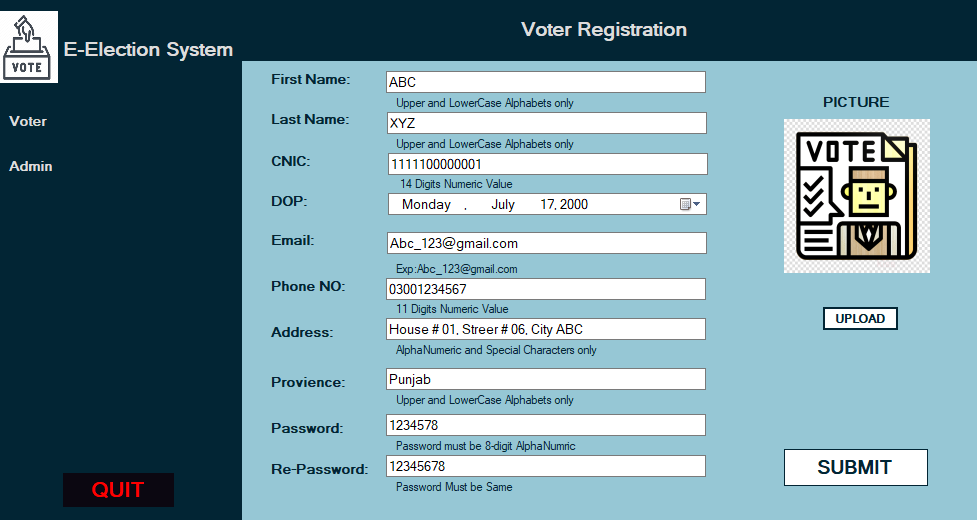


On clicking Vote here and Check Registration buttons, a login form will appear. Here voter will enter his/her CNIC and Password which he/she has given while applying for Registration. The both textbox are properly validated, and force user to enter the valid data. If voter successfully enter a valid data and his data found and match with the database, he/she will be sent to next page.

### Register as Voter

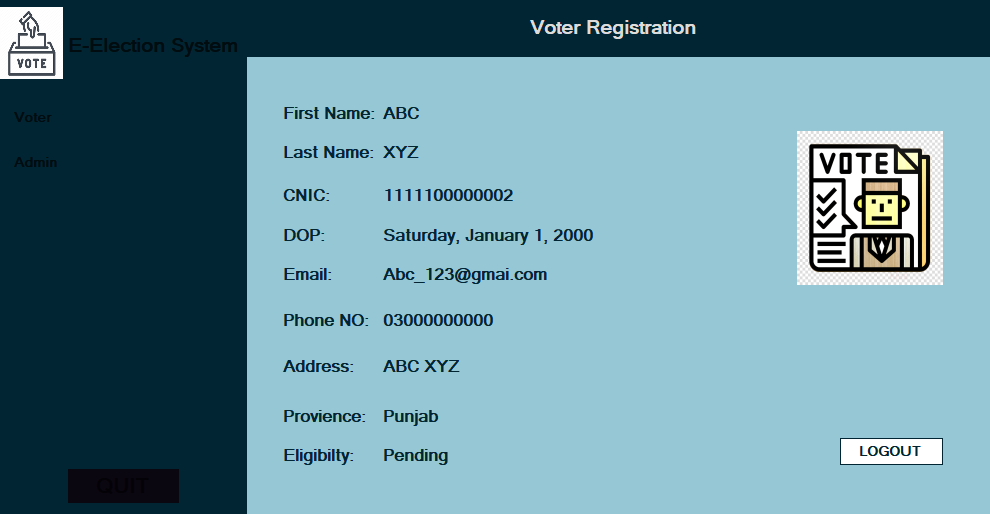


When voter click the “Register as voter” button, a form will be displayed on interface, where he/she can fill the information, has been asked from him/her. The form is proper validated and user can only able to submit his data, if he/she enters it according to the format. After submission his/her data will be stored in database and his eligibility status will be set as “Pending” and after a review of his/her data admin will decide either he/she is eligible to vote.



### Check Registration

On clicking Check Registration button, a login form will appear. Here voter will enter his/her CNIC and Password which he/she has given while applying for Registration. The both textbox are properly validated, and force user to enter the valid data. If voter successfully enter a valid data and his data found and match with the database, he/she will see his registration status.

