Online Voting System

A Mini Project-I report submitted in

partial fulfillment of the requirements

for the Degree of

Bachelor of Technology

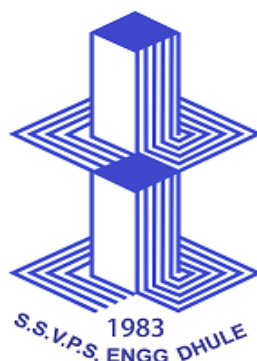in

Computer Engineering

Submitted by

Vaishnavi Sunil Patil

Roshni Kailas Patil

Piyusha Vijay Sonawane

Bhagyashri Sunil Patil

DEPARTMENT OF COMPUTER ENGINEERING
S.S.V.P.S.'s B.S. DEORE COLLEGE OF ENGINEERING, DHULE
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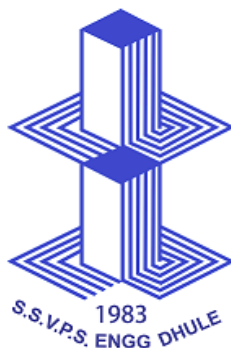
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Guided by

Prof. B.R. Mandre

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DEPARTMENT OF COMPUTER ENGINEERING

CERTIFICATE

This is to certify that the Mini Project-I entitled **"*Online Voting System*"** has been carried out by

Vaishnavi Sunil Patil

Roshni Kailas Patil

Piyusha Vijay Sonawane

Bhagyashri Sunil Patil

under my guidance in partial fulfillment of the degree of *Bachelor of Technology* in *Computer Engineering* of *Dr. Babasaheb Ambedkar Technological University, Lonere* during the academic year *2023-24*. To the best of my knowledge and belief this work has not been submitted elsewhere for the award of any other degree.

Date: **Guide**

Place: Dhule   Prof. B.R. Mandre

Head   **Principal**

Prof. B. R. Mandre   Dr. H. D. Patil

ACKNOWLEDGEMENT

ABBREVIATIONS

Abbreviation	Details
1. OTP	One Time Password
2. API	Application Programming Interface
3. EVM	Electronic Voting System
4. TCP	Transmission Control Protocol
5. CSV	Comma Separated Value
6. RDS	Remote Desktop Services

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ABSTRACT

Our country, India is the largest democratic country in the world. So, it is essential to make sure that the governing body is elected through a fair election. India has only offline voting system which is not effective and upto the mark as it requires large man force and it also requires more time to process and publish the results. Therefore, to be made effective, the system needs a change, which overcomes these disadvantages. The new method does not force the person's physical appearance to vote, which makes the things easier. This paper focusses on a system where the user can vote remotely from anywhere using his/her computer or mobile phone and doesn't require the voter to got to the polling station through two step authentication of face recognition and OTP system. This project also allows the user to vote offline as well if he/she feels that is comfortable. The problem of voting is still critical in terms of safety and security. This system deals with the design and development of a voting system using username and password in order to provide a high performance with high security to the voting system. The proposed Online Voting System allows the voters to scan their username and password, which is then matched with the data in the database. The voting system is managed in a simpler way as all the users must login by username and click on his/her favorable candidates to cast the vote.

Keywords: OTP, Face Recognition, Username, Password, Authentication, Voting, Online, Offline, Security, Online Voting System.

Chapter – 1

INTRODUCTION

India has democratic government. As now all Indian citizen become a part of the growing digital India. They have a digital ID that is Aadhar card. Voting schemes have evolved from counting hands in early days to systems that include paper, punch card, electronic voting machine. An electronic voting system which is used nowadays provide some characteristic different from the traditional voting technique, and also it provides improved features of voting system over traditional voting system such as accuracy, convenience, flexibility, privacy, verifiability and mobility. But Electronic voting systems suffers from various drawbacks such as time consuming, consumes large volume of paper work, no direct role for the higher officials, damage of machines due to lack of attention, mass update doesn't allow users to update and edit many items simultaneously etc. These drawbacks can overcome by Online Voting System. This is a voting system by which any voter can use his/her voting rights from anywhere in the country. Voter can cast their votes from anywhere in the country without visiting to voting booths, in highly secured way. That makes voting a fearless of violence and that increases the percentage of voting.

