Vidyalankar Institute of Technology
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**DEPARTMENT OF COMPUTER ENGINEERING**

# Collaborative Project Report

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|---|---|
| Semester | B.E. Semester VII – Computer Engineering |
| Subject | Blockchain |
| Subject Professor In-charge | Prof. Swapnil S. Sonawane |
| Assisting Teachers | Prof. Swapnil S. Sonawane |

| Roll Number | Name of Students |
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| 21102A0006 | Sahil Pokharkar |
| 21102A0014 | Deep Salunkhe |

**Name of the Project:**

**HardHat-Todo**

**Project Details:**

**Project Title: HardHat-Todo**

## Overview

The Decentralized Todo List Application allows users to manage their tasks using Ethereum smart contracts. This project demonstrates how blockchain technology can be used to create a transparent and tamper-proof application for task management.

## Technologies Used

- **Frontend**: React, JavaScript, CSS
- **Blockchain**: Ethereum
- **Smart Contracts**: Solidity
- **Libraries**: ethers.js, Web3Provider
- **Development Tools**: Hardhat ,MetaMask

**Features**

1. **Add Todo**: Users can create new tasks, which are stored on the Ethereum blockchain.
2. **View Todos**: Users can view all their tasks fetched from the smart contract.
3. **Complete Todo**: Users can mark tasks as completed, which updates the task state in the smart contract.
4. **Error Handling**: The application includes error handling for interactions with the blockchain, providing feedback to users when errors occur.

**Smart Contract**

- **Contract Name**: Todo
- **Functions**:
  - createTask(string content): Adds a new task to the list.
  - getAllTasks(): Retrieves all tasks stored in the smart contract.
  - toggleTaskCompletion(uint index): Toggles the completion status of a task.

**User Interface**

- The user interface is simple and intuitive, allowing users to add and view their todos easily. It includes input fields for new tasks and buttons to complete them.

**Challenges Faced**

- **Blockchain Interaction**: Understanding how to interact with Ethereum smart contracts using ethers.js posed some initial challenges.
- **Handling Asynchronous Operations**: Managing state and asynchronous calls effectively, especially when fetching data from the blockchain.
- **Error Handling**: Implementing comprehensive error handling for user interactions with the smart contract.

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**GitHub Repository Link (Public):**

