TimeLock - A Decentralized Time Capsule

Project Overview

TimeLock is a blockchain-based system that allows users to store messages, images, and files in a digital time capsule, which can only be unlocked at a predetermined future time. Utilizing smart contracts on the Ethereum blockchain, it ensures tamper-proof storage and secure, automated access control. Content is stored off-chain using IPFS for persistence and integrity. This solution offers decentralized, transparent, and trustless access to time-sensitive data, ideal for digital legacies, secure document sharing, and personal future messages.

Key Features

- Blockchain-based: Uses Ethereum smart contracts for secure, tamper-proof access.

- Decentralized Storage: Content is stored on IPFS for long-term integrity.

- User Interface: Web-based front-end for easy interaction and content upload.

- Time-Locked Access: Content is released only when the specified timestamp is met.

- Secure & Immutable: Ensures privacy and data integrity.

- Applications: Digital legacy, secure document sharing, personal journaling, and business contracts.

Problem Statement

The TimeLock project allows users to securely store memories or files in a digital time capsule. It uses encryption for privacy and blockchain for transparency. The capsule unlocks only at a future date, preserving digital legacies safely.

Tools & Technologies Used

- Smart Contract Design: Manages capsule creation, locking, and access. Capsules can be

unlocked only after the set time using blockchain timestamps.

- Backend Process: Encrypts user content, stores it in IPFS, and saves metadata (like unlock time and IPFS hash) on the blockchain using Ethers.js. MetaMask is used for user authentication.