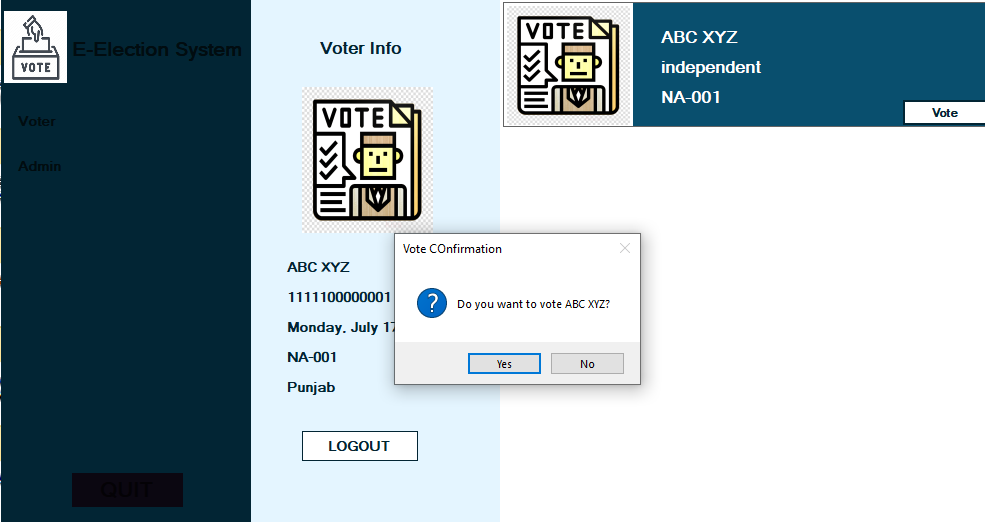


### Vote here

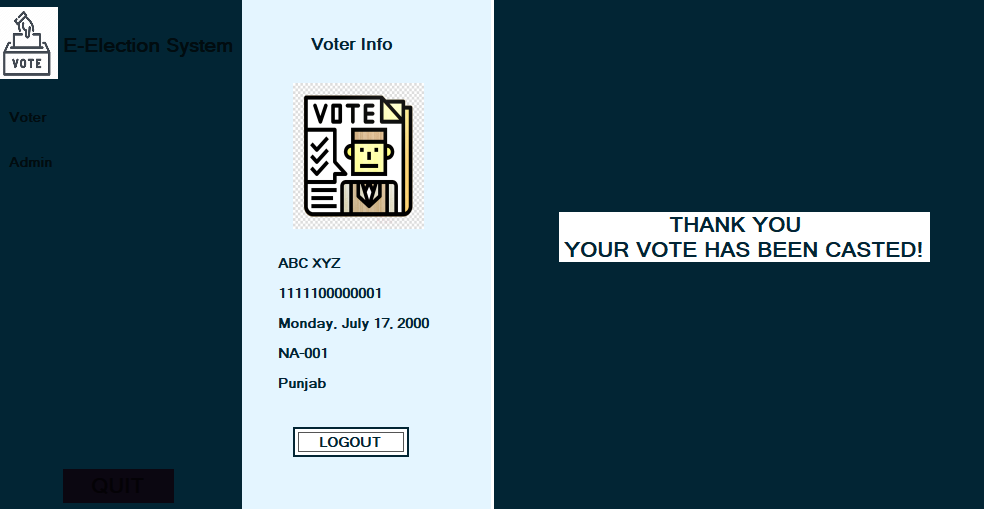
On clicking Vote here button, a login form will appear. Here voter will enter his/her CNIC and Password which he/she has given while applying for Registration. The both textbox are properly validated, and force user to enter the valid data. If voter successfully enter a valid data and his data found and match with the database, he/she will see his information and all the list of all the candidates of his/her constituency. There is Vote button at the bottom of each candidate info box, and to cast vote voter will click the button. His/her vote will be stored in database and voter status will be updated to “Pool” name for which he/she casted the vote.



When voter will the “Vote” button a dialog message box will appear with the name of candidate whom voter clicked to vote, voters will confirm either “Yes” to confirm their vote or “NO” to go back and re-choose the candidate again.

