Implementation:

Uploading Data to Blockchain:

1. The system is designed in such a way that there is an operator interacting with the system to upload and retrieve the data of patients.

2. A Meta-Mask wallet has to be opened by the operator and it should contain the test ether if using the testnet or real ether if using the main chain.

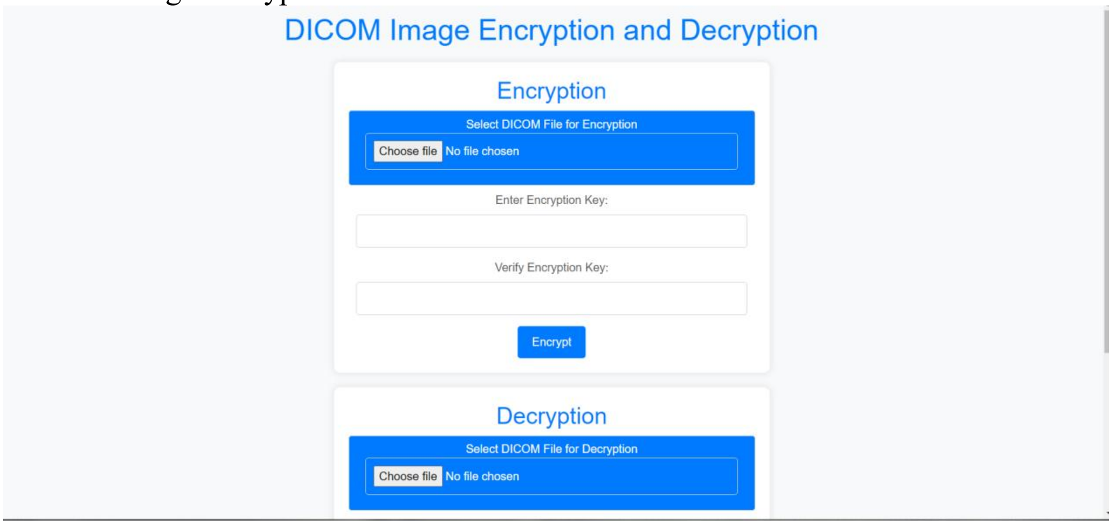
3. When a new patient comes in an unique identification number for the patient is made with the last 4 digits of his/her Aadhar along with the data and time at which the patient came in for the first visit. This serves as their unique id forever.

Here the last 4 digits of aadhar are 1088 and the date and time of patient's first visit is 26-11-23 at 11:33 (time taken in 24 hour format)

So the patients unique id is "*10882611231113*" this will be his id for the rest of his visits and this is made so that the identity of the patient is kept confidential.

4. Now the operator will take the patients DICOM images if any and encrypt them using the DICOM Encryption module with a key of the patient's choice and will be kept as secret by the patient.

DICOM image Encryption:



DICOM Image Encryption and Decryption

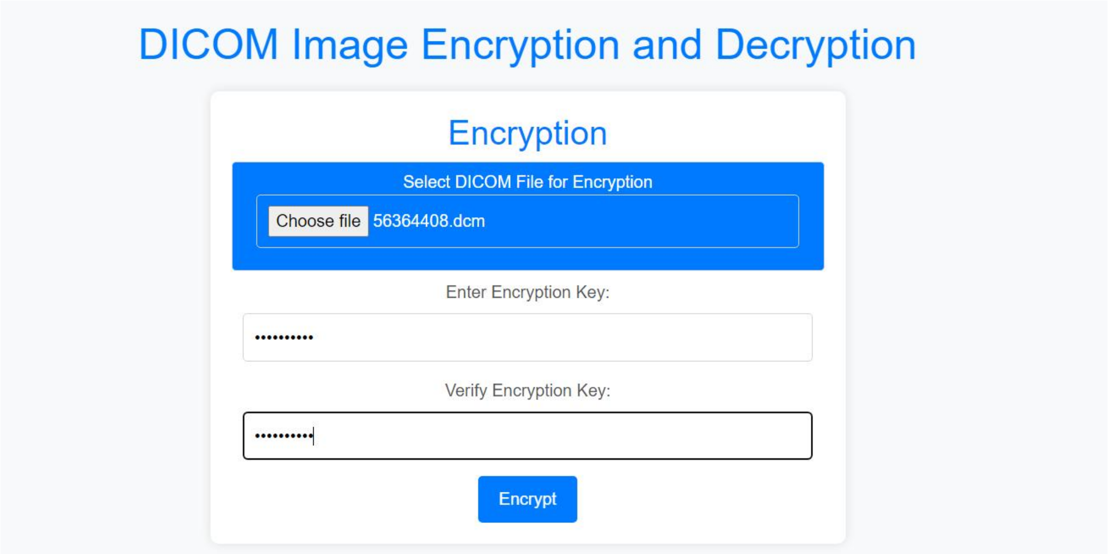
Encryption

Select DICOM File for Encryption

Decryption

Select DICOM File for Decryption

A file will be chosen and uploaded to the website then the encryption key is given by the patient to encrypt the file.


DICOM Image Encryption and Decryption

Encryption

Select DICOM File for Encryption

Choose file 56364408.dcm

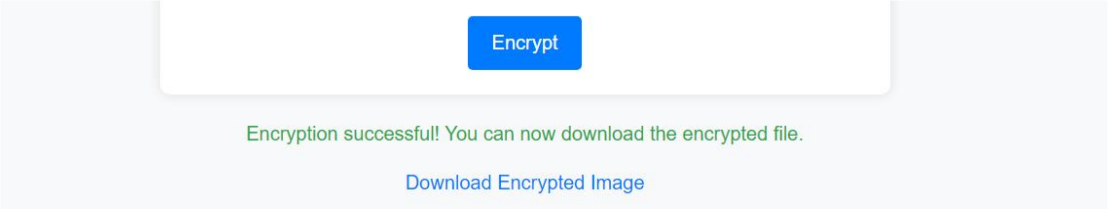
Enter Encryption Key:

••••••••••

Verify Encryption Key:

••••••••••

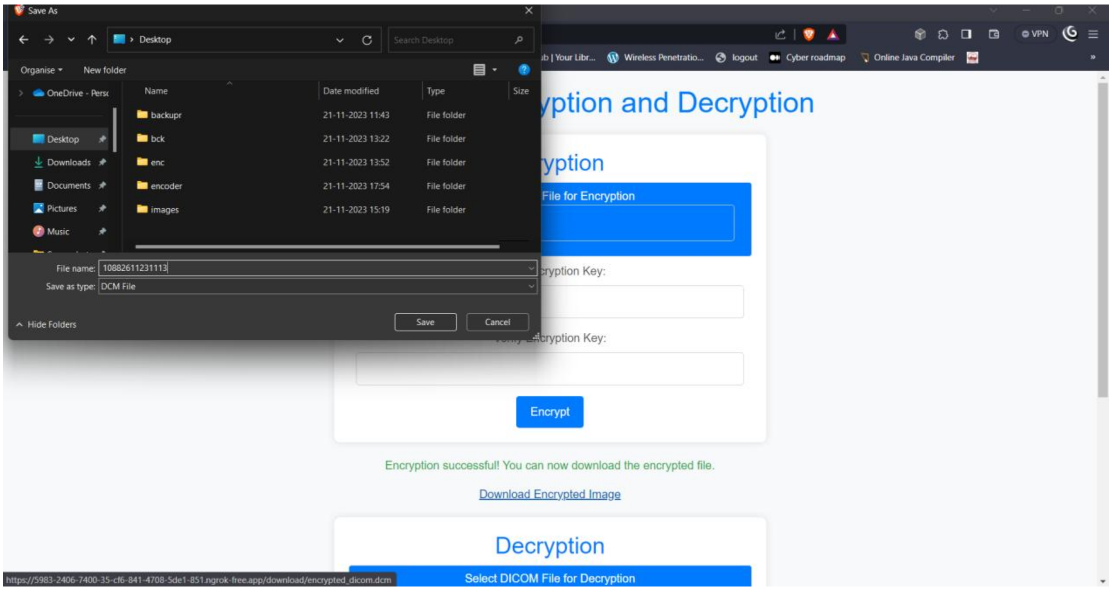
Once the image is encrypted, we get the link to download the encrypted image.



Encryption successful! You can now download the encrypted file.

Download Encrypted Image

We save the image with the unique id of the patient to the system.


Save As

Desktop

Name	Date modified	Type	Size
backupr	21-11-2023 11:43	File folder	
bck	21-11-2023 13:22	File folder	
enc	21-11-2023 13:52	File folder	
encoder	21-11-2023 17:54	File folder	
images	21-11-2023 15:19	File folder	

File name: 10882611231113

Save as type: DCM File

ption and Decryption

yption

File for Encryption

cryption Key:

cryption Key:

Encryption successful! You can now download the encrypted file.

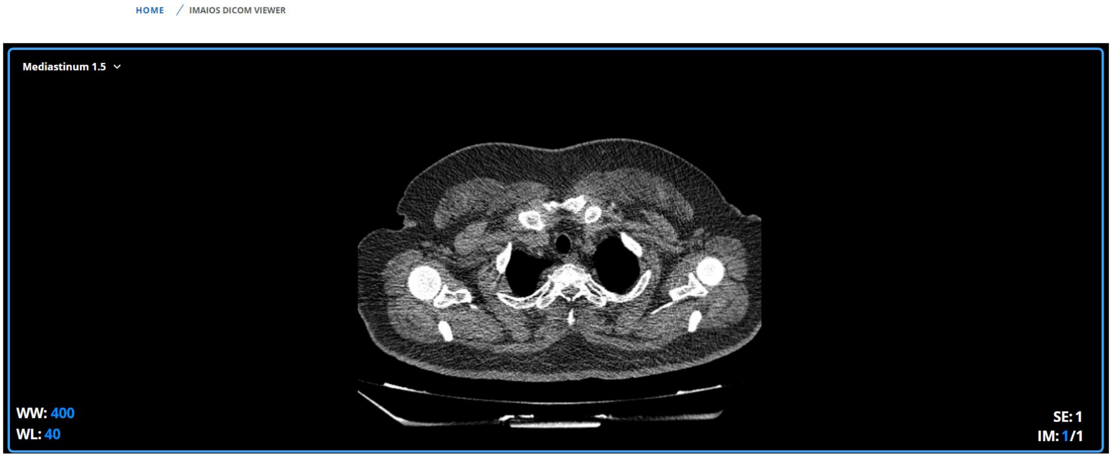
Download Encrypted Image

Decryption

Select DICOM File for Decryption

https://5983-2406-7400-35-cf6-841-4708-5de1-851.ngrok-free.app/download/encrypted_dicom.dcm

Dicom image before encryption.

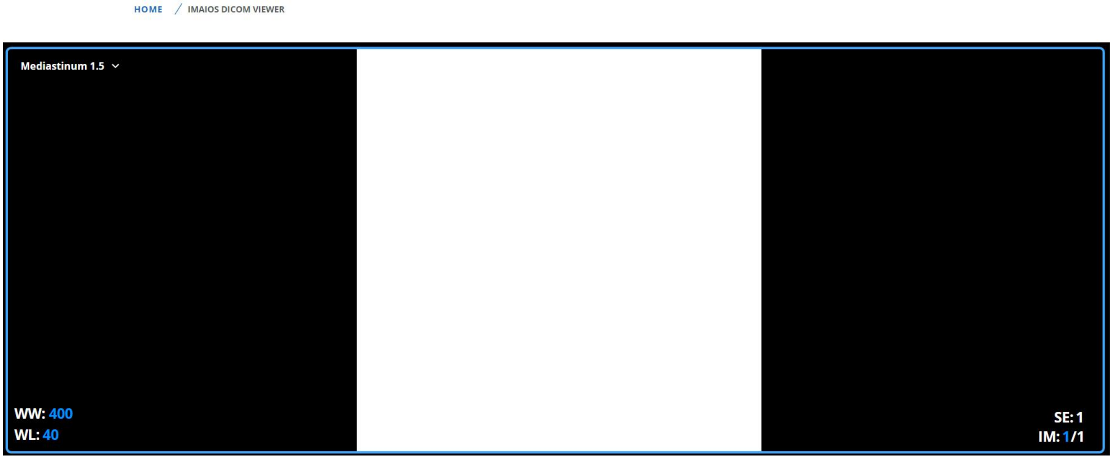

HOME / IMAIOS DICOM VIEWER

Mediastinum 1.5

WW: 400
WL: 40

SE: 1
IM: 1/1

Dicom image after encryption.


