SecureVote

Voting System Using BlockChain

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Introduction : Electronic Voting

- In every democracy, the security of an election is a matter of national security.
- The goal of electronic voting system is to minimize the cost of having a national election, while fulfilling and increasing the security conditions of an election by having traceable and verifiable process.
- But electronic voting machines have been viewed as flawed because anyone with physical access to such machine can sabotage the machine.
- So, even though electronic voting machines make voting process convenient than traditional pen and paper method, it is still prone to frauds.
- To overcome this, we need a system which is secure and gives assurance of trust to every voter that his/her vote is counted and not altered. Hence Blockchain.

Introduction : Blockchain

- A blockchain is a distributed, immutable, incontrovertible, public ledger.
- Blockchain, is a decentralized system but its core is based on the P2P network which is one of the types of distributed architectures.
- Thus, rather than having centralized storage of the votes, blockchain provides a ledger distributed over various systems/peers and provides mechanism for authenticating voter and his votes.
- All this comes with the high level of security using cryptography and Proof-of-Work protocol.

Need of such a system

1. Every year lakhs of votes are lost because of relocation. If a voter is not in his constituency during elections he cannot cast his vote.
2. This includes professionals, health-care workers, election officials, military personnel people out of the country for educational and business purpose.
3. To avoid this the voters should be able to cast their vote from anywhere, which is not possible with the current system.
4. The digitization of the voting system should be take into care the security and immutability of the votes.
5. The requirements of the system can be successfully satisfied by the blockchain technology.

Our Solution

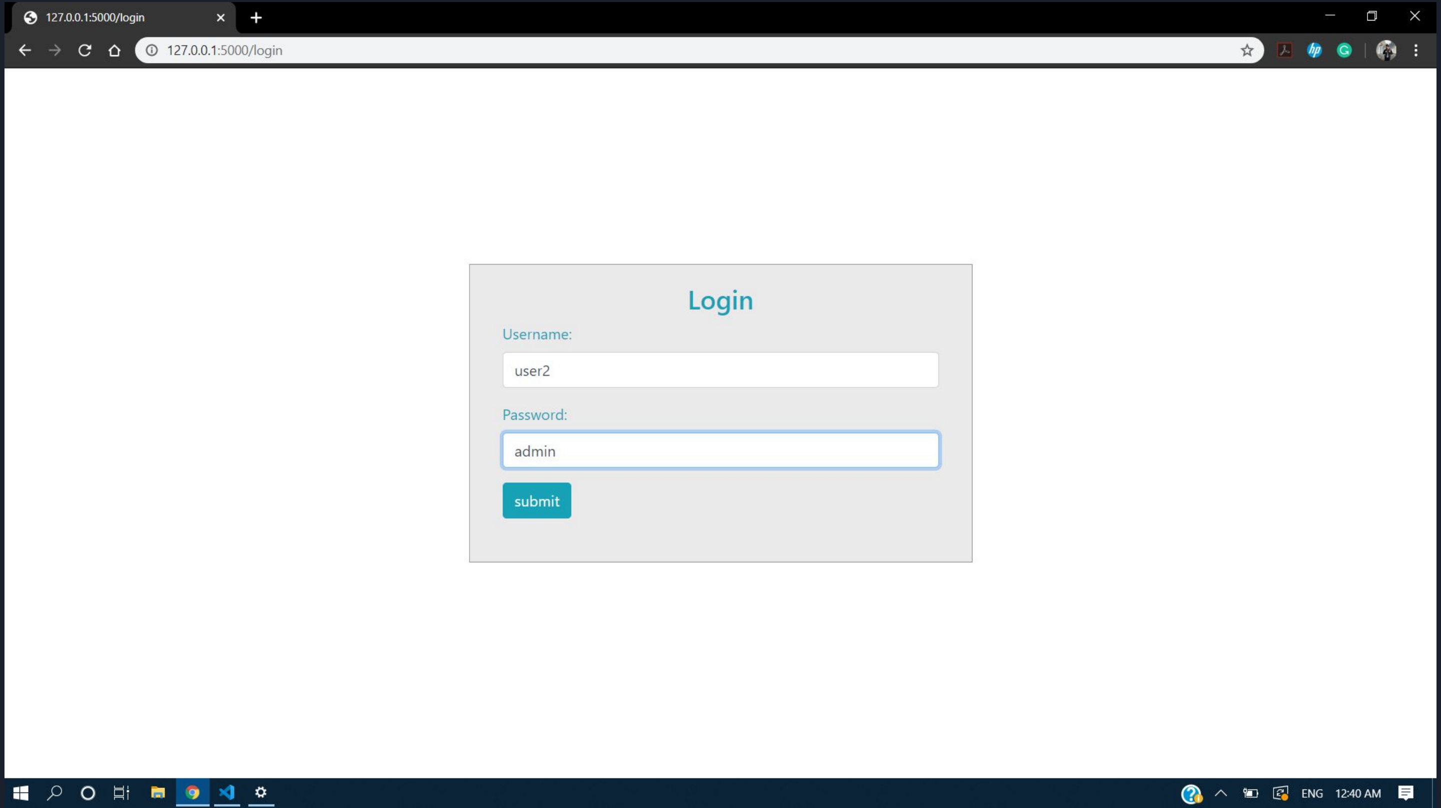
- We proposed a blockchain based solution where a voter cast his vote securely only once and can be verified by admin if the chain is tampered or not.
- Initially, for every voter, blocks are created which stores information about transaction like timestamp, proof which is used while adding new blocks in chains, hash values for previous block which is used to link the chain and voting transaction of the voter.
- So, each of this blocks created storing transaction are then added to blockchain.
- To make sure each voter vote only once, the id of user is stored in list is which is always verified before adding transaction. So, if voter's id is already present in list, then no new transaction is created and error message is displayed.

