Program:

Develop an Election contract using solidity programming. Create a struct called Candidate, the struct members are ID, name and the vote-count. The smart contract should have the functions like addcandidate, show-candidates, vote, candidatescount and the voters function to verify the status of the casted vote using the Ethereum account address. Further, compile the contract and deploy to the personal Blockchain network using Ganache.

STEP 1

Setup a Ganache as your personal blockchain for Ethereum development. It will allow you to deploy smart contracts, develop applications, and run tests.

Ganache Personal Blockchain Interface consist of:

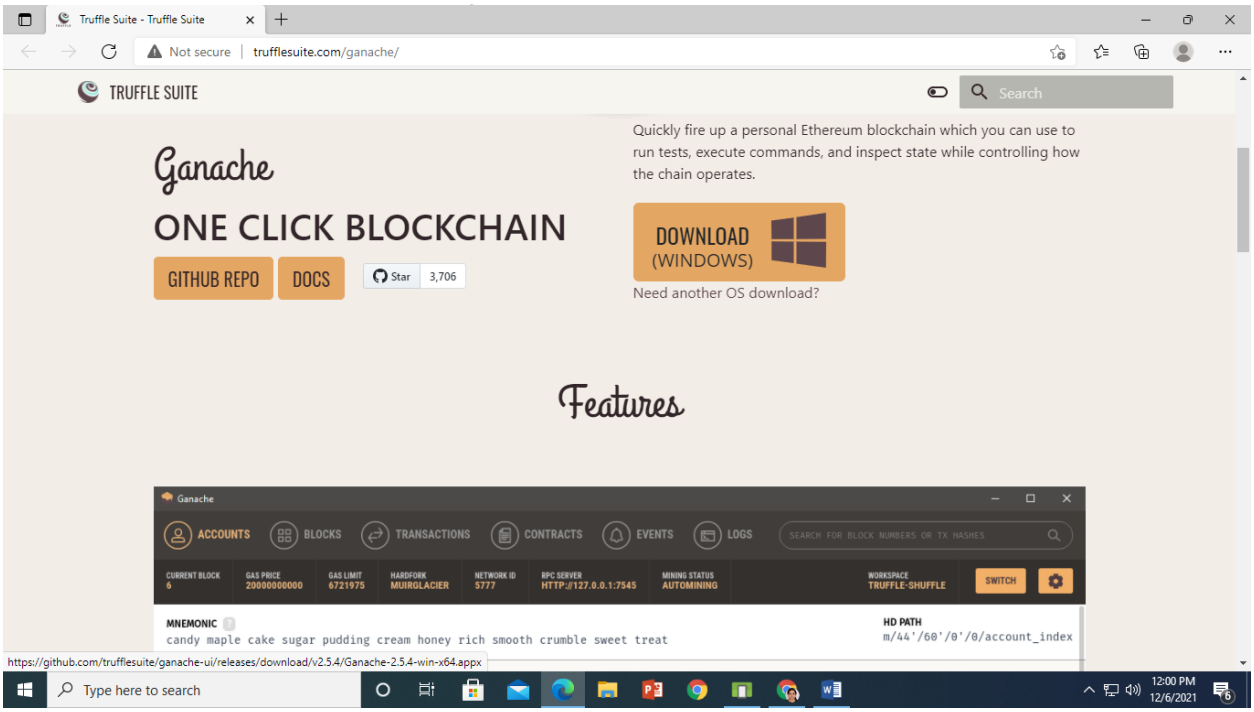
➢Accounts Page -this shows you all of the accounts that are automatically generated, along with their balances.

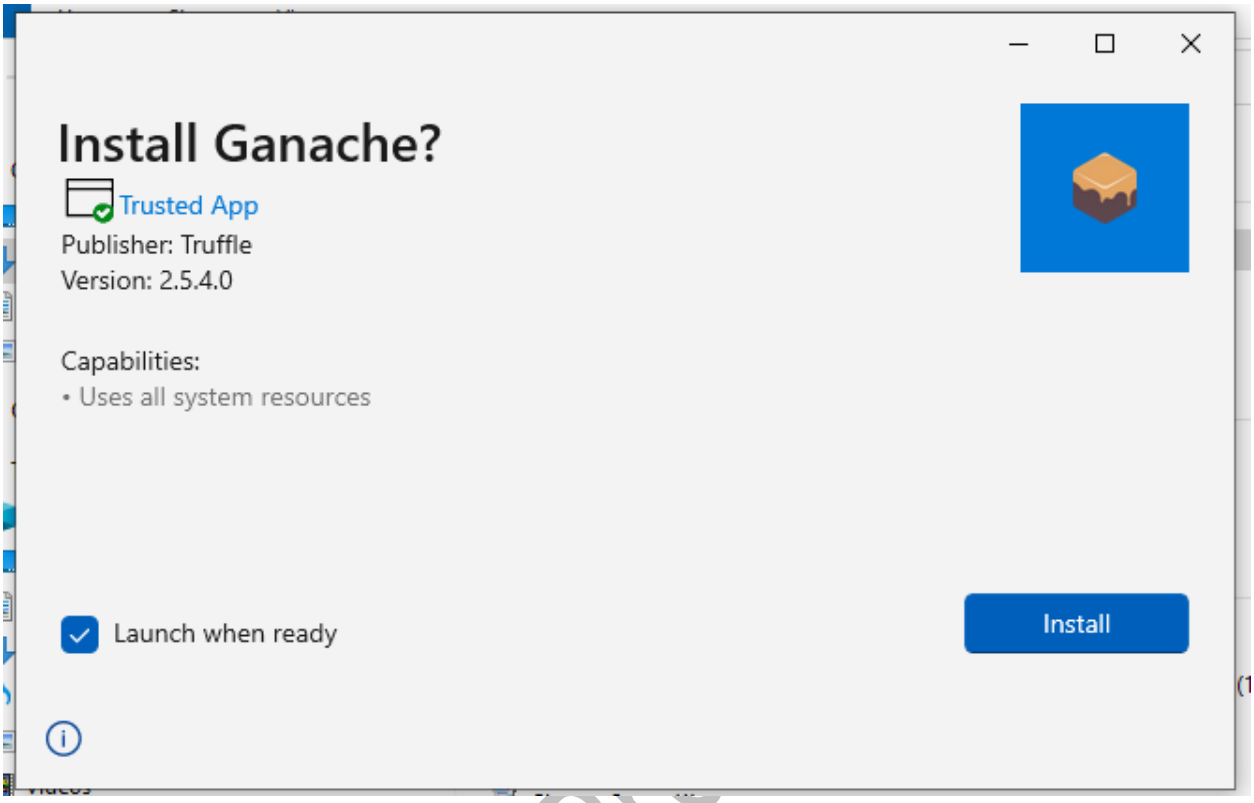
➢ Blocks Page - this shows you each block that has been mined on the personal blockchain network,
along with the gas cost and transactions.

➢Transactions Page -this list all the transactions that have taken place on the personal blockchain.

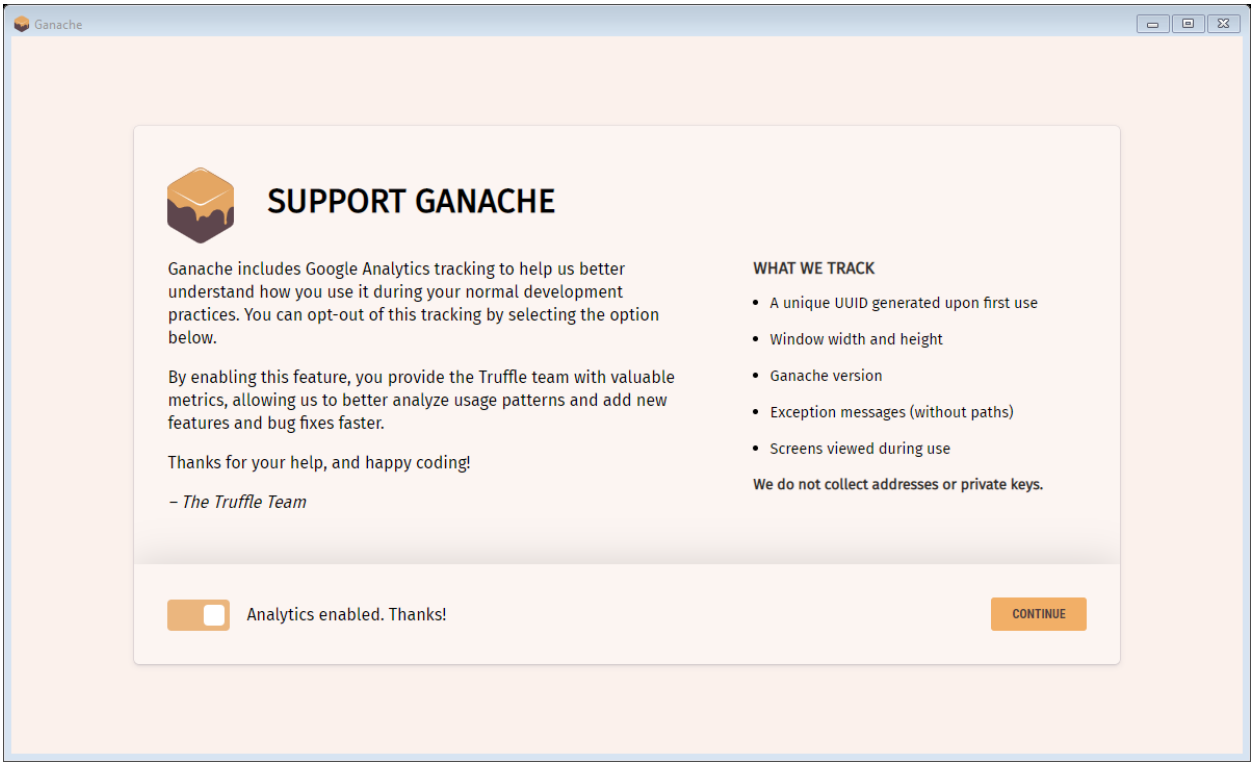
➢Logs Page - this shows you all the server logs that you might need when debugging your application.