1.1: Aim and Objectives:

The primary aim of our project is to develop an Online Voting System that seeks to use v arious stages of security authentication to enhance the electioneering process and enables all eligible voters to vote from any location.

The scope and objectives of the proposed system would be as follows –

1. To create a secured online voting platform where authenticity of votes and voters are ensured using face recognition
2. To improve the voter's identification process through biometric (facial) recognition since biometric and facial features cannot be shared.
3. To ease the problem of queuing and crowding during voting period on elections.

Chapter – 2

LITERATURE SURVEY

An election is a formal decision-making process by which a population or society chooses an individual to hold a political office. Elections have long been the standard process for modern representative democracy, dating back to the 17th century. Elections are held by both public and private bodies, such as the government, as well as private and business groups, for example, to select members for a company's Board of Directors, professional club leadership, and even voluntary associations.

Types of Voting Systems -

2.1: Paper Ballot Voting:

The paper-based voting system is the traditional method of voting that has been used throughout history. It is also the standard method of holding elections in Nigeria and other countries around the world.

It works by distributing paper ballots to eligible voters who show up at the polling unit on Election Day. The voter's identity is verified by searching for and ticking his or her name on the voters register for that polling unit. Indelible ink is used to identify an authenticated voter by smearing it on the voter's left thumb fingernail. The voter is then expected to proceed to a secret booth to vote for a candidate by pressing his right thumb into an ink stamp and placing the inked fingerprint in front of the chosen candidate on the ballot paper provided before dropping the ballot paper into a ballot box placed in an open area within the polling unit [3].

Following the close of polls or voting for the election, the polling officer opens the election ballot box for the polling unit, the ballots are counted by various election judges such as election agents and election officials, and the total vote results are reported and entered onto the election results sheet, which is also required to be signed by all election judges as well as observers present, providing authenticity to the declared results.

2.2: Electronic Voting:

It is a fundamental requirement for countries to improve their electoral systems. Because of the rapid advancement of technology in the computer and telecommunications worlds,

e-Voting-based systems are about to be introduced, which will alleviate all of the problems associated with traditional manual election systems. With the introduction of e-Voting systems, our election processes and social lives will become simpler, more efficient, and less expensive [3].

Voters can now vote in this system from anywhere in the world. Security requirements such as confidentiality, integrity, fairness, forgery attack, verifiability, and so on must be met by an e-voting system. This is since E-voting systems are more vulnerable than traditional voting systems due to the nature of digital processing of election data, which can be easily manipulated, potentially resulting in widespread fraud and corruption.

In the year 2020, Vivek S K, et.al., developed a secure, transparent and decentralized e-voting system is proposed using the Hyperledger Sawtooth blockchain framework [1]. Restricted access of the system through election polling stations allows voters to cast their votes, which are recorded in the immutable blockchain state. Fairness and reliability of the election procedure due to nil possibility of vote manipulation. The issue of fairness and reliability of the election procedure due to nil possibility of vote manipulation was addressed. The technology/platform used were Angular 8, Node.js, Amazon RDS, and Sawtooth blockchain, Python with the APIs, Docker technology, Amazon Web Services. In the year 2021, Shubham Gupta, Divanshu Jain, Milind Thomas Themalil developed a system where the voter is registered into the system database well before the time of election [2]. Now at the voting time, In the first step voter must verify his/her government identity such as Aadhar card or voting card with his/her proper picture, once it is verified, he/she moves to the second step. In second step voter has to go under the face reorganization process. Once the corresponding matching or verification is done, the voter will move to next step to cast his/her vote at the EVM. The cast vote is shown on display for the satisfaction of voters. Then the voting data is continuously uploaded on Thing Speak server.