Our Solution (Continued)

- After adding transaction, the corresponding candidate’s tally is increased by 1.
- For results, the admin first verifies if chain is valid or not by checking all blocks and their hashes. If it seems valid, then vote tally of every candidate is displayed.

Screenshots

User login



Login

Username:

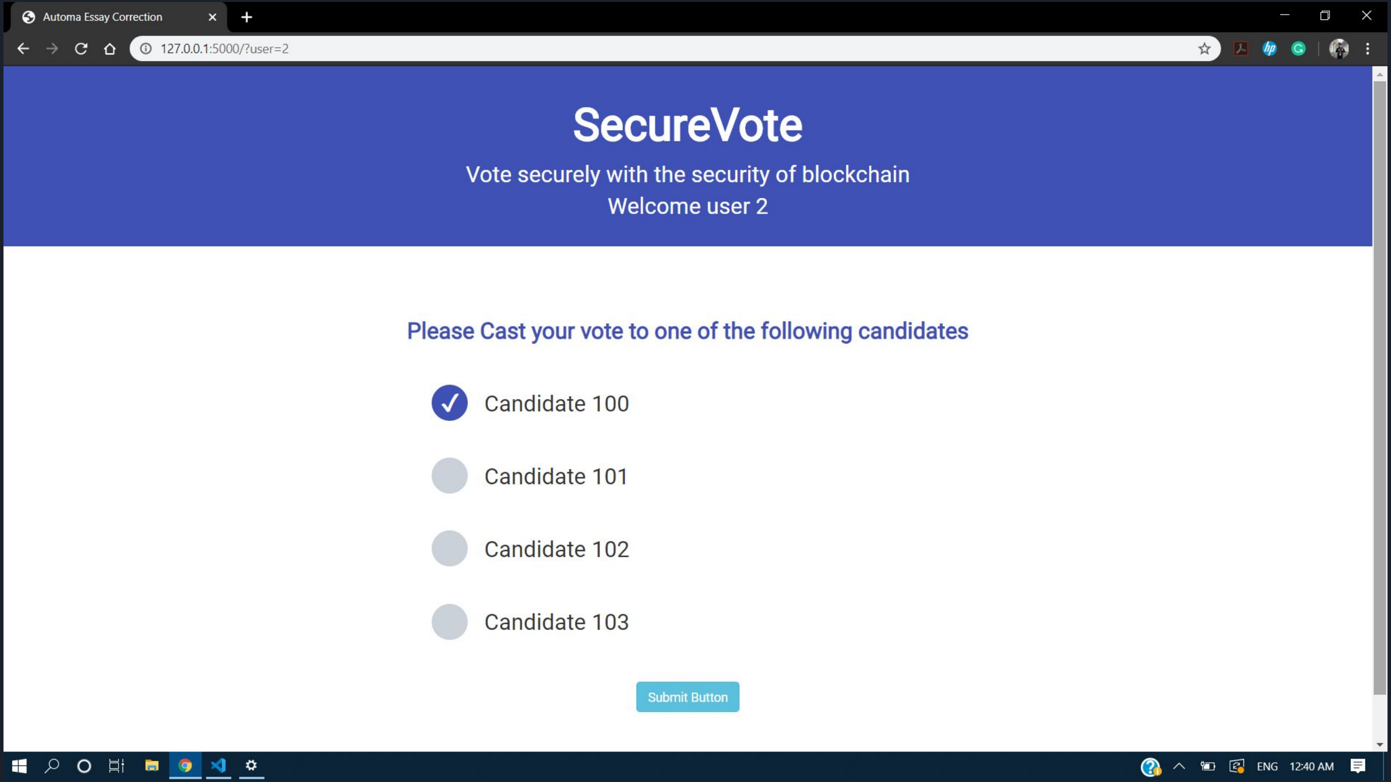
user2

Password:

admin

Screenshots

User2 attempting to vote for the first time.