Ganache: https://www.trufflesuite.com/ganache

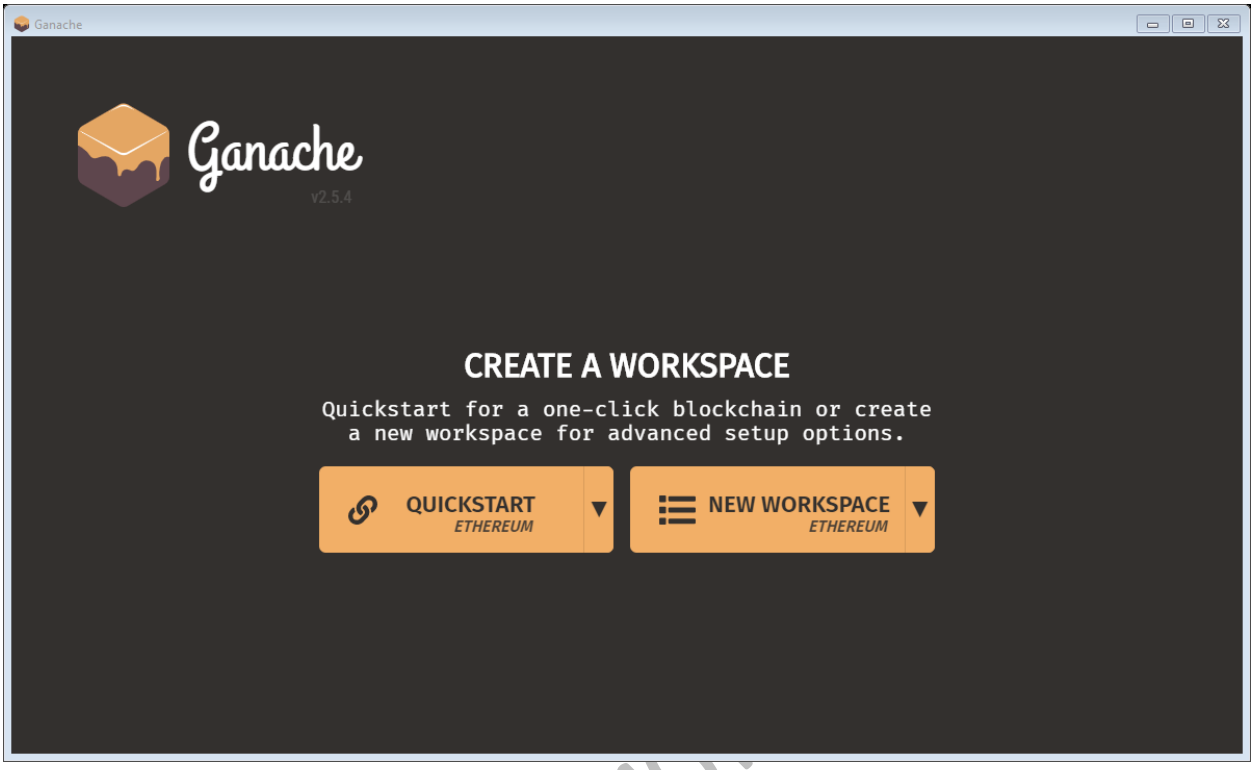




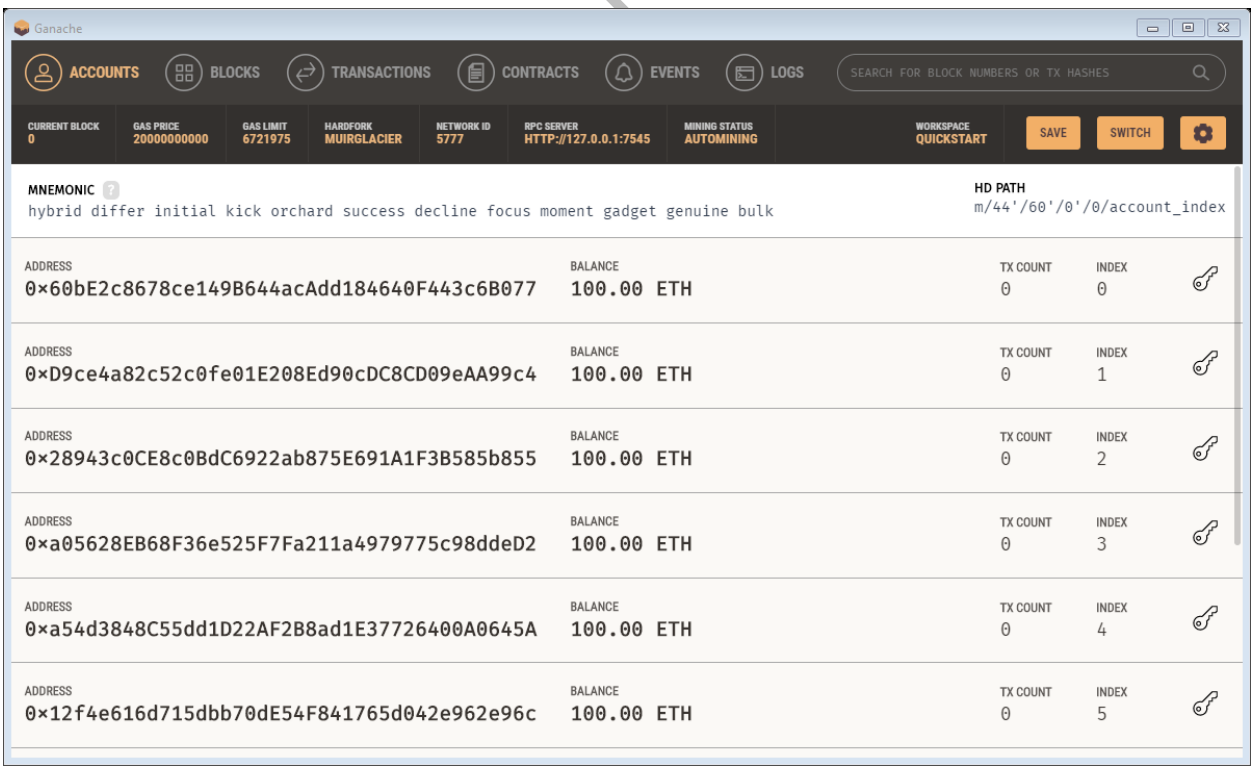
Click on install



Click on Continue



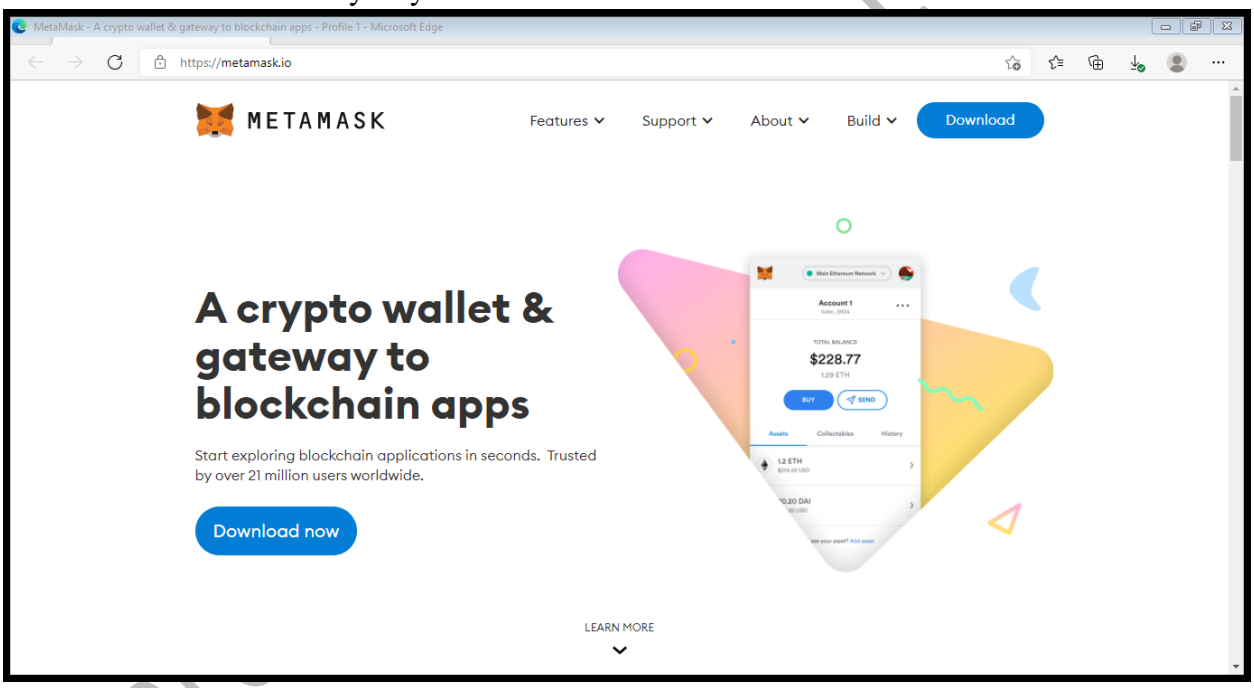
Click on QuickStart



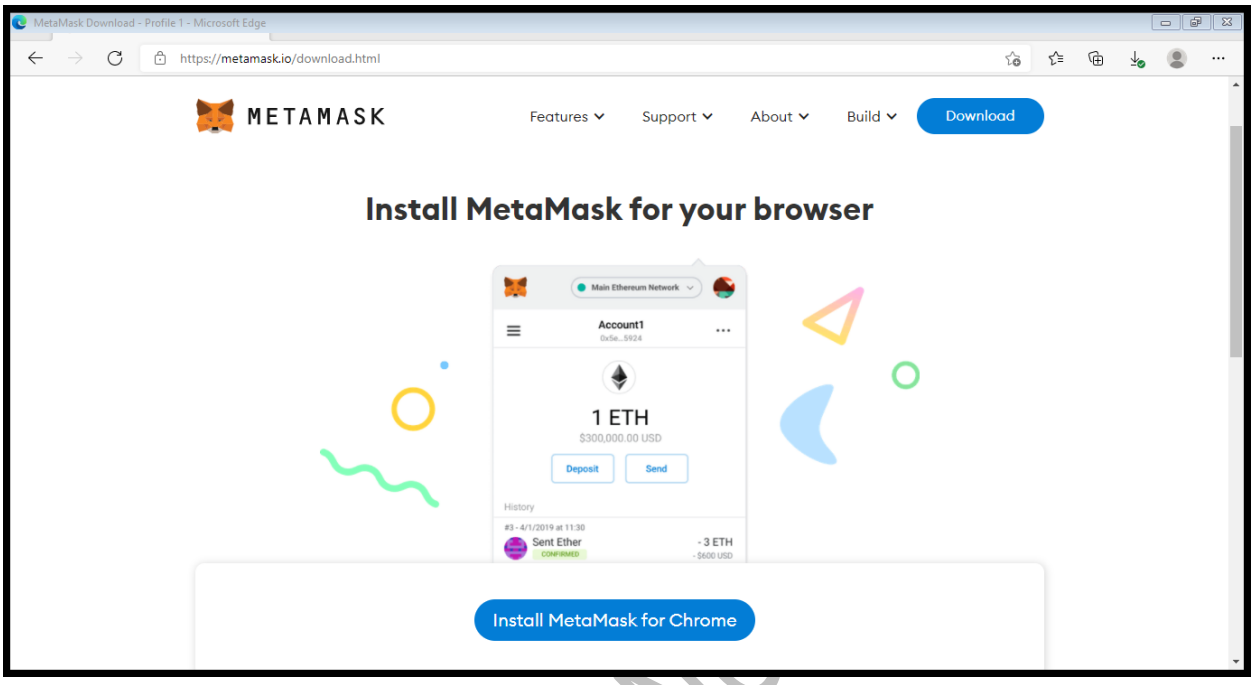
Ganache Successfully installed. Now minimize Ganache.
STEP 2

SETUP A METAMASK ETHEREUM WALLET

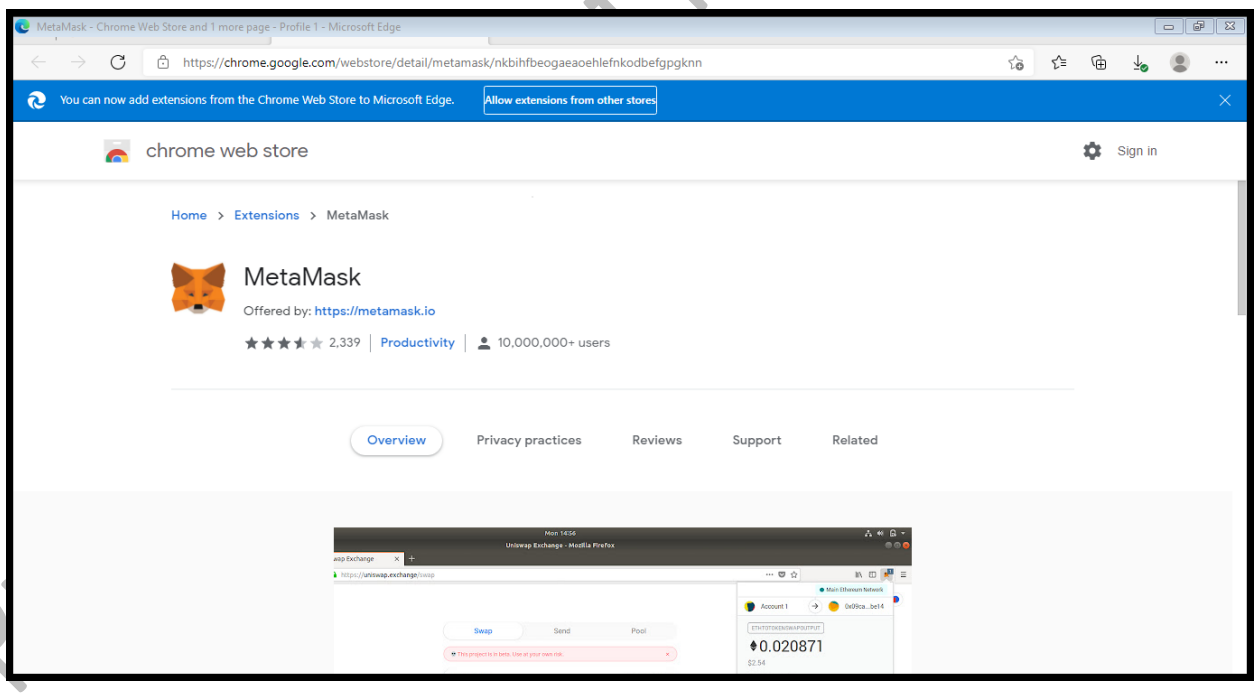
- MetaMask is just an Ethereum Browser and Ether wallet.
- It interacts with Ethereum Dapps and Smart Contracts without running a full Ethereum node.
- MetaMask add-on can be installed on Chrome, Firefox, Opera, and the new Brave browser.
- **URL: https://metamask.io/**
- Install MetaMask
- Add MetaMask extension to the Browser
- MetaMask will show up 12 words recovery key (Seed).
- These 12 words are the only way to restore MetaMask accounts.



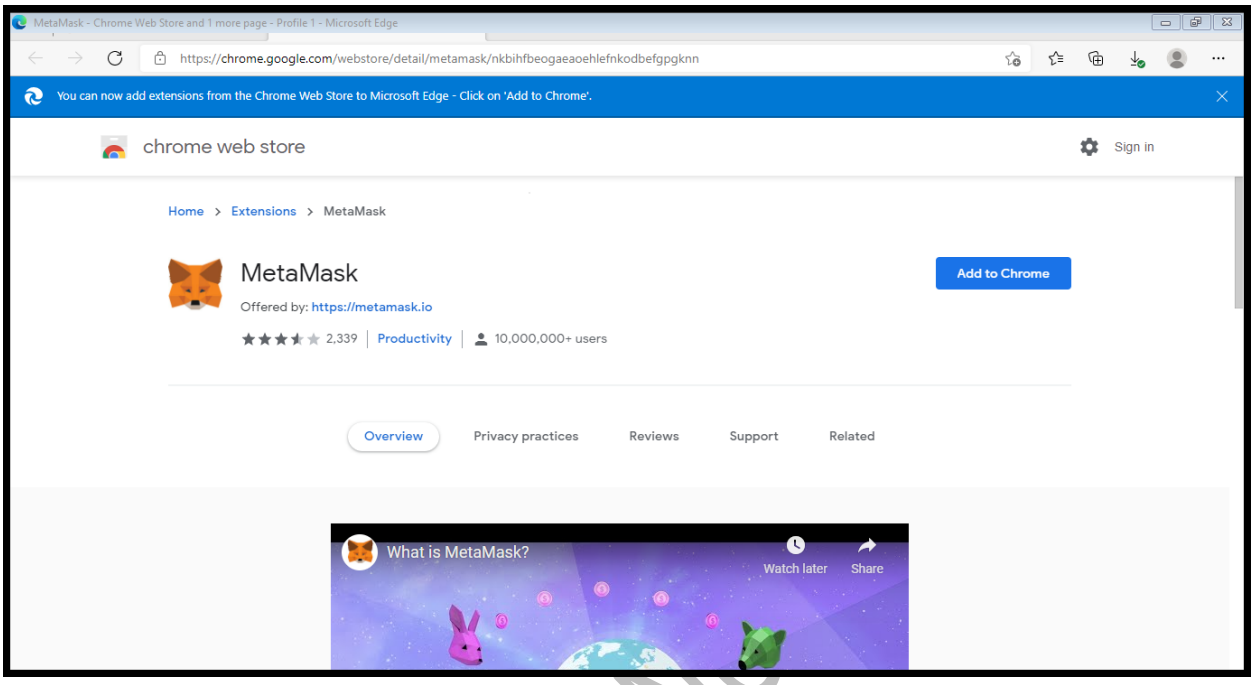
Click on download



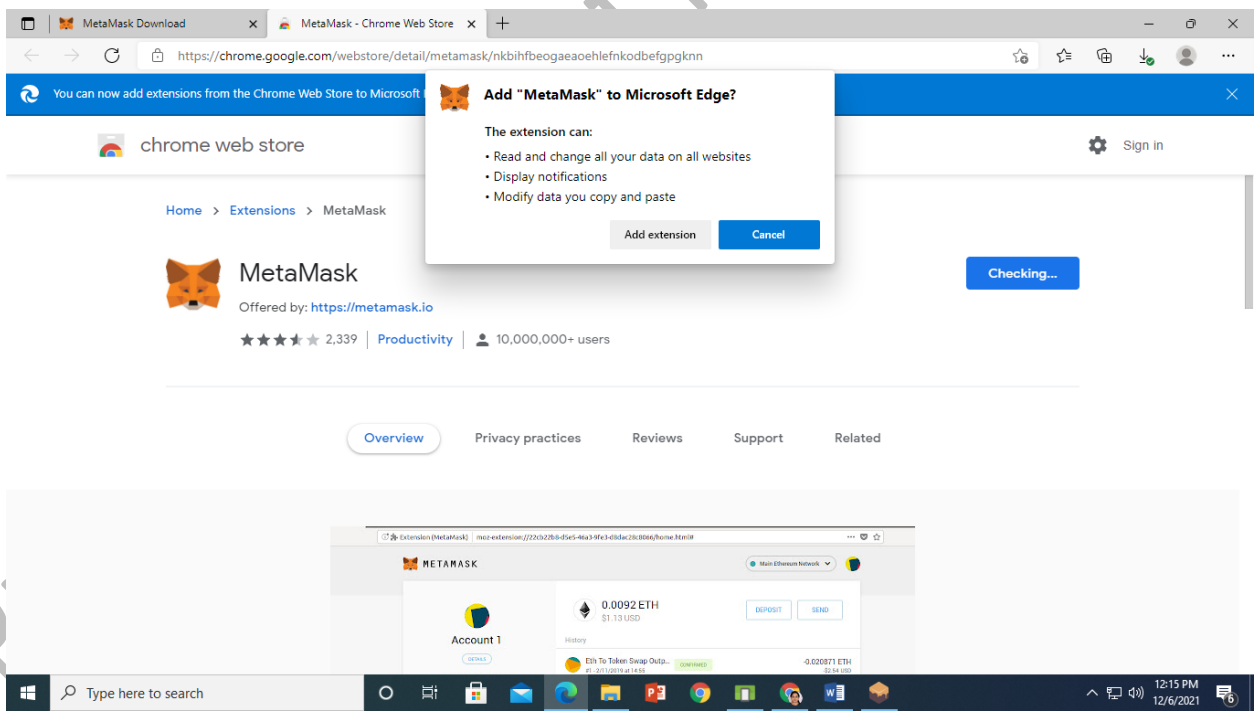
Click on Install MetaMask for Chrome.