SYSTEM MODELING

The main objective of this project is to provide a secure online system for conducting fair elections online irrespective of the location without facing any difficulties.
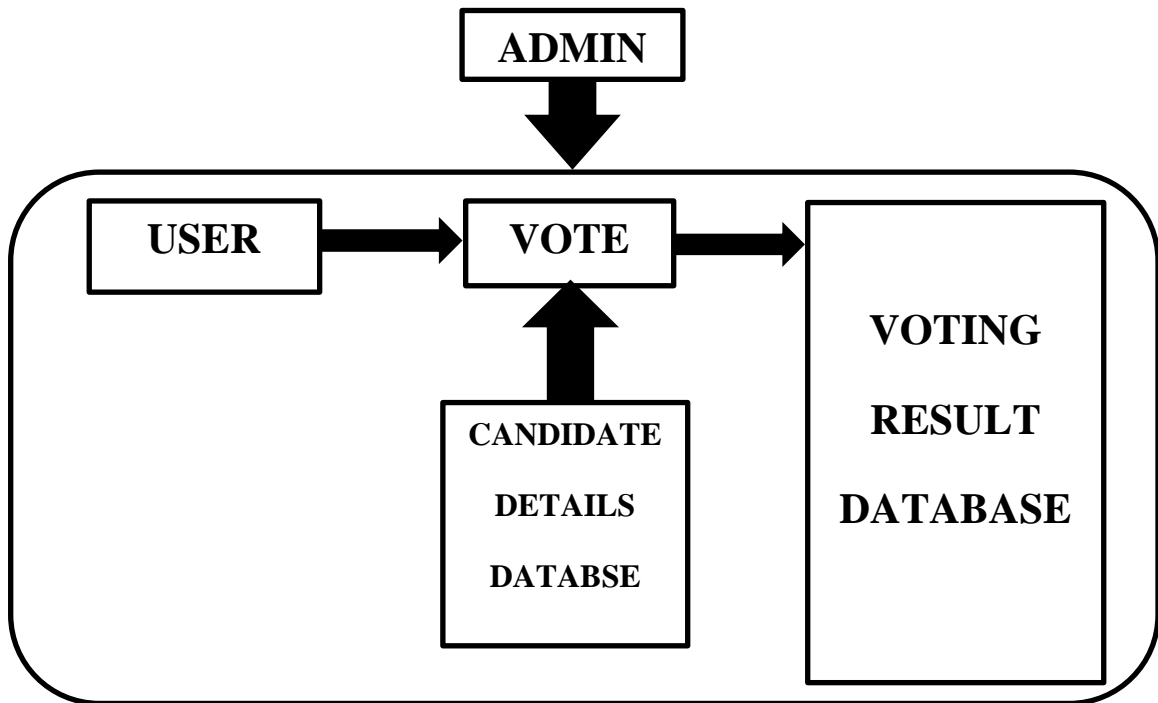

Fig 3.1: Block Diagram

3.1: Design and Implementation:

1. A secure server that only allows clients with authentic names and passwords to cast votes.

2. Server checks for authenticity of the client & also checks if client has already voted. It returns a message to the client according to the security check.

3. Voters are registered by admin and the voter list is stored in a csv file.

4. Server can take the client's name and password and match it with the txt file.

5. If details match, then the voter is redirected to the secured Voting page.

6. The voters will then cast the vote by mentioning the poll symbol of the candidate from the candidate list provided by the server.

7. The system (server) can handle multiple clients and creates a new thread for each of them.

8. One client can cast a vote once and only once.

3.2: Requirements:

Python Libraries Required:

1. Pandas
2. Tkinter
3. Socket
4. Subprocess

3.3: Tools Used:

1. Programming: Python
2. Connection: Socket Programming
3. Protocol: TCP
4. User Interface: python-tkinter
5. Data Storage: Using CSV files
6. Data Updates: python-pandas
7. OS Calls: python-subprocess

3.4: How to Run:

1. Open terminal/command prompt on your PC.

2. Navigate to 'Voting' folder

3. Run command: python homePage.py

4. A new home page window should open. If this doesn't happen, check your installations.

5. Login into Admin using given details in 'How to Login' part.

6. Click on the 'Run Server' Button.

7. Use the rest of the Buttons as per your need.

3.5: How to Login:

❖ Admin Login:

➔ Admin ID: Admin

➔ Password: admin

❖Voter Login:

❑Server should be running for voters to be able to login.

