

PATIENT DATA MANAGEMENT SYSTEM USING BLOCK CHAIN

Team Members:

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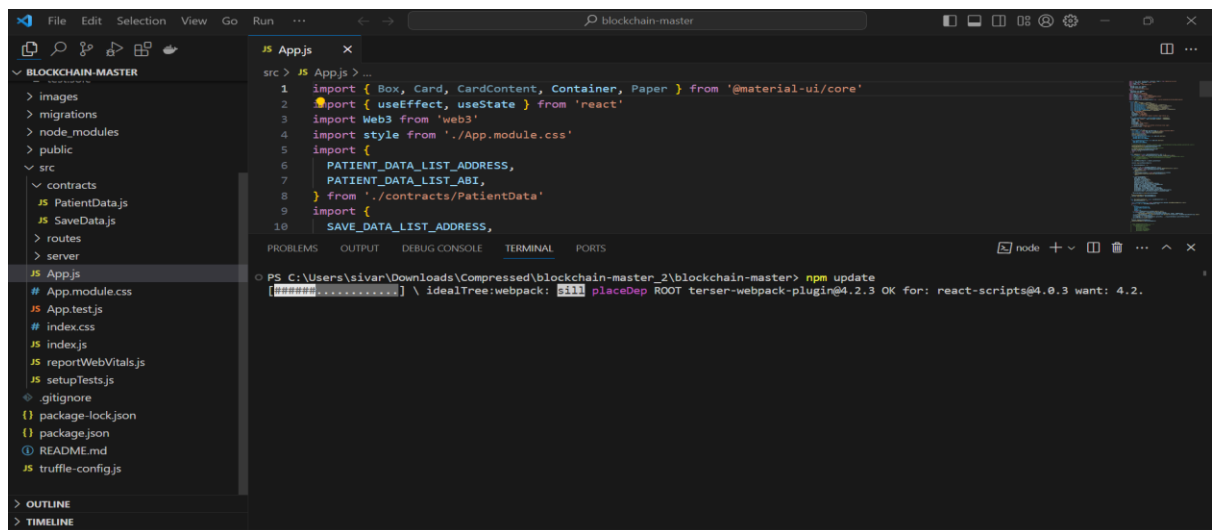
Harini Mukta---16343090

Install the following applications in your system.

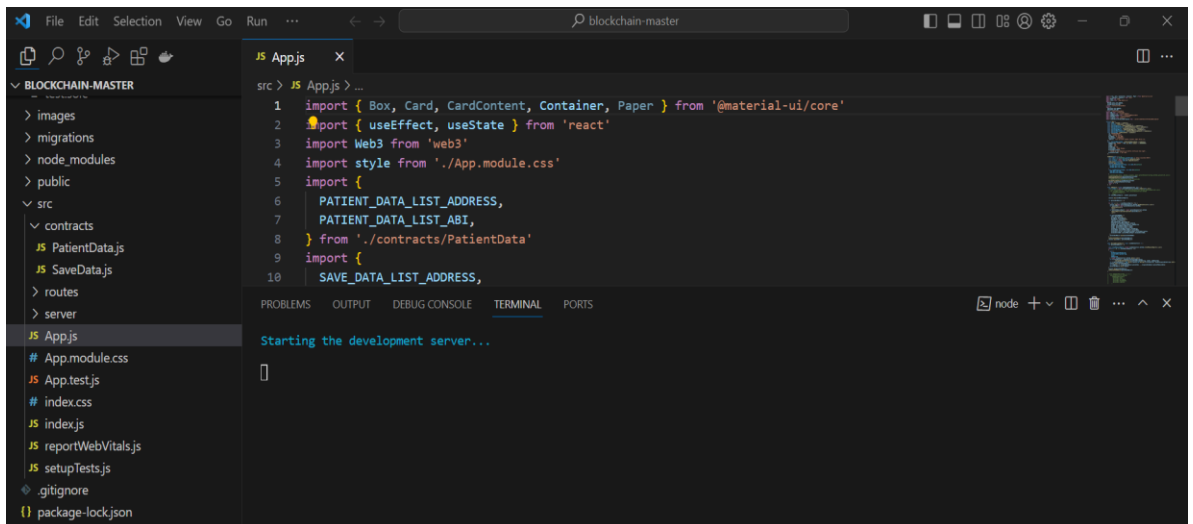
1. Ganache
2. MetaMask (Chrome Extension)
3. Node js or NVM
4. VS Code