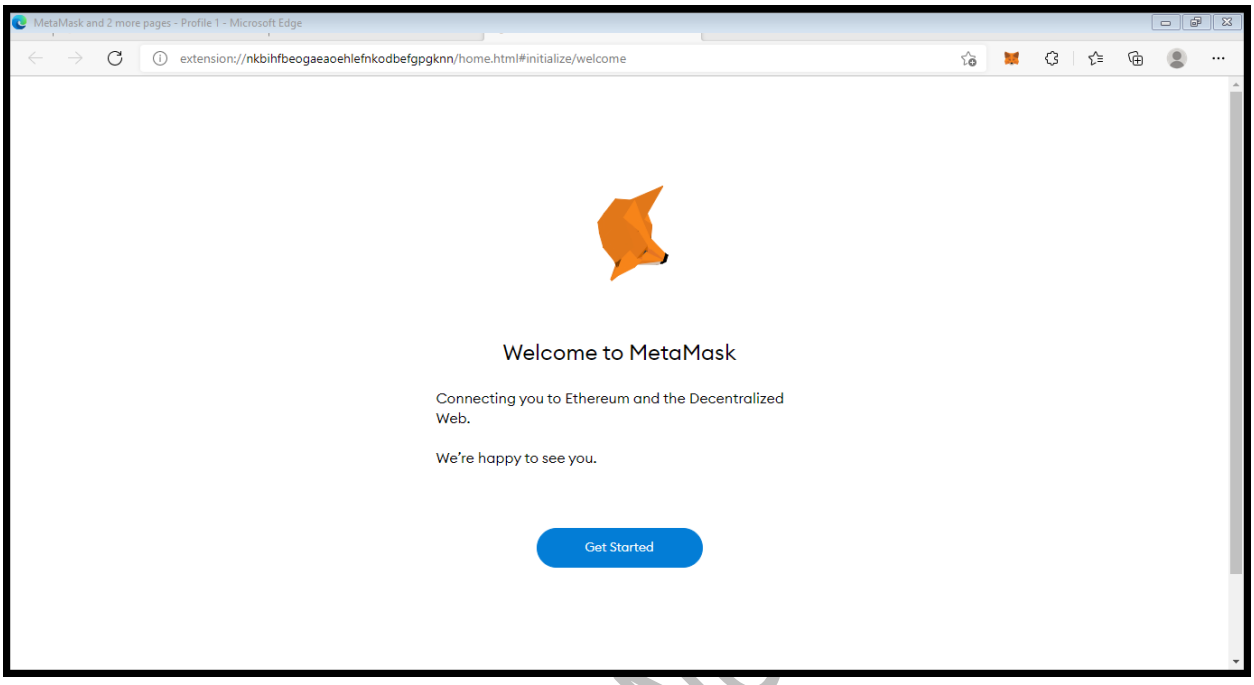
Click on Allow Extensions from other stores.