HOME / IMAIOS DICOM VIEWER

Mediastinum 1.5

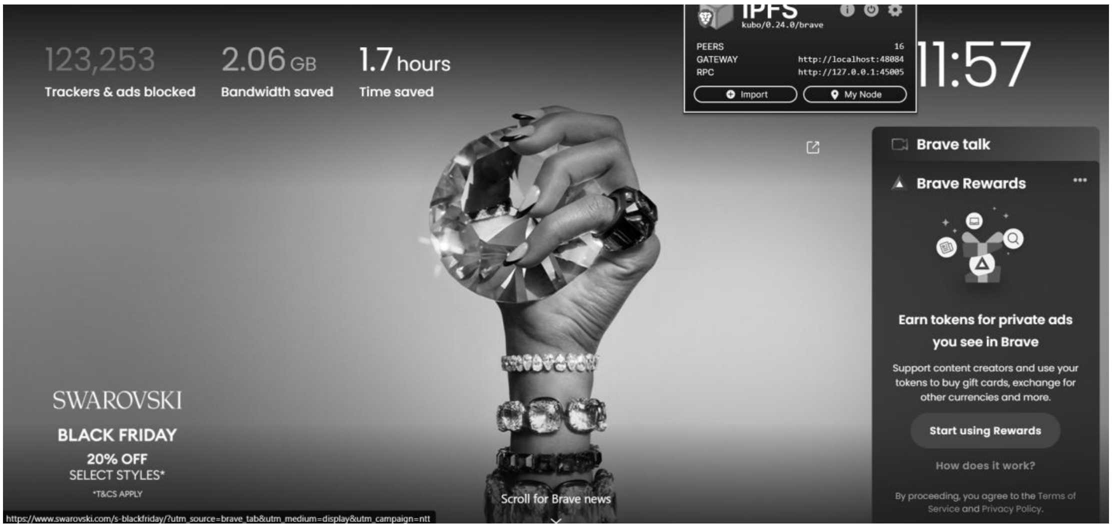
WW: 400
WL: 40

SE: 1
IM: 1/1

Note: There will be no dicom image viewer in the system, we can access it online.

5. All these encrypted DICOM images are uploaded to the IPFS as folder with patients unique id as the name of it.

An IPFS node is started on the brave browser and



kubo/0.24.0/brave

PEERS 16
GATEWAY http://localhost:48084
RPC http://127.0.0.1:45005

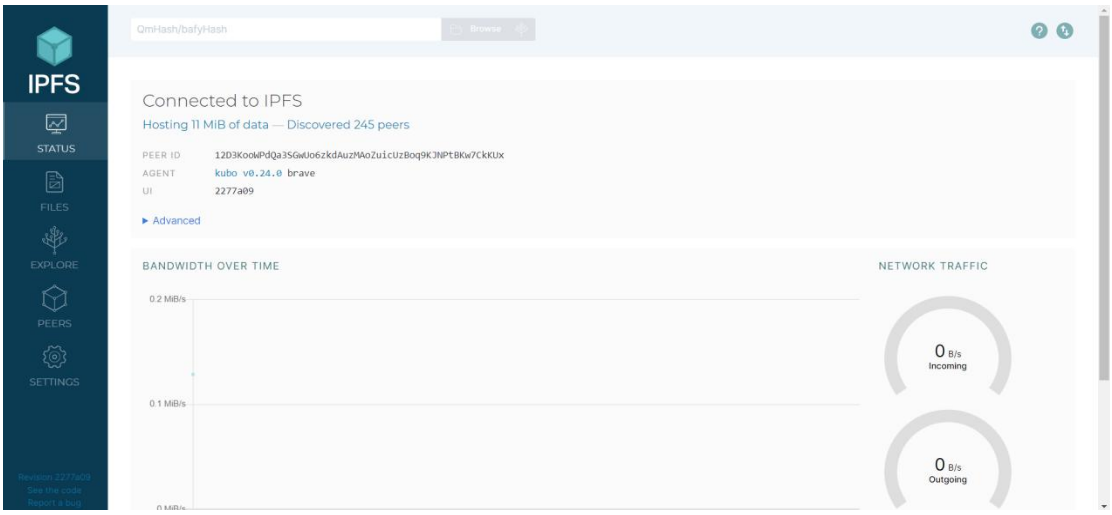
Earn tokens for private ads you see in Brave

Support content creators and use your tokens to buy gift cards, exchange for other currencies and more.

By proceeding, you agree to the Terms of Service and Privacy Policy.

https://www.swarovski.com/s-blackfriday/?utm_source=brave_tab&utm_medium=display&utm_campaign=ntt

There my node button is clicked and we get to the dashboard of the node.



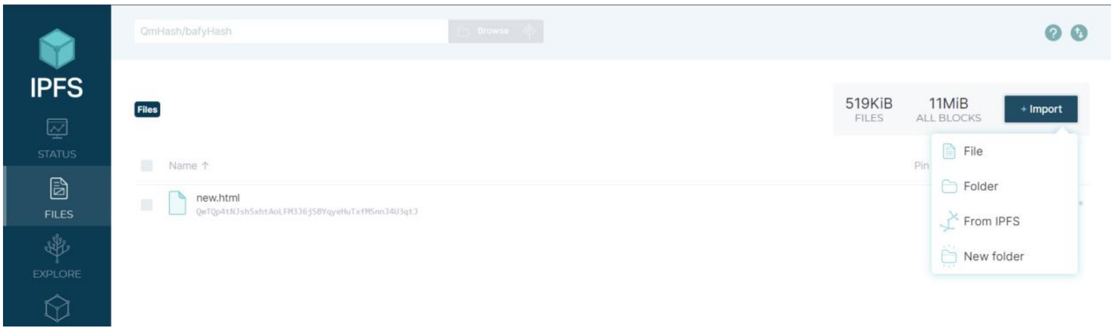
Connected to IPFS

Hosting 11 MiB of data — Discovered 245 peers

PEER ID 12D3KooWPdQa3SGwUo6zkdAuzMAoZuicUzBoq9KJNPtBKw7CkKUx
AGENT kubo v0.24.0 brave
UI 2277a09

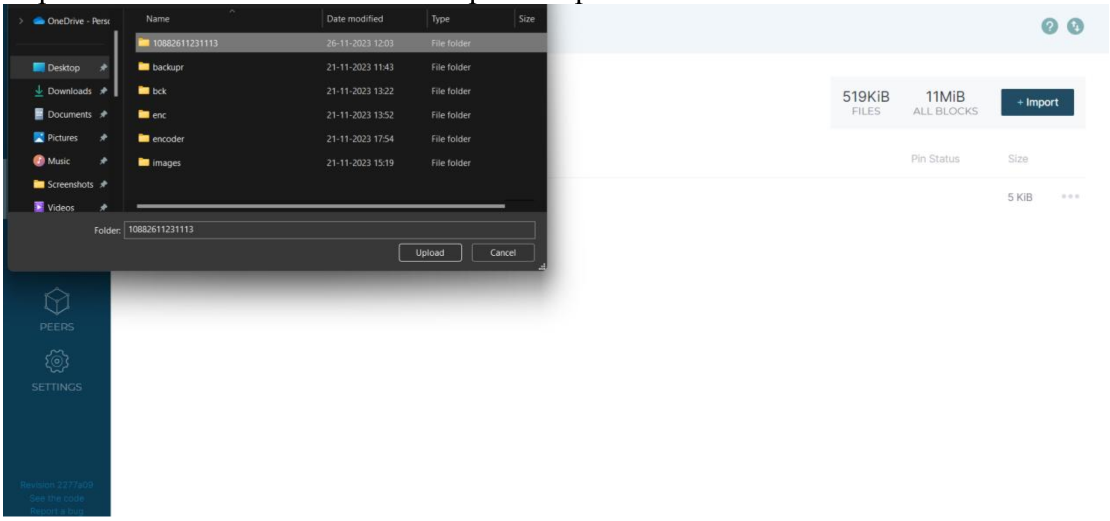
▸ Advanced

Files button is clicked and an option to import the file will be present we create a folder with the patients unique id and we upload all the dicom images there in this case only one image.



new.html
QmTQp4tNJsh5xhtAoLFM3J6j5BYqyeHuTxfMSnnJ4U3qtJ

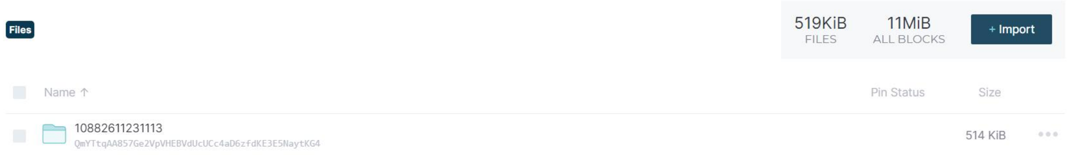
Import folder button is clicked to import the patient folder from the local device.



Name	Date modified	Type	Size
10882611231113	26-11-2023 12:03	File folder	
backupr	21-11-2023 11:43	File folder	
bck	21-11-2023 13:22	File folder	
enc	21-11-2023 13:52	File folder	
encoder	21-11-2023 17:54	File folder	
images	21-11-2023 15:19	File folder	

Folder: 10882611231113

Once the folder is uploaded we get to see the folder in the menu and with that a unique hash starting with "Q" is seen



10882611231113
QmYTtqAA857Ge2VpVHEBVdUcUCc4aD6zfdKE3E5NaytKG4
514 KiB

Now we copy the link of this folder by clicking on the 3 dots on the left hand side for the future purpose.

6. Now the patient's demographic information is collected along with the allergies, previous surgeries, prescriptions, emergency contact numbers, addresses, all types of test reports except for those that contain images are gathered and to that the previously copied IPFS link is added.
A fictional Patient's electronic health record is taken from the internet for this purpose and the previously copied ipfs link is added.

Patient Data:

Patient Name: John Doe
Date of Birth: January 15, 1980
Gender: Male
Address: 123 Health Street, Wellness City, WD 56789

Medical History:
- Allergies: None reported
- Chronic Conditions: Hypertension
- Previous Surgeries: Appendectomy (June 2010)

Medication History:

1. Lisinopril 10mg - Prescribed for hypertension. Taken daily.
   Start Date: March 1, 2018
   Last Renewal: October 15, 2023

2. Aspirin 81mg - Prescribed as a blood thinner.
   Start Date: March 1, 2018
   Last Renewal: October 15, 2023

3. Simvastatin 20mg - Prescribed for cholesterol management.
   Start Date: June 5, 2019
   Last Renewal: September 30, 2023

4. Ibuprofen 400mg - Over-the-counter pain relief.
   As needed for pain.

Recent Laboratory Results:
- Blood Pressure: Average 130/80 mmHg
- Cholesterol Levels: LDL 100 mg/dL, HDL 45 mg/dL
- Blood Glucose: 90 mg/dL

Recent Consultations:

1. Follow-up with Dr. Smith on October 10, 2023:
   - Blood pressure well-managed with current medication.
   - Discussed lifestyle changes to improve cholesterol levels.
   - Scheduled follow-up appointment in six months.