To Run the project in the VS Code, use the below commands

1. npm install
2. npm run build
3. npm start (Then the server starts running)



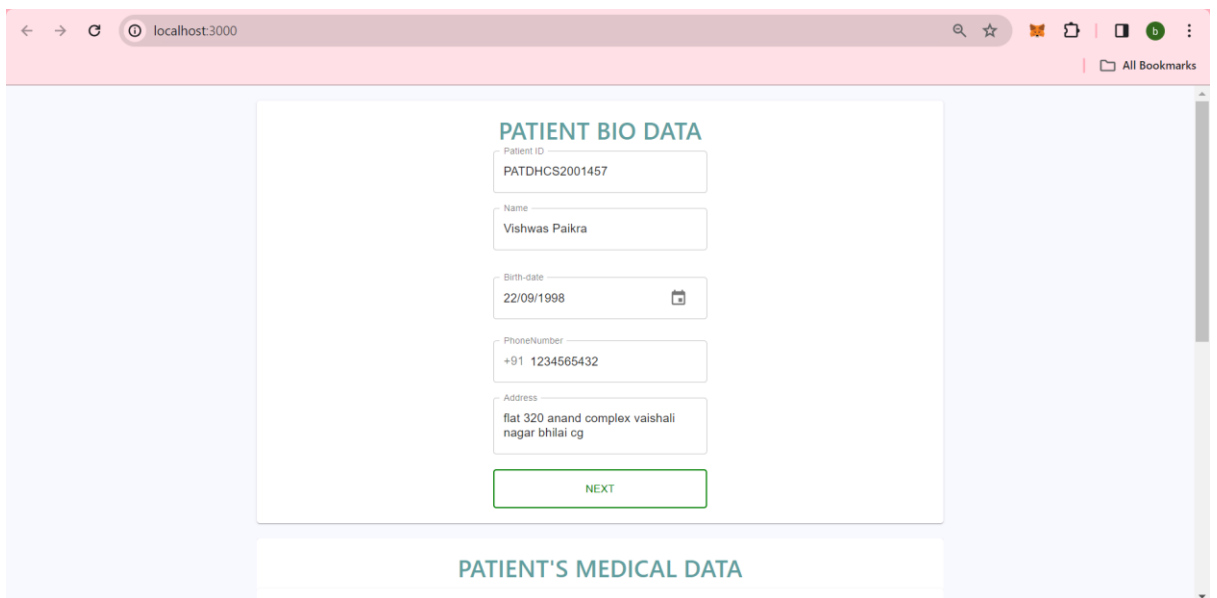
After you enter the npm start then starting the server development server and same you will observe in the Front-end. Please find the below screenshots



The screenshot shows a VS Code editor window with a file explorer on the left displaying the project structure of 'BLOCKCHAIN-MASTER'. The main editor area shows the 'App.js' file with the following code:

```
1 import { Box, Card, CardContent, Container, Paper } from '@material-ui/core'
2 import { useEffect, useState } from 'react'
3 import Web3 from 'web3'
4 import style from './App.module.css'
5 import {
6   PATIENT_DATA_LIST_ADDRESS,
7   PATIENT_DATA_LIST_ABI,
8 } from './contracts/PatientData'
9 import {
10   SAVE_DATA_LIST_ADDRESS,
```

The terminal at the bottom shows the command 'Starting the development server...' and an empty array '[]'.



