Practical 6

Blockchain Technology

2CSDE93

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Aim: To implement voting system smart contract.

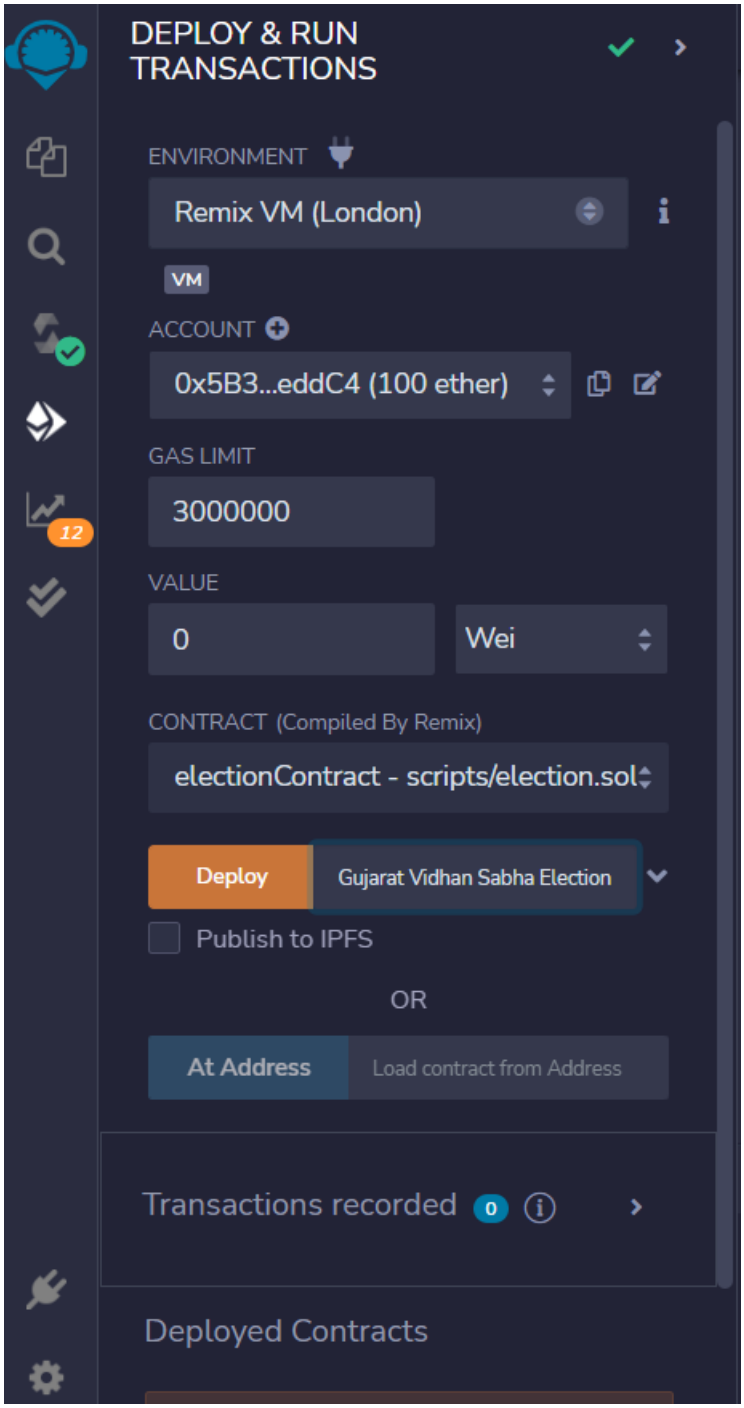
Code:

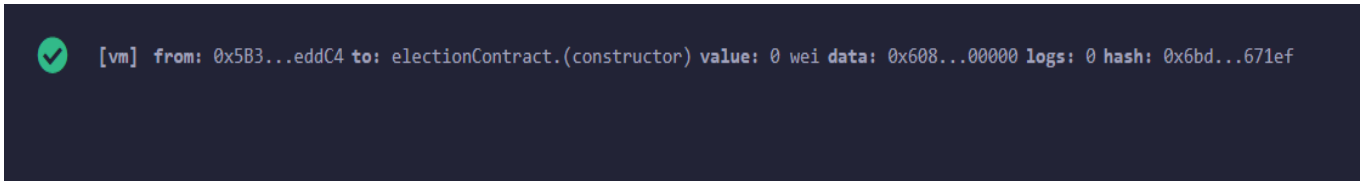
```
// SPDX-License-Identifier: GPL-3.0
pragma solidity >=0.7.0 < 0.9.0;

contract electionContract{

    struct voter{
        bool voted;
        bool authorized;
        uint candidateVote;
    }

    struct candidate{
        string name;
        uint voteCount;
    }

    enum electionState{Started, Ended}

    address public electionCommissioner;
    string public electionName;
    mapping (address => voter) public Voters;
    candidate[] public candidates;
    uint totalVotes;
    electionState public eleState;

    constructor(string memory _name) {
        electionCommissioner = msg.sender;
        electionName = _name;
        eleState = electionState.Started;
    }

    modifier onlyOwner() {
        require(msg.sender == electionCommissioner);
        _;
    }

    modifier started() {
        require(eleState == electionState.Started);
        _;
    }

    modifier notEnded() {
```

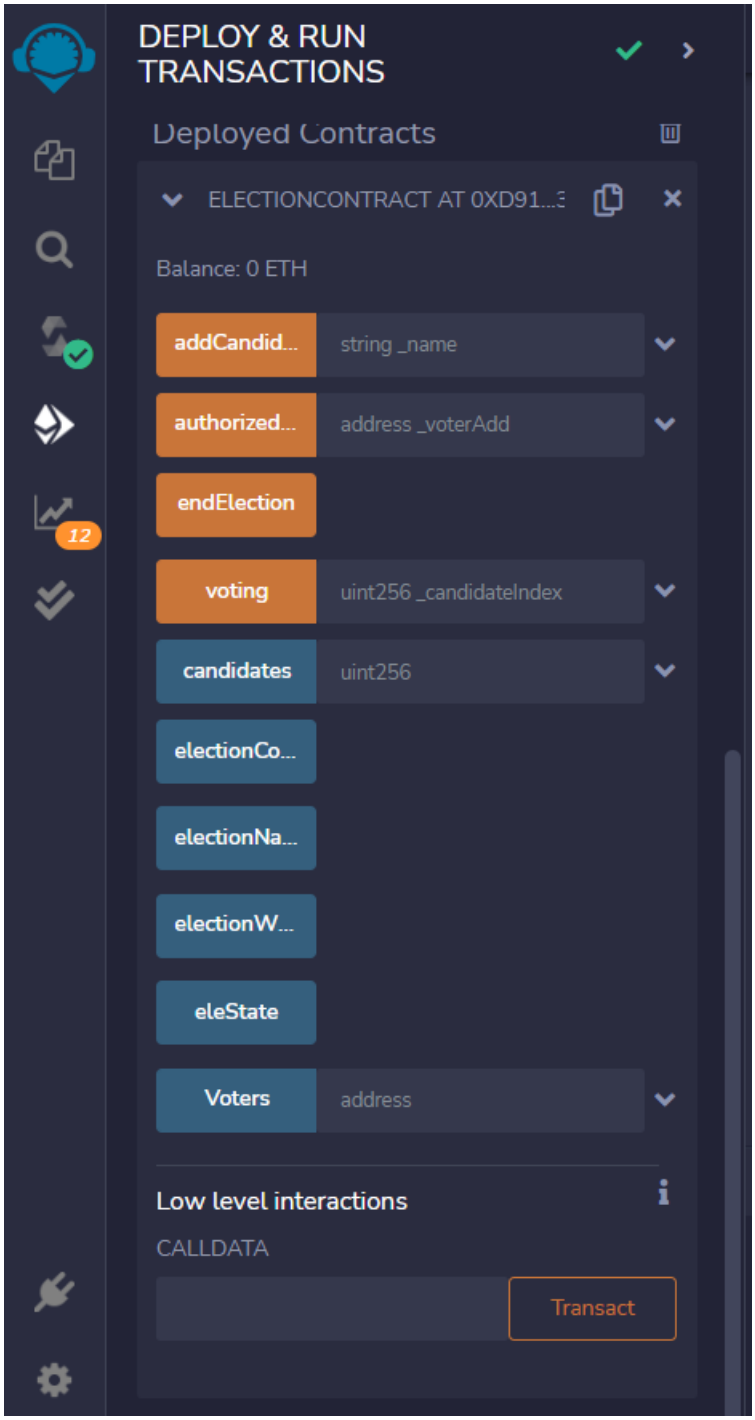
```
        require(eleState != electionState.Ended);
        _;
    }

    modifier ended() {
        require(eleState == electionState.Ended);
        _;
    }

    function authorizedVoter(address _voterAdd) public onlyOwner returns(bool)
{
        Voters[_voterAdd].authorized = true;
        return true;
    }

    function addCandidates(string memory _name) public onlyOwner returns(bool)
{
        candidates.push(candidate(_name, 0));
        return true;
    }

    function voting(uint _candidateIndex) public started notEnded
returns(bool) {
        require(!Voters[msg.sender].voted);
        require(Voters[msg.sender].authorized);

        Voters[msg.sender].candidateVote = _candidateIndex;
        Voters[msg.sender].voted = true;

        candidates[_candidateIndex].voteCount += 1;
        totalVotes += 1;

        return true;
    }

    function electionWinner() view public ended returns (string memory _name,
uint _vote) {
        uint max = 0;
        uint winnerIndex = 0;
        for (uint i = 0; i < candidates.length; i++) {
            if ( candidates[i].voteCount > max) {
                max = candidates[i].voteCount;
                winnerIndex = i;
            }
        }

        return (candidates[winnerIndex].name,
candidates[winnerIndex].voteCount);
```