SecureVote

Vote securely with the security of blockchain

Welcome user 2

Please Cast your vote to one of the following candidates

☑ Candidate 100

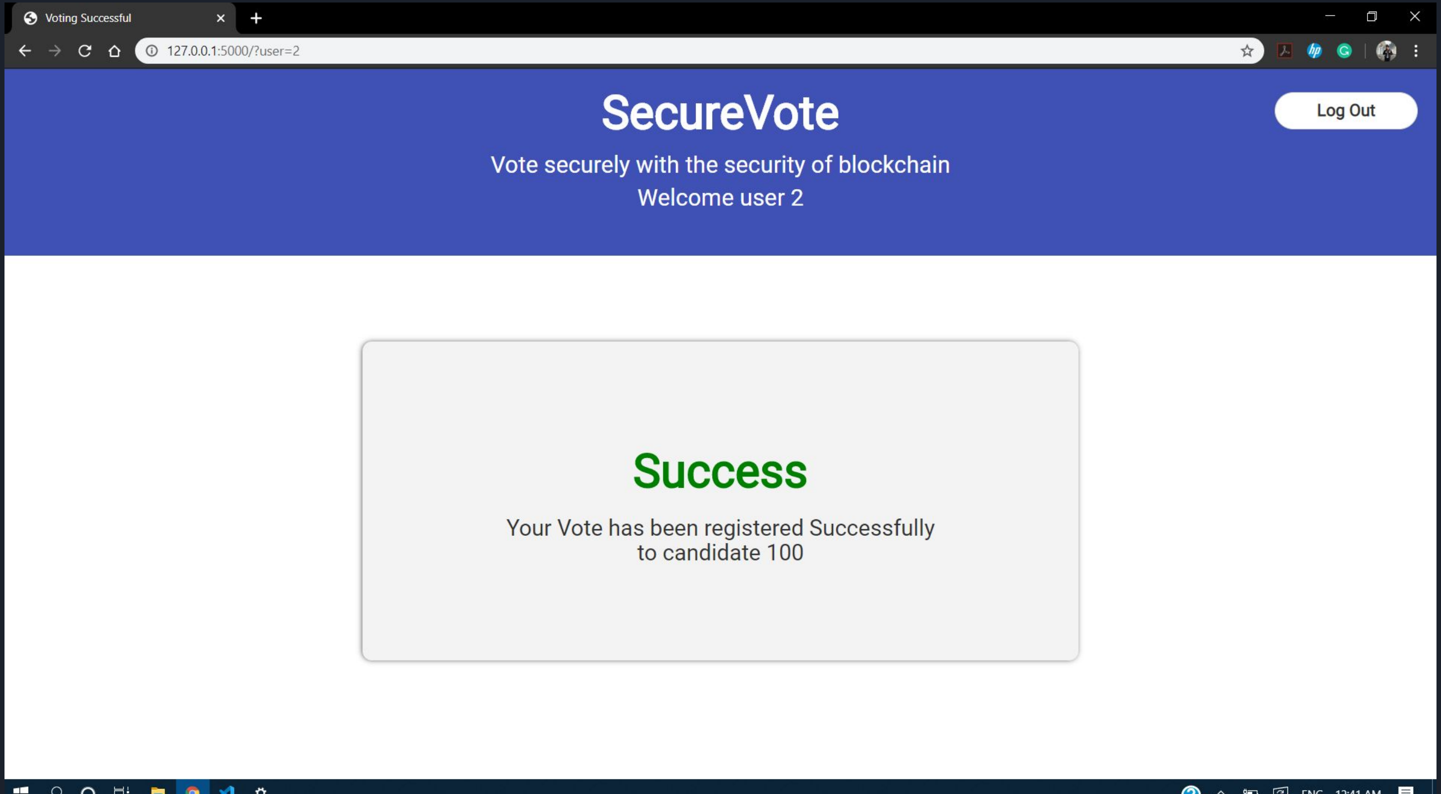
○ Candidate 101