https://github.com/deepsalunkhee/HardHat-Todo

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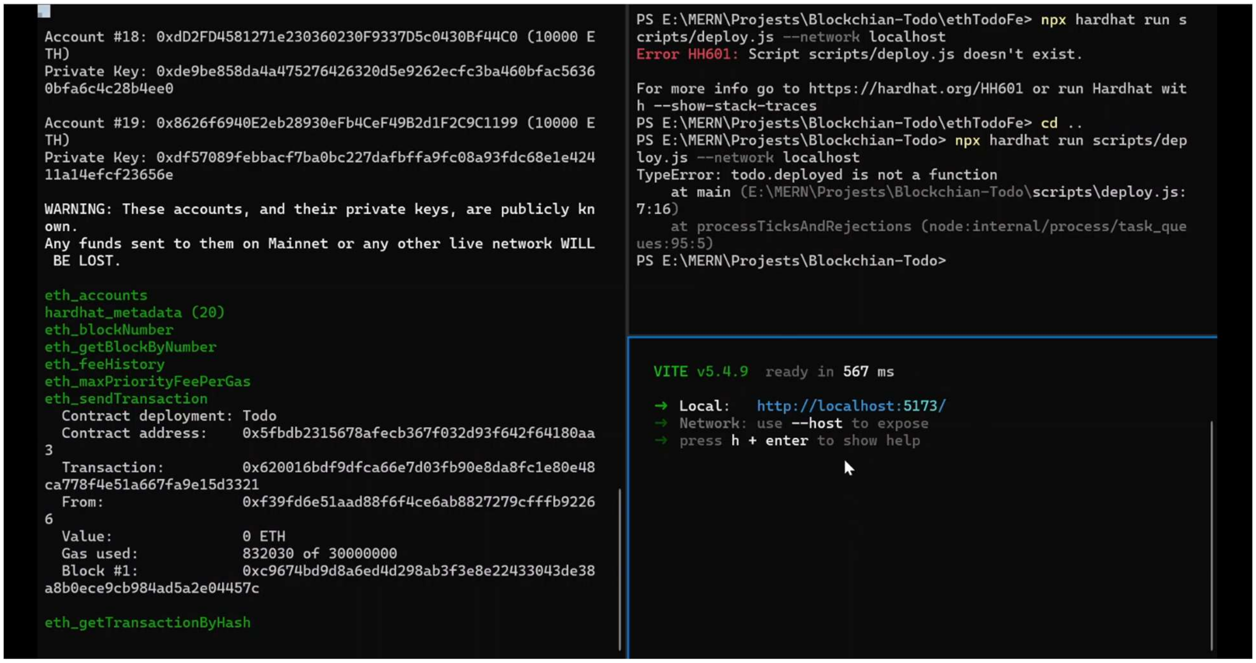
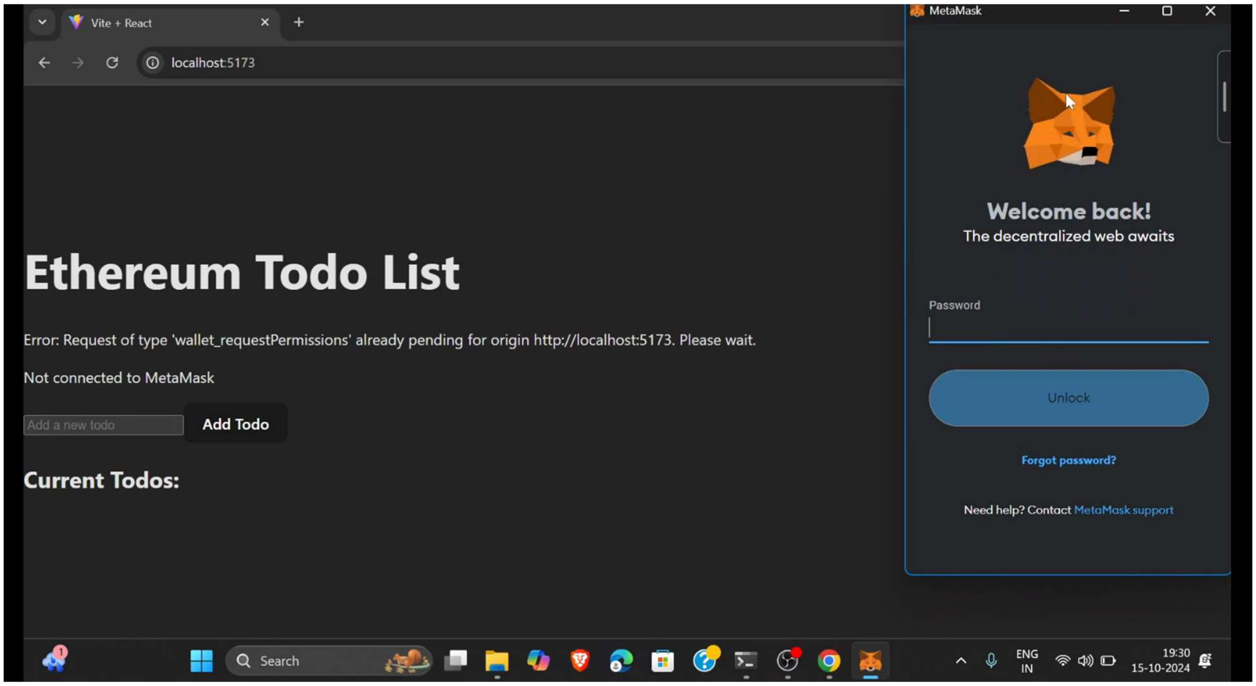
**Output Screenshots:**



```
Account #18: 0xdD2FD4581271e230360230F9337D5c0430Bf44C0 (10000 E
TH)
Private Key: 0xde9be858da4a475276426320d5e9262ecfc3ba460bfac5636
0bfa6c4c28b4ee0

Account #19: 0x8626f6940E2eb28930eFb4CeF49B2d1F2C9C1199 (10000 E
TH)
Private Key: 0xdf57089febbacf7ba0bc227dafbffa9fc08a93fdc68e1e424
11a14efcf23656e

WARNING: These accounts, and their private keys, are publicly kn
own.
Any funds sent to them on Mainnet or any other live network WILL
 BE LOST.

eth_accounts
hardhat_metadata (20)
eth_blockNumber
eth_getBlockByNumber
eth_feeHistory
eth_maxPriorityFeePerGas
eth_sendTransaction
  Contract deployment: Todo
  Contract address:    0x5fbdb2315678afecb367f032d93f642f64180aa
3
  Transaction:         0x620016bdf9dfca66e7d03fb90e8da8fc1e80e48
ca778f4e51a667fa9e15d3321
  From:                0xf39fd6e51aad88f6f4ce6ab8827279cfffb9226
6
  Value:               0 ETH
  Gas used:            832030 of 30000000
  Block #1:            0xc9674bd9d8a6ed4d298ab3f3e8e22433043de38
a8b0ece9cb984ad5a2e04457c

eth_getTransactionByHash
```

```
PS E:\MERN\Projests\Blockchian-Todo\ethTodoFe> npx hardhat run s
cripts/deploy.js --network localhost
Error HH601: Script scripts/deploy.js doesn't exist.

For more info go to https://hardhat.org/HH601 or run Hardhat wit
h --show-stack-traces
PS E:\MERN\Projests\Blockchian-Todo\ethTodoFe> cd ..
PS E:\MERN\Projests\Blockchian-Todo> npx hardhat run scripts/dep
loy.js --network localhost
TypeError: todo.deployed is not a function
    at main (E:\MERN\Projests\Blockchian-Todo\scripts\deploy.js:
7:16)
    at processTicksAndRejections (node:internal/process/task_que
ues:95:5)
PS E:\MERN\Projests\Blockchian-Todo>
```

```
  VITE v5.4.9  ready in 567 ms

  ➜  Local:   http://localhost:5173/
  ➜  Network: use --host to expose
  ➜  press h + enter to show help
```