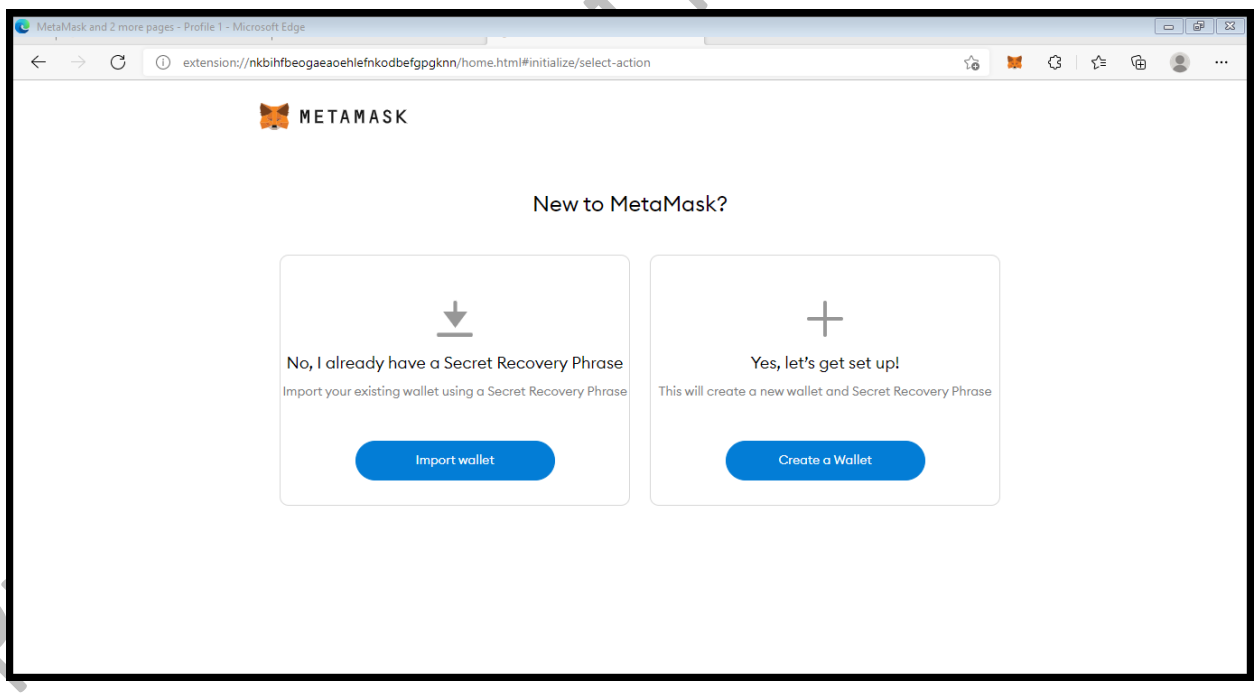
Click on Add to Chrome



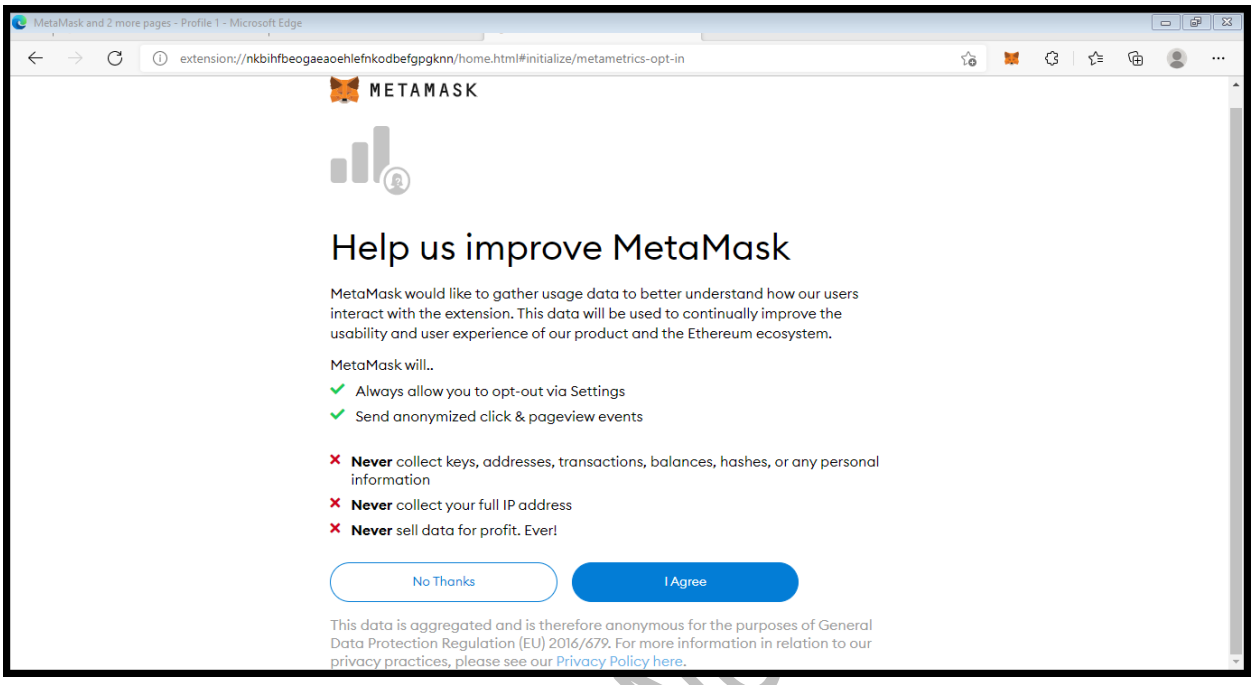
Click on Add extension



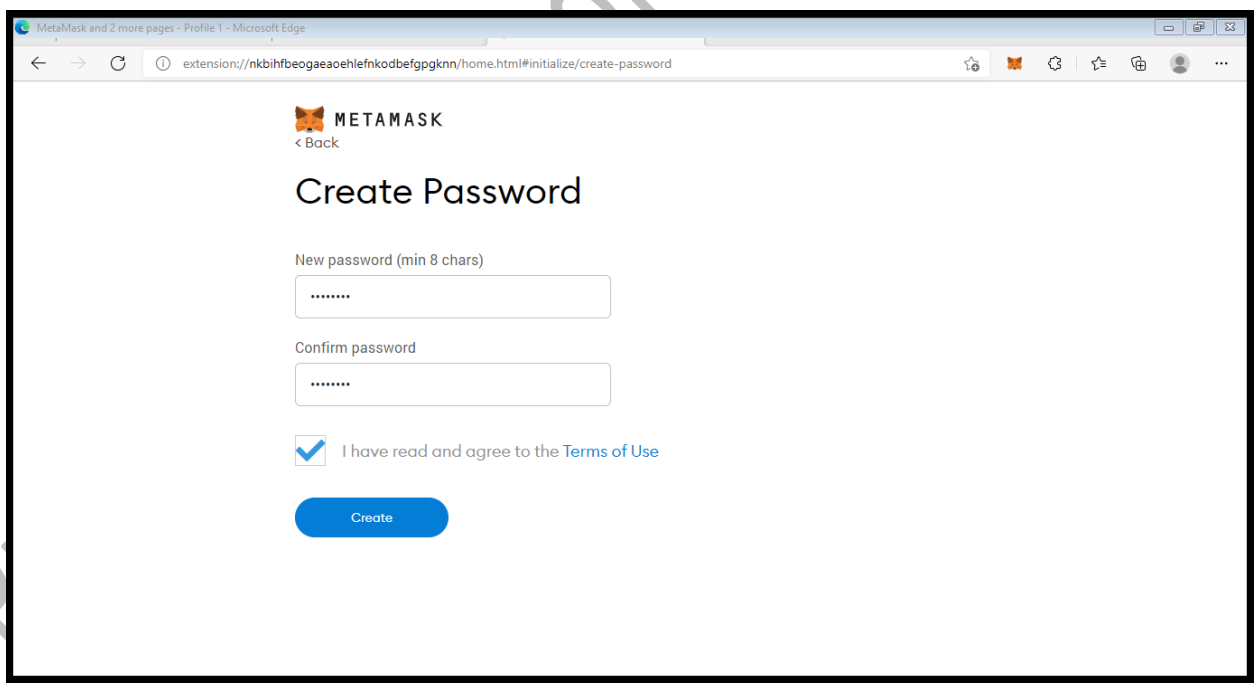
Click on Get Started



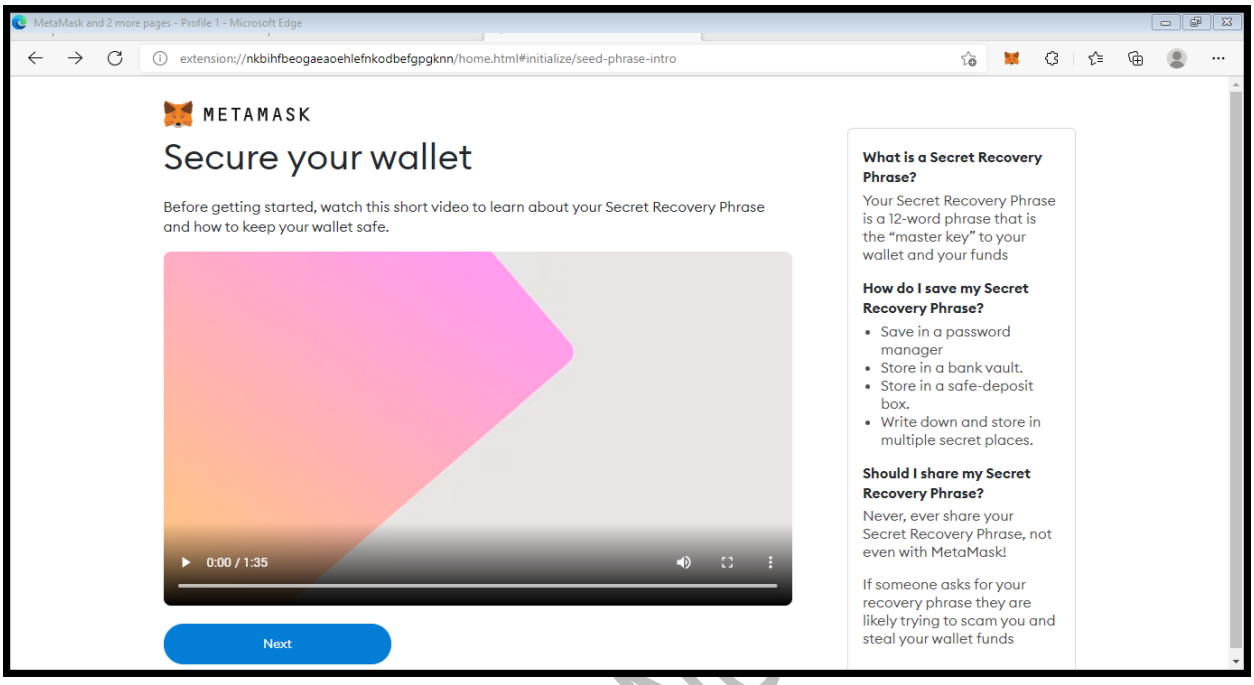
Click on Create Wallet



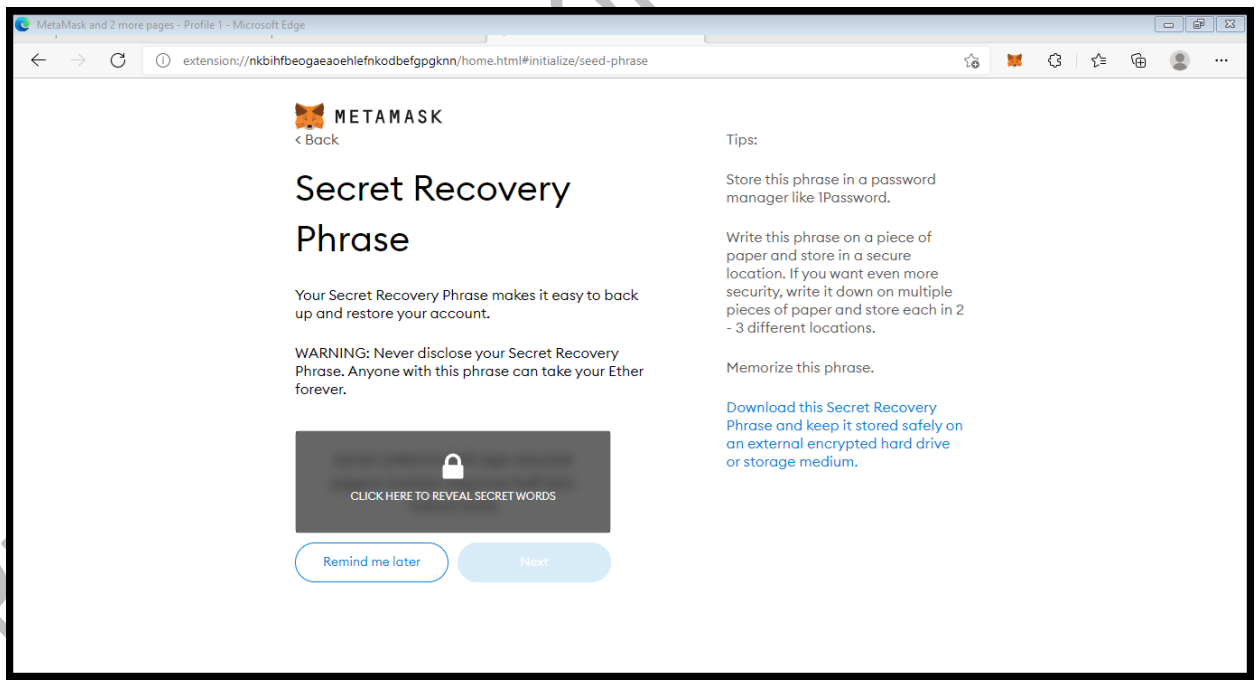
Click on I Agree



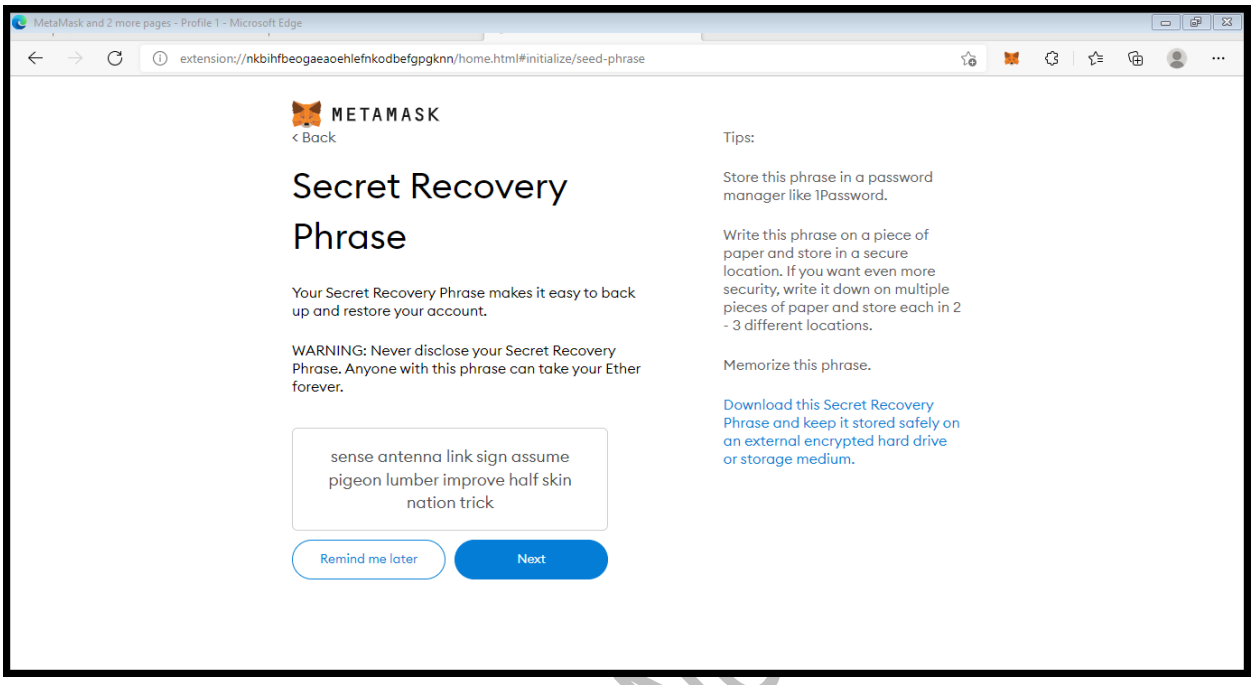
Mention password. Note down password further it is required and click on create.



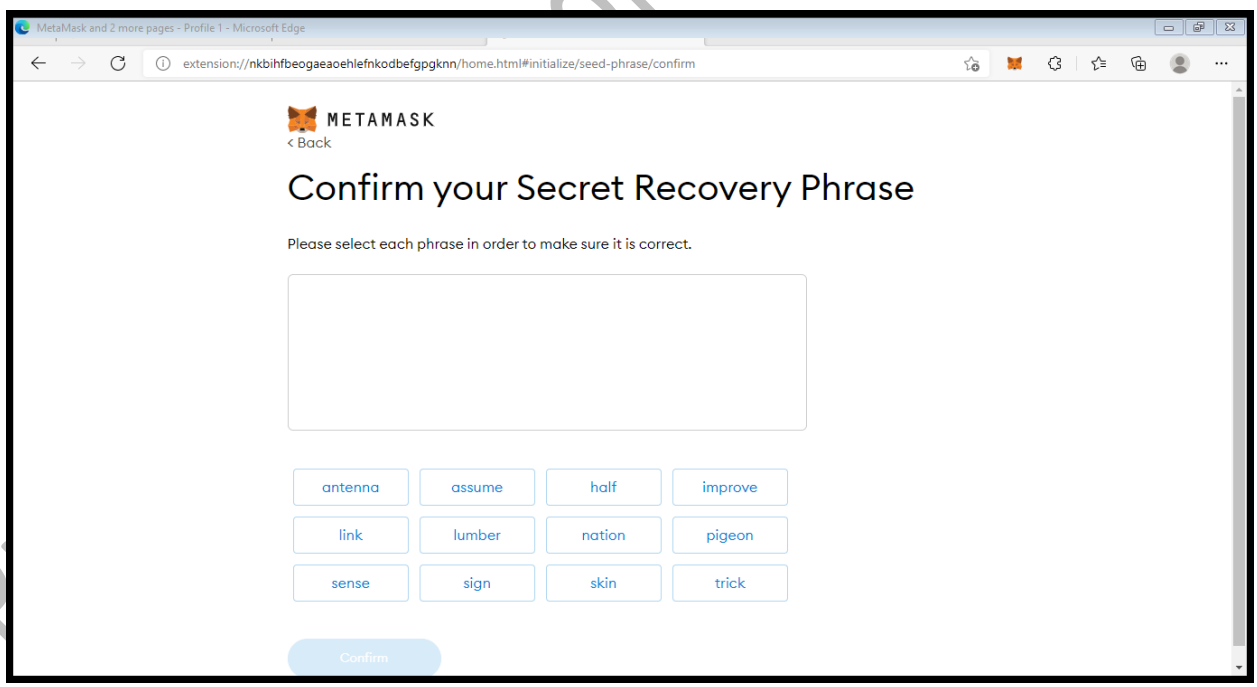
Click on Next.



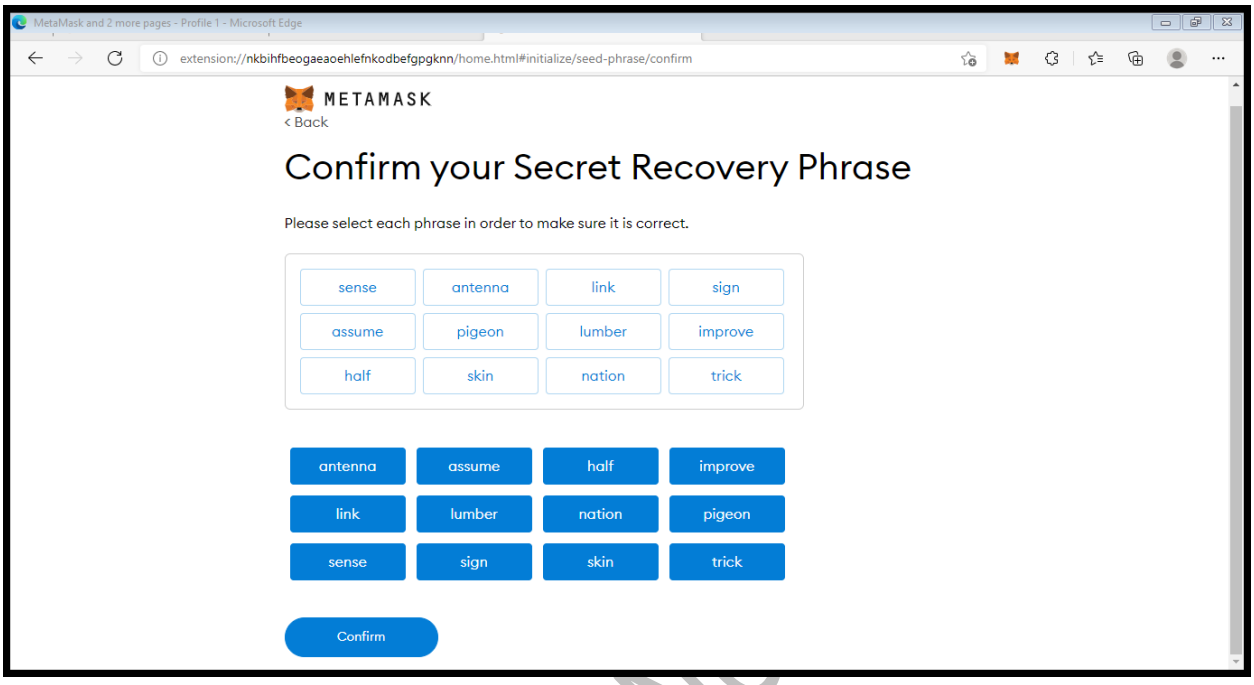
Click on Click here to reveal secret words.



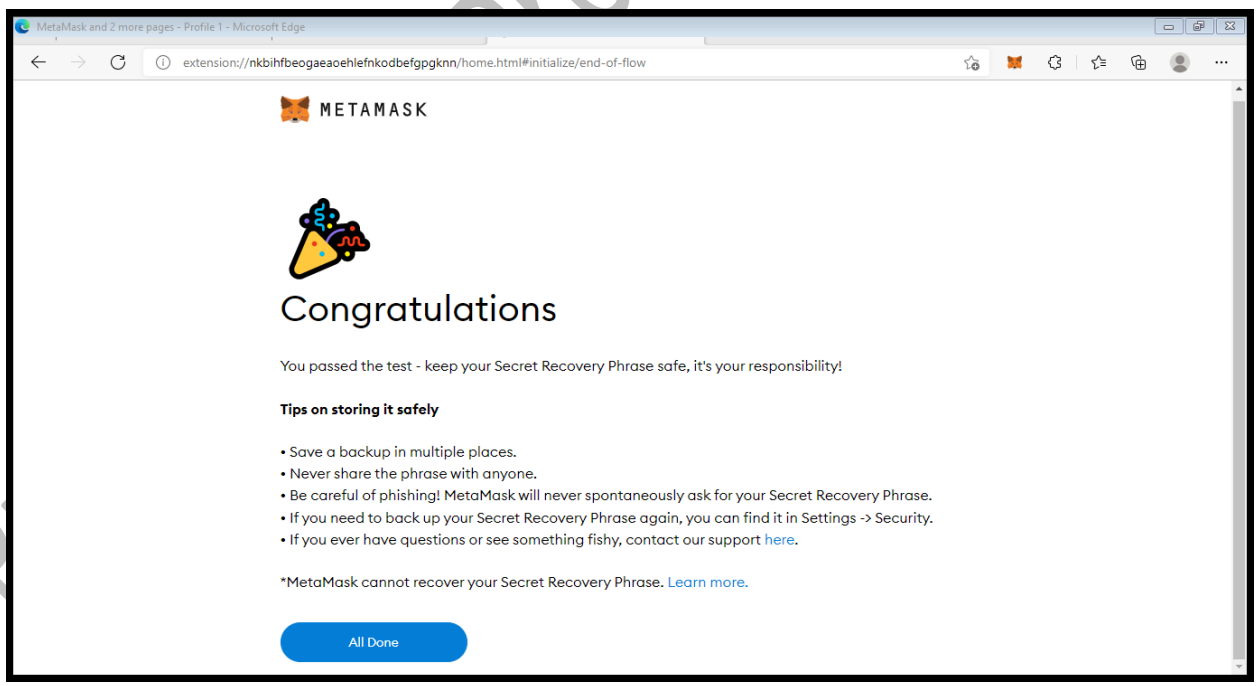
Copy all the words and save it in notepad. Then click on Next.



