School: ..... Campus: .....

Academic Year: ..... Subject Name: ..... Subject Code: .....

Semester: ..... Program: ..... Branch: ..... Specialization: .....

Date: .....

Applied and Action Learning

(Learning by Doing and Discovery)

Name of the Experiement : Connect the Dots – Ethers.js and MetaMask UI

* Coding Phase: Pseudo Code / Flow Chart / Algorithm

- Open **Remix IDE** and write the SimpleStorage.sol smart contract.
- Compile the smart contract using the **Solidity compiler** to generate the ABI.
- Deploy the contract on **Sepolia Testnet** using **MetaMask (Injected Provider)**.
- Copy the **deployed contract address**.
- Create a new **React project** using create-react-app.
- Inside the src folder, create an ABI.js file and paste the contract ABI.
- In the project root, create a **.env file** to securely store the contract address and network details.
- Install required dependencies (ethers.js as primary library, web3.js only if needed).
- In App.js, implement wallet connection and blockchain interaction logic using **ethers.js**.
- Build a simple **UI** to store and retrieve values from the contract.
- Run the project using npm start and test interactions via MetaMask popups.

Software used

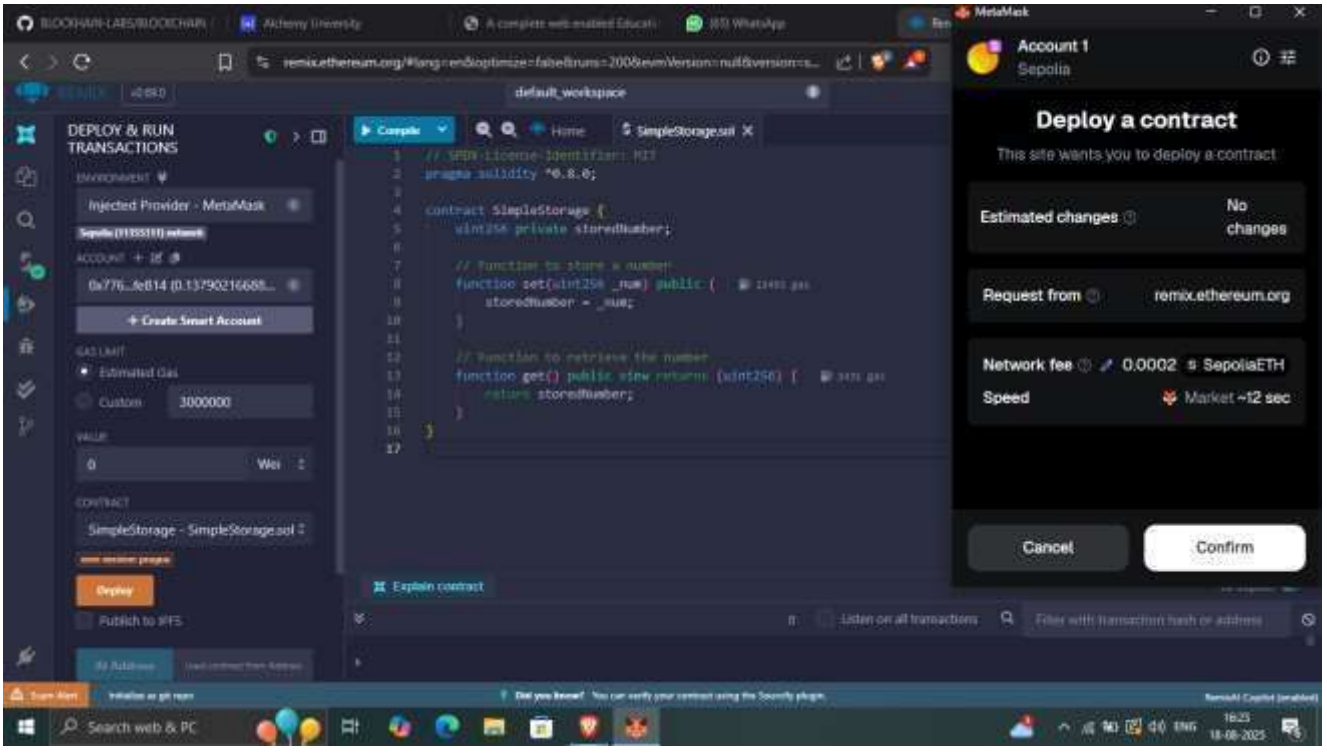
1. MetaMask Wallet
2. Remix IDE.
3. MS Word.
4. Brave for researching.

*As applicable according to the experiment.
Two sheets per experiment (10-20) to be used.

