Report On

Land Registry using Blockchain

Submitted in partial fulfillment of the requirements of the Course project in Semester VII of Final Year Computer Engineering

by

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CERTIFICATE

This is to certify that the project entitled “Title of the project” is a bonafide work of "Sakshi Ghonge (Roll No. 43), Varun Satheesh Babu (Roll No. 58), Anand Gupta (Roll No. 60), Siddhesh Jalgaonkar (Roll No. 61)" submitted to the University of Mumbai in partial fulfillment of the requirement for the Course project in semester VII of Final Year Computer Engineering.

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ABSTRACT

In this project, we aim to develop a decentralized cryptocurrency exchange which supports Land registration is a critical process that involves the legal recording of land ownership, rights, and transactions. The current land registration systems in many countries often face challenges such as corruption, inefficiency, and lack of transparency. Land Registration is a use case which involves lot of middlemen and central authorities in the process which then puts trust in the system. Keeping traces of who owns which part of land is challenging when there are hundreds or thousands of land records to maintain. Using Blockchain will remove the middlemen in the system and also will reduce corruption and increase speed of the process. Land Registration is a simple decentralized application which is build using the Ethereum Blockchain principals. We can use this registration procedure as a substitute to bypass the existing system flaws. Here the user who owns the land registers his land details and also enters market value of the land by providing all the necessary proofs. A government authority who traditionally looks into land registry is assigned as a land inspector can do the registration process. Lands coming under a particular village can be registered to the system only through the inspector who is assigned to that village.

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1. Introduction

A blockchain is a continuously expandable list (chain) of records (blocks) that are connected via encrypted data exchange. Each block typically contains a reference to the previous block, a timestamp, and transaction data. One of the most popular blockchain applications is the crypto-currency Bitcoin. Due to the fact that the transaction data on all applications (clients) are visible for everyone and traceable stored, this system is considered tamper-proof and transparent. With the use of blockchain, it is possible to run a continuously expandable list of bookings decentralized and the respective proper state must be documented because many participants are involved in the bookkeeping. This concept is referred to as Distributed Ledger technology (decentralized booking technology). What should be booked and documented with it, is irrelevant. Crucially, later transactions build on previous transactions and confirm them as correct by demonstrating knowledge of past transactions.

1.1. Problem Statement & Objectives

This project aims at creating a blockchain based ledger to store data of land owned members of the blockchain.

1.2. Scope

Blockchain is a social revolution and is making its way through all important areas especially where security is a concern. It is a social revolution and we have to take our best efforts to harness this technology to the best of our ability. There is good scope for improving the current solution for cloud storage. The application serves basic functionalities but can be extended to provide some advanced features. Deployment on main net or a private Ethereum network. So going further we would deploy it on a Main net or a private Ethereum network depending upon our requirements so that it gets connected with real world. Hosting the DAPP on a cloud platform-When deployed in real-time the number of users on the application would increase so to scale our application, we will host it on a cloud platform such as AWS. Collaboration with government agencies-The final stage of our project is to reach out to government and test our DAPP with their collaboration to collect real world inputs and see how our project stands in the real-time.

2. Literature Survey

2.1. Survey of Existing System

Blockchain for Land Administration" by Tarek Zein and Rohan Bennett (2018): This paper explores the use of blockchain technology in land administration, including land registration. It discusses the benefits and challenges of using blockchain for land registration and provides a case study of a blockchain-based land registry in Sweden."A Comparative Analysis of Land Registration Using Blockchain Technology" by Ismaila Temitayo Sanusi et al. (2019): This study compares the use of blockchain technology for land registration in Nigeria and Ghana. It analyzes the benefits and challenges of using blockchain for land registration and evaluates the feasibility of implementing blockchain-based land registries in these countries." Blockchain-Based Land Administration: A Review of Applications and Potentials" by Julius Oladele Ogunyemi et al. (2021): This paper provides a comprehensive review of blockchain-based land administration systems, including land registration, around the world. It evaluates the strengths and limitations of these systems and identifies the key challenges and opportunities for further research in this field. Analyzing various test cases Arturo Castellanos and Raquel Benbunan-Fich: proposed digitization of land records. They experienced that the internal process plays a feasible role in Blockchain digitization of land records. Digitizing land record will reduce the time delay caused in traditional process and speed up the process. A model proposed by Rishav Chatterjee we can only consider Registration Document and Khasra number (a plot or survey number given to a particular piece of land in villages). Chain code is the logic behind the entire system. Chain code was used to ensure that the land record are genuine. The Chain code used in Khasra Blockchain does alteration in the Khasra, but it is tied with the registration blockchain also. Any such binding needs a valid registration.