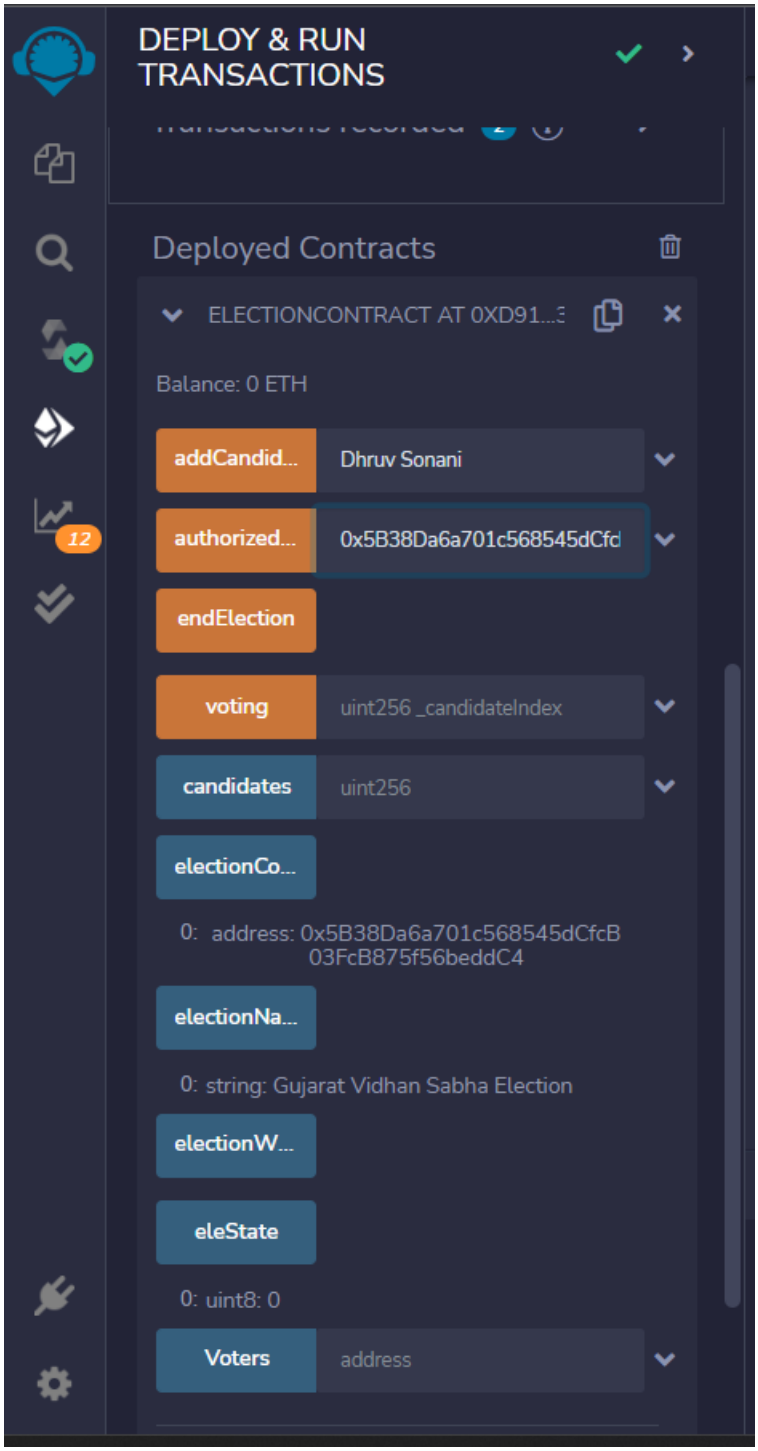
```
    }

    function endElection() public onlyOwner started notEnded returns(bool) {
        eleState = electionState.Ended;
        return true;
    }

}
```