2. Cardiologist Consultation on September 25, 2023:
   - ECG and stress test performed, results normal.
   - Recommended continued cardiovascular care.

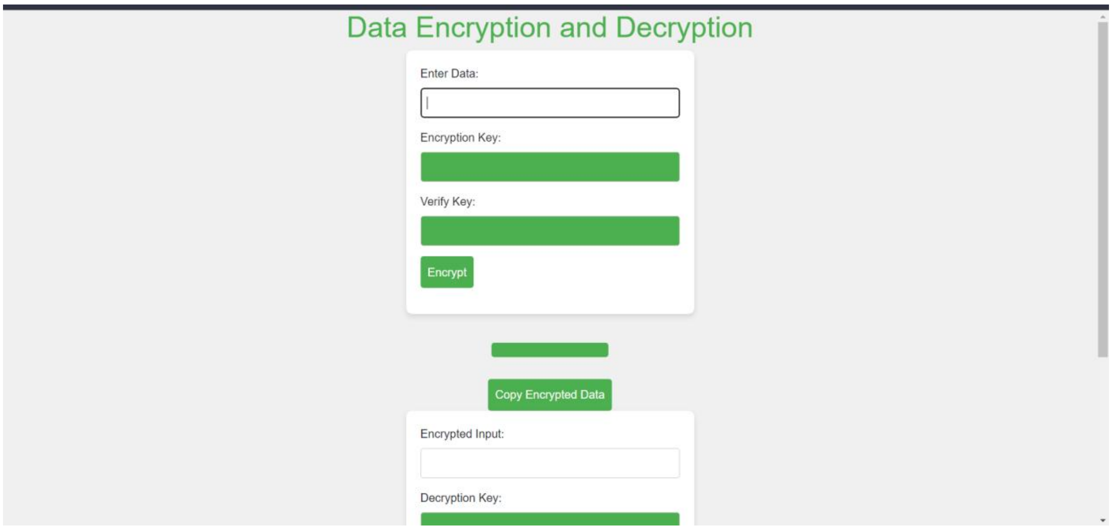
Immunization History:
- Influenza vaccine received annually.
- Tetanus vaccine updated in May 2022.

Emergency Contacts:
- Emergency Contact: Jane Doe (Spouse)
  Phone: (555) 555-1234

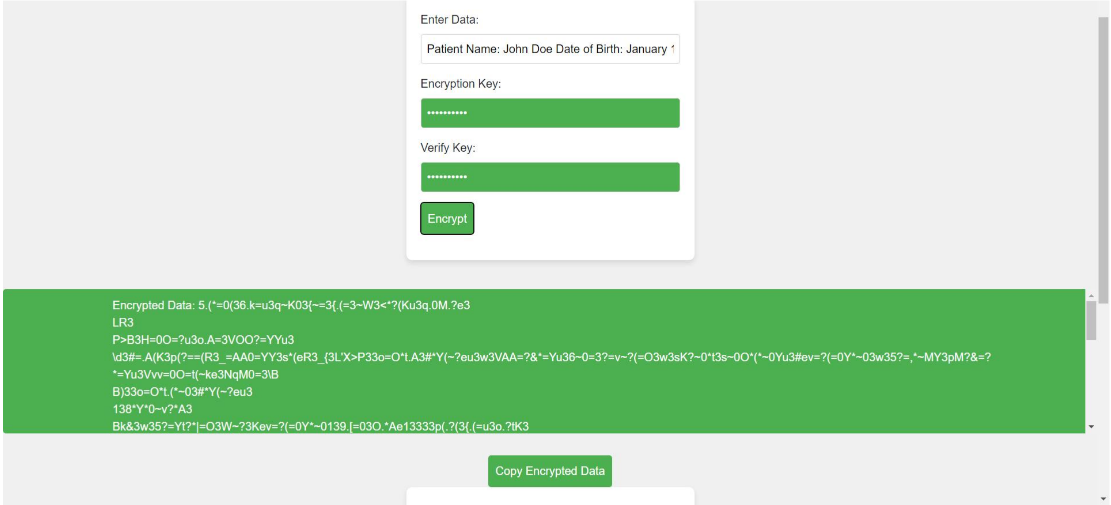
Next of Kin:
- Mary Doe (Sister)
  Phone: (555) 555-5678

7. Now all this text information is encrypted using the text Encryption module with the key of users choice it can the same as previous or a different one and the encrypted output is copied onto the clipboard.

This data is encrypted using the encryption module.



The data is put in the Enter data field and the key is given by the patient.



Enter Data: Patient Name: John Doe Date of Birth: January

Encryption Key: ••••••••••

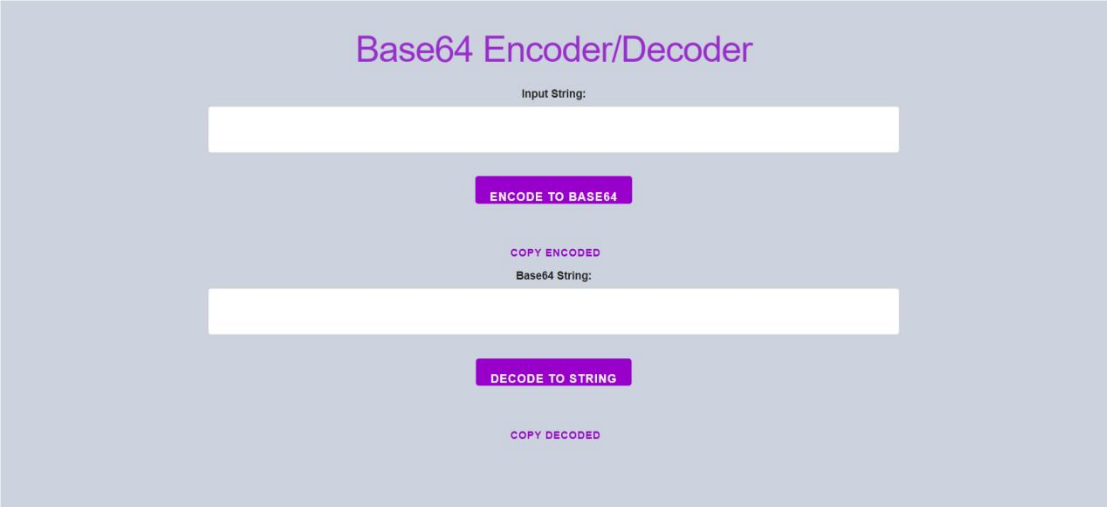
Verify Key: ••••••••••

```
Encrypted Data: 5.(*=0(36.k=u3q~K03{~=3{.(=3~W3<*?(Ku3q.0M.?e3
LR3
P>B3H=0O=?u3o.A=3VOO?=YYu3
\d3#=.A(K3p(?==(R3_=AA0=YY3s*(eR3_{3L'X>P33o=O*t.A3#*Y(~?eu3w3VAA=?&*=Yu36~0=3?=v~?(=O3w3sK?~0*t3s~0O*(*~0Yu3#ev=?(=0Y*~03w35?=,*~MY3pM?&=?
*=Yu3Vvv=0O=t(~ke3NqM0=3\B
B)33o=O*t.(*~03#*Y(~?eu3
138*Y*0~v?*A3
Bk&3w35?=Yt?*|=O3W~?3Kev=?(=0Y*~0139.[=03O.*Ae13333p(.?(3{.(=u3o.?tK3
```

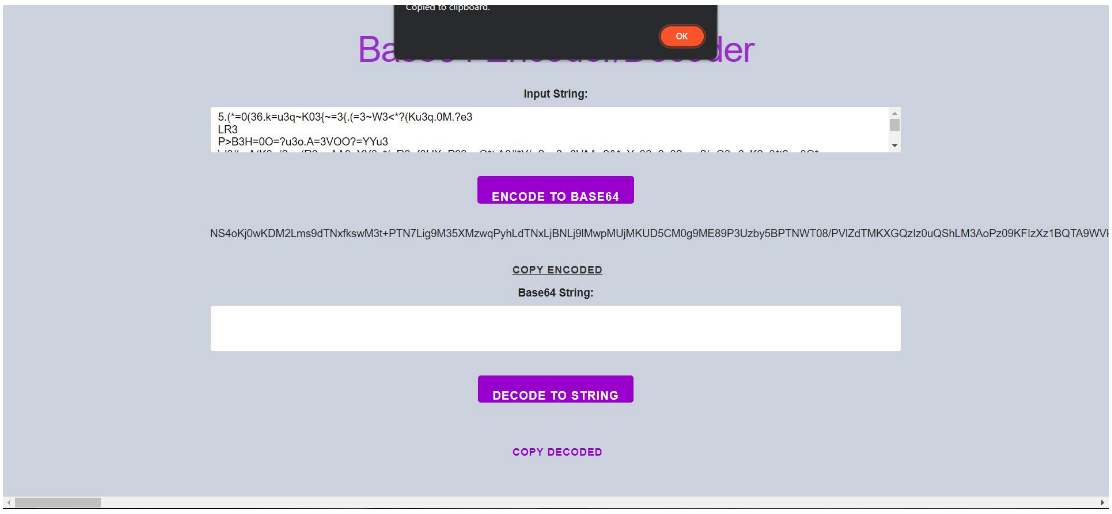
Once the data is encrypted, the data is copied to the clipboard by clicking the copy encrypted data button.

8. Before uploading the data to the blockchain it will be encoded to Base-64 using the encoder module.

The encoder module:



The copied encrypted data is put in the input string field and the encode to Base64 button is clicked once that is done copy encoded button is clicked which will copy the encoded string to the clipboard.

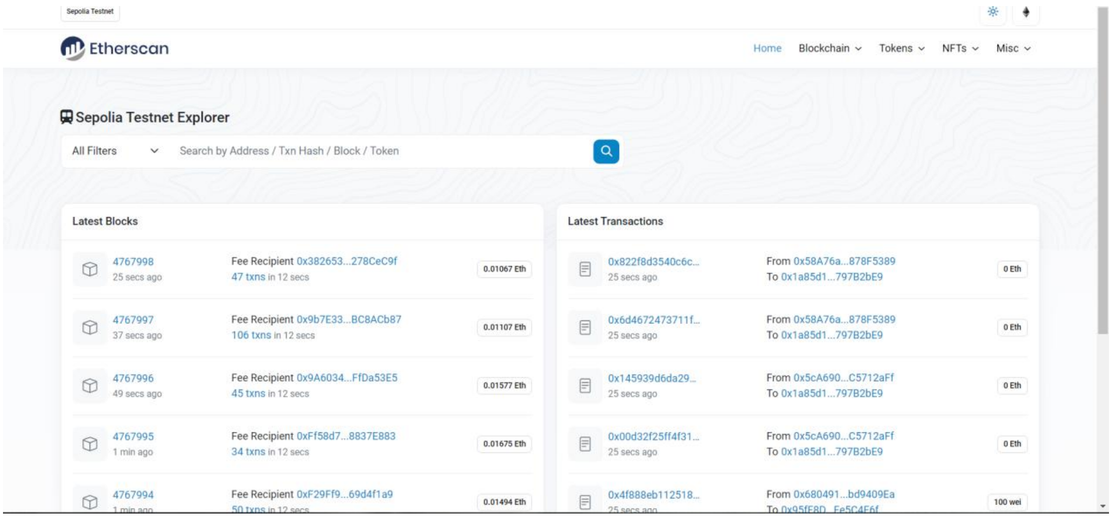


```
5.(*=0(36.k=u3q~K03{~=3{.(=3~W3<*?(Ku3q.0M.?e3
LR3
P>B3H=0O=?u3o.A=3VOO?=YYu3
```

```
NS4oKj0wKDM2Lms9dTNxfkswM3t+PTN7Lig9M35XMzwqPyhLdTNxLjBNLj9lMwpMUjMKUD5CM0g9ME89P3Uzby5BPTNWT08/PVlZdTMKXGQzlz0uQShLM3AoPz09KFlzXz1BQTA9WV
```

9. The encoded data is copied and will be uploaded to the blockchain using the smart contract at the following address “*0x18f0875585e820718c0dc518872409ee015abdd2*” and the linked meta mask wallet with the u-id as the unique identification number given to the patient. After adding the data to blockchain a transaction hash is produced and the hash has to be given to the patient to keep it as a reference.