➔Already registered voter IDs: 10001 to 10005

➔Password (for already registered voters): abcd

3.6: Workflow Description:

❖In order Description to run & test this project:

1. Open terminal & run python homePage.py to open Home Page Window.

2. Login to Admin and press 'Run Server'. This will run the Server in a new console window.

3. Now that the server is running, return to the admin homepage window.

4. Press 'Register Voter' and enter details to register a new voter. Remember or note down the 'Voter ID' that you will receive on successful registration.

5. Press 'Home' to return to the Home. Now, press 'Voter Login' to open the voter login page.

6. Enter the login details and you are redirected to the Voting Page. You will receive an error message if the Voter is invalid or has already cast a vote.

7. Cast a Vote. Now on receiving a success message, press home to return to home.

8. Login into Admin again. Press 'Show Votes' to check the votes that all parties have received so far.

9. Return to Home. You can press 'New Window' to open multiple pages and cast a vote concurrently from multiple voters.

3.7: Stepwise Output / Test Cases:

Fig 3.2: Homepage
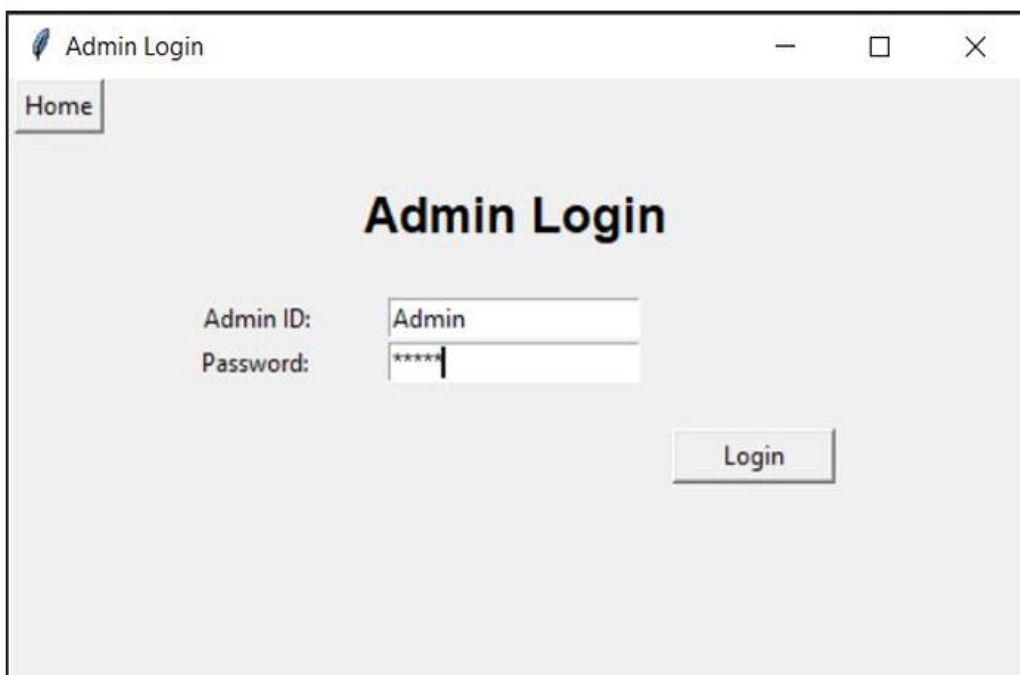
Fig 3.3: Admin Login

Fig 3.4: Admin Home

Fig 3.5: Register Voter
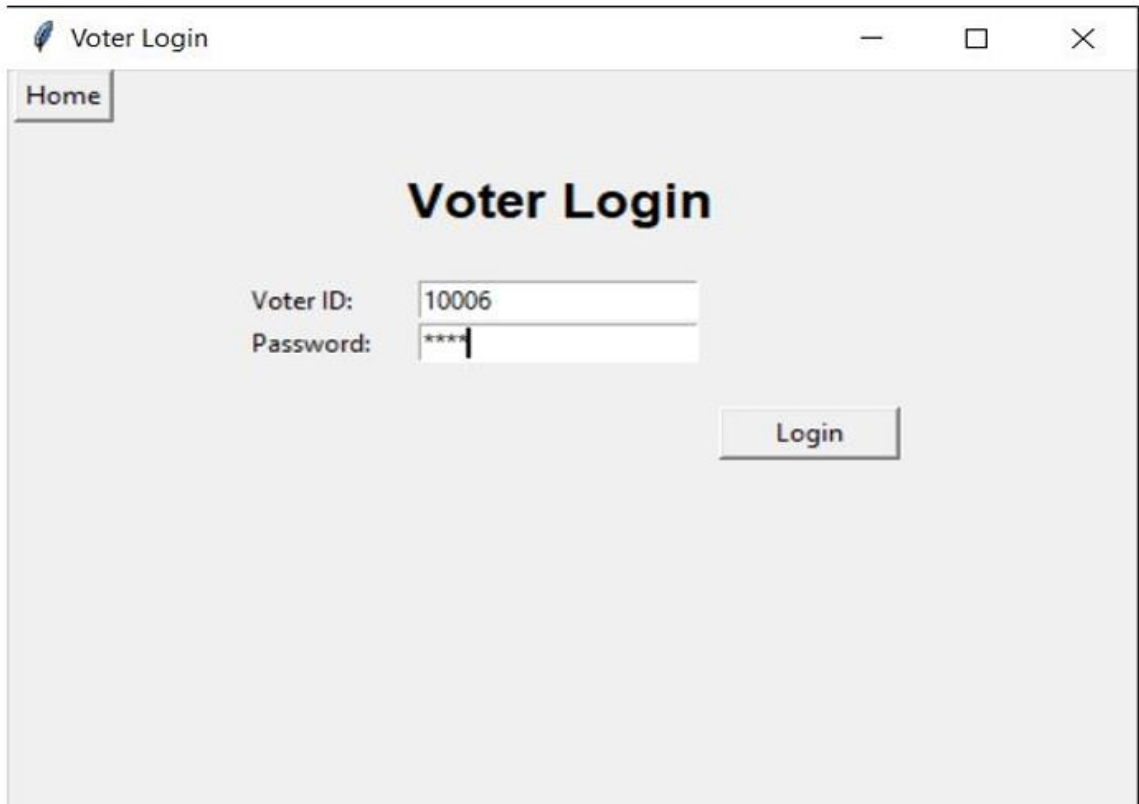
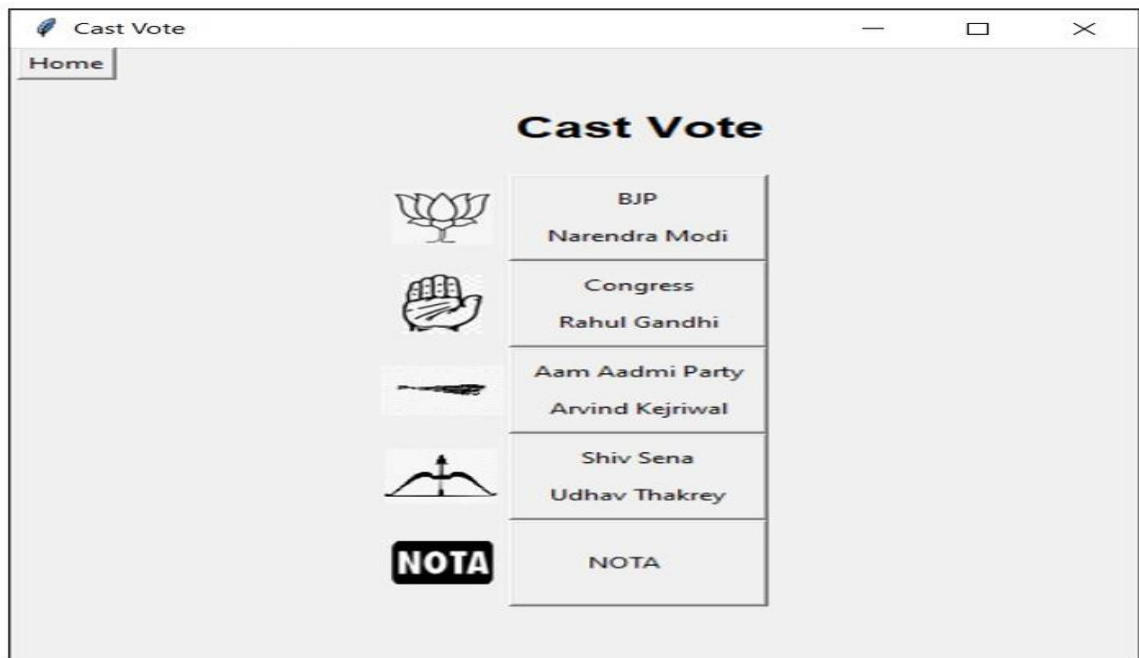**Fig 3.6: Register Success Message**