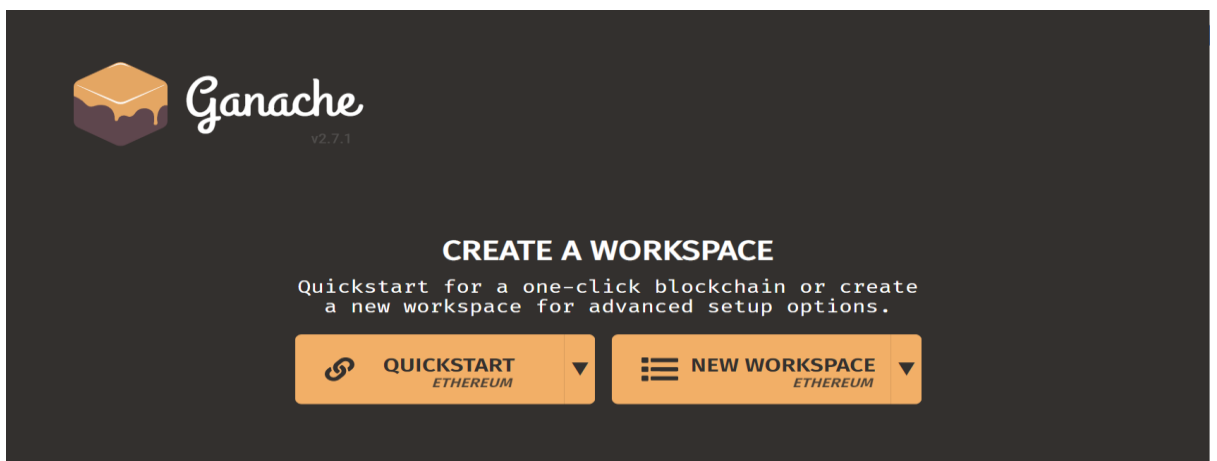
The screenshot shows a web browser window at 'localhost:3000' displaying a form titled 'PATIENT BIO DATA'. The form contains the following fields:

- Patient ID: PATDHCS2001457
- Name: Vishwas Paikra
- Birth-date: 22/09/1998
- PhoneNumber: +91 1234565432
- Address: flat 320 anand complex vaishali nagar bhilai cg

A 'NEXT' button is located at the bottom of the form. Below the form, the text 'PATIENT'S MEDICAL DATA' is visible.

Deploy the Contracts on the Blockchain Network

Open Ganache and select quick start



ACCOUNTS

BLOCKS

TRANSACTIONS

CONTRACTS

EVENTS

LOGS

SEARCH FOR BLOCK NUMBERS OR TX HASHES

CURRENT BLOCK0

GAS PRICE20000000000

GAS LIMIT6721975

HARDFORKMERGE

NETWORK ID5777

RPC SERVERHTTP://127.0.0.1:7545

MINING STATUSAUTOMINING

WORKSPACEQUICKSTART

SAVE

SWITCH

MNEMONIC ⓘ

blouse senior fan valley rural thrive cereal round year eternal admit smoke

HD PATH

m44'60'0'0account_index

ADDRESS

0xF36F807008Fb1169db3cdE68cf459d9968EEf932

BALANCE

100.00 ETH

TX COUNT

0

INDEX

0

ADDRESS

0xB7e9b0eFb5ADE3a57928a6C684E0bc1b6e65dFAC

BALANCE

100.00 ETH

TX COUNT

0

INDEX

1

ADDRESS

0x43b3cc76f76cdae7F8855878f629CcA927428E67

BALANCE

100.00 ETH

TX COUNT

0

INDEX

2

ADDRESS

0x6B4bC285b74F4DF0431c0b11f8cA798031Dc2D60

BALANCE

100.00 ETH

TX COUNT

0

INDEX

3

Make sure you have truffle installed

Use the link to install truffle <https://www.npmjs.com/package/truffle>

Use the command to install the Truffle - npm install -g truffle

```
C:\Users\sivar>npm install -g truffle
npm WARN deprecated testrpc@0.0.1: testrpc has been renamed to ganache-cli, please use this package instead
npm WARN deprecated mkdirp-promise@5.0.1: This package is broken and no longer maintained. 'mkdirp' works now, please switch to that.
npm WARN deprecated har-validator@5.1.5: this library is no longer supported
npm WARN deprecated apollo-datasource@3.3.2: The 'apollo-datasource' package is part of Apollo Server v1 and v2, which are no longer supported. Please use @apollo/server and @apollo/utils-logger instead.
```

```
C:\Users\sivar>truffle -v
Truffle v5.11.5 (core: 5.11.5)
Ganache v7.9.1
Solidity v0.5.16 (solc-js)
Node v18.18.2
Web3.js v1.10.0
```