○ Candidate 102

○ Candidate 103

Screenshots

Vote success



SecureVote

Vote securely with the security of blockchain

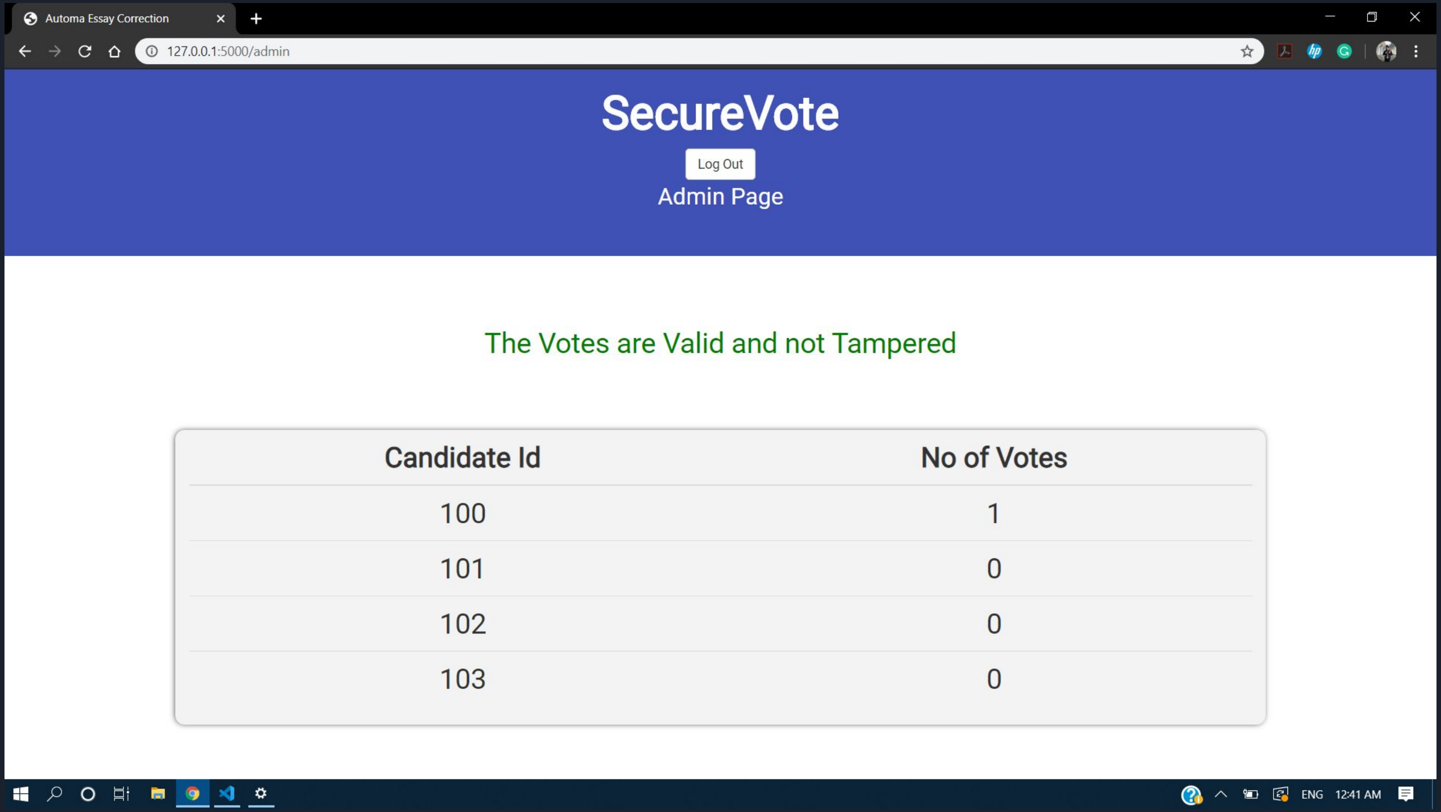
Welcome user 2

Success

Your Vote has been registered Successfully to candidate 100