2.2. Limitations of Existing system or Research gap

Blockchain technology is still emerging, and its widespread adoption for land registration is limited in many regions. Traditional systems are deeply ingrained and trusted. Implementing blockchain for land registration can be technically challenging, especially in areas with limited access to technology and the internet. Developing and maintaining a blockchain system can be expensive, particularly for governments with limited resources. It may not be cost-effective in the short term. Blockchain systems can struggle with scalability when handling a large number of land transactions. This could lead to slower processing times. Interoperability: Existing land registration systems may not easily integrate with blockchain technology, leading to data silos and inefficiencies. Security Concerns: While blockchain is considered secure, it is not immune to hacking or fraud. If not implemented and maintained properly, there can be security vulnerabilities. Land registration involves complex legal and regulatory frameworks. Adapting these to blockchain systems can be challenging and time-consuming. Blockchain relies on digital infrastructure, which isn't universally accessible. This may exclude certain demographics from the land registration process. Blockchain's transparency may raise concerns about the privacy of landowners and sensitive information about the properties: Blockchain systems are not immune to human errors during data entry or smart contract coding, which can lead to inaccuracies in land records. Such an incident happened with Mt. Gox which was the world’s largest cryptocurrency exchange. It suffered the theft of 850,000 bitcoins, caused to its collapse.

2.3. Course Project Contribution

This project provides a distributed and secure system to store land records so that there is no breach of information and no information loss on node failure.