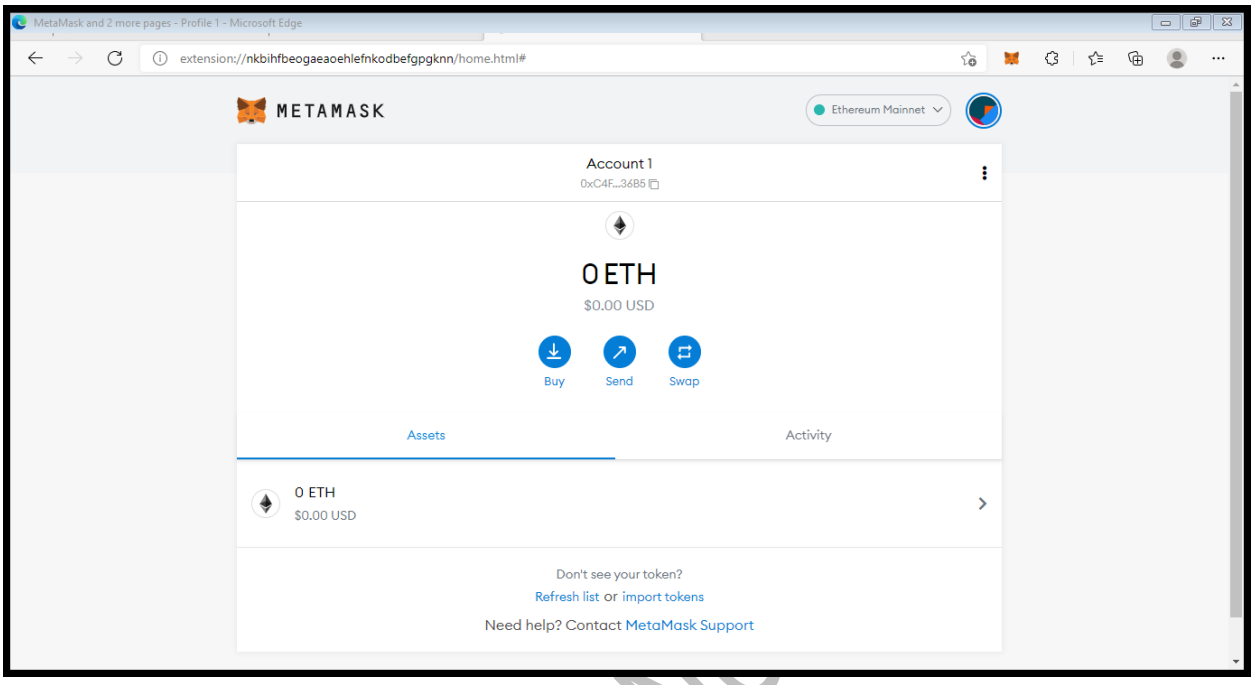
Refer the notepad and select the words in same sequence.

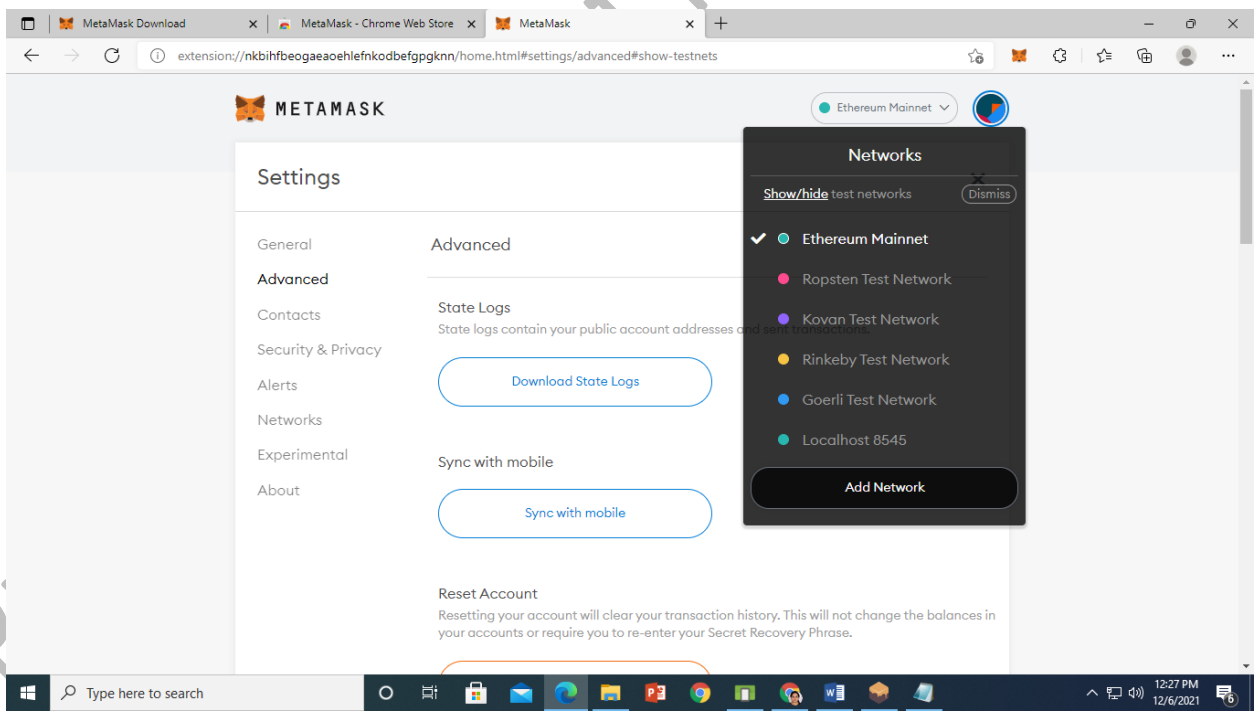


Click on confirm.

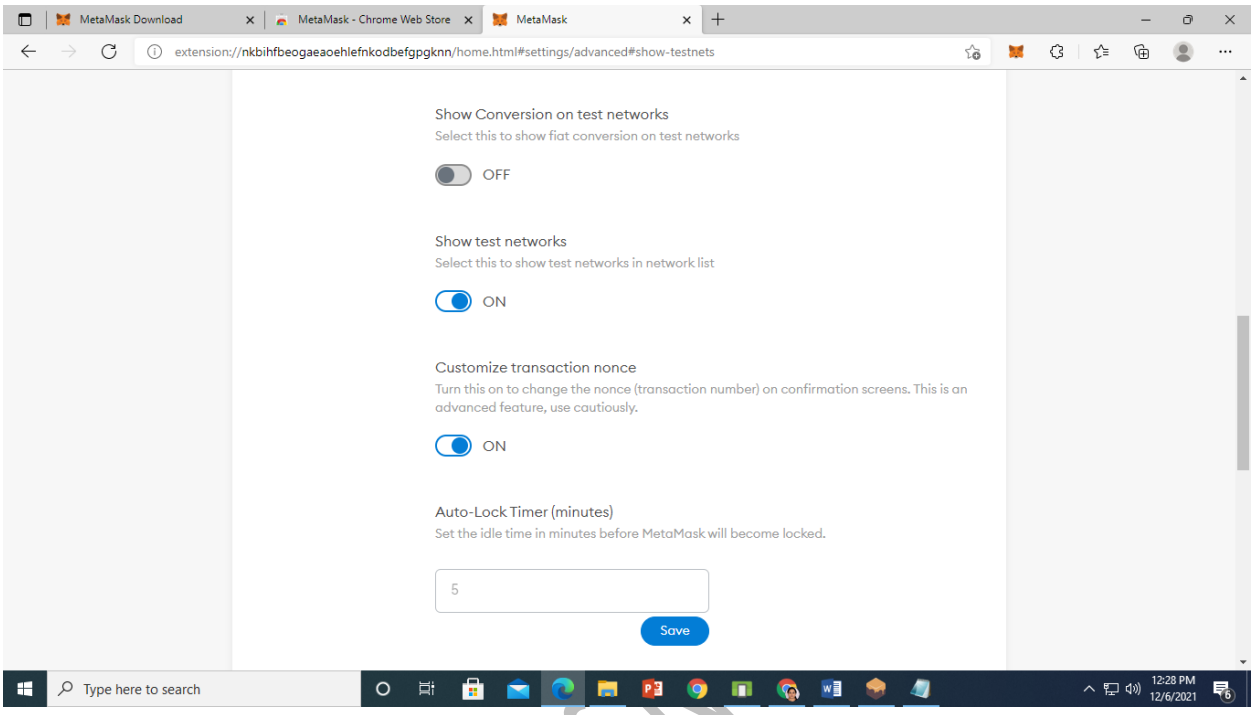


Click on All Done.

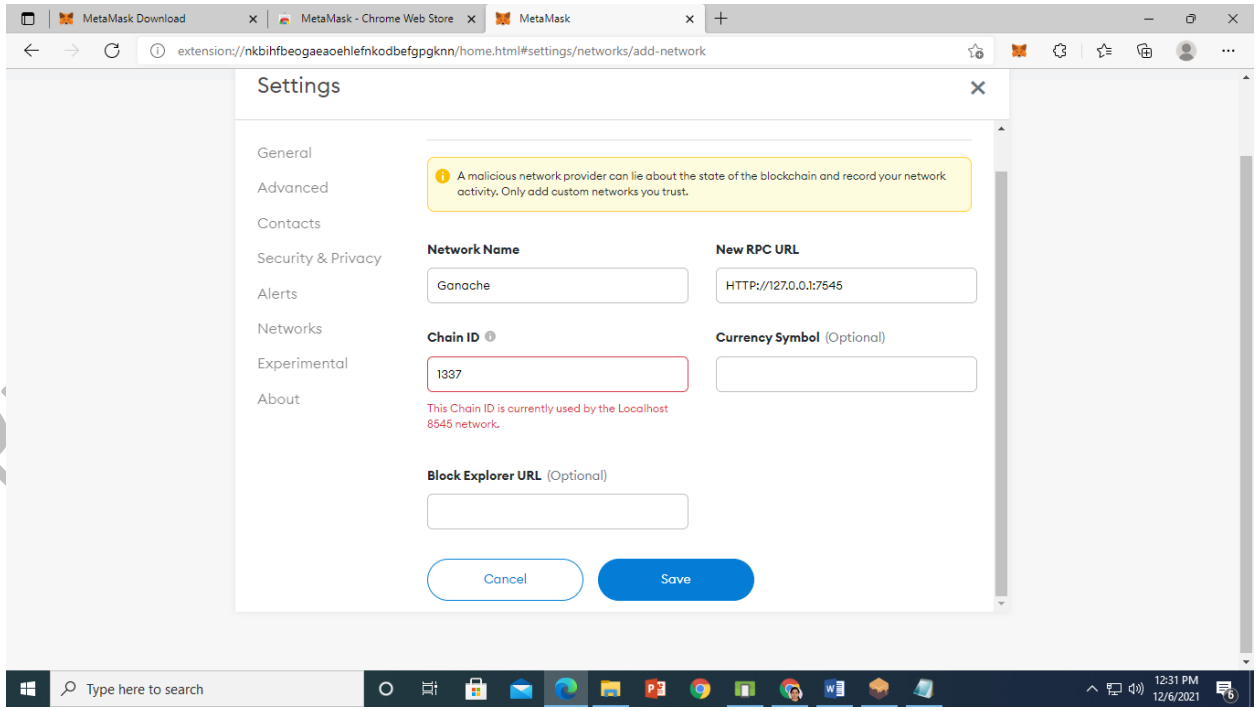




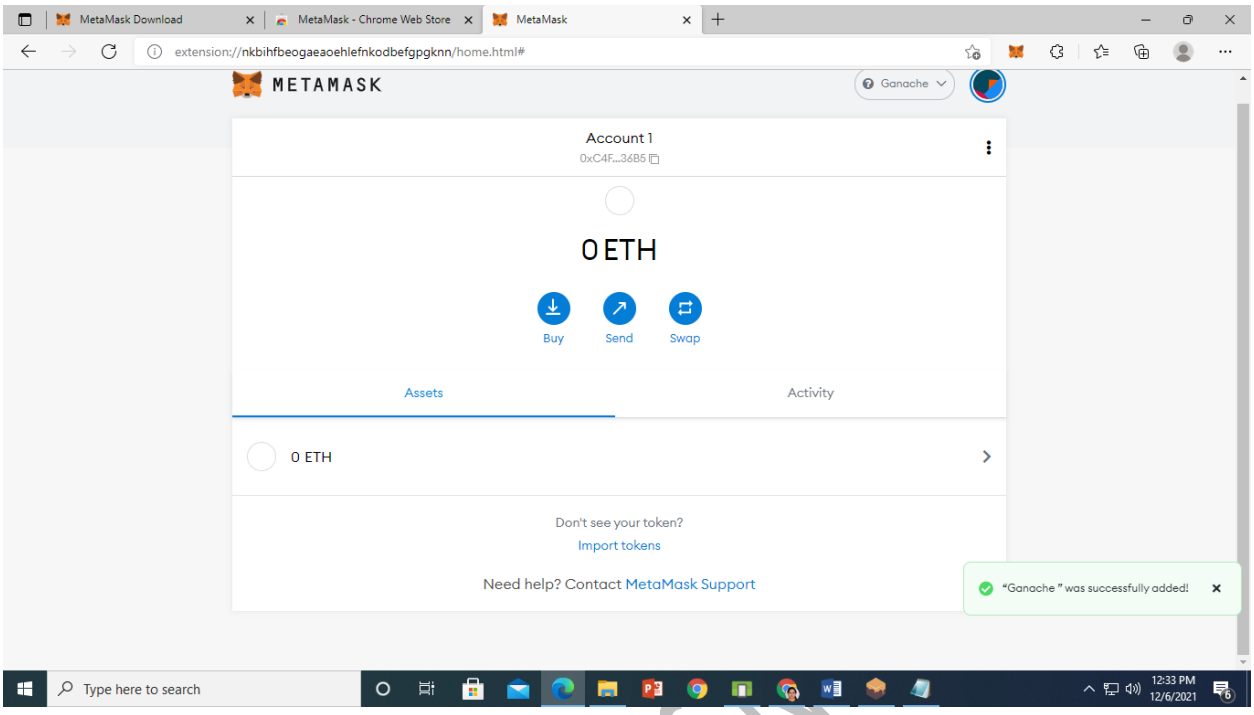
Click on Show/Hide test network.