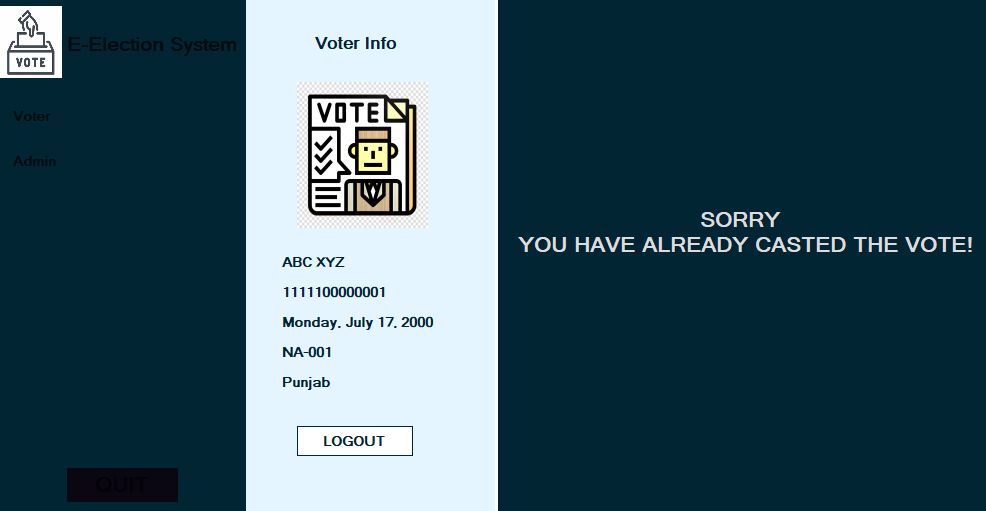


If voter press “Yes” button of confirmation dialog box , his/her vote will be cast and stored in the date base. Voter will see a confirmation message on screen after he/she successfully cast his/her vote.



If voter has already casted his/her vote and try to cast again, the system will deny him/her by checking his/her credentials from database and as message will be shown on screen. Same will

be the case with those voter who are ineligible or their eligibility status in “Pending” state.



# Admin

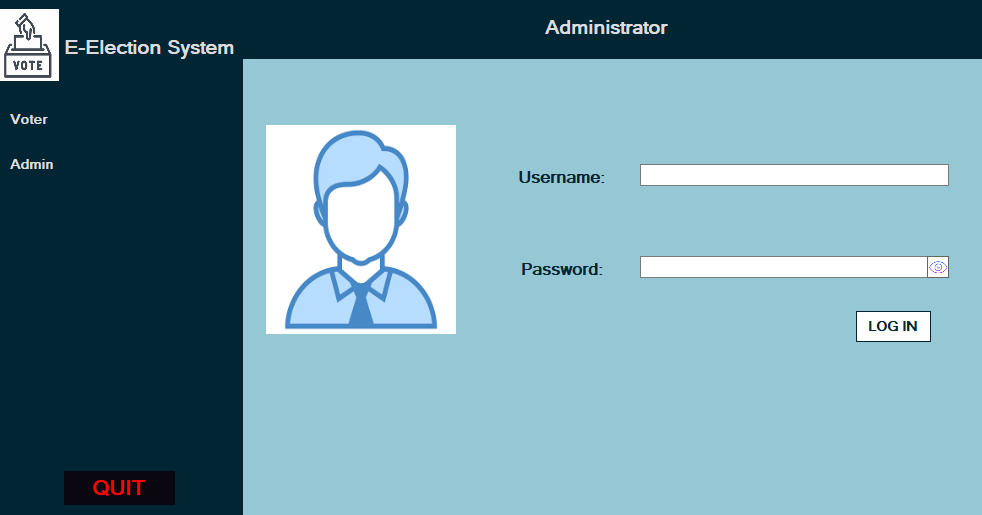
On clicking Admin button a sub-menu will be visible, consist of a button.

## Log in



## Admin login

When admin click on the admin login a login page will be shown, from where they will be able to login and access the admin side of the application. A username and password is required to successfully enter the admin side.