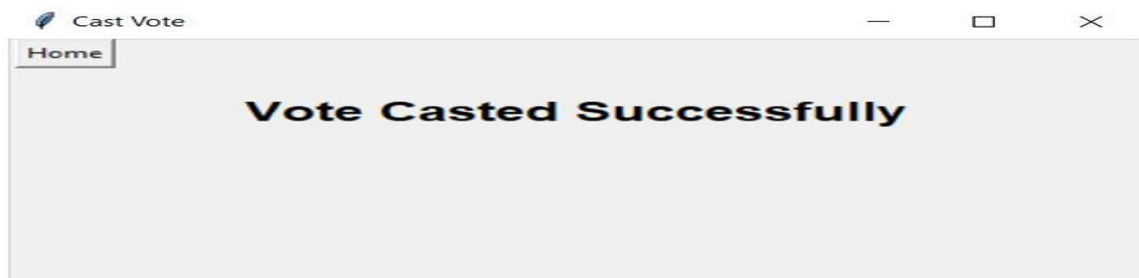**Fig 3.7: Voter Login**

Fig 3.8: Voting Page
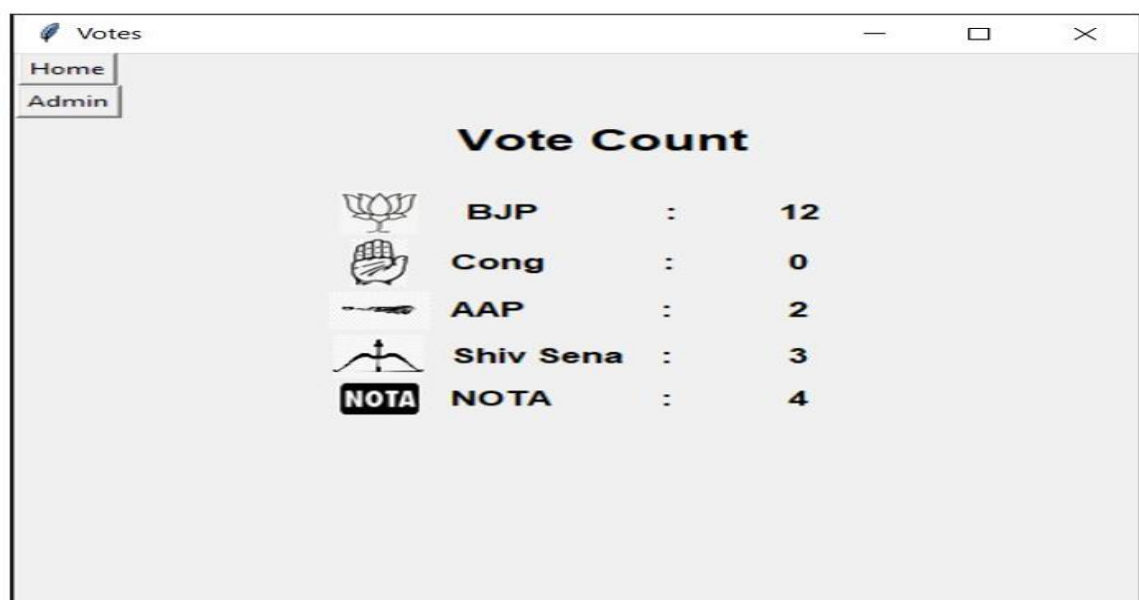

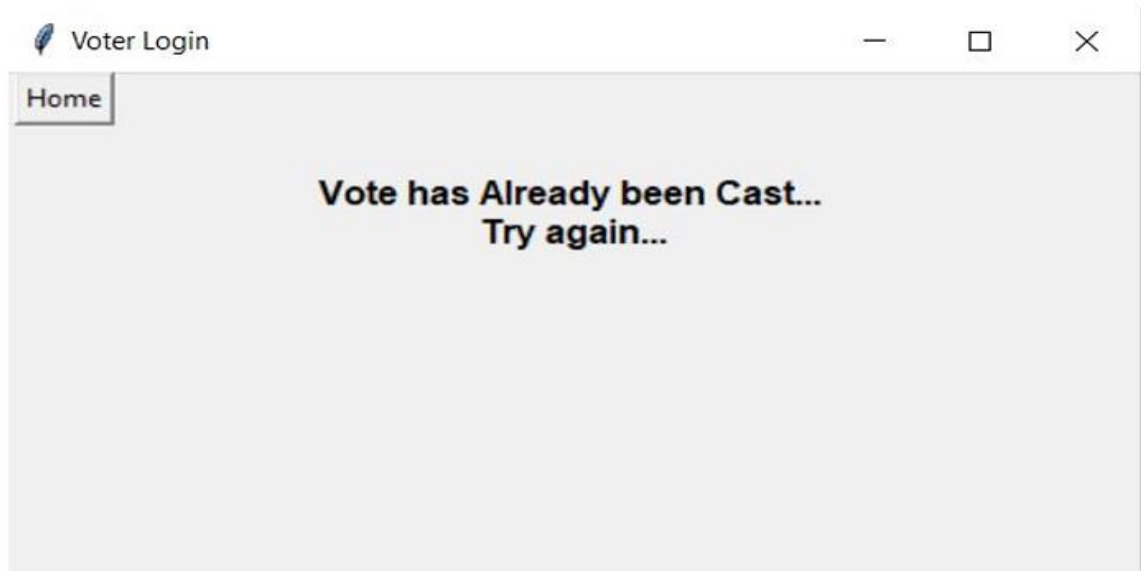**Fig 3.9: Vote Casted Successfully Message**