Once the truffle is installed – then deploy the smart contracts using the command truffle migrate

```
PS C:\Users\sivar\Downloads\Compressed\blockchain-master_2\blockchain-master> truffle migrate

Compiling your contracts...
> Compiling ./contracts/Migrations.sol
> Compiling ./contracts/PatientData.sol
> Compiling ./contracts/SaveData.sol
> Artifacts written to C:\Users\sivar\Downloads\Compressed\blockchain-master_2\blockchain-master\build\contracts
> Compiled successfully using:
   - solc: 0.5.16+commit.9c3226ce.Emscripten.clang

Starting migrations...
=====
> Network name: 'development'
> Network id: 5777
> Block gas limit: 6721975 (0x6691b7)

1_initial_migration.js
```

```
File Edit Selection View Go Run ... blockchain-master
BLOCKCHAIN-MASTER
  > images
  > migrations
  > node_modules
  > public
  > src
  > contracts
    > PatientData.js
    > SaveData.js
  > routes
  > server
  > App.js
  > App.module.css
  > App.test.js
  > index.css
  > index.js
  > reportWebVitals.js
  > setupTests.js
  > .gitignore
  > package-lock.json
  > package.json
  > README.md
  > truffle-config.js
  > OUTLINE
  > TIMELINE

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
> Blocks: 0
> contract address: 0xb3ec230d95797a5564ef38148f3e1c87435388af
> block number: 3
> block timestamp: 1701391489
> account: 0xf36f80708fb1169db3cd68cf459d9968EEf932
> balance: 99.99389971960835717
> gas used: 1693498 (0x19d73a)
> gas price: 3.17606086 gwei
> value sent: 0 ETH
> total cost: 0.00537865271428828 ETH

Replacing 'SaveData'
-----
> transaction hash: 0xb49578be89b8c6a9e5901c052e773fb53436fab33fe828ce5f770d18bed6b1f6
> Blocks: 0
> contract address: 0xb8650609a9af6403577111ef7d0ccc041008b6
> block number: 4
> block timestamp: 1701391489
> account: 0xf36f80708fb1169db3cd68cf459d9968EEf932
> balance: 99.992471074409257811
> gas used: 455787 (0x6f46b)
> gas price: 3.134134038 gwei
> value sent: 0 ETH
> total cost: 0.001428497550777906 ETH

> Saving migration to chain.
> Saving artifacts
-----
> Total cost: 0.006807150265066186 ETH

Summary
=====
> Total deployments: 3
> Final cost: 0.007379508015066186 ETH
```

```
File Edit Selection View Go Run ... blockchain-master
BLOCKCHAIN-MASTER
  > images
  > migrations
  > node_modules
  > public
  > src
  > contracts