The contract to interact with the blockchain is accessed using the following website **https://sepolia.etherscan.io/**



Sepolia Testnet Explorer

Latest Blocks

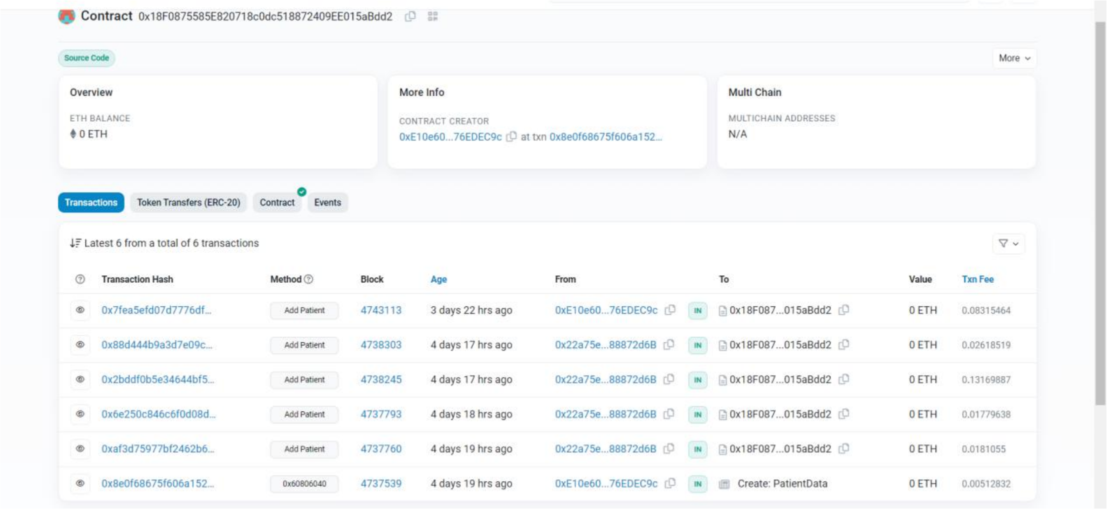
4767998 25 secs ago	Fee Recipient 0x382653...278CeC9f 47 txns in 12 secs	0.01067 Eth
4767997 37 secs ago	Fee Recipient 0x9b7E33...BC8ACb87 106 txns in 12 secs	0.01107 Eth
4767996 49 secs ago	Fee Recipient 0x9A6034...FfDa53E5 45 txns in 12 secs	0.01577 Eth
4767995 1 min ago	Fee Recipient 0xFf58d7...8837E883 34 txns in 12 secs	0.01675 Eth
4767994 1 min ago	Fee Recipient 0xF29Ff9...69d4f1a9 50 txns in 12 secs	0.01494 Eth

Latest Transactions

0x822f8d3540c6c... 25 secs ago	From 0x58A76a...878F5389 To 0x1a85d1...797B2bE9	0 Eth
0x6d4672473711f... 25 secs ago	From 0x58A76a...878F5389 To 0x1a85d1...797B2bE9	0 Eth
0x145939d6da29... 25 secs ago	From 0x5cA690...C5712aFf To 0x1a85d1...797B2bE9	0 Eth
0x00d32f25ff4f31... 25 secs ago	From 0x5cA690...C5712aFf To 0x1a85d1...797B2bE9	0 Eth
0x4f888eb112518... 25 secs ago	From 0x680491...bd9409Ea To 0x95fE8D...Fe5C4F6f	100 wei

Note: This is a ethereum testnet called sepolia when the projec is really deployed, it will be deployed to the ethereum mainnet where we have to pay real money for the transaction fees.

Contract address mentioned above is entered in the search box and that takes us to the contract home page where it contains the information about all the transactions that are done on the contract from the day of creation till data every transaction is recorded with a unique hash to the transaction.



Contract 0x18F0875585E820718c0dc518872409EE015aBdd2

Overview
ETH BALANCE
0 ETH

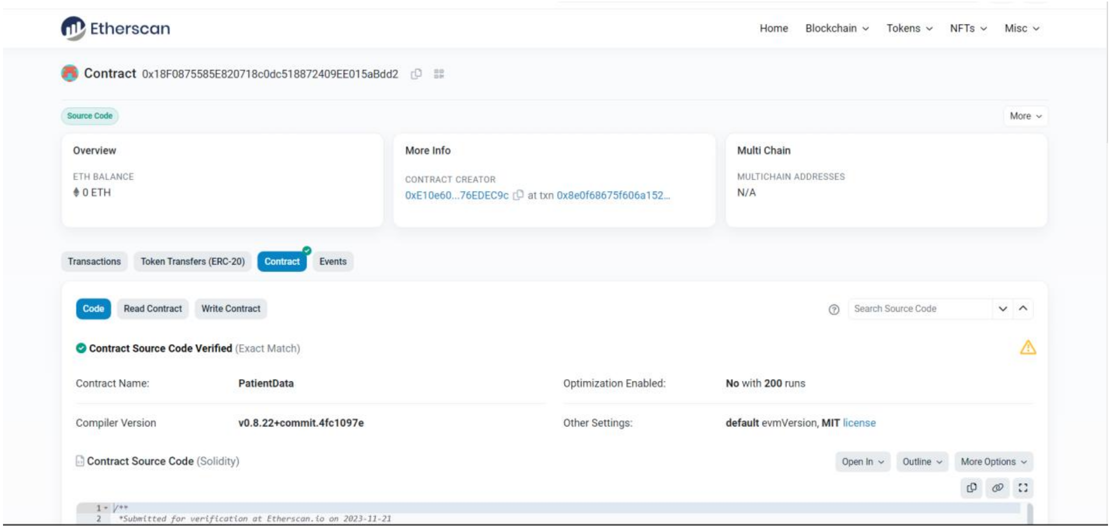
More Info
CONTRACT CREATOR
0xE10e60...76EDEC9c at txn 0x8e0f68675f606a152...

Multi Chain
MULTICHAIN ADDRESSES
N/A

Latest 6 from a total of 6 transactions

Transaction Hash	Method	Block	Age	From		To	Value	Txn Fee
0x7fea5efd07d7776df...	Add Patient	4743113	3 days 22 hrs ago	0xE10e60...76EDEC9c	IN	0x18F087...015aBdd2	0 ETH	0.08315464
0x88d444b9a3d7e09c...	Add Patient	4738303	4 days 17 hrs ago	0x22a75e...88872d6B	IN	0x18F087...015aBdd2	0 ETH	0.02618519
0x2bddf0b5e34644bf5...	Add Patient	4738245	4 days 17 hrs ago	0x22a75e...88872d6B	IN	0x18F087...015aBdd2	0 ETH	0.13169887
0x6e250c846c6f0d08d...	Add Patient	4737793	4 days 18 hrs ago	0x22a75e...88872d6B	IN	0x18F087...015aBdd2	0 ETH	0.01779638
0xaf3d75977bf2462b6...	Add Patient	4737760	4 days 19 hrs ago	0x22a75e...88872d6B	IN	0x18F087...015aBdd2	0 ETH	0.0181055
0x8e0f68675f606a152...	0x60806040	4737539	4 days 19 hrs ago	0xE10e60...76EDEC9c	IN	Create: PatientData	0 ETH	0.00512832

Next the contract button with a little check mark on it has to be clicked there the options to interact with the contract are present.



Contract 0x18F0875585E820718c0dc518872409EE015aBdd2

Overview
ETH BALANCE
0 ETH

More Info
CONTRACT CREATOR
0xE10e60...76EDEC9c at txn 0x8e0f68675f606a152...

Multi Chain
MULTICHAIN ADDRESSES
N/A

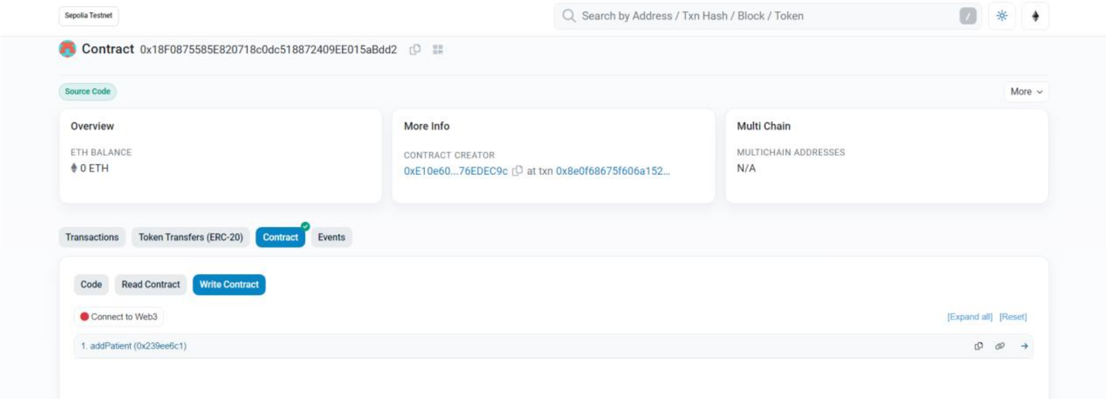
Contract Source Code Verified (Exact Match)

Contract Name: PatientData
Optimization Enabled: No with 200 runs
Compiler Version v0.8.22+commit.4fc1097e
Other Settings: default evmVersion, MIT license

Contract Source Code (Solidity)

```
/**
 *Submitted for verification at Etherscan.io on 2023-11-21
```

Now the connect to web3 button has to be clicked and then the metamaks wallet should be linked to the website.



Contract 0x18F0875585E820718c0dc518872409EE015aBdd2

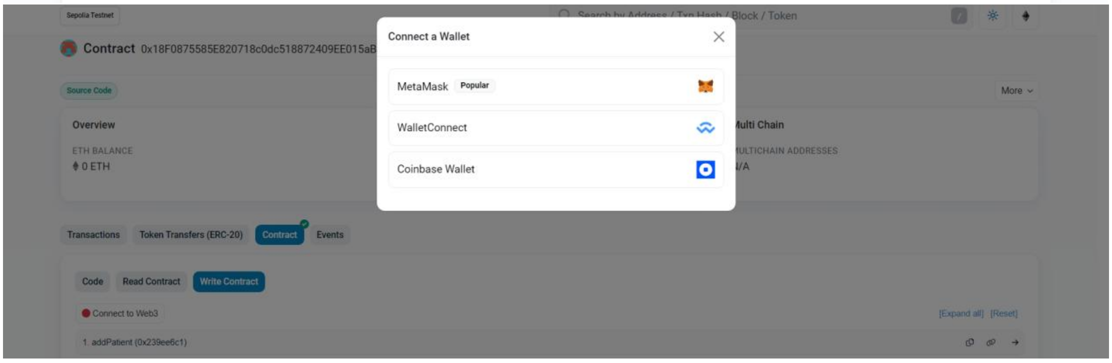
Overview
ETH BALANCE
0 ETH

More Info
CONTRACT CREATOR
0xE10e60...76EDEC9c at txn 0x8e0f68675f606a152...