3. Proposed System

3.1. Architecture/Block diagram

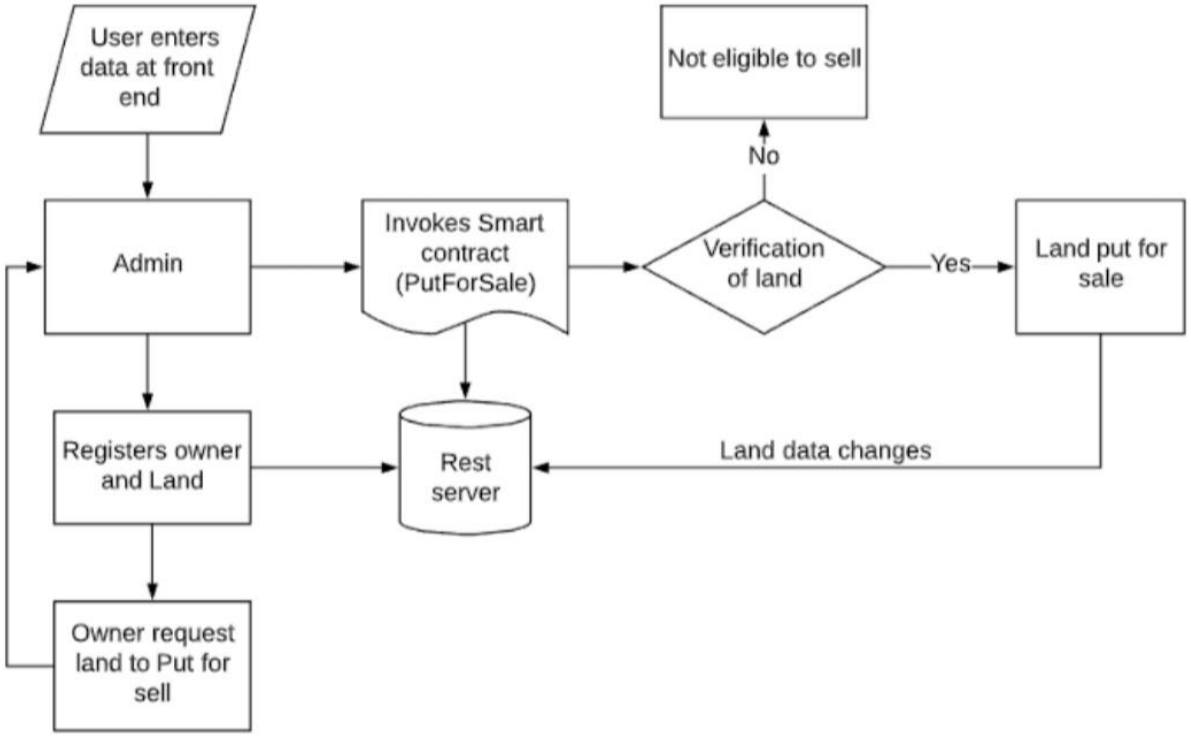


Fig 3.1

3.2. Algorithm and Process Design

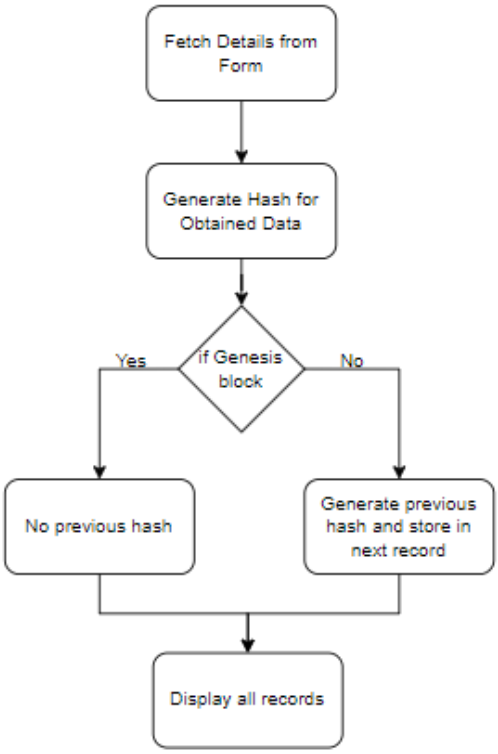


Fig 3.2

3.3. Details of Hardware & Software

The technologies used for implementation of this project are as follows:

- Python
- Flask
- HTML
- CSS

Hardware Requirements:

- Desktop/Laptop

- Internet Connection

4. Experiment and Results for Validation and Verification Analysis

The following are the output images of implementation of proposed system:

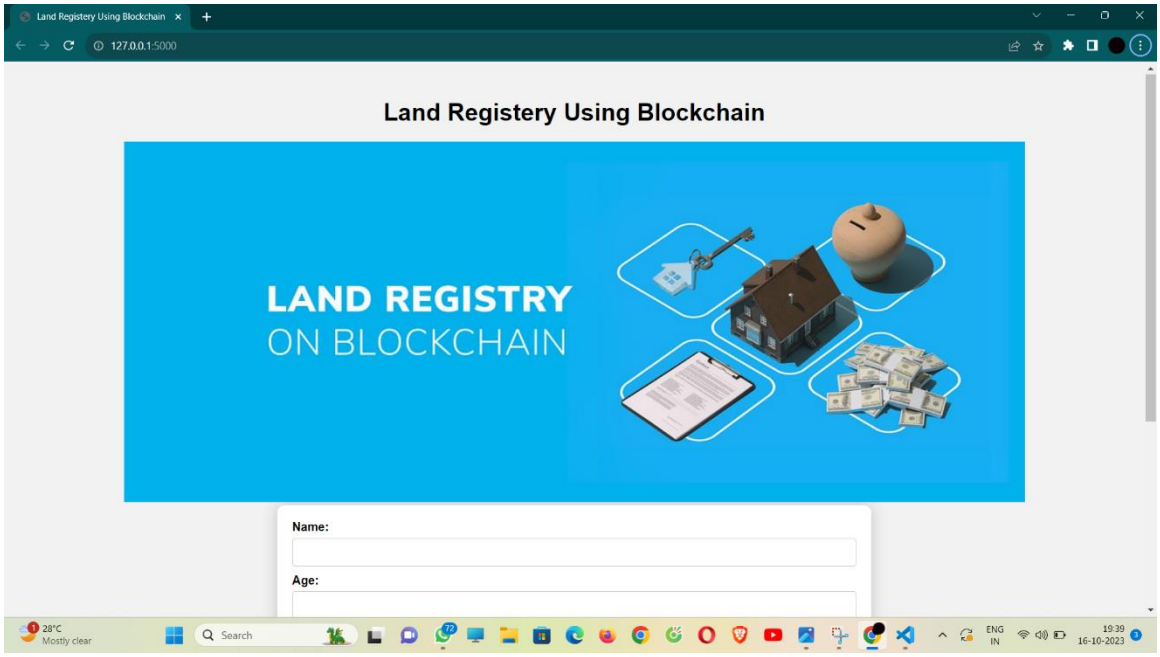


Fig 4.1

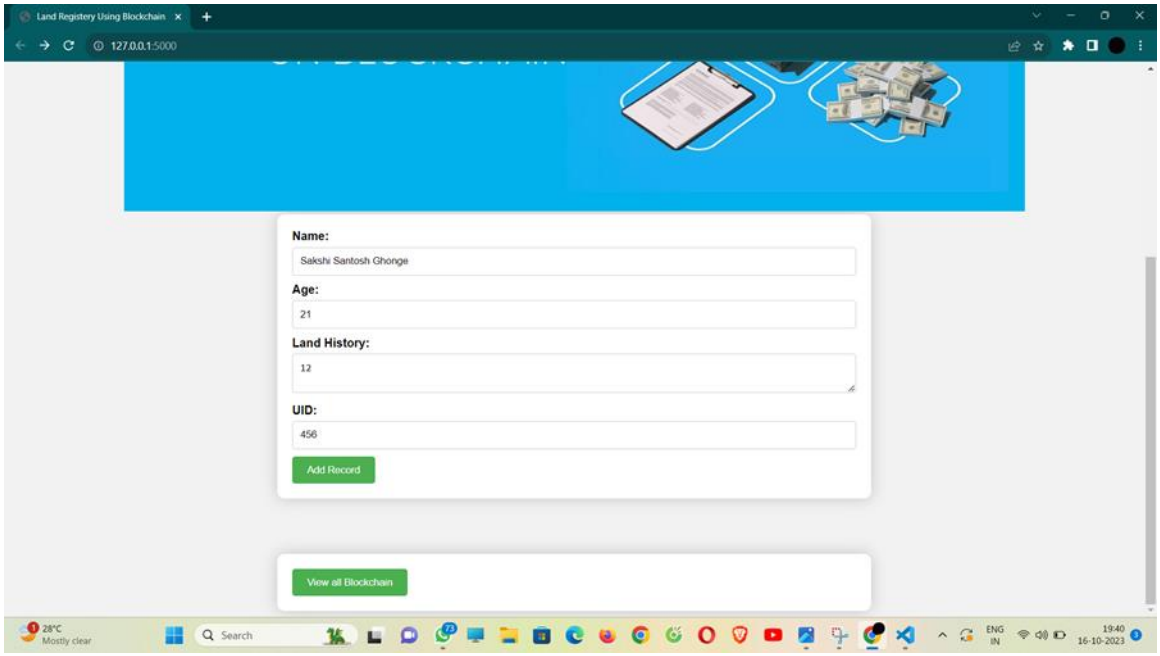

Land Registery Using Blockchain
127.0.0.1:5000
Name:
Sakshi Santosh Ghonge
Age:
21
Land History:
12
UID:
456
Add Record
View all Blockchain