# Administrator

After admin successfully logged in, he will be shown an administrator page which includes a side bar menu to handle the application. Side bar menu include following buttons:-

1:- Add Candidate 2: Register Vote

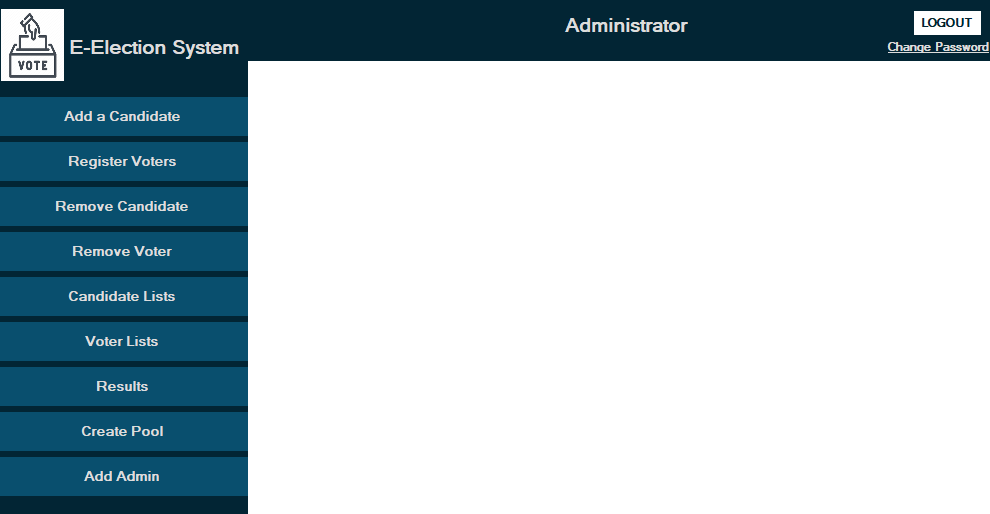
3:- Remove Candidate 4:- Remove Voter

5:- Candidates List 6:- Voter Lists

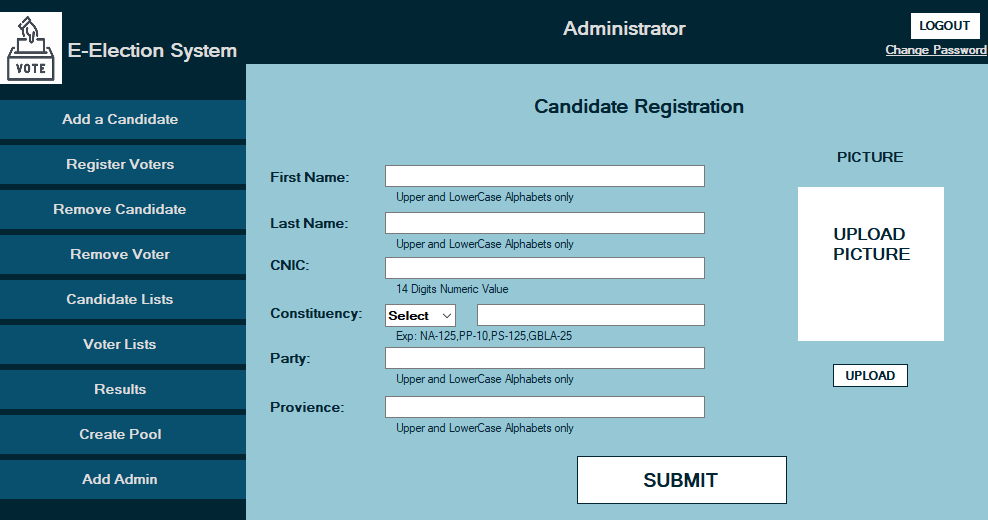
7:- Results 8:- Create POOL

9:- Add Admin

Admin can logout by clicking a button on the “LOGOUT” top right corner of the page and can change password of his account by clicking “change password” button just below the “LOGOUT” button.