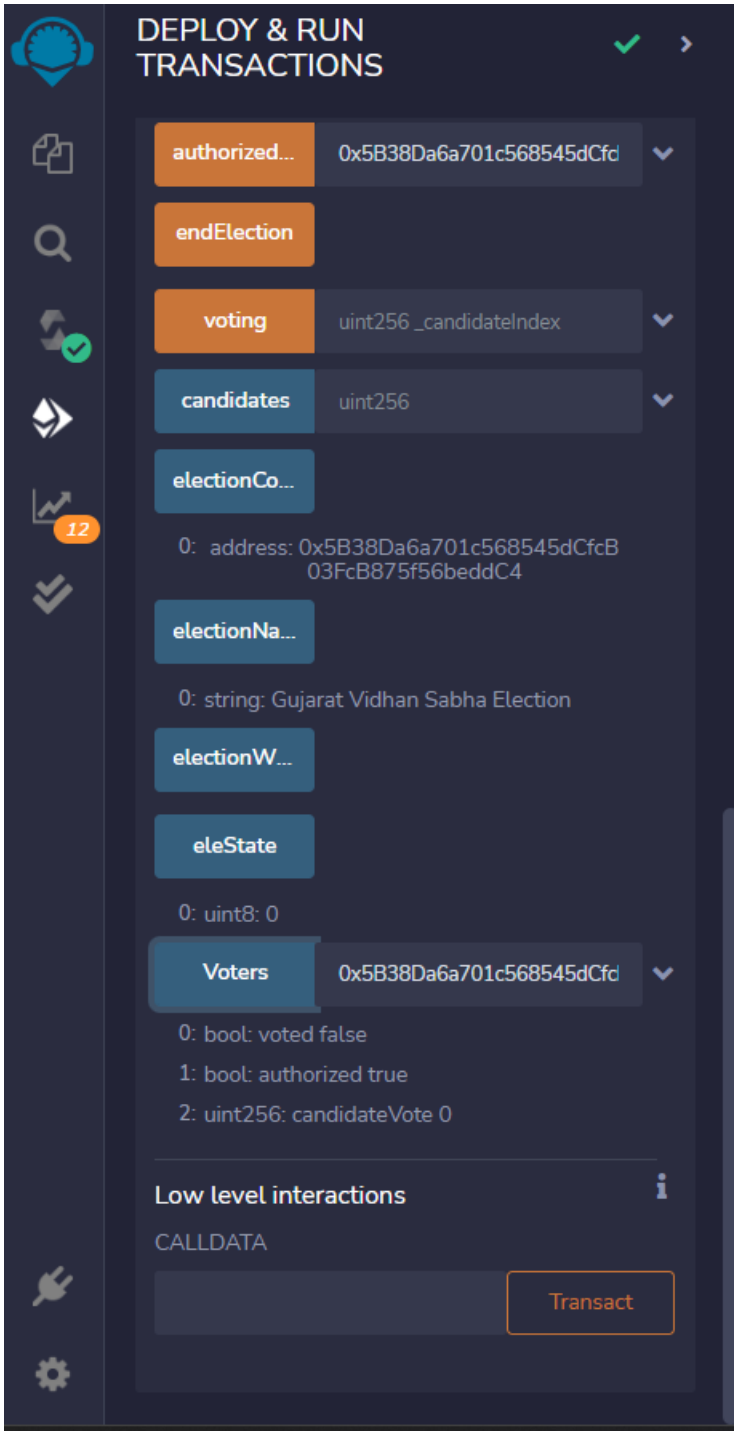
Output:

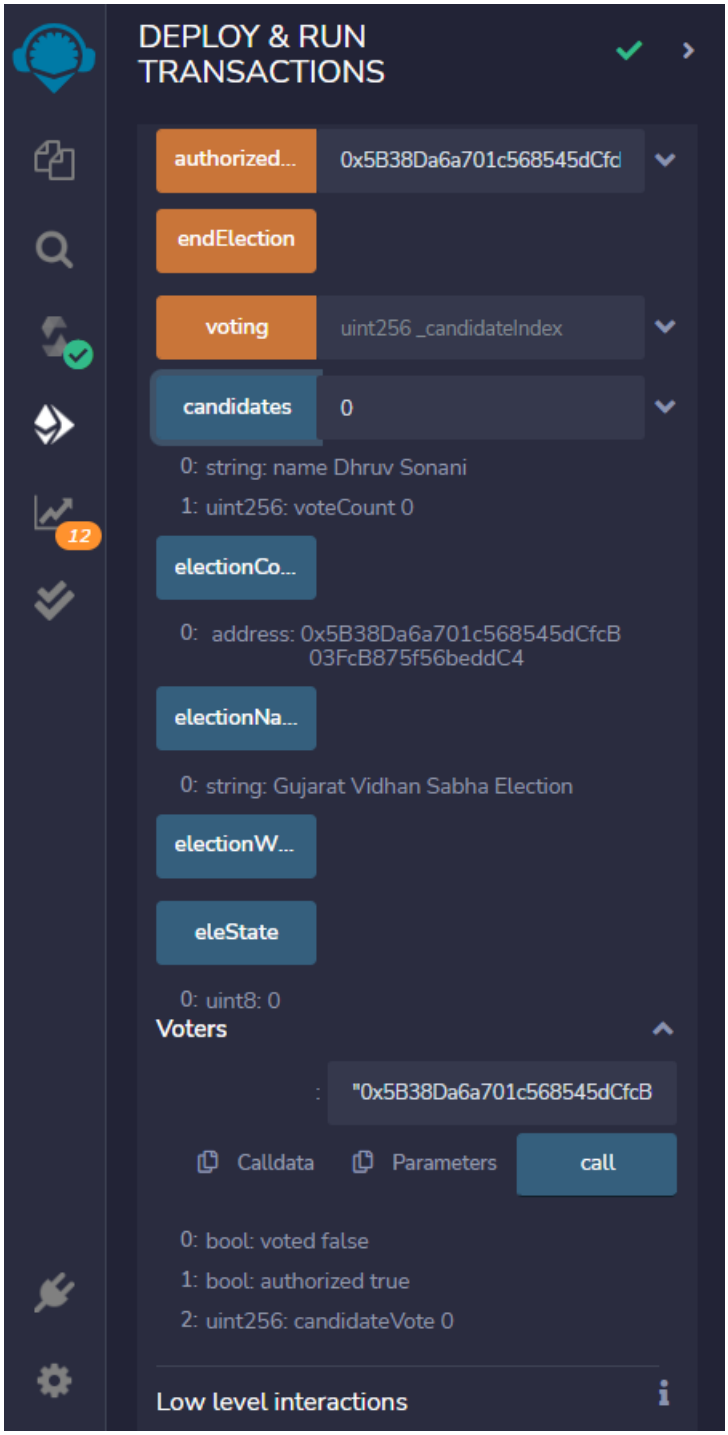

DEPLOY & RUN TRANSACTIONS
ENVIRONMENT
Remix VM (London)
VM
ACCOUNT
0x5B3...eddC4 (100 ether)
GAS LIMIT
3000000
VALUE
0
Wei
CONTRACT (Compiled By Remix)
electionContract - scripts/election.sol
Deploy
Gujarat Vidhan Sabha Election
Publish to IPFS
OR
At Address
Load contract from Address
Transactions recorded 0
Deployed Contracts