Fig 4.2

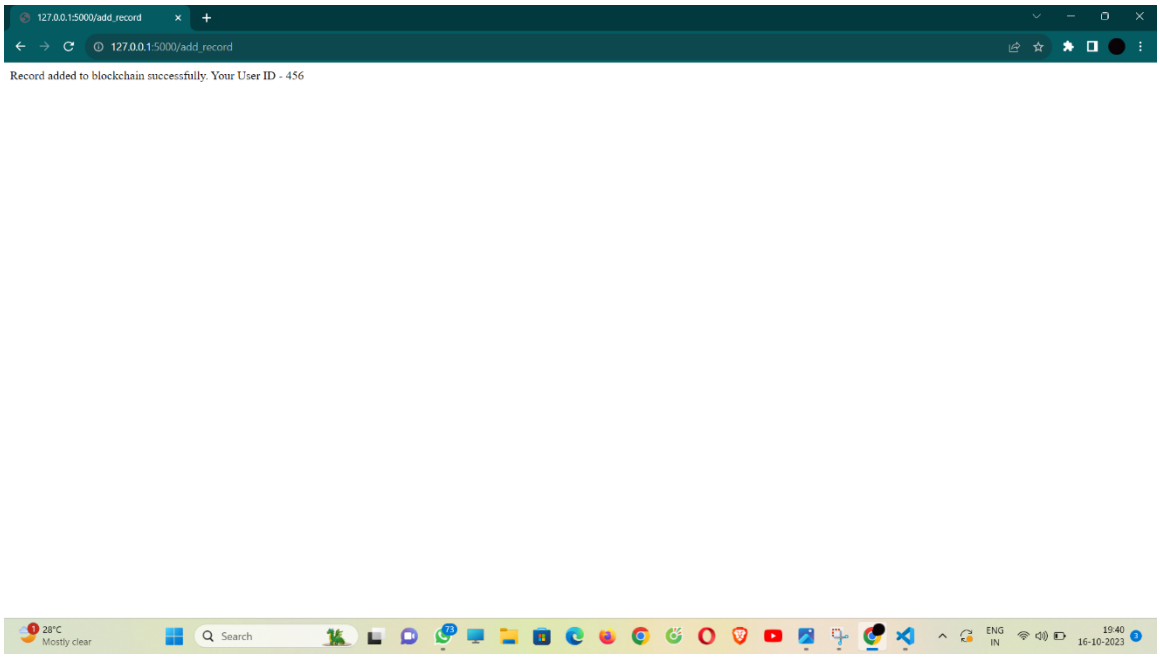

127.0.0.1:5000/add_record
127.0.0.1:5000/add_record
Record added to blockchain successfully. Your User ID - 456