Screenshots

Total vote count page



SecureVote

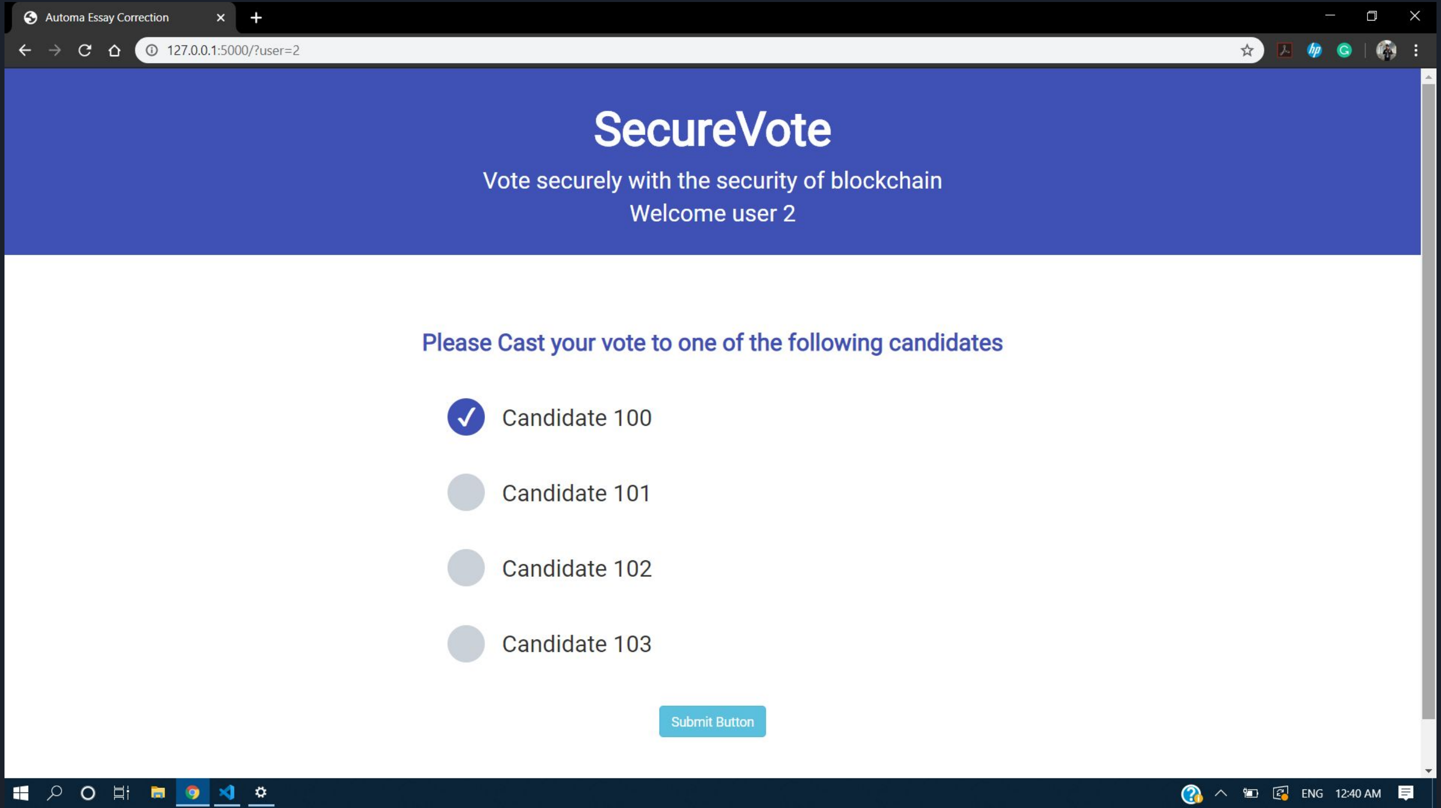
Admin Page

The Votes are Valid and not Tampered

Candidate Id	No of Votes
100	1
101	0
102	0
103	0