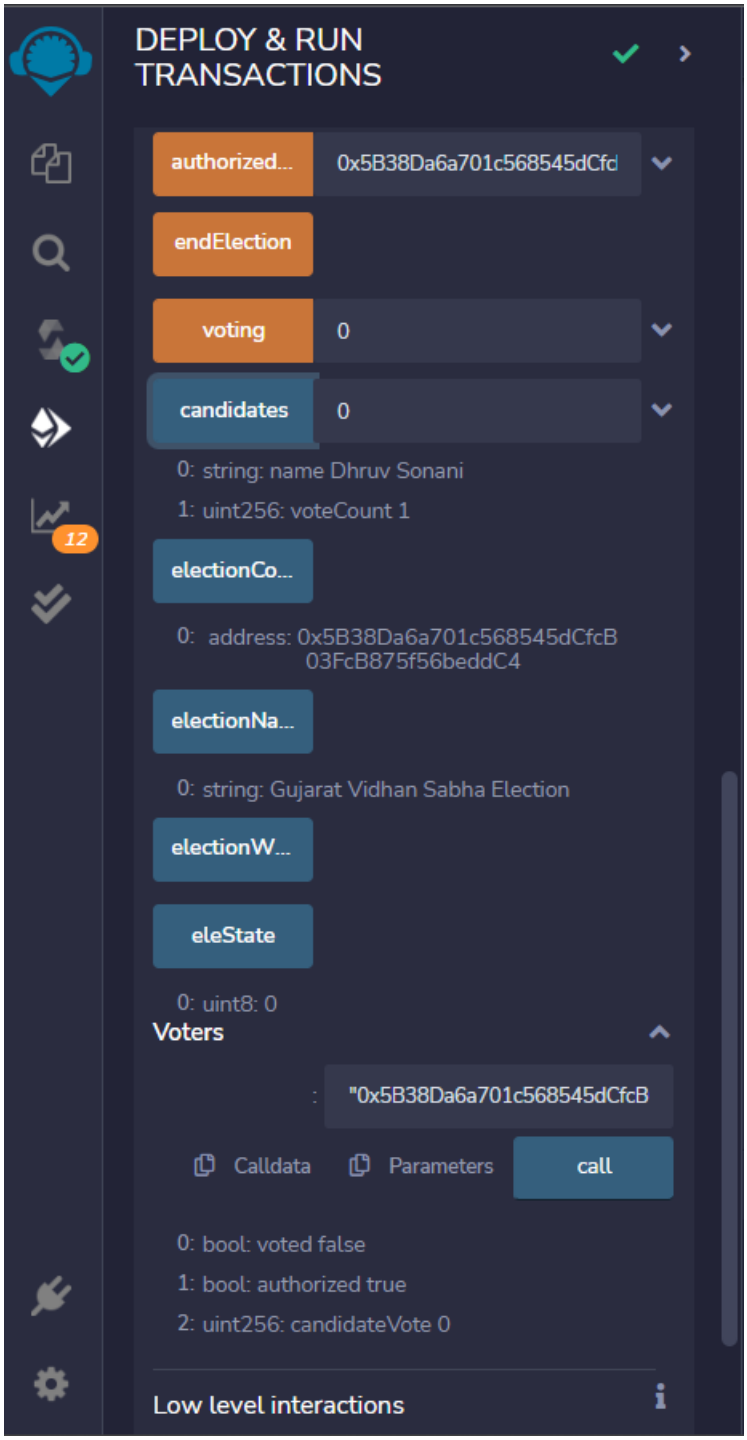

[vm] from: 0x5B3...eddC4 to: electionContract.(constructor) value: 0 wei data: 0x608...00000 logs: 0 hash: 0x6bd...671ef