On show test network. scroll up and select dropdown list Ethereum Mainnet and click on Add Network



Click on save.



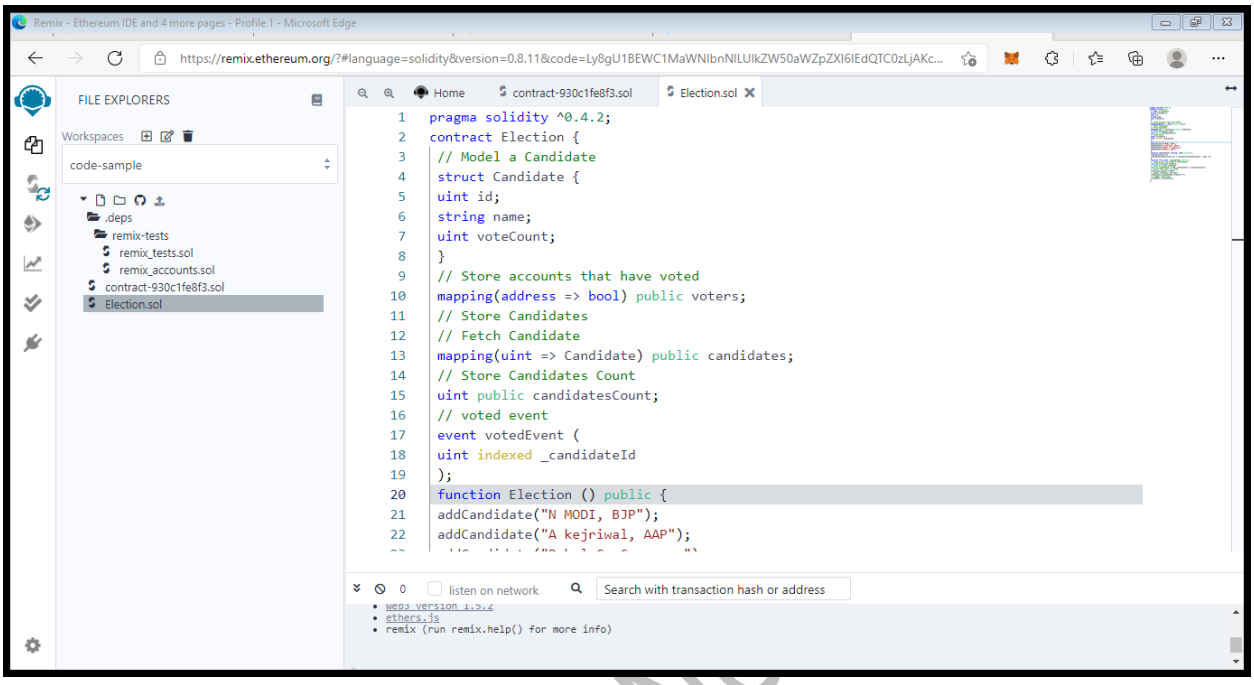
Ganache was successfully added.

STEP 3

On remix IDE Create Election.sol Contract.

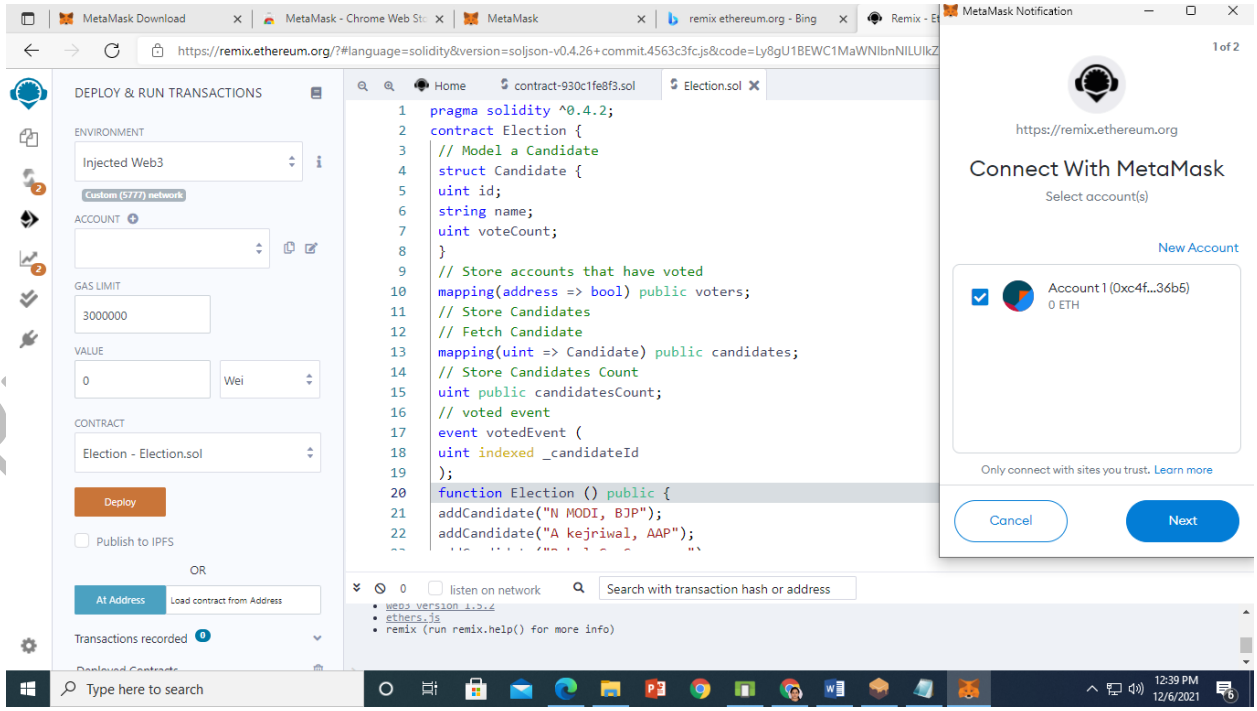
```
pragma solidity ^0.4.2;
contract Election {
 // Model a Candidate
 struct Candidate {
 uint id;
 string name;
 uint voteCount;
 }
 // Store accounts that have voted
 mapping(address => bool) public voters;
 // Store Candidates
 // Fetch Candidate
 mapping(uint => Candidate) public candidates;
 // Store Candidates Count
 uint public candidatesCount;
```

```
// voted event
event votedEvent (
uint indexed _candidateId
);
function Election () public {
addCandidate("N MODI, BJP");
addCandidate("A kejriwal, AAP");
addCandidate("Rahul G, Congress");
addCandidate("Nikhil, JDS");
}
function addCandidate (string _name) private {
candidatesCount ++;
candidates[candidatesCount] = Candidate(candidatesCount, _name, 0);
}
function vote (uint _candidateId) public {
// require that they haven't voted before
require(!voters[msg.sender]);
// require a valid candidate
require(_candidateId > 0 && _candidateId <= candidatesCount);
// record that voter has voted
voters[msg.sender] = true;
// update candidate vote Count
candidates[_candidateId].voteCount ++;
// trigger voted event
votedEvent(_candidateId);
}
}
```

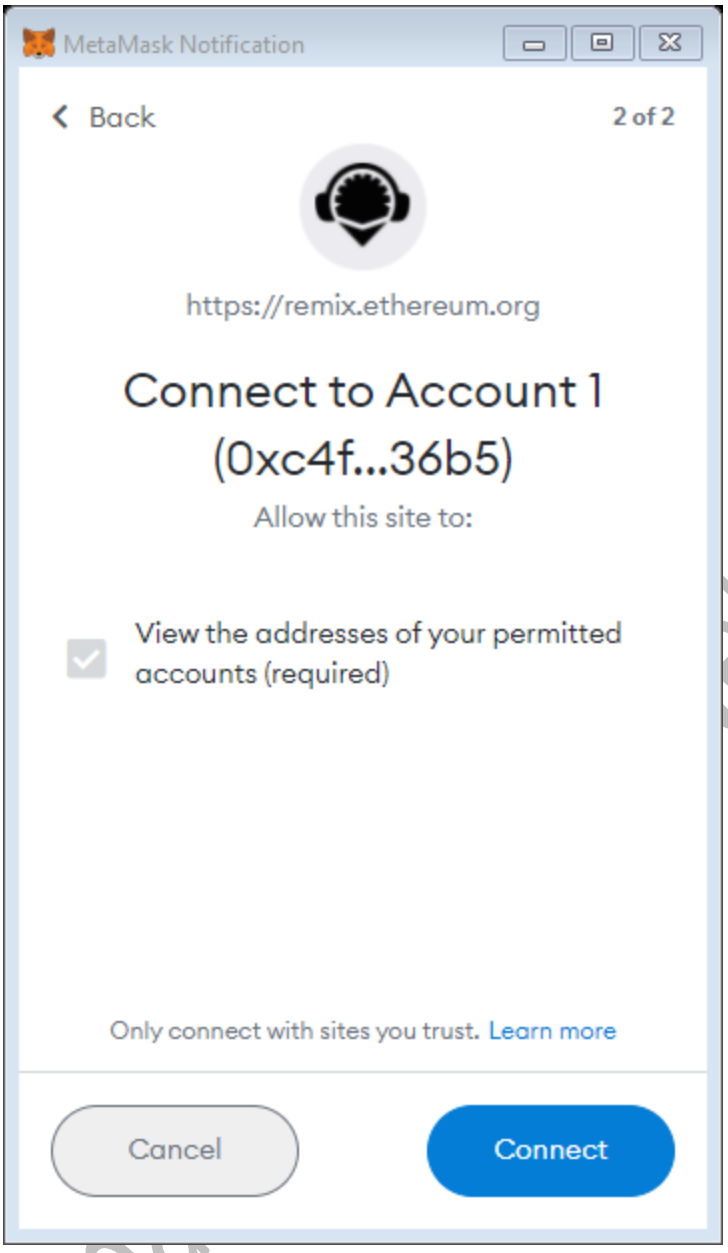


Compile the contract.

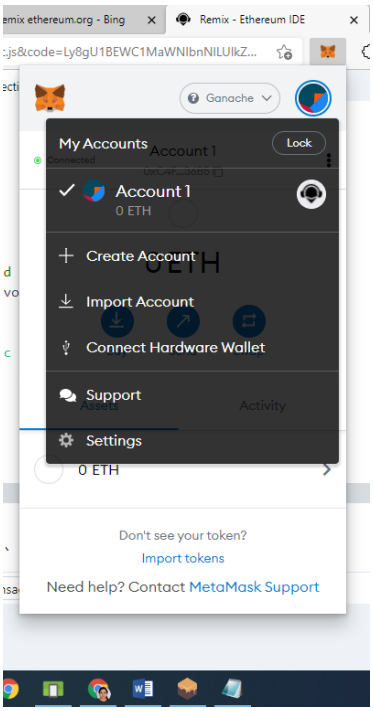
Now we will deploy the contract for that click on deploy. Then change environment and select Injected Web3. You will get following metamask window