Fig 3.10: Show Votes

Fig 3.11: If the vote already been casted
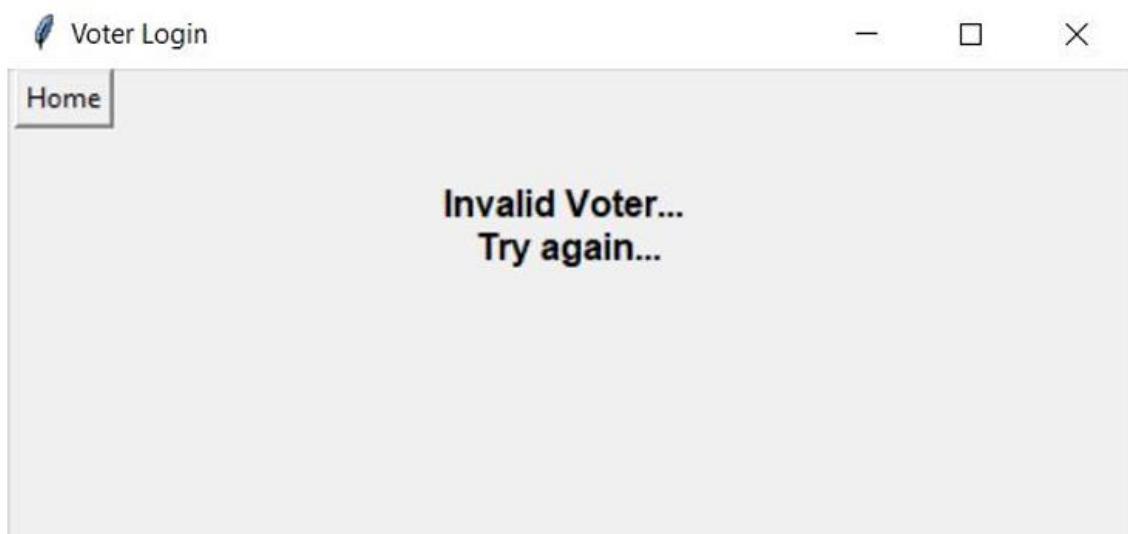
Fig 3.12: If the voter is not registered/invalid voter