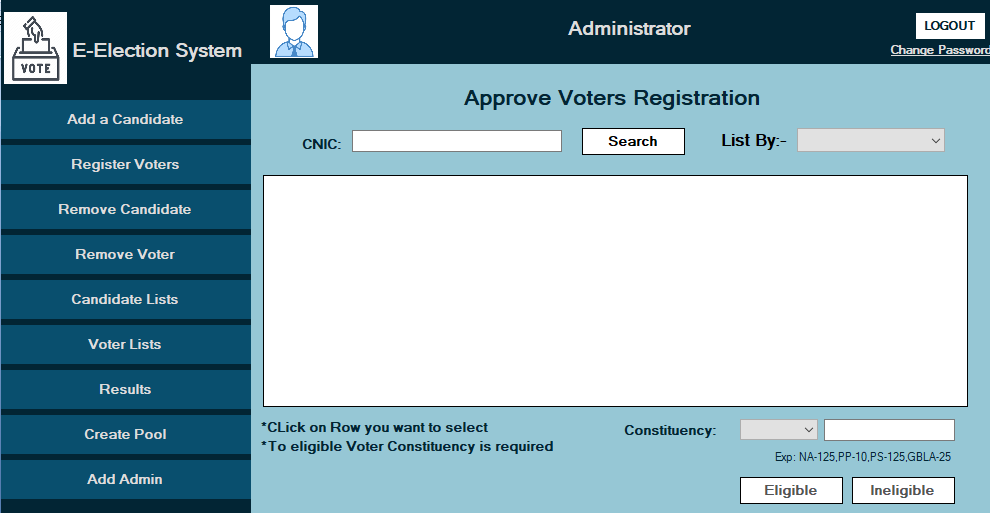


## Add a Candidate



Admin can register a new candidate by clicking on “Add a Candidate” button. The form is to be filled by the credential of the candidate including picture according to the format described under each text box. CNIC is the primary key in database, so it is not possible to enter two candidates with same CNIC. Submit button works only when every textbox and picture box data is valid and according to format. If the data us valid it will be sent to database for future use while Pooling.

