

# Online Voting System

Online Voting is a web-based voting system that will help you manage your elections easily and securely. This voting system can be used for casting votes during the elections.

Here the client is the person who tries to vote and server is the database that stores and handles all the activities of the online voting system.

In this system the voter(client) do not have to go to the polling booth to cast their vote. They can use their personal computer to cast their votes.

There is a database (server) which is maintained in which all the name of the voters with their complete information is stored. If invalid/wrong details are submitted, then the person(client) is not registered to vote.

The System Administrator registers the voters by simply filling a registration form to register the voters. After the user successfully registers themselves, he/she can vote.

The client if already registered only needs to go online and give vote directly. If not already registered can register there directly and cast their vote. The server(database) stores each of the clients votes.

The advantage of online voting is that the voters have the choice of voting at their own free time and there is reduced congestion. It also minimizes on errors of vote counting.

# Concept/Theory Applied

Here the concept used is simple **Client-Server paradigm using TCP/IP protocol, a reliable and connection-oriented protocol.**

Client/server applications use the following functions to exchange data in a TCP/IP network:

- Socket creation-

To perform network I/O, the first thing a process must do is call the socket function, specifying the type of communication protocol desired (TCP using IPv4, UDP using IPv6, Unix domain stream protocol, etc.), used by both Server & Client.

- Binding-

After creation of the socket, bind function binds the socket to the address and port number specified in addr(custom data structure), only by Server.

- Listen-

It puts the server socket in a passive mode, where it waits for the client to approach the server to make a connection, only by Server.

- Accept-

It extracts the first connection request on the queue of pending connections for the listening socket, sockfd(socket already created), creates a new connected socket, and returns a new file descriptor referring to that socket, only by Server.

- Send-

The send function is used to send data over stream sockets or CONNECTED datagram sockets, used by both Client & Server.

- Recv-

The recv function is used to receive data over stream sockets or CONNECTED datagram sockets, used by both Client & Server.

- Connect-

The connect() system call connects the socket referred to by the file descriptor sockfd to the address specified by addr. Server's address and port is specified in addr, used only by Client.

## **FEW FEATURES OF TCP:**

- It is a connection oriented protocol.
- It provides process-to-process communication.
- It is reliable and provides flow and error control mechanism.
- It is a stream oriented protocol.
- Provides full duplex communication.
- It supports multiplexing and demultiplexing.
- It also implements the congestion control mechanism.

# Implementation

The Online Voting System is implemented by TCP/IP Protocol using client-server paradigm. The program is divided into two parts:-

- Client - "the voters"
- Server - "the business logic behind electoral database"

The server is further divided into the following parts that consist of the following files:-

- "Candidates.txt" - It consist the name of the candidates who are standing for the election on behalf of their respective political parties.
- "Voters.txt" - It consist of the name of the voters who are eligible for giving their votes.
- "Vote.txt" - It consist of the name and votes of the voters who have given to their respective political parties.

The following three cases have been observed in the Online voting System:-

- The voters have already registered their name in the voter's list can give his vote to his party and that person's vote will be stored in "vote.txt".
- If the voter had already given his vote and appeared again then, he/she won't be allowed as it has been already counted . So , no duplication is being allowed.
- If by any chance, the Voter's name isn't in the list, he/she can register there itself and cast the vote, thus avoiding any inconvenience.

# Test-Cases

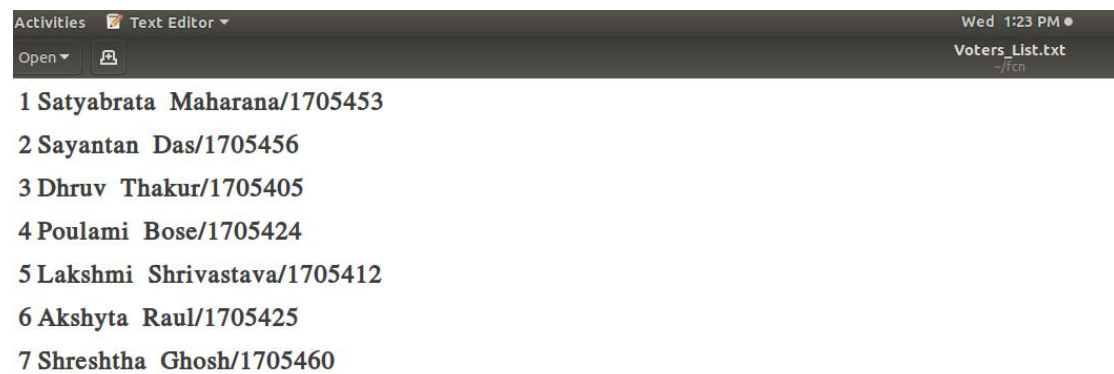
## 1. Candidates.txt



Activities Text Editor Wed 1:23 PM  
Open Candidates\_List.txt  
~/fcn

```
1 Rajat N. BJP
2 Nischay K gupta INC
3 Vipul Prakash AAP
```