# Ethereum Todo List

Error: Request of type 'wallet_requestPermissions' already pending for origin http://localhost:5173. Please wait.

Not connected to MetaMask

Add a new todo | Add Todo

## Current Todos:

**Welcome back!**

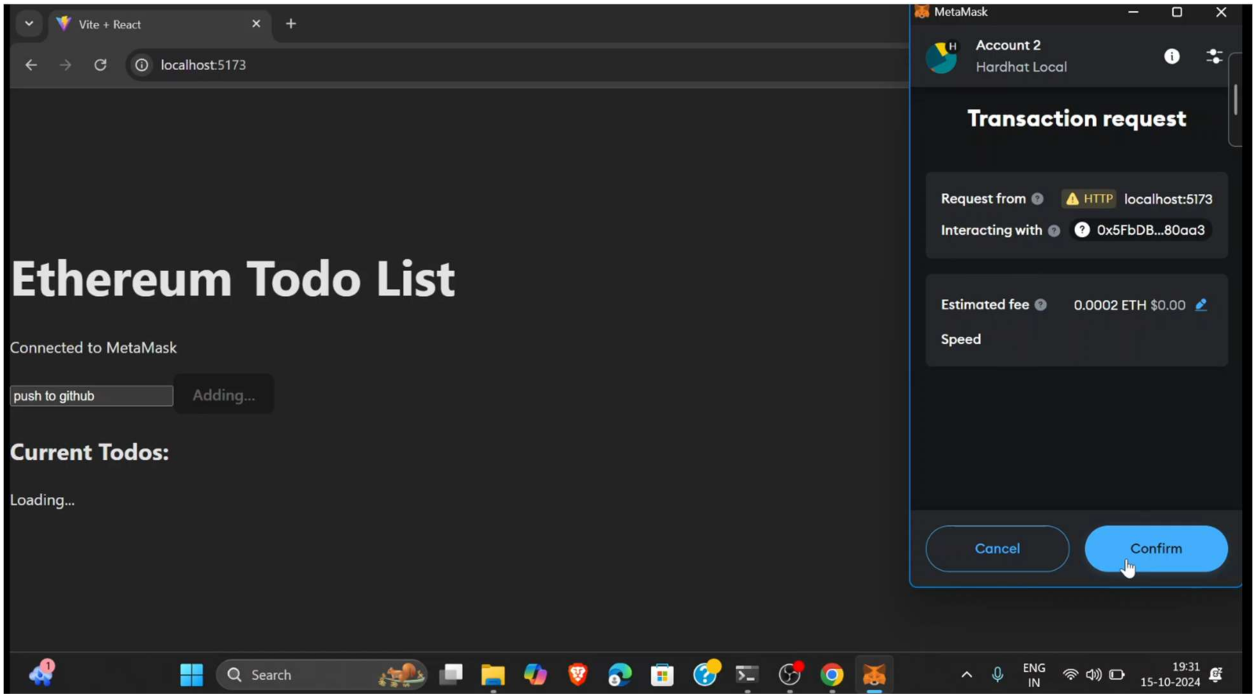
The decentralized web awaits

Password

Unlock

Forgot password?