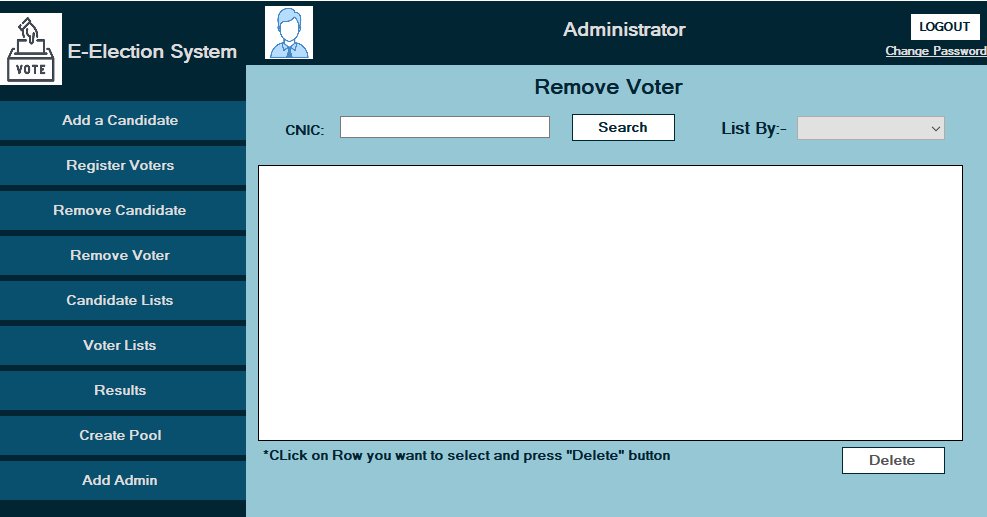
## Register Voter

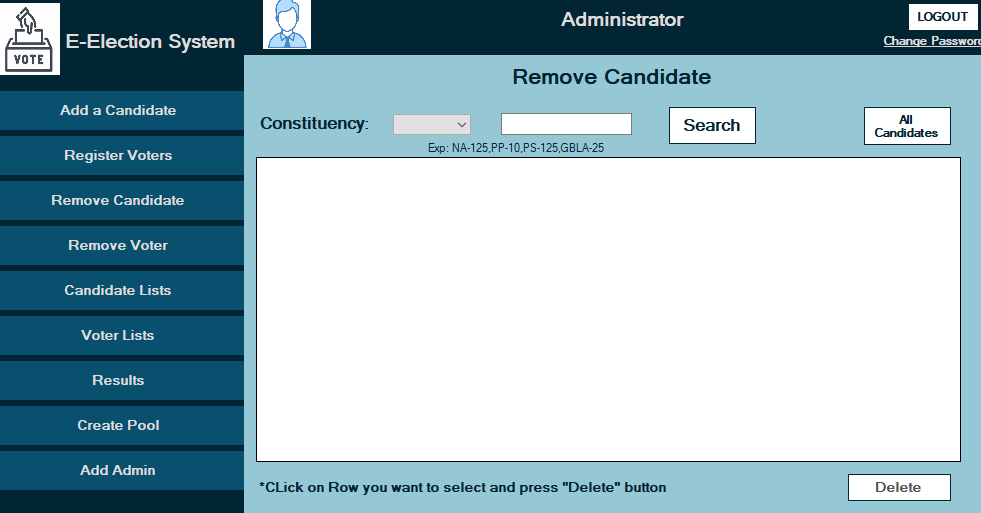


Admin can search voter by their CNIC or by their Eligibility status by clicking on the button, and then he will approve the Voters, who applied for registration, after checking the credentials submitted by the voter. If he finds everything fine and voter is eligible to vote, then he will set the constituency of voter according to Voter’s address. If the credentials are faulty, admin can Ineligible voter from casting vote. Eligible and Ineligible buttons will do the process for admin.

## Remove Candidate and Voters

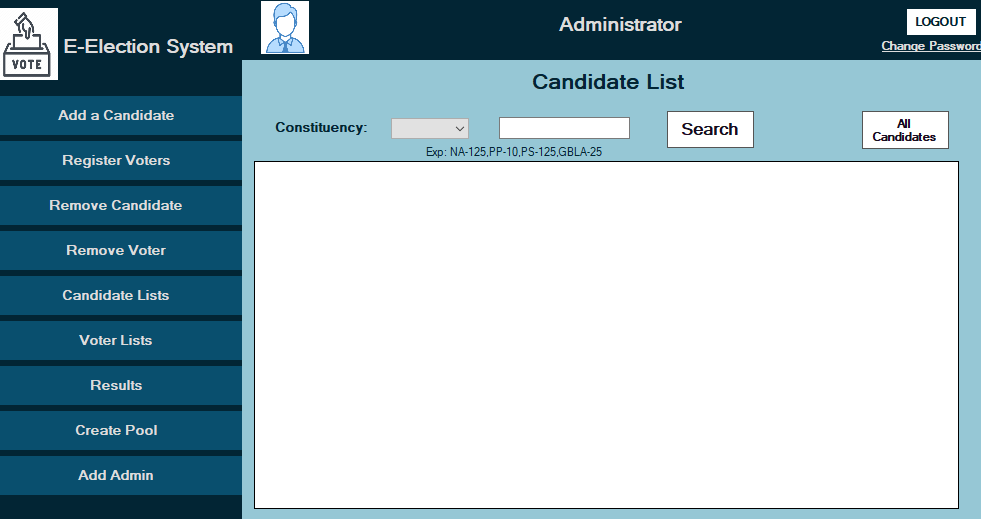
Admin can remove candidate and voter by just clicking the data row in data grid box, of candidate and voter to whom he wants to remove from database. But the deletion process can’t be done during the pool is active or voter’s votes are stored in against each voter, if you want to delete data, first de-Active the pool than rest the Voter status from create pool page.





## Candidates and Voter Lists

Admin can access candidate and voter list by clicking Candidate list for candidates and voter lists for voter. A complete detail will display in grid box in form of tables.