- Frontend Process: Web interface for login via MetaMask, content upload, and unlock date selection. After the unlock date, users can retrieve and decrypt their data.
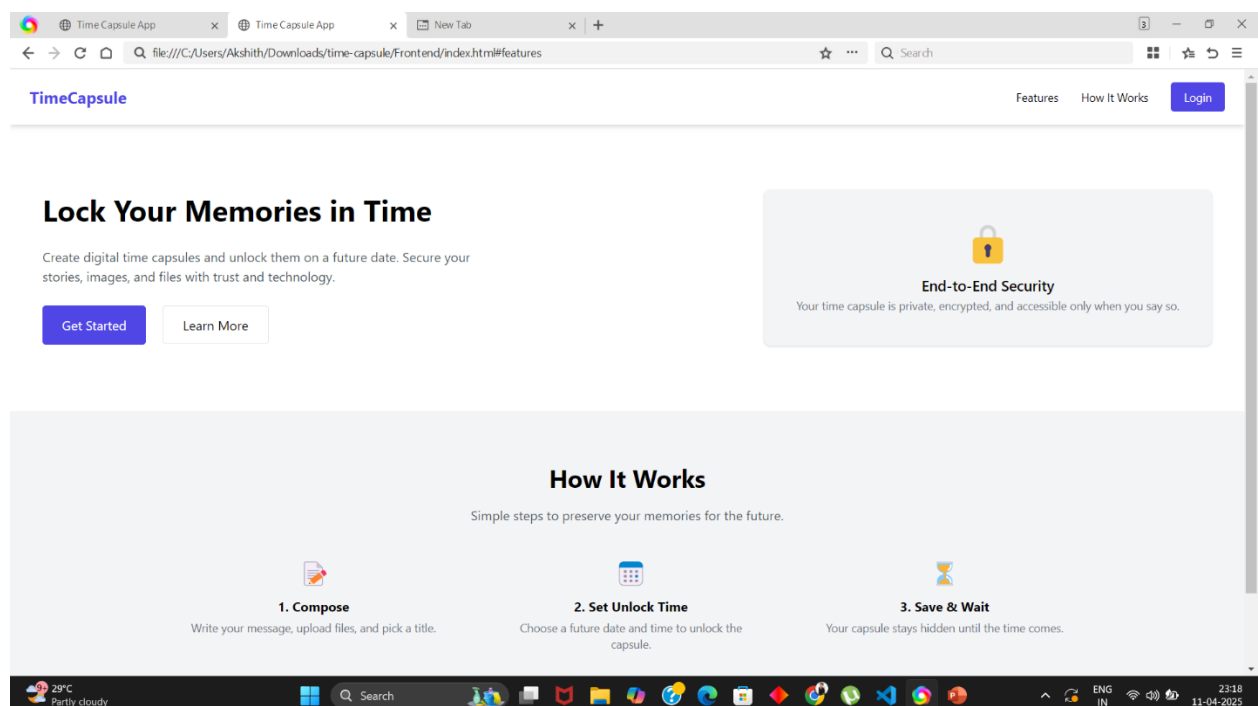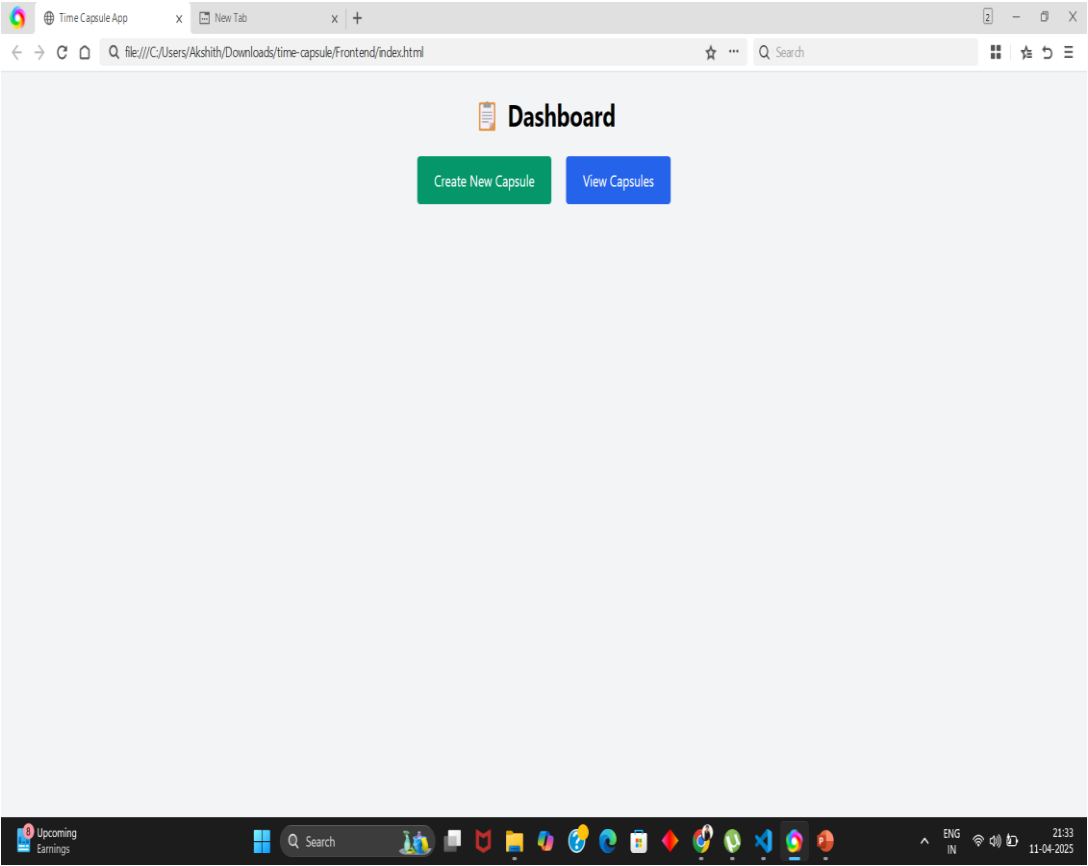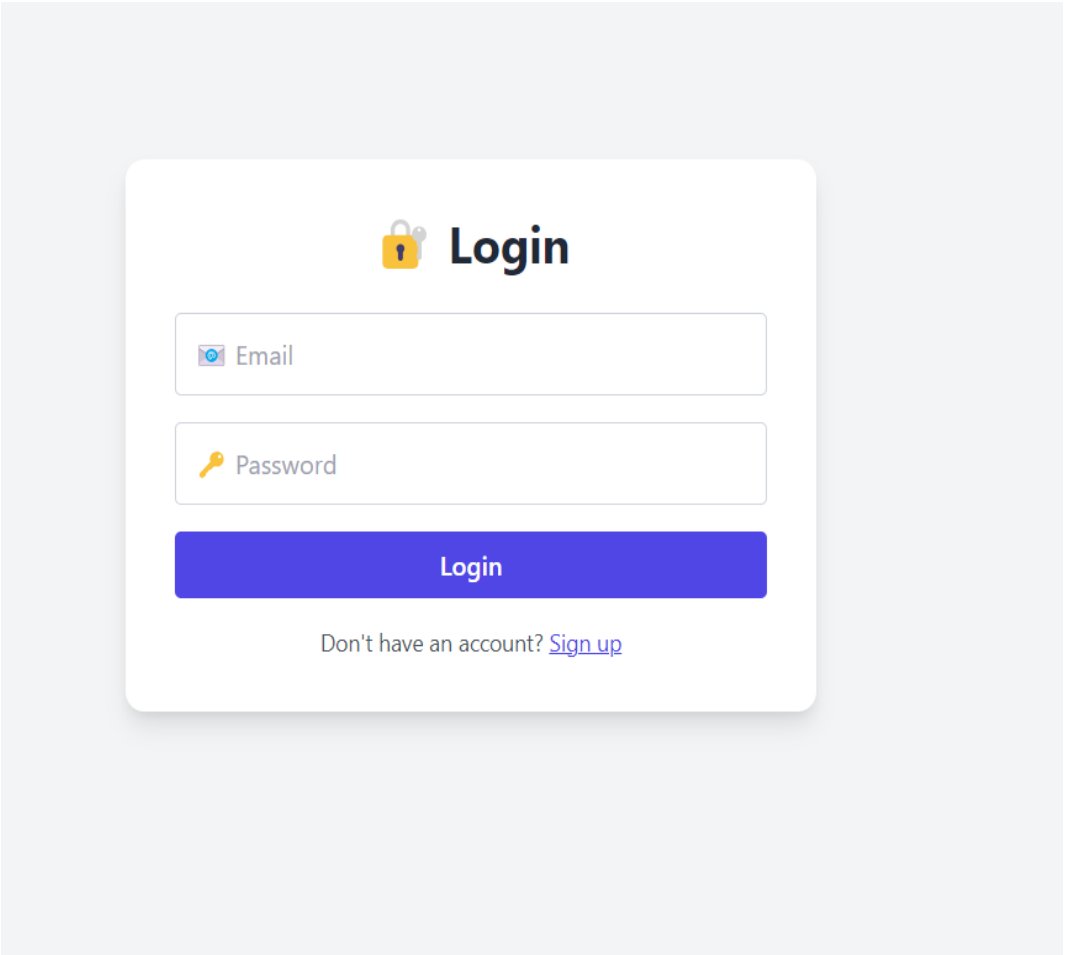
Privacy and Security