    > PatientData.js
    > SaveData.js
  > routes
  > server
  > App.js
  > App.module.css
  > App.test.js
  > index.css
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  > .gitignore
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  > package.json
  > README.md
  > truffle-config.js
  > OUTLINE
  > TIMELINE

src > contracts > PatientData.js
1 export const PATIENT_DATA_LIST_ADDRESS = "0xb3ec230d95797a5564ef38148f3e1c87435388af"
2 export const PATIENT_DATA_LIST_ABI = [
3   {
4     "constant": true,
5     "inputs": [],
6     "name": "countMedicalReports",
7     "outputs": [
8       {
9         "name": "",
10        "type": "uint256"
11      }
12    ],
13    "payable": false,
14    "stateMutability": "view",
15    "type": "function",
16    "signature": "0x360df29"
17  }
18 ]

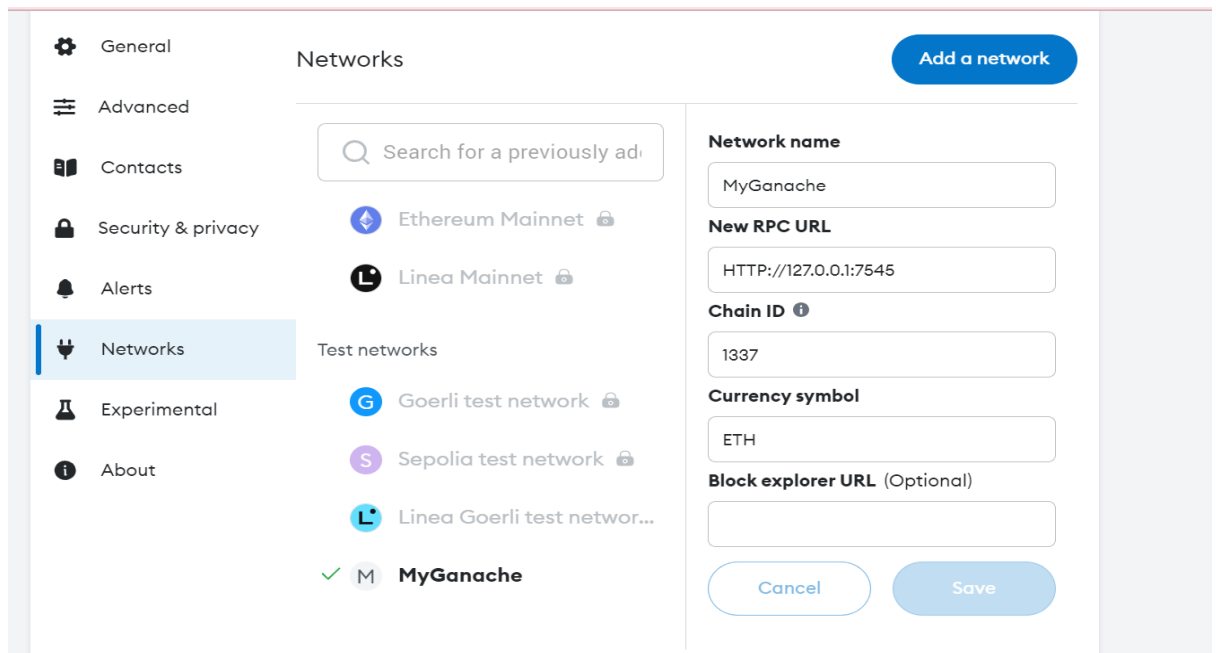
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
2_deploy_contracts.js
=====
Replacing 'PatientData'
-----
> transaction hash: 0xbcf1ef161ddb0891d5669b20d1d8da248107521690a63864279af72262df5e8
> Blocks: 0
> contract address: 0xb3ec230d95797a5564ef38148f3e1c87435388af
> block number: 3
> block timestamp: 1701391489
> account: 0xf36f80708fb1169db3cd68cf459d9968EEf932
```

```
File Edit Selection View Go Run ... blockchain-master
BLOCKCHAIN-MASTER
  > images
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  > TIMELINE

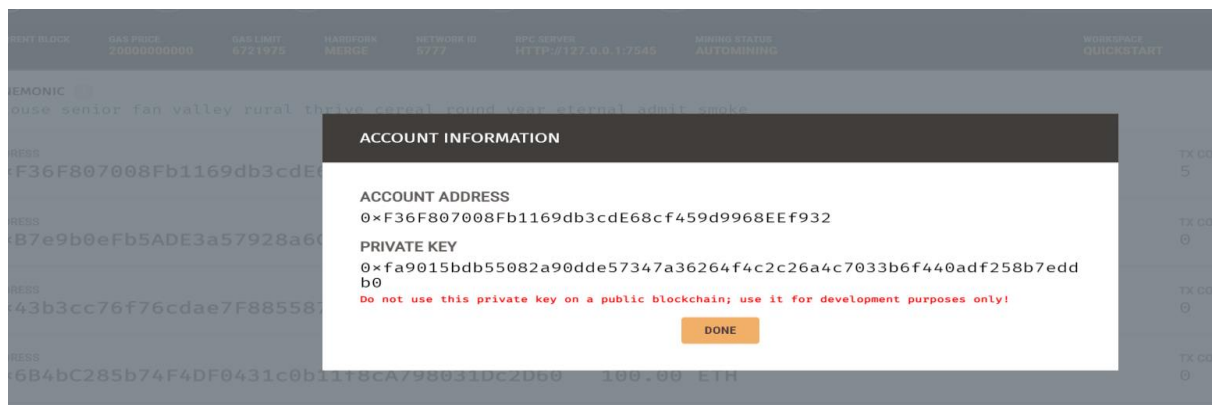
src > contracts > SaveData.js
1 export const SAVE_DATA_LIST_ADDRESS = "0xb8650609a9af6403577111ef7d0ccc041008b6"
2 export const SAVE_DATA_LIST_ABI = [
3   {
4     "constant": true,
5     "inputs": [
6       {
7         "name": "",
8         "type": "address"
9       }
10    ],
11    "name": "senders",
12    "outputs": [
13      {
14        "name": "totalMedicalReports",
15        "type": "uint256"
16      }
17    ]
18  }
19 ]

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
Replacing 'SaveData'
-----
> transaction hash: 0xb49578be89b8c6a9e5901c052e773fb53436fab33fe828ce5f770d18bed6b1f6
> Blocks: 0
> contract address: 0xb8650609a9af6403577111ef7d0ccc041008b6
> block number: 4
> block timestamp: 1701391489
> account: 0xf36f80708fb1169db3cd68cf459d9968EEf932
> balance: 99.992471074409257811
> gas used: 455787 (0x6f46b)
> gas price: 3.134134038 gwei
```