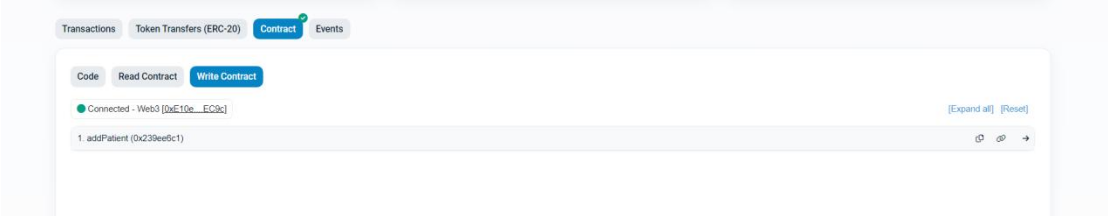
Multi Chain
MULTICHAIN ADDRESSES
N/A

● Connect to Web3

1. addPatient (0x239ee6c1)



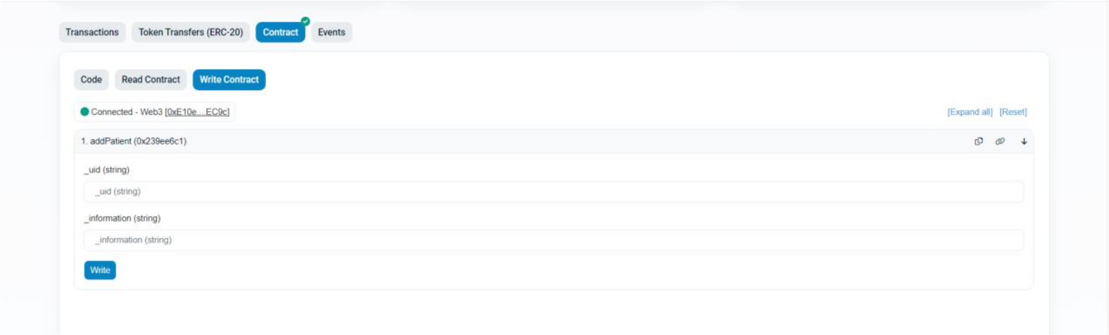
Once connected a green dot along with the masked wallet address is seen on the top.



● Connected - Web3 [0xE10e...EC9c]

1. addPatient (0x239ee6c1)

Now add patient button is clicked.



Connected - Web3 [0xE10e....EC9c]

1. addPatient (0x239ee6c1)

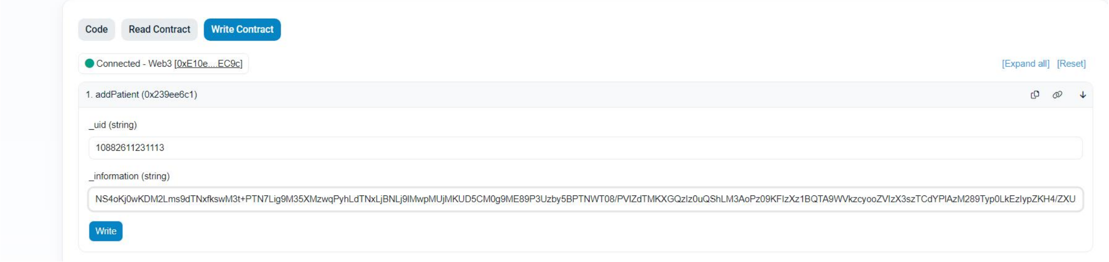
_uid (string)

_uid (string)

_information (string)

_information (string)

The uid of the patient has to be entered in the uid input filed and the encoded data has to be entered in the information input field.



Connected - Web3 [0xE10e....EC9c]

1. addPatient (0x239ee6c1)

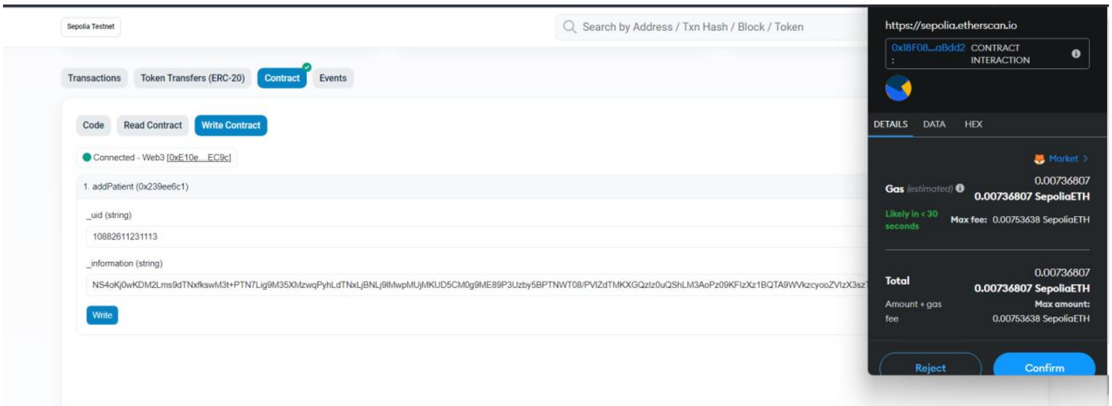
_uid (string)

10882611231113

_information (string)

NS4oKj0wKDM2Lms9dTNxfkswM3t+PTN7Lig9M35XMzwqPyhLdTNxLjBNLj9IMwpMUjMKUD5CM0g9ME89P3Uzby5BPTNWT08/PVIZdTMKXGQzIz0uQShLM3AoPz09KFIzXz1BQTA9WVkzcyooZVIzX3szTCdYPlAzM289Typ0LkEzIypZKH4/ZXU

Once the write button is clicked meta mask wallet is opened,the transaction charges to add the data to blockchain are given and an option to accept or reject the transaction.



Connected - Web3 [0xE10e....EC9c]

1. addPatient (0x239ee6c1)

_uid (string)

10882611231113

_information (string)

NS4oKj0wKDM2Lms9dTNxfkswM3t+PTN7Lig9M35XMzwqPyhLdTNxLjBNLj9IMwpMUjMKUD5CM0g9ME89P3Uzby5BPTNWT08/PVIZdTMKXGQzIz0uQShLM3AoPz09KFIzXz1BQTA9WVkzcyooZVIzX3sz

https://sepolia.etherscan.io

0x18F08...aBdd2 : CONTRACT INTERACTION

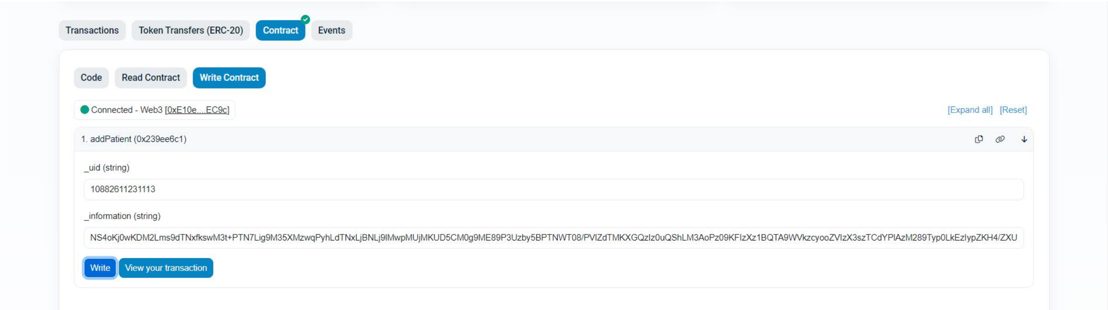
Gas (estimated) 0.00736807 0.00736807 SepoliaETH

Likely in < 30 seconds Max fee: 0.00753638 SepoliaETH

Total 0.00736807 0.00736807 SepoliaETH

Amount + gas fee Max amount: 0.00753638 SepoliaETH

Once the transaction is confirmed, we get to view the transaction button and once clicked we go to the page where we have the details of block to which the data is added and so on.



Connected - Web3 [0xE10e....EC9c]

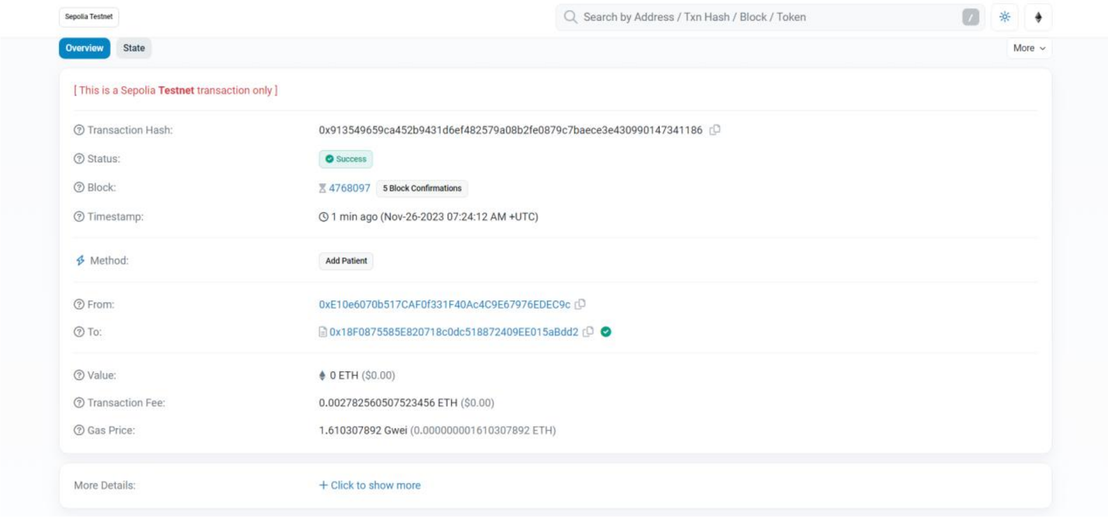
1. addPatient (0x239ee6c1)

_uid (string)

10882611231113

_information (string)

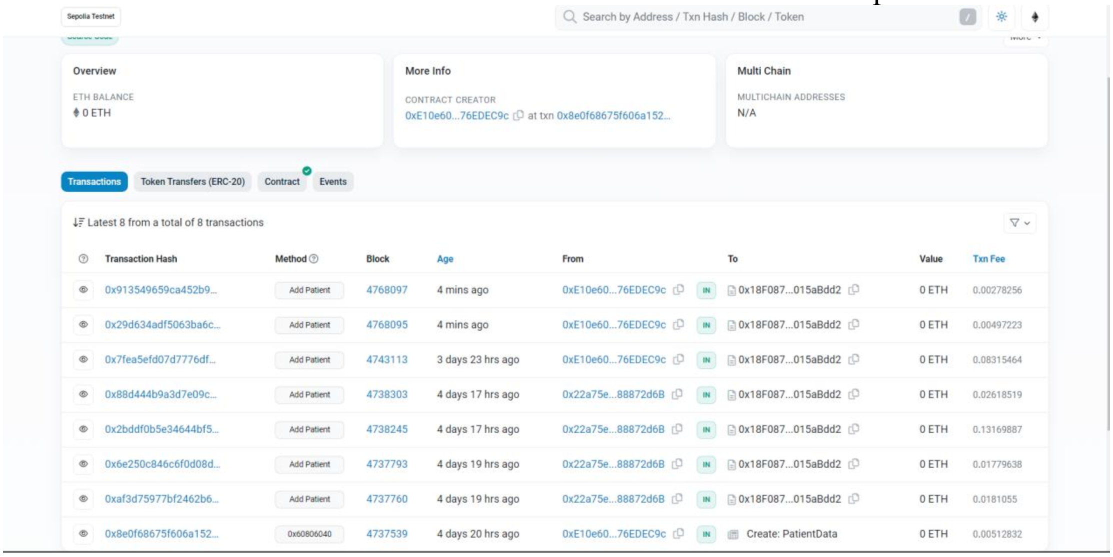
NS4oKj0wKDM2Lms9dTNxfkswM3t+PTN7Lig9M35XMzwqPyhLdTNxLjBNLj9lMwpMUjMKUD5CM0g9ME89P3Uzby5BPTNWT08/PVlZdTMKXGQzIz0uQShLM3AoPz09KFIzXz1BQTA9WVkzcyooZVlzX3szTCdYPlAzM289Typ0LkEzIypZKH4/ZXU



[This is a Sepolia **Testnet** transaction only]

Transaction Hash:	0x913549659ca452b9431d6ef482579a08b2fe0879c7baece3e430990147341186
Status:	Success
Block:	4768097 5 Block Confirmations
Timestamp:	1 min ago (Nov-26-2023 07:24:12 AM +UTC)
Method:	Add Patient
From:	0xE10e6070b517CAF0f331F40Ac4C9E67976EDEC9c
To:	0x18F0875585E820718c0dc518872409EE015aBdd2
Value:	0 ETH ($0.00)
Transaction Fee:	0.002782560507523456 ETH ($0.00)
Gas Price:	1.610307892 Gwei (0.000000001610307892 ETH)
More Details:	+ Click to show more

Once the transaction is successful the transaction can be seen on the home page of the contract which contains the information of which wallet is used to upload the data.