Need help? Contact MetaMask support



Ethereum Todo List

Connected to MetaMask

push to github | Adding...

Current Todos:

Loading...

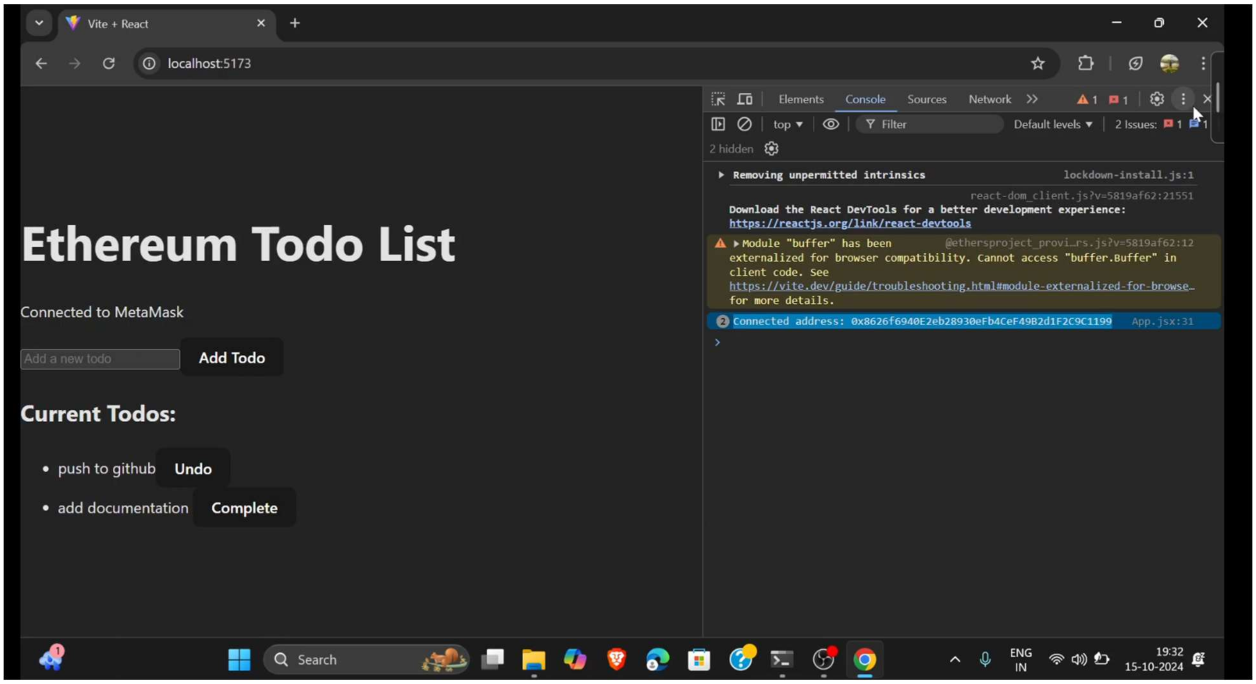
Account 2
Hardhat Local

Transaction request

Request from: HTTP localhost:5173
Interacting with: 0x5FbDB...80aa3

Estimated fee: 0.0002 ETH $0.00
Speed

Cancel | Confirm



Ethereum Todo List

Connected to MetaMask

Add a new todo | Add Todo

Current Todos:

- push to github Undo
- add documentation Complete

```
▶ Removing unpermitted intrinsics                                   lockdown-install.js:1
                                                     react-dom_client.js?v=5819af62:21551
Download the React DevTools for a better development experience:
https://reactjs.org/link/react-devtools
▶ Module "buffer" has been                @ethersproject_provi…rs.js?v=5819af62:12
externalized for browser compatibility. Cannot access "buffer.Buffer" in
client code. See
https://vite.dev/guide/troubleshooting.html#module-externalized-for-browse…
for more details.
2 Connected address: 0x8626f6940E2eb28930eFb4CeF49B2d1F2C9C1199          App.jsx:31
>
```