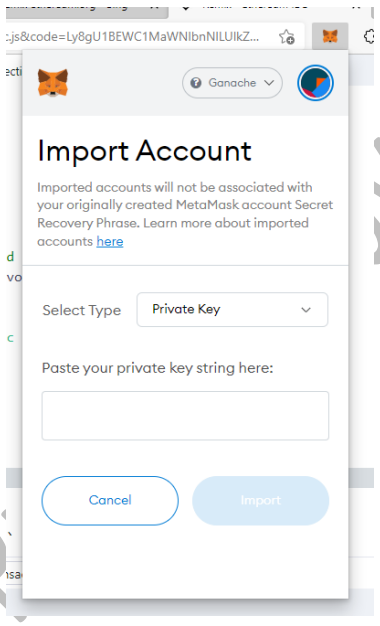
Click on next



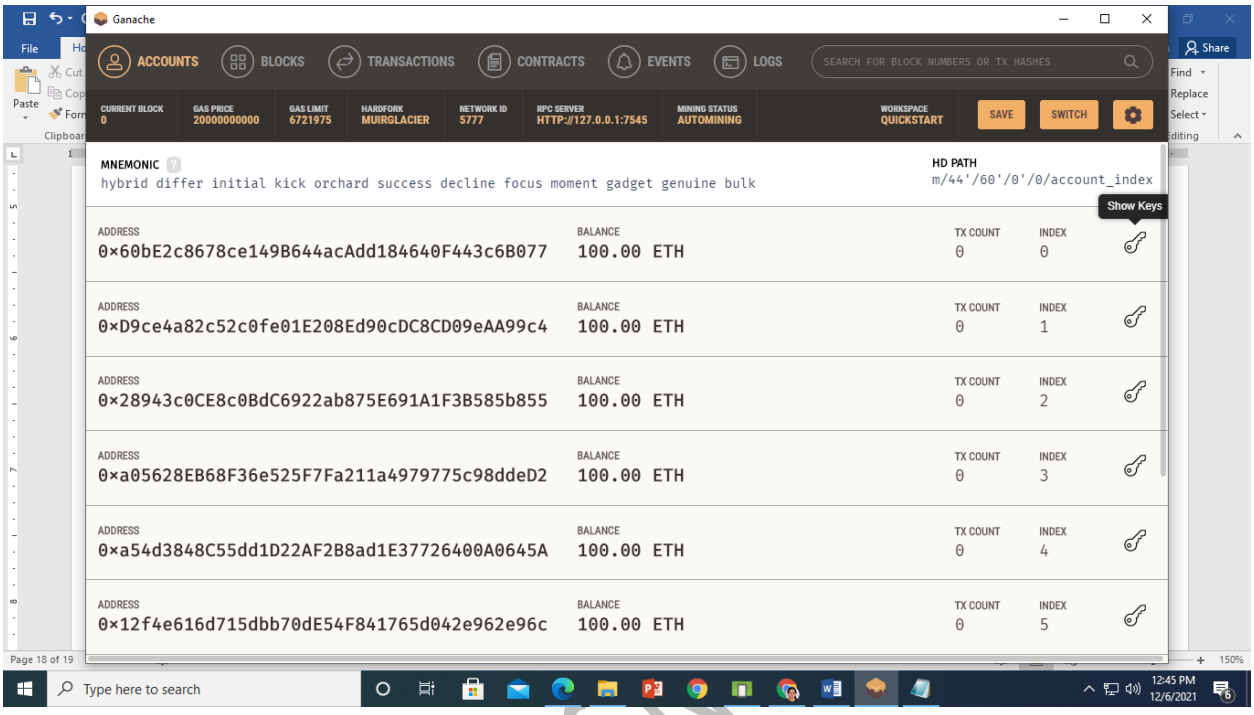
Click on connect

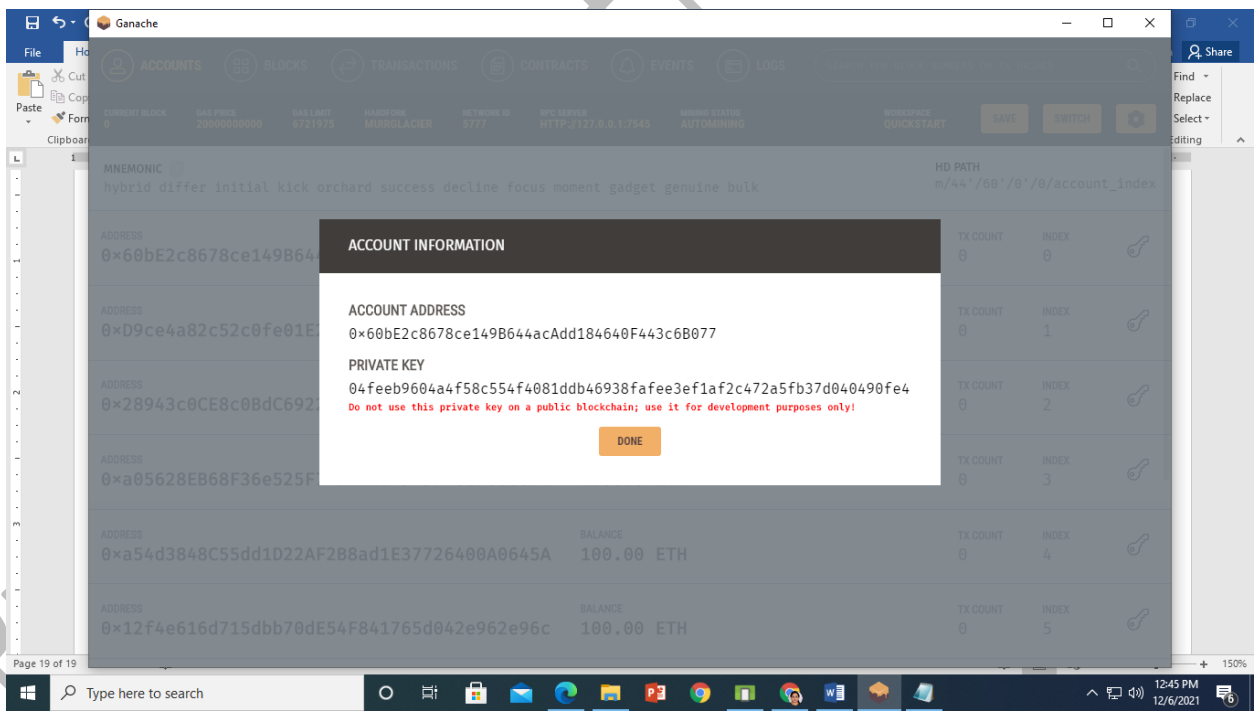


Click on Import Account (to import Ganache Account)

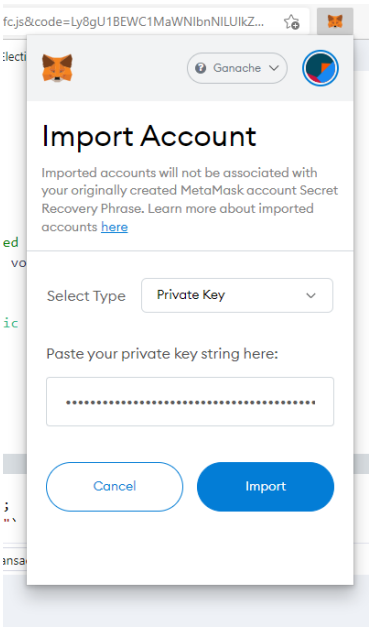


Now Maximize Ganache and click on key symbol of first account



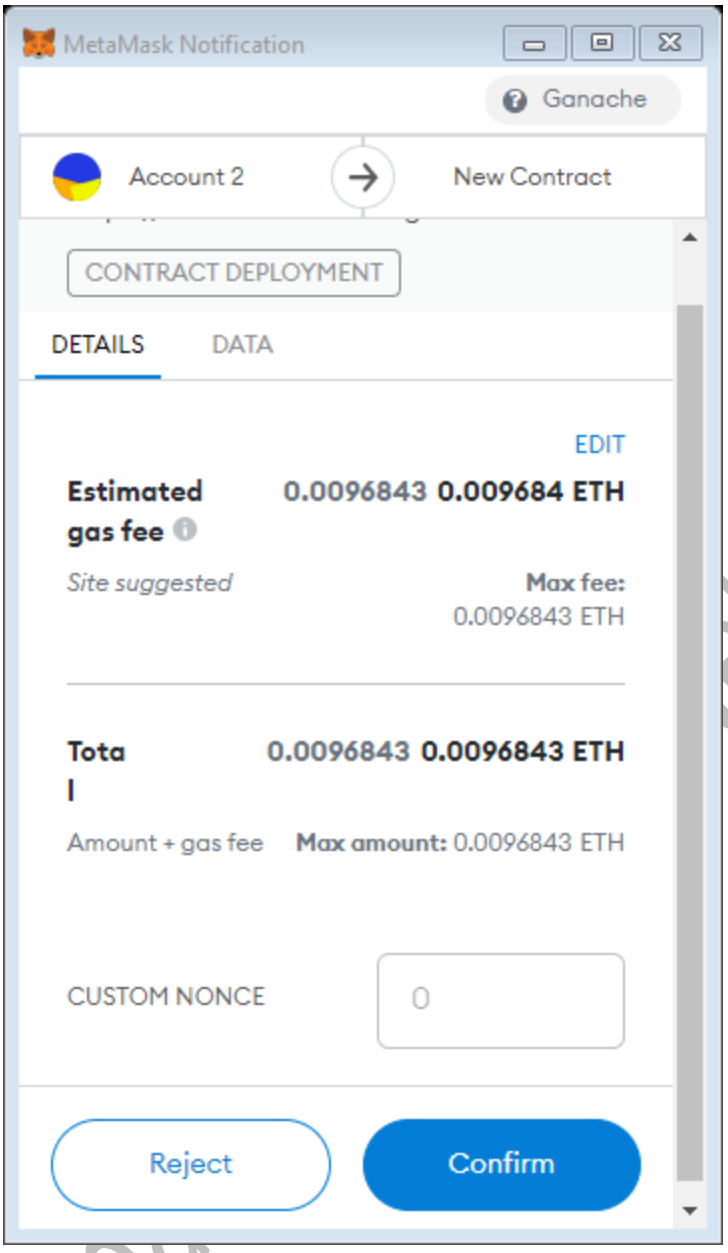


Copy Private Key n Paste it in metamask.

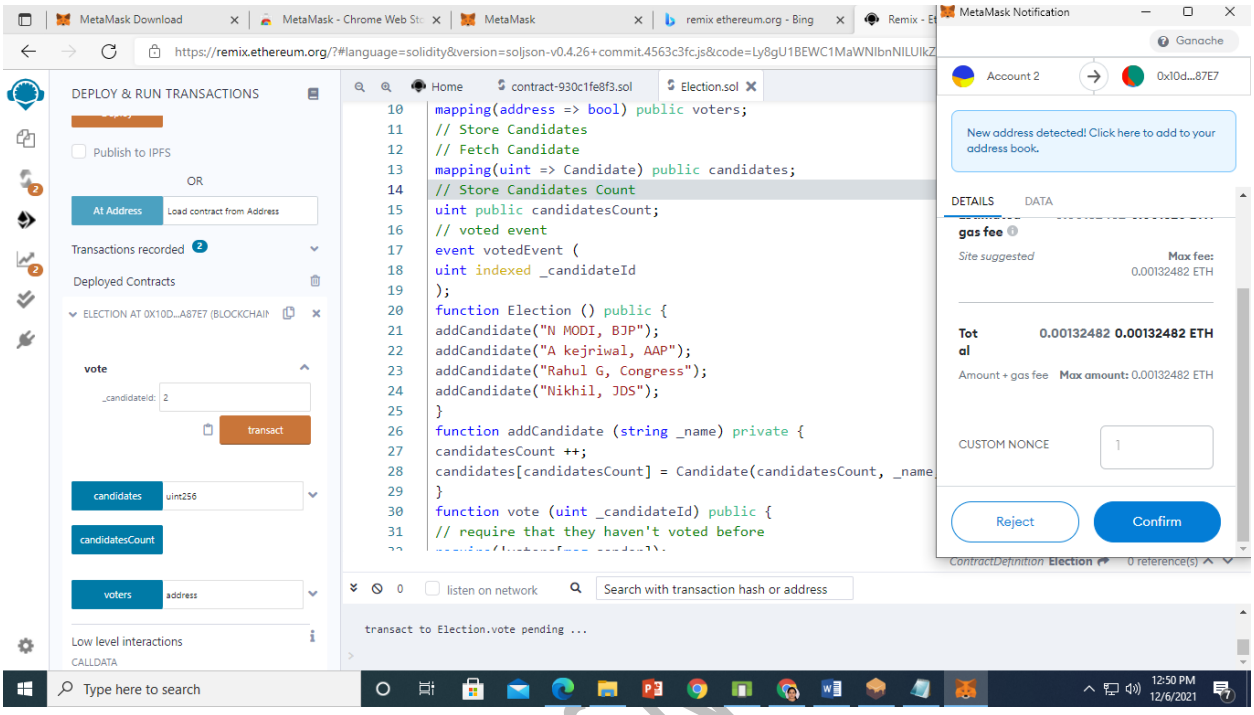


Now Click on Import.

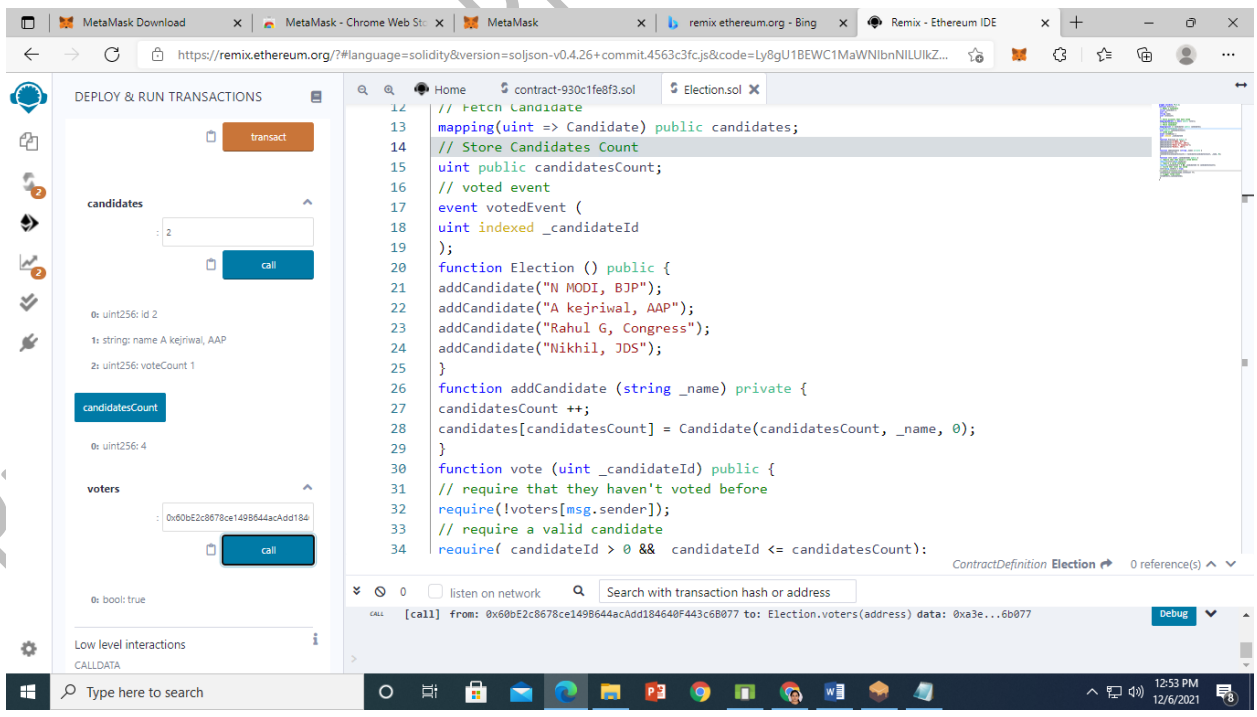
On Remix IDE now deploy the Election Contract.