## Screenshot (99).png

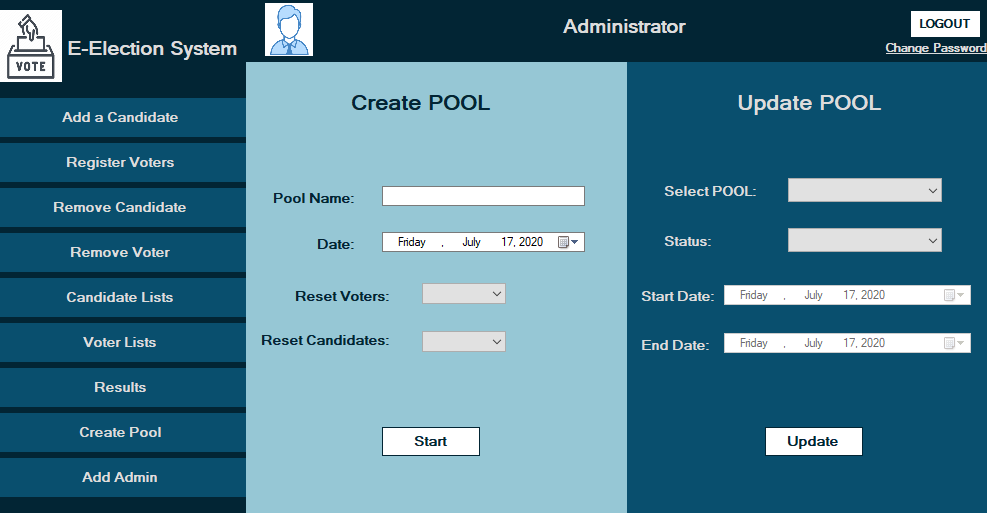
## Results

Admin can access the results when the pool is ended. The Results can be searched by constituency, the total vote casted to each candidate will appear against their names and the list will be display in order of vote count descending order, and winner will appear against the name of most voted candidate other will follow. But the Results can’t be accessed done during the pool is active, if admin wants to access results, first he must de-Active the current pool.

## Screenshot (100).png

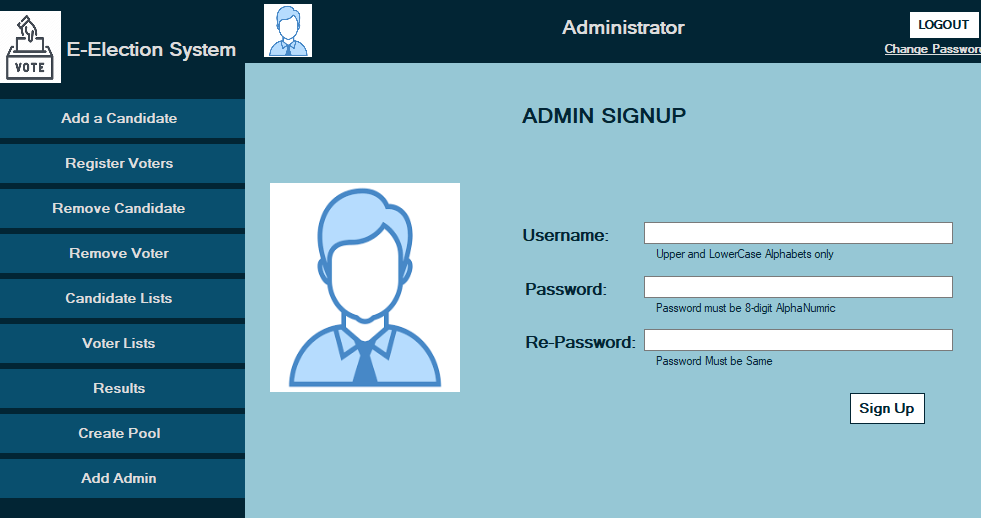
## Create POOL

Admin can add a new pool and can start, restart and end the existing Pool. If a pool is in Active state all other process will be disabled, Only pooling will happen in pool active state.



## Admin Signup

Admin can also add new admin by saving their credentials in database. Only registered admin are allowed to add new admin.



# Conclusion

One of the most critical ways that individuals can influence governmental decision-making is through voting. Voting is a formal expression of preference for a [candidate](http://hrlibrary.umn.edu/edumat/studyguides/votingrights.html#candidate) for office or for a proposed resolution of an issue. Voting generally takes place in the context of a large-scale national or regional election; however, local and small-scale community elections can be just as critical to individual participation in government.

So I do believe that the E-Voting will certainly bring Accessibility to everyone specially the disables, Transparency on which a good and bad Election depends and ballot casting is not most secure way to cast a vote, so Transparency can be achieved by internet voting, Testing will be easy and its cost will be onetime cost and everything once made or bought will be preserved for future can be used with a little up gradation. So certainly E-Voting is path to future. And sooner or later it will replace the ballot voting around the world.

# Note:

Admin Login Username=”Admin”, Password=”12345678”.

Database connection string needs to be updated in DBhandler.cs file, in case of database connection error.

Voter and Candidate images are stored in subfolder placed in resource folder, in case of error their paths needs to be change in voter registration and candidate registration form.