Screenshots

User2 re-attempting to vote



SecureVote

Vote securely with the security of blockchain
Welcome user 2

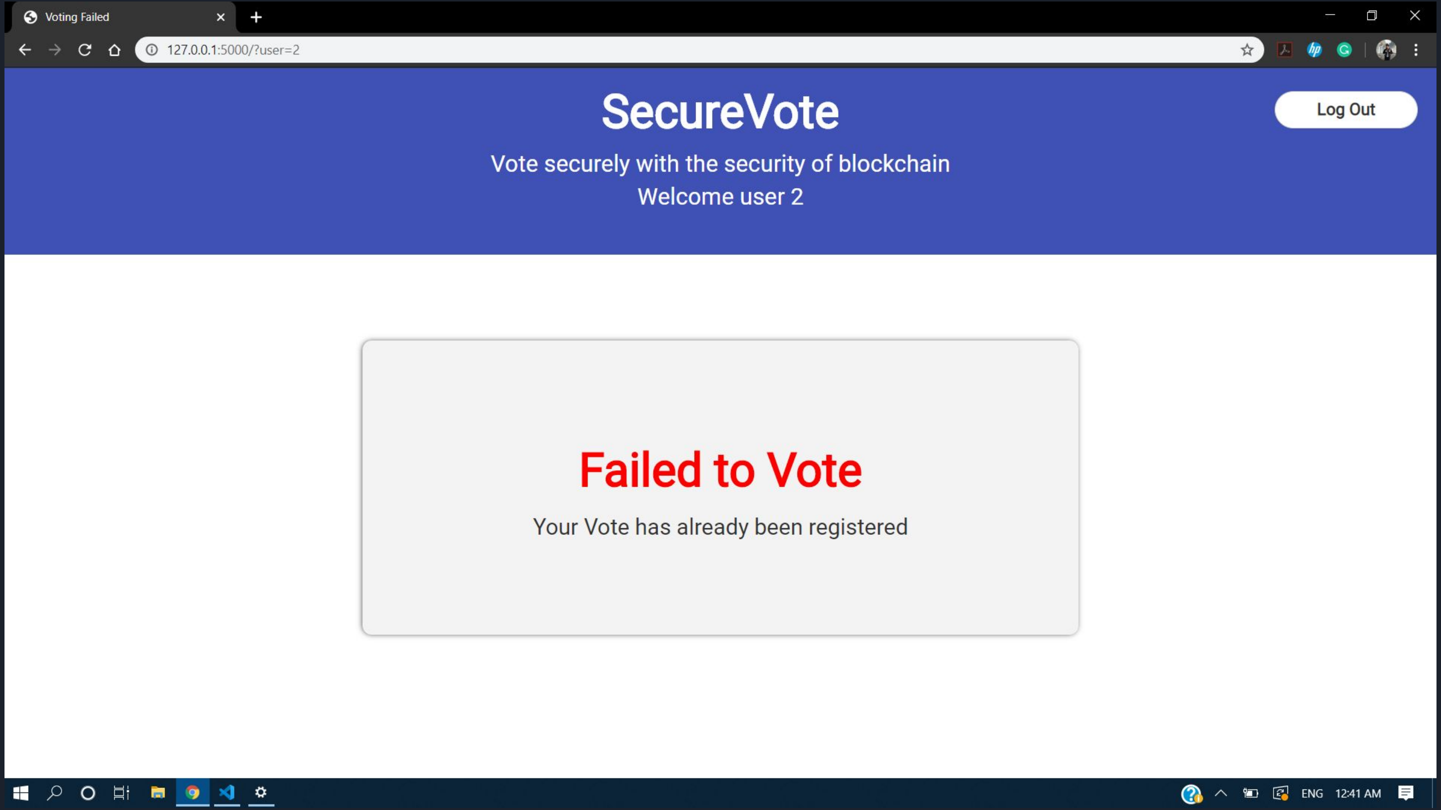
Please Cast your vote to one of the following candidates