Create an account in MetaMask



copy one of the private key present in Ganache app



Import the private key in the metamask to create account and change not connected to connected

PATIENT BIO DATA

Patient ID

PATDHCS2001457

Name

Vishwas Paikra

Birth-date

22/09/1998

PhoneNumber

+91 1234565432

Address

flat 320 anand complex vaishali
nagar bhilai cg

NEXT

Import account

< X

Imported accounts won't be associated with your MetaMask Secret Recovery Phrase. Learn more about imported accounts [here](#)

Select Type Private Key ▾

Enter your private key string here:

.....

Cancel Import

M Contract i... -O ETH
Confirmed -O ETH

M Contract i... -O ETH
Confirmed -O ETH

M Contract i... -O ETH

Patient ID PATDHCS2001457

Name _____
Vishwas Paikra

Birth-date 22/09/1998

PhoneNumber +91 1234565432

Address _____
flat 320 anand complex vaishali
nagar bhilai cg

NEXT

PATIENT'S MEDICAL D

localhost 8545

○ Not connected

Account 5

0x4fD...63A0

100 ETH

Buy

Send

Swap

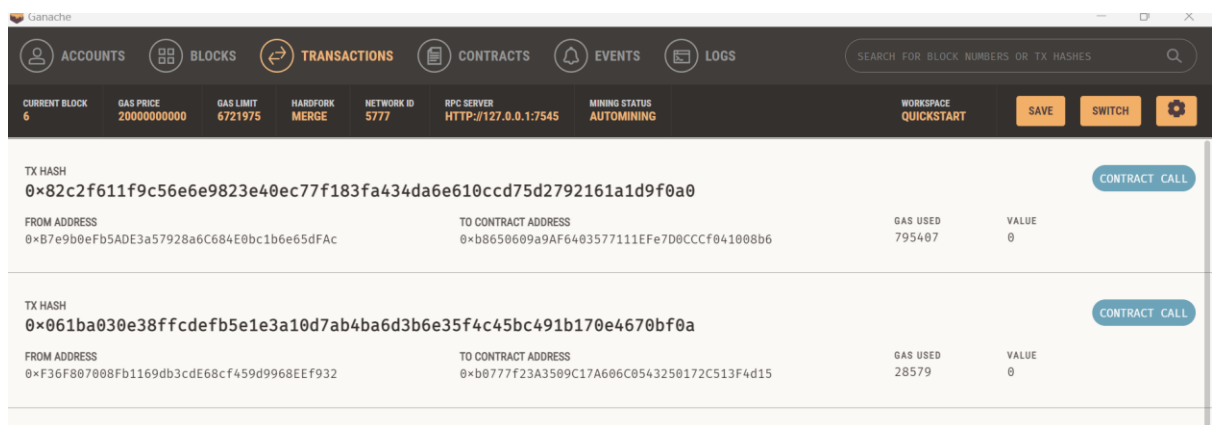
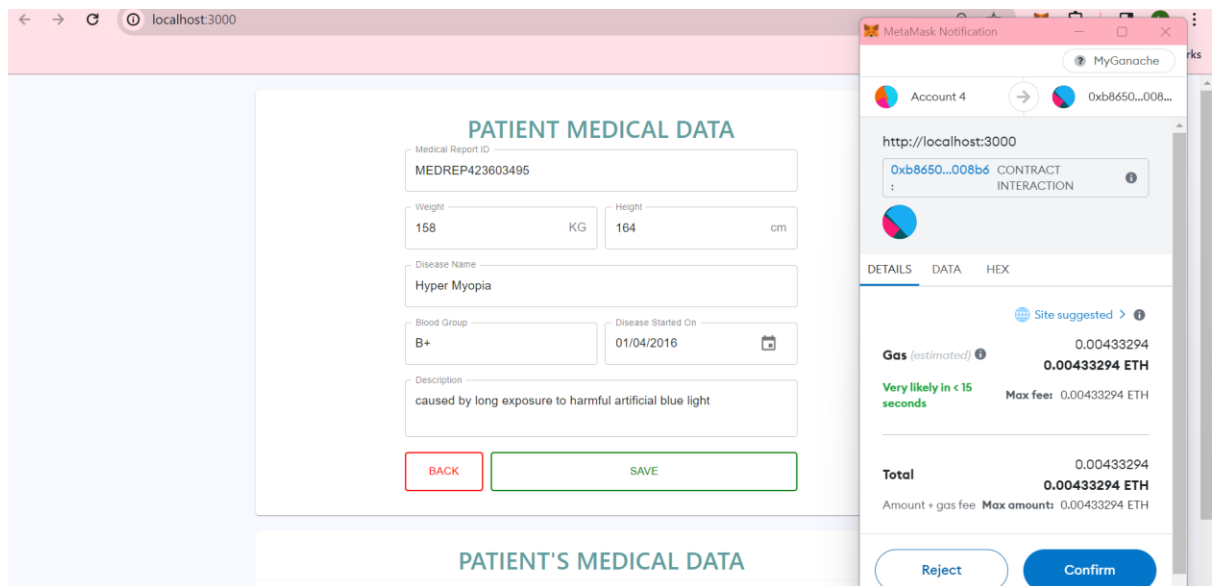
Assets