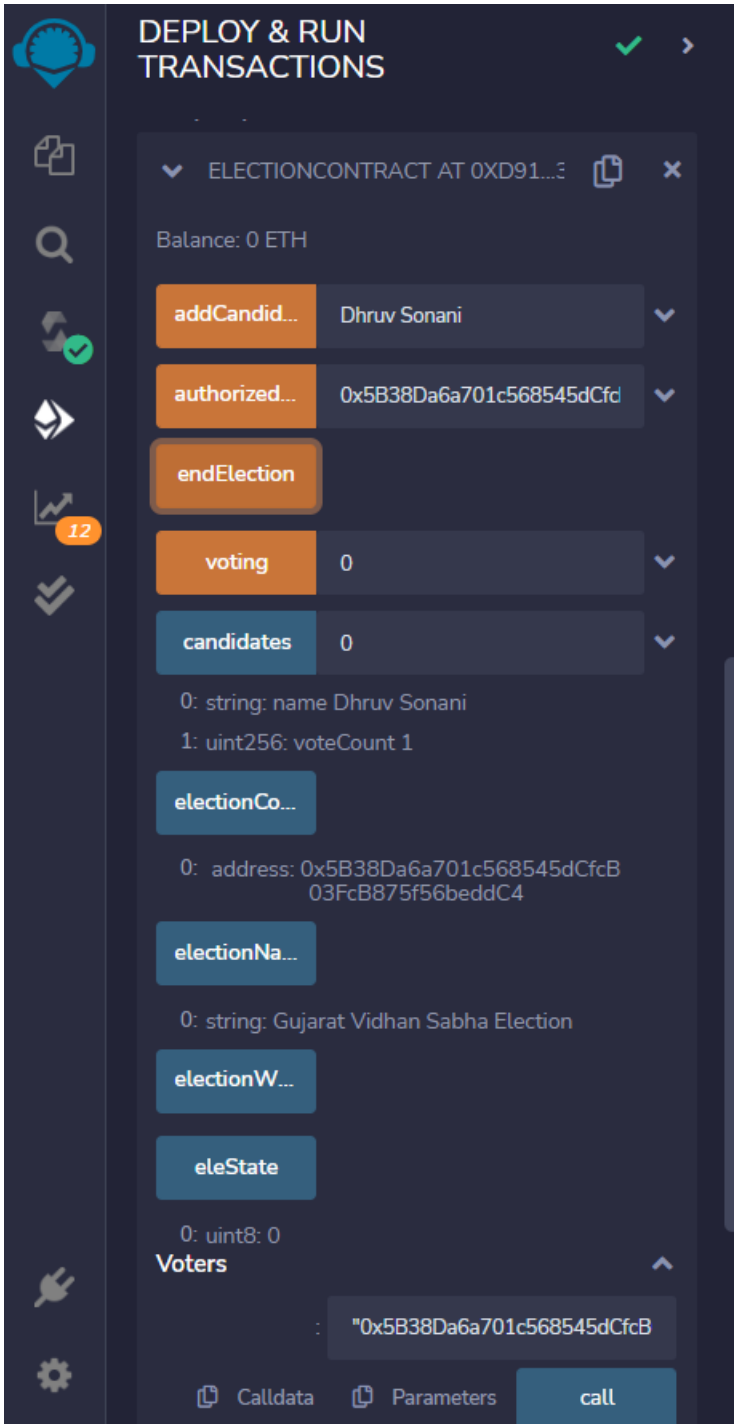

DEPLOY & RUN
TRANSACTIONS
Deployed Contracts
ELECTIONCONTRACT AT 0XD91...3
Balance: 0 ETH
addCandid...
string _name
authorized...
address _voterAdd
endElection
voting
uint256 _candidateIndex
candidates
uint256
electionCo...
electionNa...
electionW...
eleState
Voters
address
Low level interactions
CALLDATA
Transact
12