- ☑ Candidate 100
- ○ Candidate 101
- ○ Candidate 102
- ○ Candidate 103

Submit Button

Screenshots

Attempt failure message



SecureVote

Vote securely with the security of blockchain

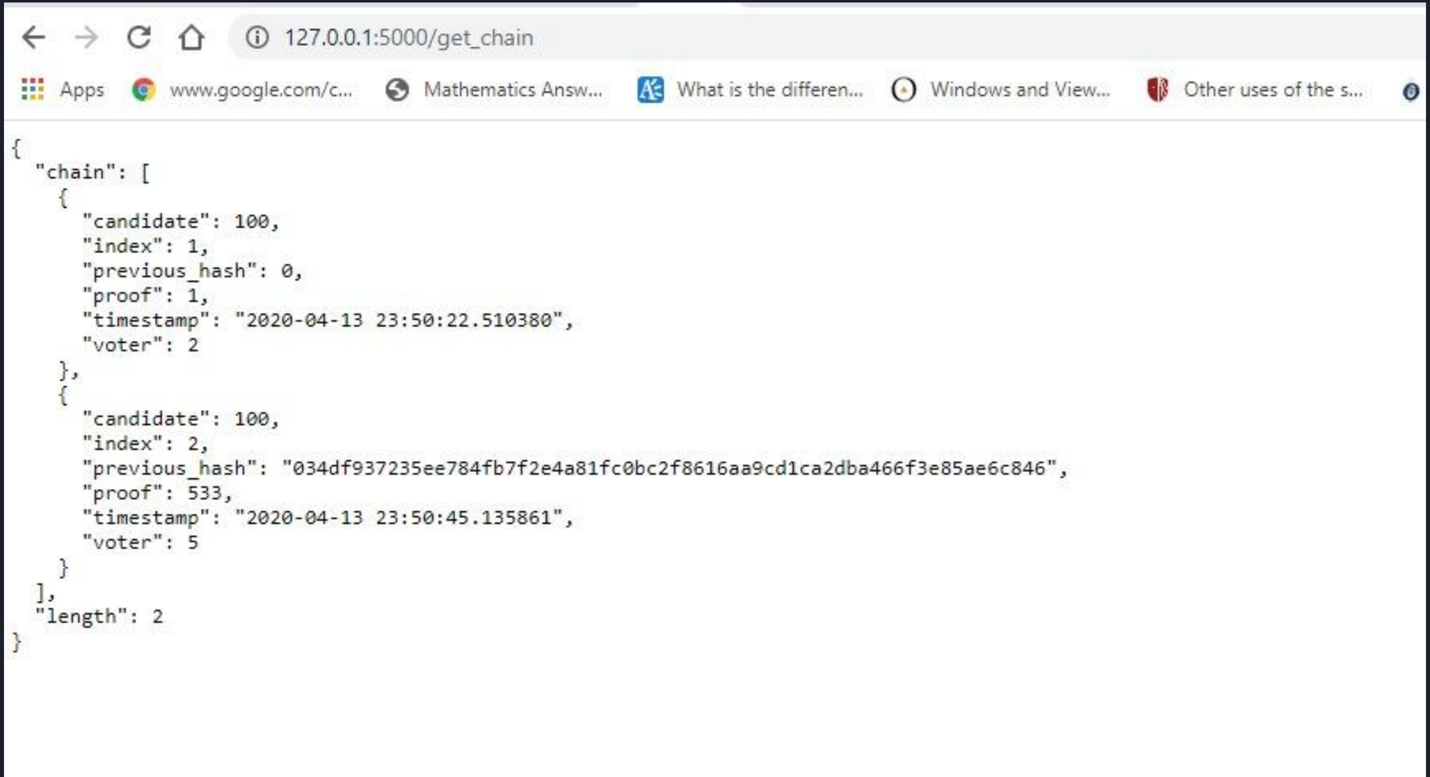
Welcome user 2

Failed to Vote

Your Vote has already been registered

Screenshots

The Chain with transaction information



```
{
  "chain": [
    {
      "candidate": 100,
      "index": 1,
      "previous_hash": 0,
      "proof": 1,
      "timestamp": "2020-04-13 23:50:22.510380",
      "voter": 2
    },
    {
      "candidate": 100,
      "index": 2,
      "previous_hash": "034df937235ee784fb7f2e4a81fc0bc2f8616aa9cd1ca2dba466f3e85ae6c846",
      "proof": 533,
      "timestamp": "2020-04-13 23:50:45.135861",
      "voter": 5
    }
  ],
  "length": 2
}
```