Activity

You have no transactions

Need help? Contact [MetaMask Support](#)

Once you enter the data from the front-end then MetaMask will interact with ganache (smart contract) and you have to confirm on that transaction.



Sno.	Name	Birth Date	Phone Number	Address	weight	height	blood Group	Disease Name	Disease Description
1	Vishwas Paikra	22/9/1998 25yrs	1234565432	flat 320 anand complex vaishali nagar bhilai cg	158	164	B+	Hyper Myopia	caused by long exposure to harmful artificial blue light

Conclusion:

We know that the data in blockchain is immutable i.e once the data is written in the blockchain it cannot be deleted and anybody have access to the blockchain network

can access the any data present inside the blockchain which is a major issue with blockchain especially if we want to create a database in the blockchain which needs to be deleted once its work is over or if any user wants its data to be removed from the database or if you don't want to share your data with everyone or you want to share your data with the selected few. So in order to achieve a little privacy inside the blockchain we created this method where the original data is encrypted twice first locally and then in the Third party system. And when we send the data to the blockchain the data is in encrypted form so it means that if somebody tries to look inside the blockchain to steal the data for fault reasons it will be useless as the person will not be able to understand this data. In case if a user would one day wish its data to be deleted from the blockchain it can be apparently done by deleting all the keys associated with the data in order to decrypt the data. It means that the key of the encrypted data present in the Third-Party System's database associated with its respective owner will simply be deleted. Once the key is deleted the encrypted data is nothing more than random bits which are totally useless and cannot be utilized in any shape or form. This is how our method works to achieve privacy within blockchain.

PATIENT'S MEDICAL DATA										
Sno.	Name	Birth Date	Phone Number	Address	weight	height	blood Group	Disease Name	Disease Description	Disease StartedOn
1	Vishwas Paikra	19/01/1997 22yrs	1234565432	flat 320 anand complex vaishali nagar bhilai cg	158	164	B+	Hyper Myopia	caused by long exposure to harmful artificial blue light	1/4/2016 5yrs
2	AJAY AGARKAR	19/01/1997 22yrs	1234565432	flat 320 anand complex vaishali nagar bhilai cg	158	164	B+	Hyper Myopia	caused by long exposure to harmful artificial light	
3	Rajesh Arrora	19/01/1997 22yrs	1234565432	flat 720 vihar society smriti nagar bhilai cg	180	174	B+	dyslexia	caused	

1 time encrypted data is decrypted back locally with the key of first encryption fetched from the blockchain