Fig 4.3

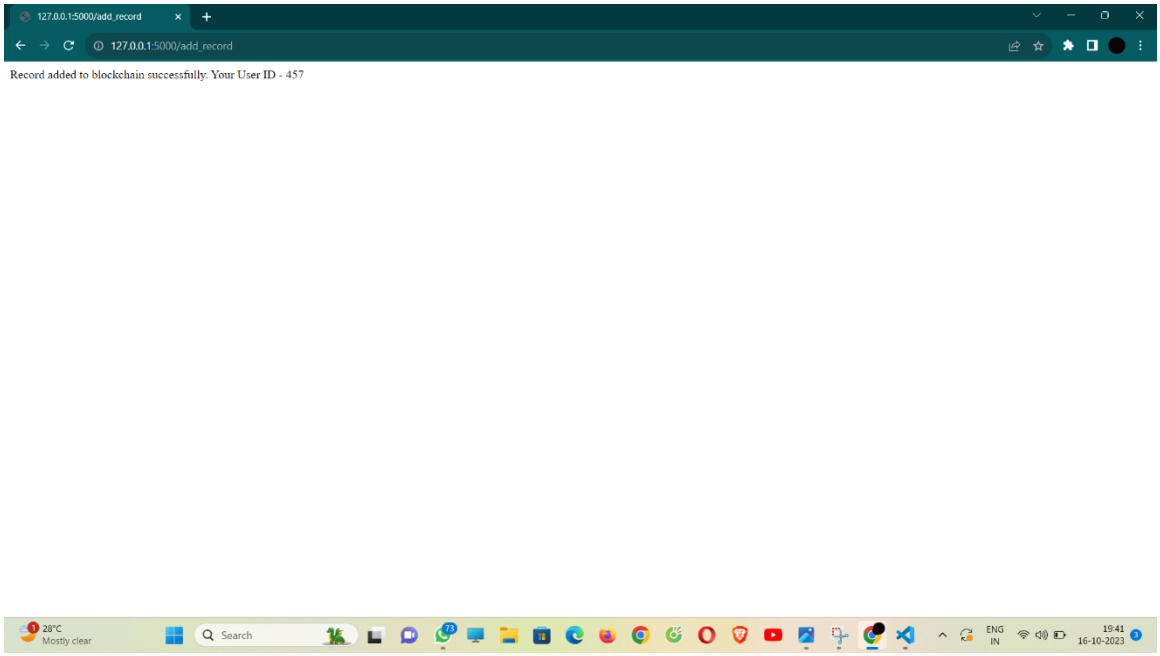
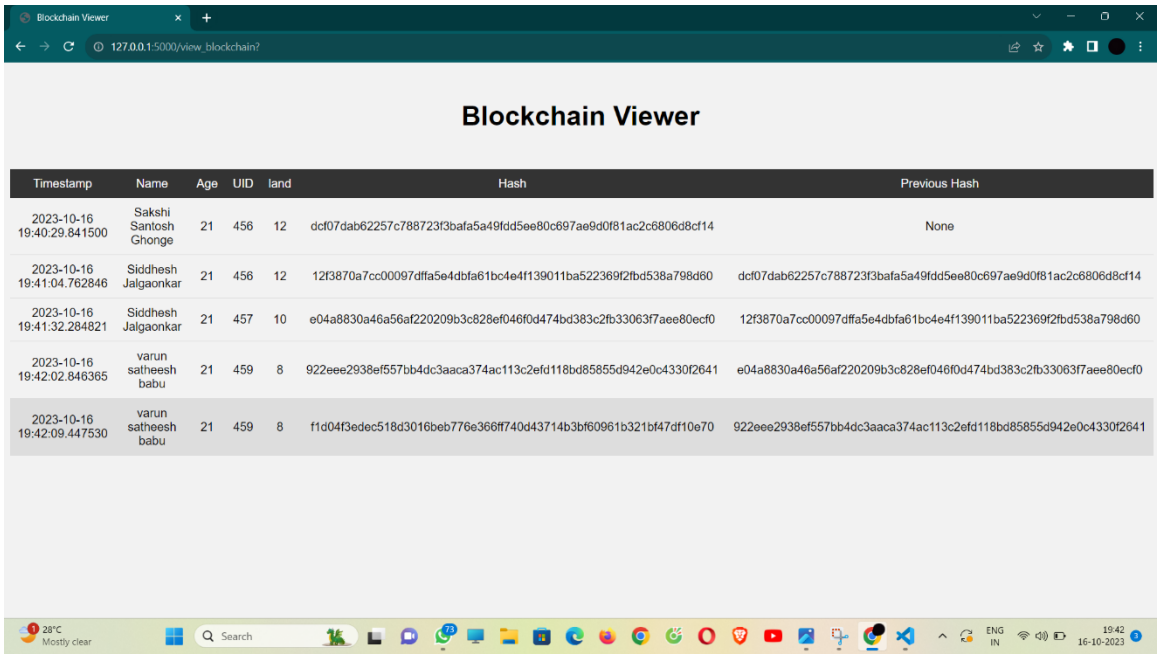