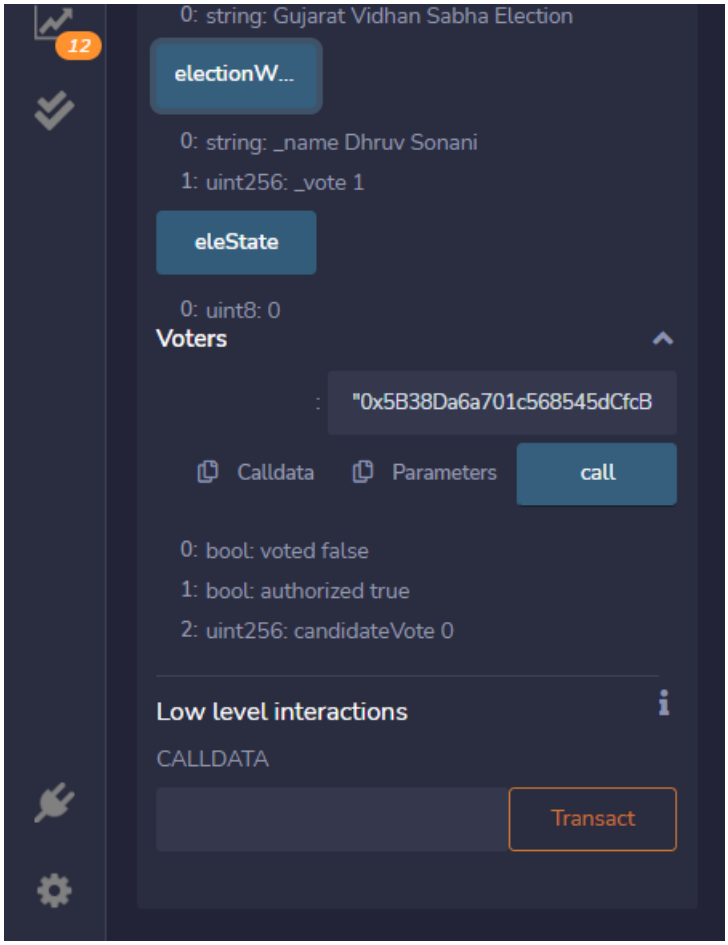

DEPLOY & RUN
TRANSACTIONS
Deployed Contracts
ELECTIONCONTRACT AT 0XD91...3
Balance: 0 ETH
addCandid...
Dhruv Sonani
authorized...
0x5B38Da6a701c568545dCfd
endElection
voting
uint256 _candidateIndex
candidates
uint256
electionCo...
0: address: 0x5B38Da6a701c568545dCfcB
03FcB875f56beddC4
electionNa...
0: string: Gujarat Vidhan Sabha Election
electionW...
eleState
0: uint8: 0
Voters
address
12


DEPLOY & RUN TRANSACTIONS
authorized...
0x5B38Da6a701c568545dCfd
endElection
voting
uint256 _candidateIndex
candidates
uint256
electionCo...
0: address: 0x5B38Da6a701c568545dCfcB 03FcB875f56beddC4
electionNa...
0: string: Gujarat Vidhan Sabha Election
electionW...
eleState
0: uint8: 0
Voters
0x5B38Da6a701c568545dCfd
0: bool: voted false
1: bool: authorized true
2: uint256: candidateVote 0
Low level interactions
CALLDATA
Transact
12


DEPLOY & RUN TRANSACTIONS
authorized...
0x5B38Da6a701c568545dCfd
endElection
voting
uint256 _candidateIndex
candidates
0
0: string: name Dhruv Sonani
1: uint256: voteCount 0
electionCo...
0: address: 0x5B38Da6a701c568545dCfcB 03FcB875f56beddC4
electionNa...
0: string: Gujarat Vidhan Sabha Election
electionW...
eleState
0: uint8: 0
Voters
"0x5B38Da6a701c568545dCfcB
Calldata
Parameters
call
0: bool: voted false
1: bool: authorized true
2: uint256: candidateVote 0
Low level interactions


DEPLOY & RUN TRANSACTIONS
authorized...
0x5B38Da6a701c568545dCfd
endElection
voting
0
candidates
0
0: string: name Dhruv Sonani
1: uint256: voteCount 1
electionCo...
0: address: 0x5B38Da6a701c568545dCfcB 03FcB875f56beddC4
electionNa...
0: string: Gujarat Vidhan Sabha Election
electionW...
eleState
0: uint8: 0
Voters
"0x5B38Da6a701c568545dCfcB
Calldata
Parameters
call
0: bool: voted false
1: bool: authorized true
2: uint256: candidateVote 0
Low level interactions


DEPLOY & RUN TRANSACTIONS
ELECTIONCONTRACT AT 0XD91...3
Balance: 0 ETH
addCandid...
Dhruv Sonani
authorized...
0x5B38Da6a701c568545dCfd
endElection
voting
0
candidates
0
0: string: name Dhruv Sonani
1: uint256: voteCount 1
electionCo...
0: address: 0x5B38Da6a701c568545dCfcB 03FcB875f56beddC4
electionNa...
0: string: Gujarat Vidhan Sabha Election
electionW...
eleState
0: uint8: 0
Voters
"0x5B38Da6a701c568545dCfcB
Calldata
Parameters
call


12
0: string: Gujarat Vidhan Sabha Election
electionW...
0: string: _name Dhruv Sonani
1: uint256: _vote 1
eleState
0: uint8: 0
Voters
: "0x5B38Da6a701c568545dCfcB
Calldata
Parameters
call
0: bool: voted false
1: bool: authorized true
2: uint256: candidateVote 0
Low level interactions
CALLDATA
Transact