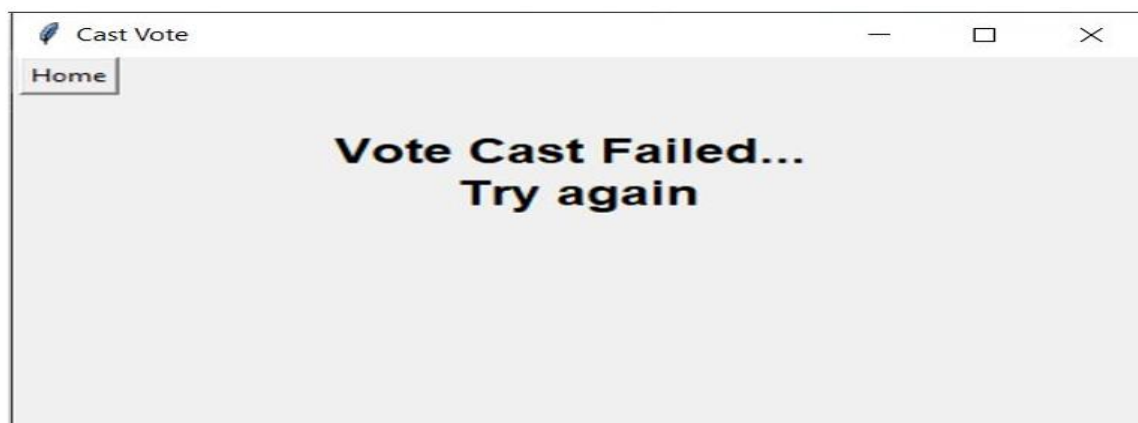**Fig 3.13: Error while casting vote**

Fig 3.14: Server Output

	voter_id	Name	Gender	Zone	City	Passw	hasVoted
0	10001	Deep	Male	West	Gandhinag	abcd	0
1	10002	Prachi	Female	South	Surat	abcd	0
2	10003	Het	Male	East	Surat	abcd	0
3	10004	Shivanshi	Female	East	Gandhinag	abcd	0
4	10005	Rohan	Male	North	Bengaluru	abcd	0

Voter Info Database

	Sign	Name	Vote Count
0	bjp	Narendra Modi	15
1	cong	Rahul Gandhi	0
2	aap	Arvind Kejriwal	3
3	ss	Udhav Thakrey	4
4	nota	NOTA	5

Fig 3.15: Database

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Chapter – 4

CONCLUSION

4.1: Conclusion:

Online Voting Systems have many advantages over the traditional voting system. Some of these advantages are less cost, faster generation results, easy accessibility, accuracy, and low risk of human and mechanical errors. It is very difficult to develop online voting system which can allow security and privacy on the high level. Future development focused to design a system which can be easy to use and will provide security and privacy of votes on acceptable level by proper authentication and processing section. It is easy to use and it is less time consuming. It is very easy to debug. The voting system proposed by us is far more secure and efficient than the traditional voting system. Delays in results and vote manipulation are easily avoided in this system. The most notable aspect of our project is the use of two-factor authentication, which allows for easier and more precise voter verification. For the same reason, whenever a user registers, he or she must provide his or her voter id, which allows for easier verification of both voters and candidates. The proposed online system is expected to increase the transparency and reliability of the current electoral system.

4.2: Future Scope:

Although this project tries to cover all limitations related to authentication and security, these are some of the few points where the scope of the project can be expanded -

1.In the future, we can make entire election system with a 'Live Result Update' feature.
2.This system that can also guarantee high level secrecy, security, and verifiability of a marked ballot transmitted over the Internet.
3.For advanced security, Block chain can also be integrated with the system for decentralization of database where the data is stored in multiple blocks so that even if one block is tampered, the data wouldn't be manipulated
4.This Online Voting System can be advanced to be used by any organization in the world for conducting smooth and fair elections.

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[1] Vivek S K, et.al., "E-Voting System using Hyperledger Sawtooth", International Conference on Advances in Computing, Communication & Materials (ICACCM), pp. 29-35, 2020

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[2] Shubham Gupta, Divanshu Jain, Milind Thomas Themalil, "Electronic Voting Mechanism using Microcontroller ATmega328P with Face Recognition", Proceedings of the Fifth International Conference on Computing Methodologies and Communication (ICCMC 2021), pp. 1471-147, 2021

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