Overview

ETH BALANCE

0 ETH

More Info

CONTRACT CREATOR

0xE10e60...76EDEC9c at txn 0x8e0f68675f606a152...

Multi Chain

MULTICHAIN ADDRESSES

N/A

Latest 8 from a total of 8 transactions

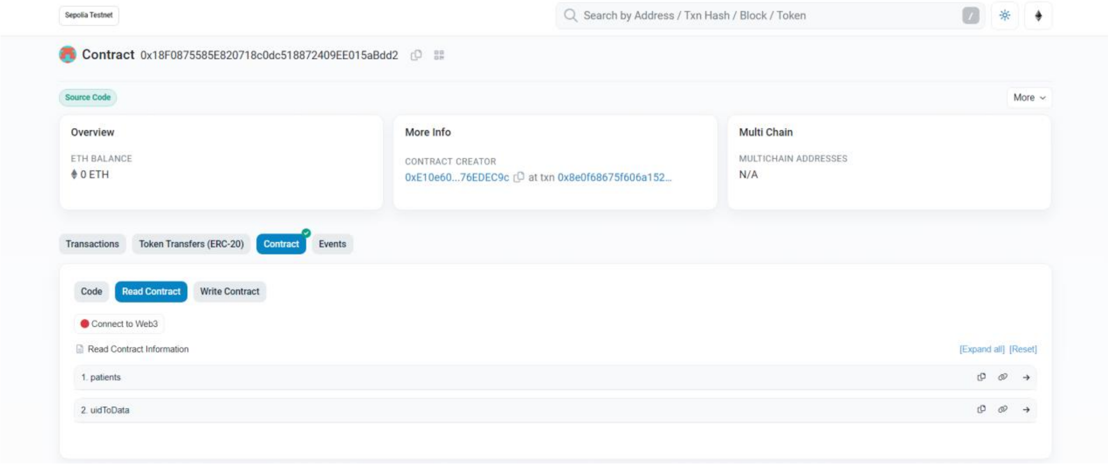
Transaction Hash	Method	Block	Age	From		To	Value	Txn Fee
0x913549659ca452b9...	Add Patient	4768097	4 mins ago	0xE10e60...76EDEC9c	IN	0x18F087...015aBdd2	0 ETH	0.00278256
0x29d634adf5063ba6c...	Add Patient	4768095	4 mins ago	0xE10e60...76EDEC9c	IN	0x18F087...015aBdd2	0 ETH	0.00497223
0x7fea5efd07d7776df...	Add Patient	4743113	3 days 23 hrs ago	0xE10e60...76EDEC9c	IN	0x18F087...015aBdd2	0 ETH	0.08315464
0x88d444b9a3d7e09c...	Add Patient	4738303	4 days 17 hrs ago	0x22a75e...88872d6B	IN	0x18F087...015aBdd2	0 ETH	0.02618519
0x2bddf0b5e34644bf5...	Add Patient	4738245	4 days 17 hrs ago	0x22a75e...88872d6B	IN	0x18F087...015aBdd2	0 ETH	0.13169887
0x6e250c846c6f0d08d...	Add Patient	4737793	4 days 19 hrs ago	0x22a75e...88872d6B	IN	0x18F087...015aBdd2	0 ETH	0.01779638
0xaf3d75977bf2462b6...	Add Patient	4737760	4 days 19 hrs ago	0x22a75e...88872d6B	IN	0x18F087...015aBdd2	0 ETH	0.0181055
0x8e0f68675f606a152...	0x60806040	4737539	4 days 20 hrs ago	0xE10e60...76EDEC9c	IN	Create: PatientData	0 ETH	0.00512832

10. Patient should have his unique ID, keys, Transaction Hash.

Retrieving Data From Blockchain:

1. We need to navigate to the same contract and select read contract and there a function called UID to Data here the UID of the patient has to be entered and the encoded data is retrieved.

Read Contract has to be clicked, for this we don't have to connect to the metamask wallet we can just retrive the data without any transaction fee.



Sepolia Testnet

Search by Address / Txn Hash / Block / Token

Contract 0x18F0875585E820718c0dc518872409EE015aBdd2

Source Code

More

Overview

ETH BALANCE
0 ETH

More Info

CONTRACT CREATOR
0xE10e60...76EDEC9c at txn 0x8e0f68675f606a152...

Multi Chain

MULTICHAIN ADDRESSES
N/A

Transactions | Token Transfers (ERC-20) | Contract | Events

Code | Read Contract | Write Contract

● Connect to Web3

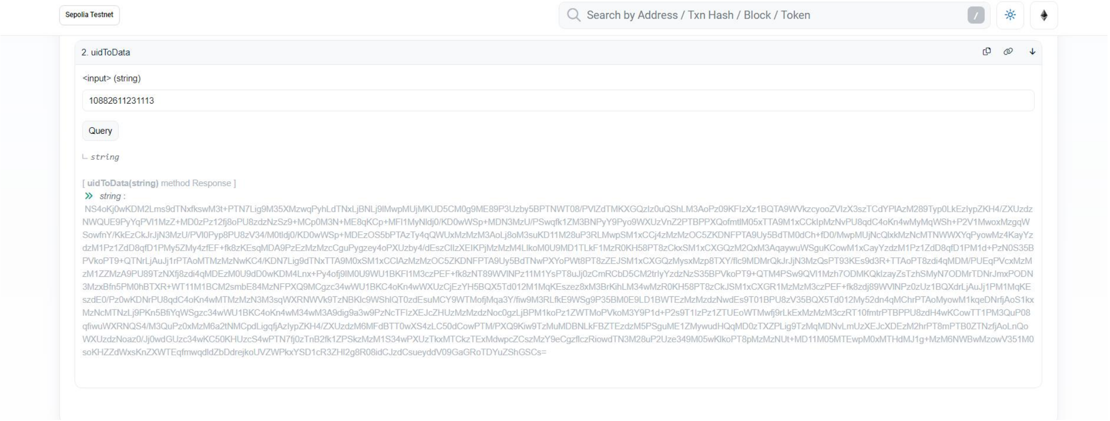
Read Contract Information

[Expand all] [Reset]

1. patients

2. uidToData

Now uid to data has to be clicked and the uid of the patient has to be given and the query button has to be clicked to retrive the data of the patient that we uploaded.



Sepolia Testnet

Search by Address / Txn Hash / Block / Token

2. uidToData

<input> (string)

10882611231113

Query

└ *string*

[**uidToData(string)** method Response]

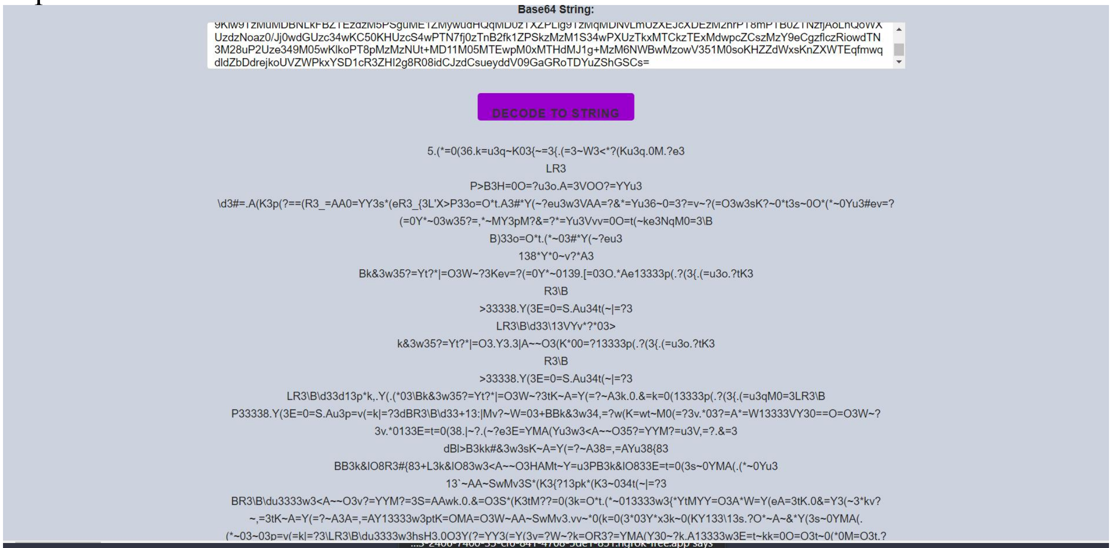
» *string* :

```
NS4oKj0wKDM2Lms9dTNxfkswM3t+PTN7Lig9M35XMzwqPyhLdTNxLjBNLj9lMwpMUjMKUD5CM0g9ME89P3Uzby5BPTNWT08/PVlZdTMKXGQzIz0uQShLM3AoPz09KFIzXz1BQTA9WVkzcyooZVIzX3szTCdYPlAzM289Typ0LkEzIypZKH4/ZXUzdz
NWQUE9PyYqPVI1MzZ+MD0zPz12fj8oPU8zdzNzSz9+MCp0M3N+ME8qKCp+MFI1MyNldj0/KD0wWSp+MDN3MzU/PSwqfk1ZM3BNPyY9Pyo9WXUzVnZ2PTBPPXQofmtlM05xTTA9M1xCCklpMzNvPU8qdC4oKn4wMyMqWSh+P2V1MwoxMzgqW
SowfnY/KkEzCkJrJjN3MzU/PVl0Pyp8PU8zV34/M0tldj0/KD0wWSp+MDEzOS5bPTAzTy4qQWUxMzMzM3AoLj8oM3suKD11M28uP3RLMwpSM1xCCj4zMzMzOC5ZKDNFPTA9Uy5BdTM0dCh+fD0/MwpMUjNcQlxkMzNcMTNWWXYqPyowMz4KayYz
dzM1Pz1ZdD8qfD1PMy5ZMy4zfEF+fk8zKEsqMDA9PzEzMzMzcCguPygzey4oPXUzby4/dEszCllzXEIKPjMzMzM4LlkoM0U9MD1TLkF1MzR0KH58PT8zCkxSM1xCXGQzM2QxM3AqaywuWSguKCowM1xCayYzdzM1Pz1ZdD8qfD1PM1d+PzN0S35B
PVkoPT9+QTNrLjAuJj1rPTAoMTMzMzNwKC4/KDN7Lig9dTNxTTA9M0xSM1xCClAzMzMzOC5ZKDNFPTA9Uy5BdTNwPXYoPWt8PT8zZEJSM1xCXGQzMysxMzp8TXY/flc9MDMrQkJrJjN3MzQsPT93KEs9d3R+TTAoPT8zdi4qMDM/PUEqPVcxMzM
zM1ZZMzA9PU89TzNXfj8zdi4qMDEzM0U9dD0wKDM4Lnx+Py4ofj9lM0U9WU1BKFI1M3czPEF+fk8zNT89WVlNPz11M1YsPT8uJj0zCmRCbD5CM2trIyYzdzNzS35BPVkoPT9+QTM4PSw9QVI1Mzh7ODMKQklzayZsTzhSMyN7ODMrTDNrJmxPODN
3MzxBfn5PM0hBTXR+WT11M1BCM2smbE84MzNFPXQ9MCgzc34wWU1BKC4oKn4wWXUzCjEzYH5BQX5Td012M1MqKEszez8xM3BrKihLM34wMzR0KH58PT8zCkJSM1xCXGR1MzMzM3czPEF+fk8zdj89WVlNPz0zUz1BQXdrLjAuJj1PM1MqKE
szdE0/Pz0wKDNrPU8qdC4oKn4wMTMzMzN3M3sqWXRNWVk9TzNBKlc9WShlQT0zdEsuMCY9WTMofjMqa3Y/fiw9M3RLfkE9WSg9P35BM0E9LD1BWTEzMzMzdzNwdEs9T01BPU8zV35BQX5Td012My52dn4qMChrPTAoMyowM1kqeDNrfjAoS1kx
MzNcMTNzLj9PKn5BfiYqWSgzc34wWU1BKC4oKn4wM34wM3A9dig9a3w9PzNcTFIzXEJcZHUzMzMzdzNoc0gzLjBPM1koPz1ZWTMoPVkoM3Y9P1d+P2s9T1IzPz1ZTUEoWTMwfj9rLkExMzMzM3czRT10fmtrPTBPPU8zdH4wKCowTT1PM3QuP08
qfiwuWXRNQS4/M3QuPz0xMzM6a2tNMCpdLigqfjAzIypZKH4/ZXUzdzM6MFdBTT0wXS4zLC50dCowPTM/PXQ9Kiw9TzMuMDBNLkFBZTEzdzM5PSguME1ZMywudHQqMD0zTXZPLig9TzMqMDNvLmUzXEJcXDEzM2hrPT8mPTB0ZTNzfjAoLnQo
WXUzdzNoaz0/Jj0wdGUzc34wKC50KHUzcS4wPTN7fj0zTnB2fk1ZPSkzMzM1S34wPXUzTkxMTCkzTExMdwpcZCszMzY9eCgzflczRiowdTN3M28uP2Uze349M05wKlkoPT8pMzMzNUt+MD11M05MTEwpM0xMTHdMJ1g+MzM6NWBwMzowV351M0
soKHZZdWxsKnZXWTEqfmwqdldZbDdrejkoUVZWPkxYSD1cR3ZHI2g8R08idCJzdCsueyddV09GaGRoTDYuZShGSCs=
```