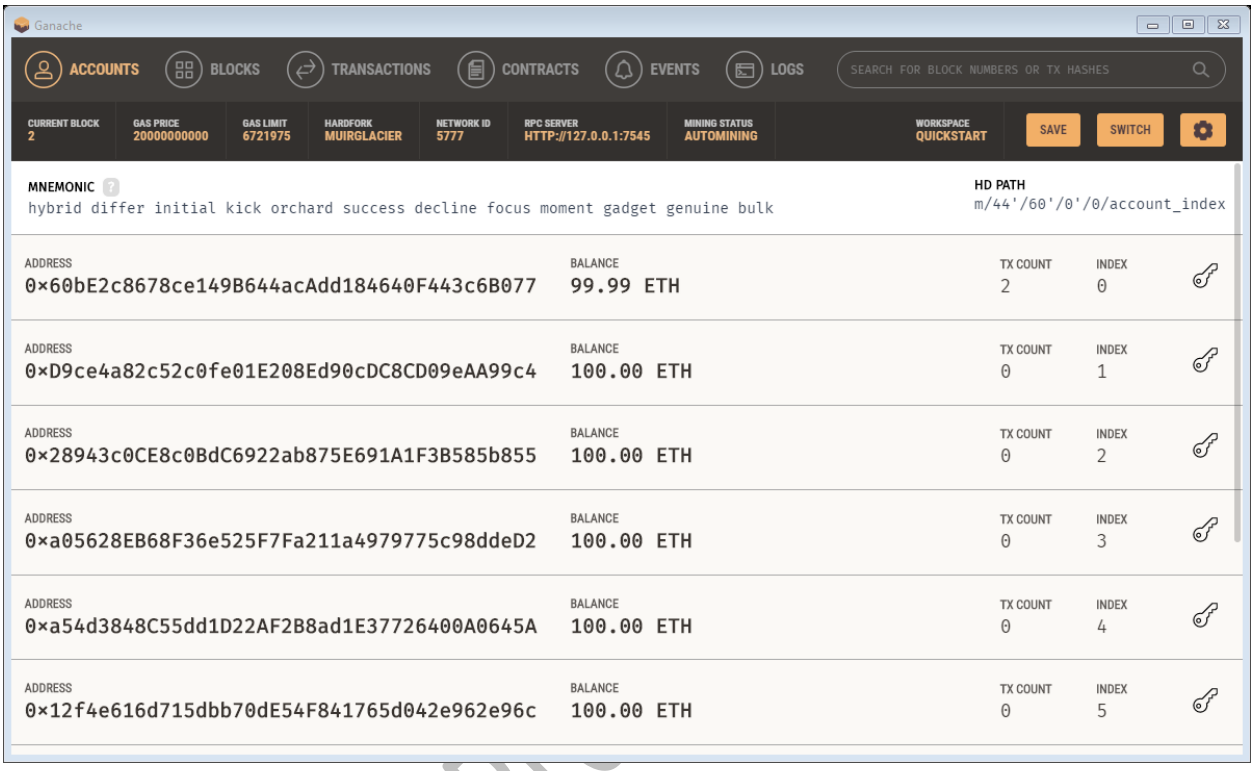
Click on confirm.

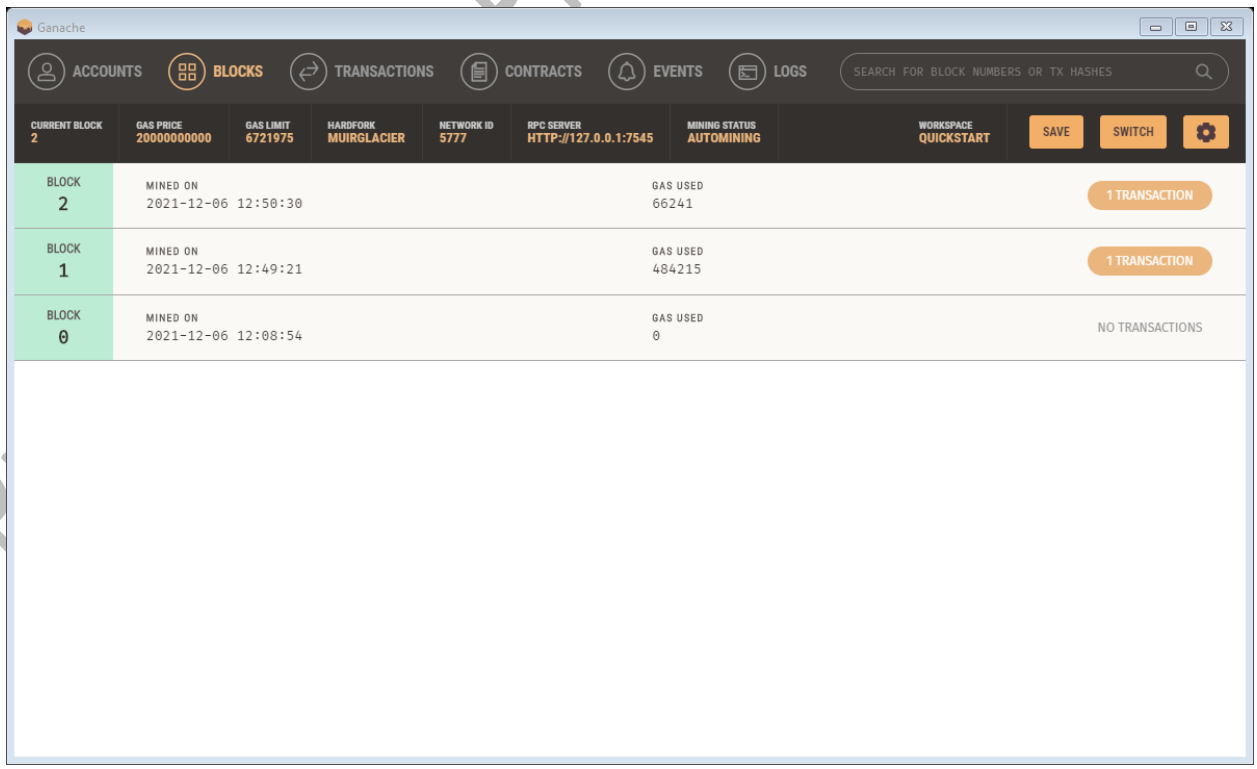


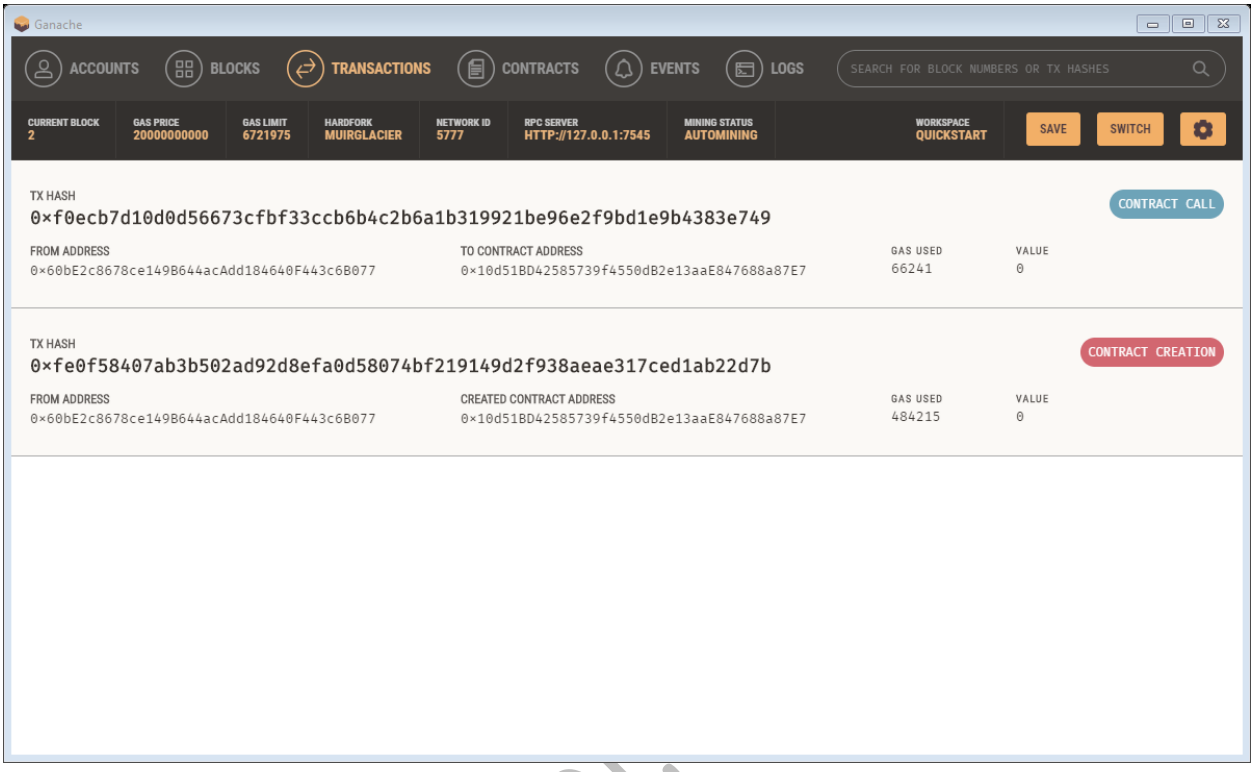
When you click on transact. Metamask window will ask for confirmation. So click on confirm.

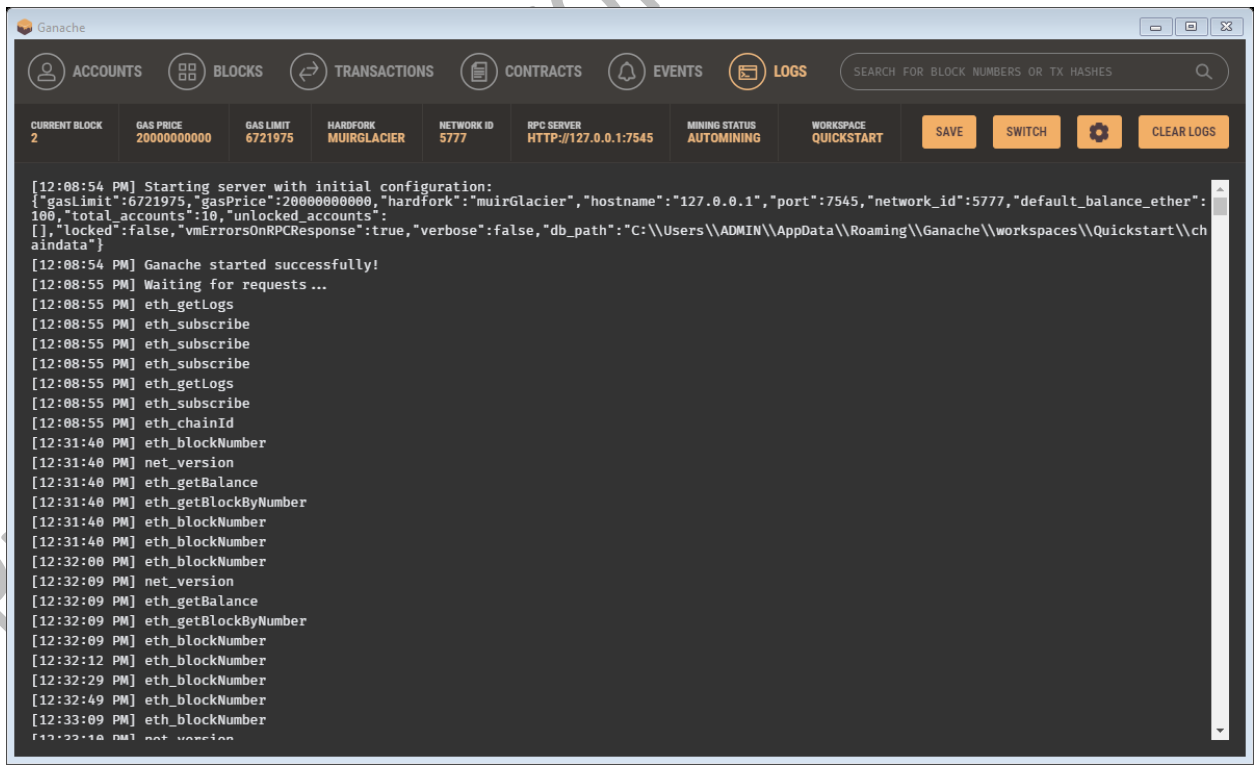


Now you can observe Ganache and Metamask






Ganache
ACCOUNTS
BLOCKS
TRANSACTIONS
CONTRACTS
EVENTS
LOGS
SEARCH FOR BLOCK NUMBERS OR TX HASHES
CURRENT BLOCK 2
GAS PRICE 20000000000
GAS LIMIT 6721975
HARDFORK MUIRGLACIER
NETWORK ID 5777
RPC SERVER HTTP://127.0.0.1:7545
MINING STATUS AUTOMINING
WORKSPACE QUICKSTART
SAVE
SWITCH
TX HASH
0×f0ecb7d10d0d56673cfbf33ccb6b4c2b6a1b319921be96e2f9bd1e9b4383e749
CONTRACT CALL
FROM ADDRESS
0×60bE2c8678ce149B644acAdd184640F443c6B077
TO CONTRACT ADDRESS
0×10d51BD42585739f4550dB2e13aaE847688a87E7
GAS USED
66241
VALUE
0
TX HASH
0×fe0f58407ab3b502ad92d8efa0d58074bf219149d2f938aeae317ced1ab22d7b
CONTRACT CREATION
FROM ADDRESS
0×60bE2c8678ce149B644acAdd184640F443c6B077
CREATED CONTRACT ADDRESS
0×10d51BD42585739f4550dB2e13aaE847688a87E7
GAS USED
484215
VALUE
0


Ganache
ACCOUNTS
BLOCKS
TRANSACTIONS
CONTRACTS
EVENTS
LOGS
SEARCH FOR BLOCK NUMBERS OR TX HASHES
CURRENT BLOCK 2
GAS PRICE 20000000000
GAS LIMIT 6721975
HARDFORK MUIRGLACIER
NETWORK ID 5777
RPC SERVER HTTP://127.0.0.1:7545
MINING STATUS AUTOMINING
WORKSPACE QUICKSTART
SAVE
SWITCH
CLEAR LOGS
[12:08:54 PM] Starting server with initial configuration:
{"gasLimit":6721975,"gasPrice":20000000000,"hardfork":"muirGlacier","hostname":"127.0.0.1","port":7545,"network_id":5777,"default_balance_ether":
100,"total_accounts":10,"unlocked_accounts":
[],"locked":false,"vmErrorsOnRPCResponse":true,"verbose":false,"db_path":"C:\\Users\\ADMIN\\AppData\\Roaming\\Ganache\\workspaces\\Quickstart\\ch
aindata"}
[12:08:54 PM] Ganache started successfully!
[12:08:55 PM] Waiting for requests...
[12:08:55 PM] eth_getLogs
[12:08:55 PM] eth_subscribe
[12:08:55 PM] eth_subscribe
[12:08:55 PM] eth_subscribe
[12:08:55 PM] eth_getLogs
[12:08:55 PM] eth_subscribe
[12:08:55 PM] eth_chainId
[12:31:40 PM] eth_blockNumber
[12:31:40 PM] net_version
[12:31:40 PM] eth_getBalance
[12:31:40 PM] eth_getBlockByNumber
[12:31:40 PM] eth_blockNumber
[12:31:40 PM] eth_blockNumber
[12:32:00 PM] eth_blockNumber
[12:32:09 PM] net_version
[12:32:09 PM] eth_getBalance
[12:32:09 PM] eth_getBlockByNumber
[12:32:09 PM] eth_blockNumber
[12:32:12 PM] eth_blockNumber
[12:32:29 PM] eth_blockNumber
[12:32:49 PM] eth_blockNumber
[12:33:09 PM] eth_blockNumber