## 2. Voters.txt(Initially)



Activities Text Editor Wed 1:23 PM  
Open Voters\_List.txt  
~/fcn

```
1 Satyabrata Maharana/1705453
2 Sayantan Das/1705456
3 Dhruv Thakur/1705405
4 Poulami Bose/1705424
5 Lakshmi Shrivastava/1705412
6 Akshyta Raul/1705425
7 Shreshtha Ghosh/1705460
```

## 3. Votes.txt: Empty as no one has voted till now.



Activities Text Editor Wed 1:24 PM  
Open Votes.txt  
~/fcn

```
1
```

## 4. Server ready and waiting for Client connection/Voters.



```
kunal@kunal-hp-pavilion-x360-convertible-14-ba0xx:~$ cd fcn
kunal@kunal-hp-pavilion-x360-convertible-14-ba0xx:~/fcn$ gcc server.c
./a.out
kunal@kunal-hp-pavilion-x360-convertible-14-ba0xx:~/fcn$ ./a.out
Socket Created
Bind Done
Listening for Incoming Connections.....
```

## 5. Client connected and voted. Here the voter "Sayantan Das" goes for duplication( to vote again) and is rejected.

```
kunal@kunal-hp-pavilion-x360-convertible-14-ba0xx:~/fcn$ gcc client.c
kunal@kunal-hp-pavilion-x360-convertible-14-ba0xx:~/fcn$ ./a.out
Socket Created
Server Message: Connection Established!

Enter your name and CNIC in format (Ayesha Kerketta/1805409): Sayantan Das/1705456
Server Message: Welcome Voter.

Server Message: Following are the list of candidates and their symbols:
Rajat N.          BJP
Nischay K gupta  INC
Vipul Prakash    AAP

Enter the candidate's symbol: BJP
Server Message: Congratulations! You have succesfully casted your vote.

kunal@kunal-hp-pavilion-x360-convertible-14-ba0xx:~/fcn$ ./a.out
Socket Created
Server Message: Connection Established!

Enter your name and CNIC in format (Ayesha Kerketta/1805409): Sayantan Das/1705456
Server Message: Welcome Voter.

Server Message: Sorry! You have already casted a vote. You can't vote again.

kunal@kunal-hp-pavilion-x360-convertible-14-ba0xx:~/fcn$ _
```

## 6. New voter("Arnab"), name not registered, gets his name registered and thereafter votes.

```
kunal@kunal-hp-pavilion-x360-convertible-14-ba0xx:~/fcn$ ./a.out
Socket Created
Server Message: Connection Established!

Enter your name and CNIC in format (Ayesha Kerketta/1805409): Arnab/1705656
Server Message: Sorry! Your name is not in the authorized voters list.

Enter your name and CNIC in format (Ayesha Kerketta/1805409): Arnab/1705656
kunal@kunal-hp-pavilion-x360-convertible-14-ba0xx:~/fcn$ ./a.out
Socket Created
Server Message: Connection Established!

Enter your name and CNIC in format (Ayesha Kerketta/1805409): Arnab/1705656
Server Message: Welcome Voter.

Server Message: Following are the list of candidates and their symbols:
Rajat N.          BJP
Nischay K gupta  INC
Vipul Prakash    AAP

Enter the candidate's symbol: INC
Server Message: Congratulations! You have succesfully casted your vote.
```

## 7. Voter.txt (Updated)

```
Activities Text Editor Wed 1:27 PM
Open Voters_List.txt ~/fcfn

1 Satyabrata Maharana/1705453
2 Sayantan Das/1705456
3 Dhruv Thakur/1705405
4 Poulami Bose/1705424
5 Lakshmi Shrivastava/1705412
6 Akshyta Raul/1705425
7 Shreshtha Ghosh/1705460
8 Arnab/1705656
```

## 8. Votes.txt(Updated:list of those who have already voted)

```
Activities Text Editor Wed 1:26 PM
Open Votes.txt ~/fcfn

1 Sayantan Das/1705456,BJP
2
3 Arnab/1705656,INC
4
```

## 9. Status of Server as Voting Goes on

```
kunal@kunal-hp-pavilion-x360-convertible-14-ba0xx:~$ cd fcn
kunal@kunal-hp-pavilion-x360-convertible-14-ba0xx:~/fcfn$ gcc server.c
./a.out
kunal@kunal-hp-pavilion-x360-convertible-14-ba0xx:~/fcfn$ ./a.out
Socket Created
Bind Done
Listening for Incoming Connections.....
Client Connected with IP: 127.0.0.1 and Port No: 57714
Sayantan Das/1705456
Client Connected with IP: 127.0.0.1 and Port No: 57718
Sayantan Das/1705456
Client Connected with IP: 127.0.0.1 and Port No: 57722
Arnab/1705656
Client Connected with IP: 127.0.0.1 and Port No: 57726
Arnab/1705656
```