The string that we got there is the encoded string we have to decode it using the decoder module.

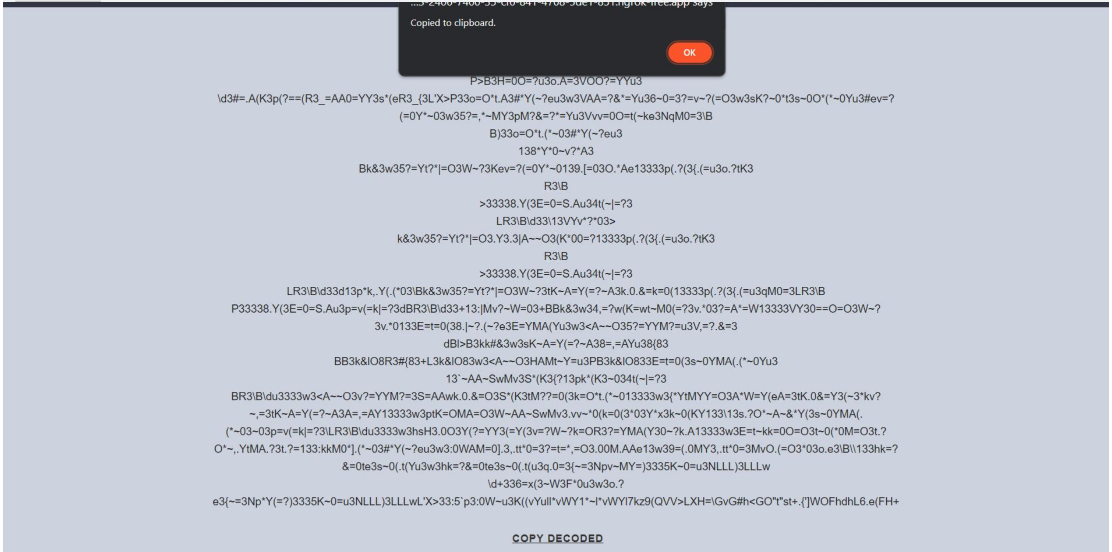
2. The encoded data has to be decoded using the decoder module and this decoded data has to be given as the input to the decryption module.

Once we put the data in decoder we get the decoded string and that has to be copied to the clipboard.



```
UzdzNoaz0/Jj0wdGUzc34wKC50KHUzcS4wPTN7fj0zTnB2fk1ZPSkzMzM1S34wPXUzTkxMTCkzTExMdwpcZCszMzY9eCgzflczRiowdTN
3M28uP2Uze349M05wKlkoPT8pMzMzNUt+MD11M05MTEwpM0xMTHdMJ1g+MzM6NWBwMzowV351M0soKHZZdWxsKnZXWTEqfmwq
dldZbDdrejkoUVZWPkxYSD1cR3ZHI2g8R08idCJzdCsueyddV09GaGRoTDYuZShGSCs=
```

```
5.(*=0(36.k=u3q~K03{~=3{.(=3~W3<*?(Ku3q.0M.?e3
LR3
P>B3H=0O=?u3o.A=3VOO?=YYu3
\d3#=.A(K3p(?==(R3_=AA0=YY3s*(eR3_{3L'X>P33o=O*t.A3#*Y(~?eu3w3VAA=?&*=Yu36~0=3?=v~?(=O3w3sK?~0*t3s~0O*(*~0Yu3#ev=?
(=0Y*~03w35?=,*~MY3pM?&=?*=Yu3Vvv=0O=t(~ke3NqM0=3\B
B)33o=O*t.(*~03#*Y(~?eu3
138*Y*0~v?*A3
Bk&3w35?=Yt?*|=O3W~?3Kev=?(=0Y*~0139.[=03O.*Ae13333p(.?(3{.(=u3o.?tK3
R3\B
>33338.Y(3E=0=S.Au34t(~|=?3
LR3\B\d33\13VYv*?*03>
k&3w35?=Yt?*|=O3.Y3.3|A~~O3(K*00=?13333p(.?(3{.(=u3o.?tK3
R3\B
>33338.Y(3E=0=S.Au34t(~|=?3
LR3\B\d33d13p*k,.Y(.(*03\Bk&3w35?=Yt?*|=O3W~?3tK~A=Y(=?~A3k.0.&=k=0(13333p(.?(3{.(=u3qM0=3LR3\B
P33338.Y(3E=0=S.Au3p=v(=k|=?3dBR3\B\d33+13:|Mv?~W=03+BBk&3w34,=?w(K=wt~M0(=?3v.*03?=A*=W13333VY30==O=O3W~?
3v.*0133E=t=0(38.|~?.(~?e3E=YMA(Yu3w3<A~~O35?=YYM?=u3V,=?.&=3
dBl>B3kk#&3w3sK~A=Y(=?~A38=,=AYu38{83
BB3k&lO8R3#{83+L3k&lO83w3<A~~O3HAMt~Y=u3PB3k&lO833E=t=0(3s~0YMA(.(*~0Yu3
13`~AA~SwMv3S*(K3{?13pk*(K3~034t(~|=?3
BR3\B\du3333w3<A~~O3v?=YYM?=3S=AAwk.0.&=O3S*(K3tM??=0(3k=O*t.(*~013333w3{*YtMYY=O3A*W=Y(eA=3tK.0&=Y3(~3*kv?
~,=3tK~A=Y(=?~A3A=,=AY13333w3ptK=OMA=O3W~AA~SwMv3.vv~*0(k=0(3*03Y*x3k~0(KY133\13s.?O*~A~&*Y(3s~0YMA(.
(*~03~03p=v(=k|=?3\LR3\B\du3333w3hsH3.0O3Y(?=YY3(=Y(3v=?W~?k=OR3?=YMA(Y30~?k.A13333w3E=t~kk=0O=O3t~0(*0M=O3t.?
```