Fig 4.4



Timestamp	Name	Age	UID	land	Hash	Previous Hash
2023-10-16 19:40:29.841500	Sakshi Santosh Ghonge	21	456	12	dcf07dab62257c788723f3bafa5a49fdd5ee80c697ae9d0f81ac2c6806d8cf14	None
2023-10-16 19:41:04.762846	Siddhesh Jalgaonkar	21	456	12	12f3870a7cc00097dffa5e4dbfa61bc4e4f139011ba522369f2fbd538a798d60	dcf07dab62257c788723f3bafa5a49fdd5ee80c697ae9d0f81ac2c6806d8cf14
2023-10-16 19:41:32.284821	Siddhesh Jalgaonkar	21	457	10	e04a8830a46a56af220209b3c828ef046f0d474bd383c2fb33063f7aee80ecf0	12f3870a7cc00097dffa5e4dbfa61bc4e4f139011ba522369f2fbd538a798d60
2023-10-16 19:42:02.846365	varun satheesh babu	21	459	8	922eee2938ef557bb4dc3aaca374ac113c2efd118bd85855d942e0c4330f2641	e04a8830a46a56af220209b3c828ef046f0d474bd383c2fb33063f7aee80ecf0
2023-10-16 19:42:09.447530	varun satheesh babu	21	459	8	f1d04f3edec518d3016beb776e366ff740d43714b3bf60961b321bf47df10e70	922eee2938ef557bb4dc3aaca374ac113c2efd118bd85855d942e0c4330f2641

Fig 4.5

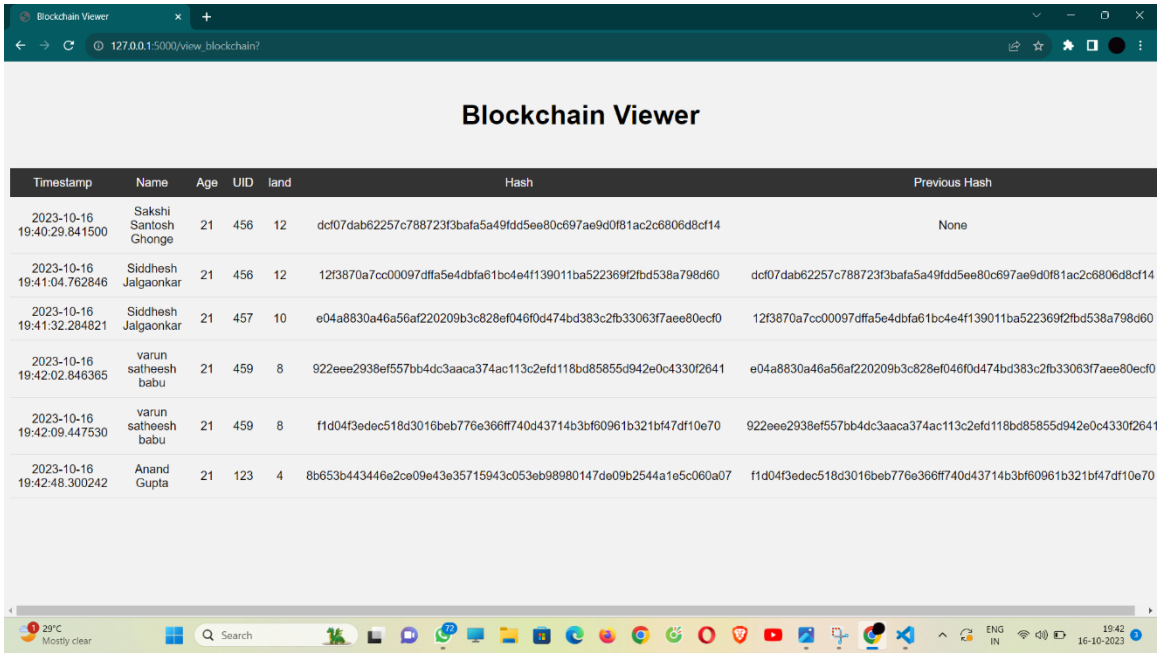


Fig 4.6

5. Conclusion and Future work

In conclusion, implementing land registration using blockchain technology offers significant advantages in terms of transparency, security, and efficiency. By leveraging blockchain, land registration processes can be streamlined and made more accessible to the public. This approach ensures a tamper-resistant and immutable record of property ownership, reducing fraud and disputes. However, successful implementation requires careful planning, stakeholder collaboration, and adherence to legal and regulatory frameworks. With the right methodology and continuous maintenance, blockchain-based land registration can revolutionize property management and provide a more equitable and trustworthy system for all parties involved.

6. References

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