- Time-Based Access Control

- End-to-End Encryption

- Tamper-resistant via Decentralization

Applications

- Personal journals and memories

- Digital wills

- Legacy messages

- Secure future document delivery
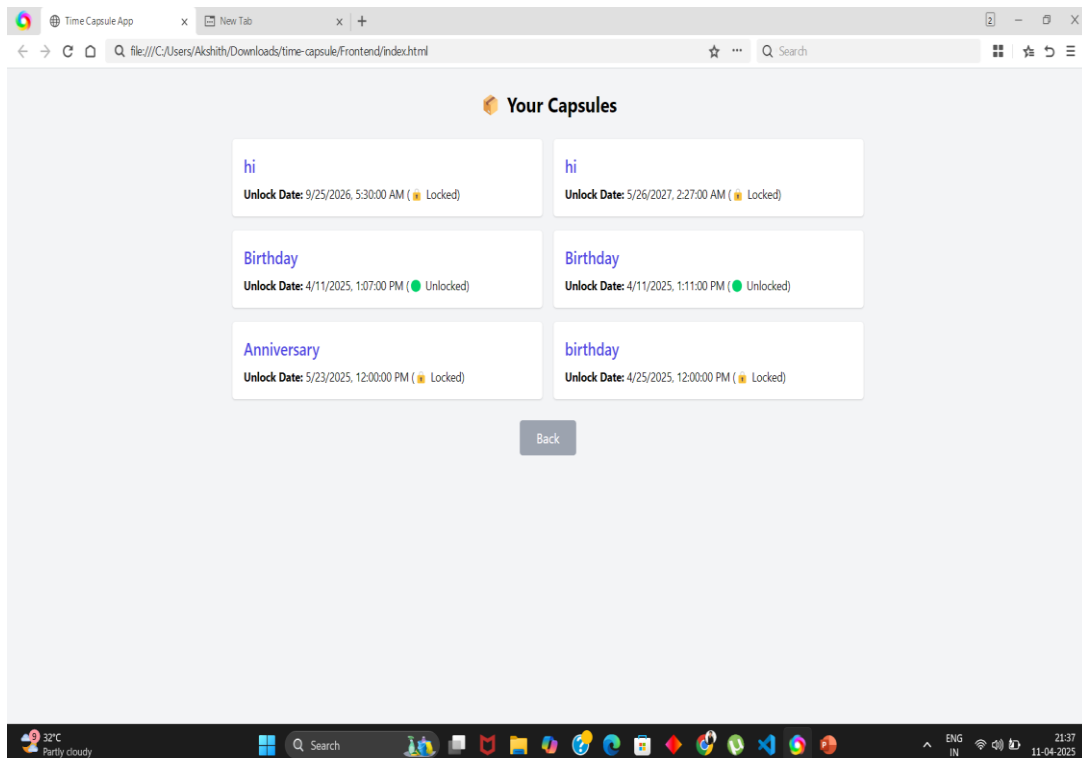
Results

🔒 **Login**

Email

Password

Login

Don't have an account? Sign up

📋 **Dashboard**

Create New Capsule   View Capsules

Conclusion

TimeLock is a smart way to connect emotions with technology. It allows people to save digital memories and set a time for when they can be opened in the future. Everything is kept safe and private using encryption, IPFS, and blockchain. It's like a digital time capsule that only opens when the time is right.