...3-2406-7400-35-cf0-841-4708-5de1-851.ngrok-free.app says

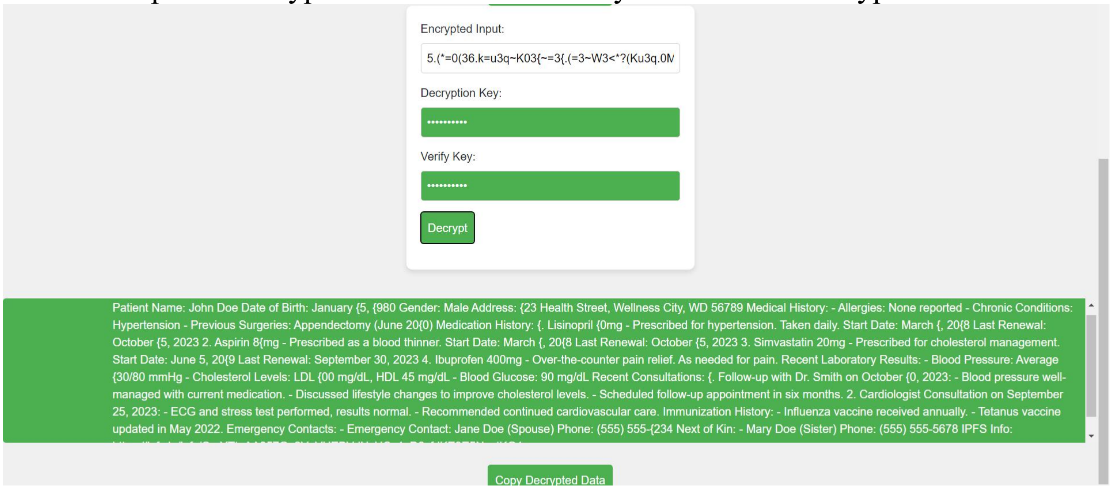
Copied to clipboard.

```
P>B3H=0O=?u3o.A=3VOO?=YYu3
\d3#=.A(K3p(?==(R3_=AA0=YY3s*(eR3_{3L'X>P33o=O*t.A3#*Y(~?eu3w3VAA=?&*=Yu36~0=3?=v~?(=O3w3sK?~0*t3s~0O*(*~0Yu3#ev=?
(=0Y*~03w35?=,*~MY3pM?&=?*=Yu3Vvv=0O=t(~ke3NqM0=3\B
B)33o=O*t.(*~03#*Y(~?eu3
138*Y*0~v?*A3
Bk&3w35?=Yt?*|=O3W~?3Kev=?(=0Y*~0139.[=03O.*Ae13333p(.?(3{.(=u3o.?tK3
R3\B
>33338.Y(3E=0=S.Au34t(~|=?3
LR3\B\d33\13VYv*?*03>
k&3w35?=Yt?*|=O3.Y3.3|A~~O3(K*00=?13333p(.?(3{.(=u3o.?tK3
R3\B
>33338.Y(3E=0=S.Au34t(~|=?3
LR3\B\d33d13p*k,.Y(.(*03\Bk&3w35?=Yt?*|=O3W~?3tK~A=Y(=?~A3k.0.&=k=0(13333p(.?(3{.(=u3qM0=3LR3\B
P33338.Y(3E=0=S.Au3p=v(=k|=?3dBR3\B\d33+13:|Mv?~W=03+BBk&3w34,=?w(K=wt~M0(=?3v.*03?=A*=W13333VY30==O=O3W~?
3v.*0133E=t=0(38.|~?.(~?e3E=YMA(Yu3w3<A~~O35?=YYM?=u3V,=?.&=3
dBl>B3kk#&3w3sK~A=Y(=?~A38=,=AYu38{83
BB3k&lO8R3#{83+L3k&lO83w3<A~~O3HAMt~Y=u3PB3k&lO833E=t=0(3s~0YMA(.(*~0Yu3
13`~AA~SwMv3S*(K3{?13pk*(K3~034t(~|=?3
BR3\B\du3333w3<A~~O3v?=YYM?=3S=AAwk.0.&=O3S*(K3tM??=0(3k=O*t.(*~013333w3{*YtMYY=O3A*W=Y(eA=3tK.0&=Y3(~3*kv?
~,=3tK~A=Y(=?~A3A=,=AY13333w3ptK=OMA=O3W~AA~SwMv3.vv~*0(k=0(3*03Y*x3k~0(KY133\13s.?O*~A~&*Y(3s~0YMA(.
(*~03~03p=v(=k|=?3\LR3\B\du3333w3hsH3.0O3Y(?=YY3(=Y(3v=?W~?k=OR3?=YMA(Y30~?k.A13333w3E=t~kk=0O=O3t~0(*0M=O3t.?
```

```
O*~,.YtMA.?3t.?=133:kkM0*].(*~03#*Y(~?eu3w3:0WAM=0].3,.tt*0=3?=t=*,=O3.00M.AAe13w39=(.0MY3,.tt*0=3MvO.(=O3*03o.e3\B\\133hk=?
&=0te3s~0(.t(Yu3w3hk=?&=0te3s~0(.t(u3q.0=3{~=3Npv~MY=)3335K~0=u3NLLL)3LLLw
\d+336=x(3~W3F*0u3w3o.?
e3{~=3Np*Y(=?)3335K~0=u3NLLL)3LLLwL'X>33:5`p3:0W~u3K((vYull*vWY1*~l*vWYl7kz9(QVV>LXH=\GvG#h<GO"t"st+.{']WOFhdhL6.e(FH+
```

3. The patient enters the key for decryption(same key as encryption) and the text data of the patient is retrieved.

The data is put in decryption module and the key is entered to decrypt the data.



Encrypted Input:

5.(*=0(36.k=u3q~K03{~=3{.(=3~W3<*?(Ku3q.0M

Decryption Key:

•••••••••••

Verify Key:

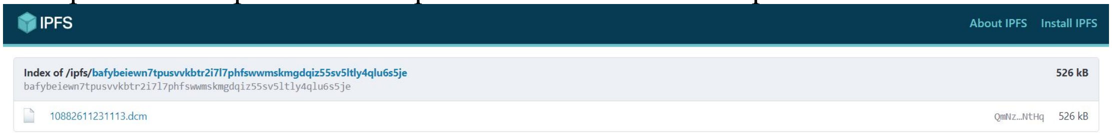
•••••••••••

Patient Name: John Doe Date of Birth: January {5, {980 Gender: Male Address: {23 Health Street, Wellness City, WD 56789 Medical History: - Allergies: None reported - Chronic Conditions: Hypertension - Previous Surgeries: Appendectomy (June 20{0) Medication History: {. Lisinopril {0mg - Prescribed for hypertension. Taken daily. Start Date: March {, 20{8 Last Renewal: October {5, 2023 2. Aspirin 8{mg - Prescribed as a blood thinner. Start Date: March {, 20{8 Last Renewal: October {5, 2023 3. Simvastatin 20mg - Prescribed for cholesterol management. Start Date: June 5, 20{9 Last Renewal: September 30, 2023 4. Ibuprofen 400mg - Over-the-counter pain relief. As needed for pain. Recent Laboratory Results: - Blood Pressure: Average {30/80 mmHg - Cholesterol Levels: LDL {00 mg/dL, HDL 45 mg/dL - Blood Glucose: 90 mg/dL Recent Consultations: {. Follow-up with Dr. Smith on October {0, 2023: - Blood pressure well-managed with current medication. - Discussed lifestyle changes to improve cholesterol levels. - Scheduled follow-up appointment in six months. 2. Cardiologist Consultation on September 25, 2023: - ECG and stress test performed, results normal. - Recommended continued cardiovascular care. Immunization History: - Influenza vaccine received annually. - Tetanus vaccine updated in May 2022. Emergency Contacts: - Emergency Contact: Jane Doe (Spouse) Phone: (555) 555-{234 Next of Kin: - Mary Doe (Sister) Phone: (555) 555-5678 IPFS Info:

So finally we get the decrypted information and the data can be used by the doctor to assess the health status of the patient.

4. The patient DICOM image folder is downloaded with the link from the patient information and the images are decrypted using the DICOM decryption module and the whole data is given to the doctor.

The ipfs link is copied from the patient information and is pasted in the brave browser.

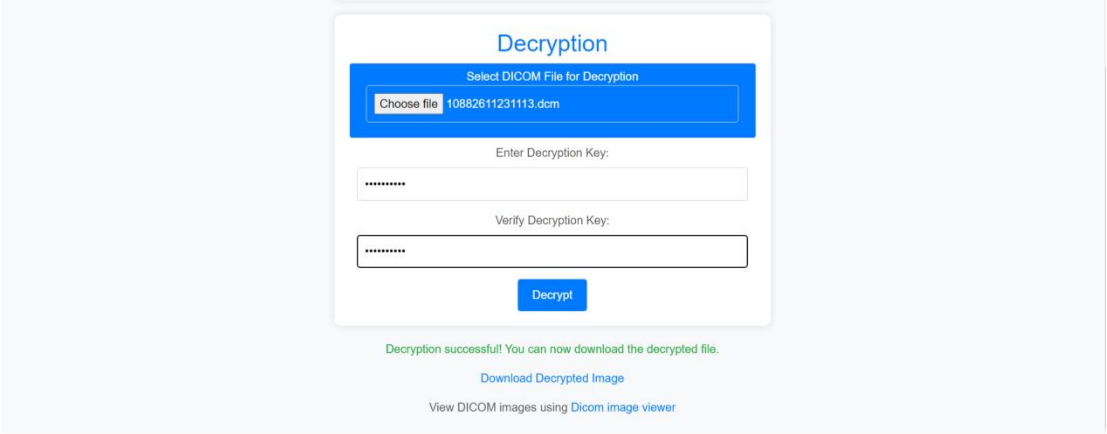


Index of /ipfs/bafybeiewn7tpusvvkbtr2i7l7phfswwmskmgdqiz55sv5ltly4qlu6s5je 526 kB
bafybeiewn7tpusvvkbtr2i7l7phfswwmskmgdqiz55sv5ltly4qlu6s5je

10882611231113.dcm QmNz...NtHq 526 kB

The images are downloaded by clicking on the file.

This downloaded file is put in the DICOM decryption module to get the decrypted image.



Select DICOM File for Decryption

Choose file 10882611231113.dcm

Enter Decryption Key:

••••••••••

Verify Decryption Key:

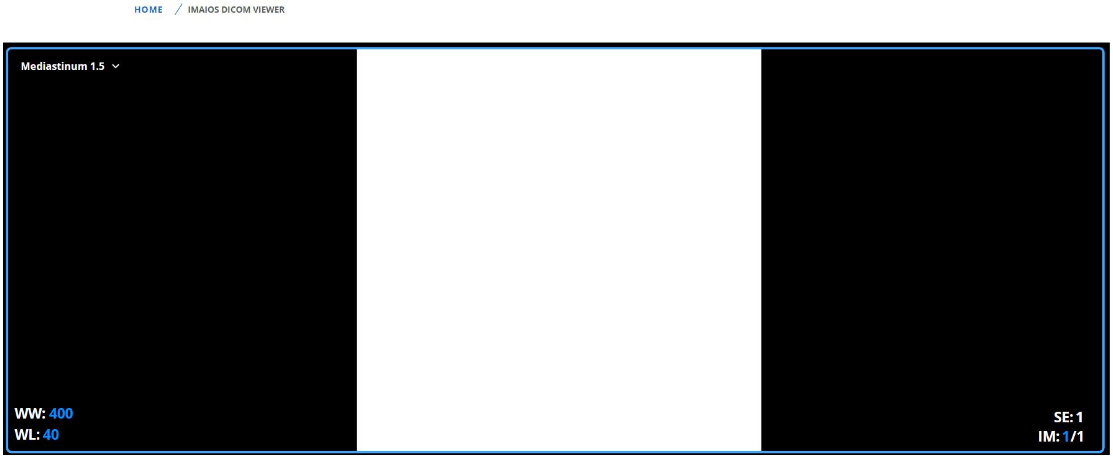
••••••••••

Decryption successful! You can now download the decrypted file.

View DICOM images using Dicom image viewer

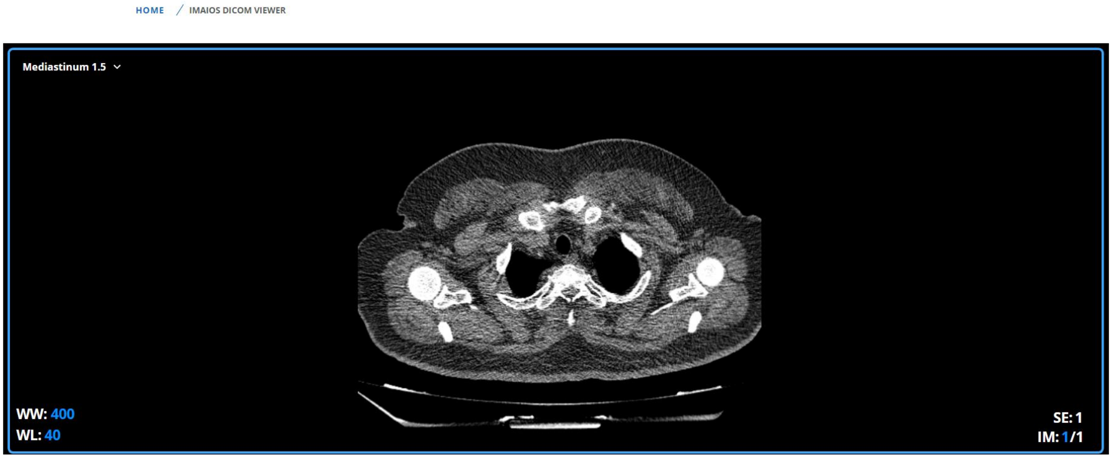
The decrypted image is downloaded to the local system and is viewed using the DICOM viewer.

Encrypted DICOM:



WW: 400
WL: 40
SE: 1
IM: 1/1

Decrypted DICOM:



WW: 400
WL: 40
SE: 1
IM: 1/1

In this way the patient can share his data at the hospital of his choice without compromising the integrity and confidentiality of the data.