* Implementation Phase: Final Output (no error)

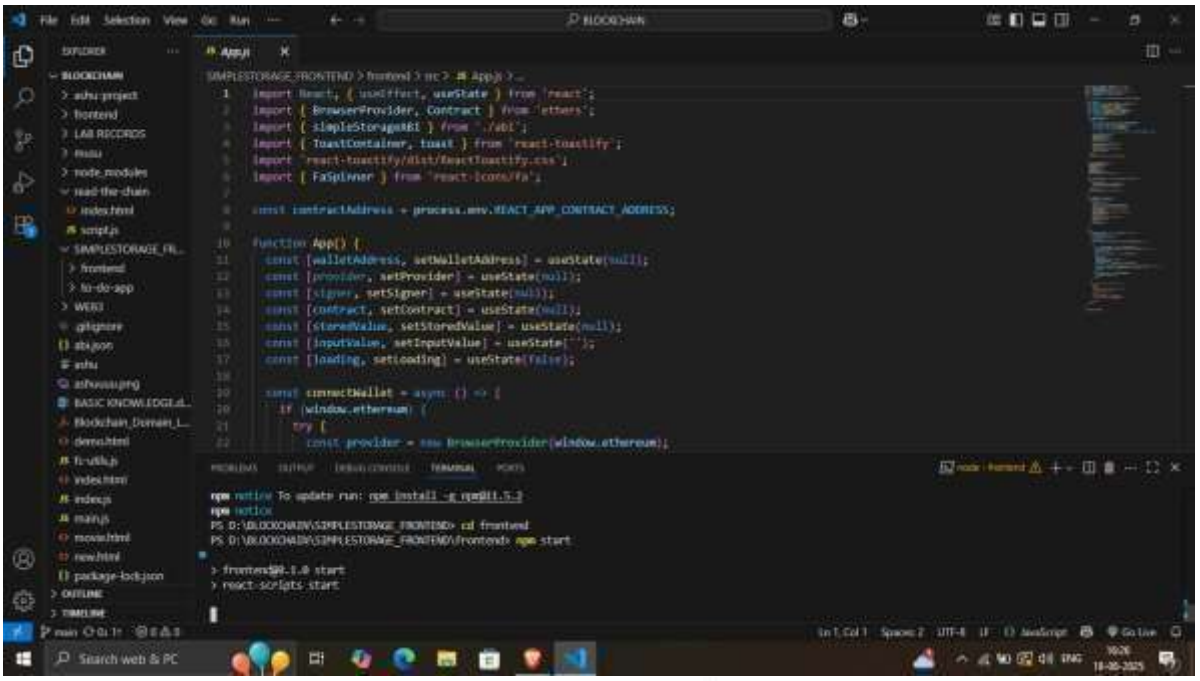
1. Firstly go to remix ide and write a smart contract on simplestorage.sol and compile it.
2. After compilation ABI will generated.
3. Then go to deploy and run transactions section and choose environment as injected provider-metamask, then simply deploy it.
4. Now we have to work on frontend first create a folder for your frontend then open terminal to install the react modules . Then create a ABI.js file inside your src folder where we have to store the abi of our smart contract and then create a .env file in the root of the project folder to dtore contract address and tectnet network.
5. Now in app.js write the frontend code and wallet connection code also.
6. Now simply move forward terminal of V.S Code just run the project with command npm start.

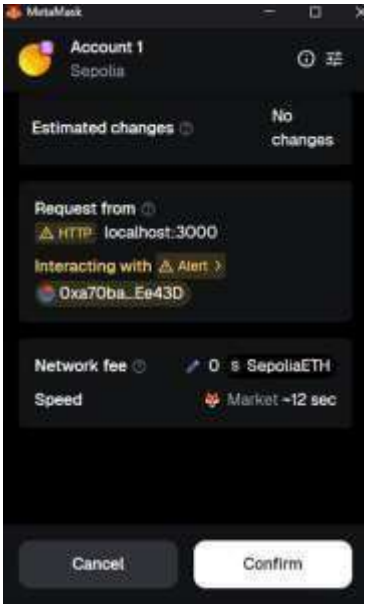
```
// SPDX-License-Identifier: MIT
pragma solidity ^0.8.0;

contract SimpleStorage {
    uint256 private storedNumber;

    // Function to store a number
    function set(uint256 _num) public {    22492 gas
        storedNumber = _num;
    }

    // Function to retrieve the number
    function get() public view returns (uint256) {    2431 gas
        return storedNumber;
    }
}
```



*As applicable according to the experiment.
Two sheets per experiment (10-20) to be used.

* Implementation Phase: Final Output (no error)





*As applicable according to the experiment.
Two sheets per experiment (10-20) to be used.

* Observations:

- Smart contract successfully deployed on **Sepolia Testnet**.
- **MetaMask wallet connection** worked with the React frontend.
- UI allowed users to **store and retrieve values**.
- **ethers.js** ensured a secure and modern interaction with the contract.
- .env file maintained contract details securely.
- The setup provides a **scaffold for future DApp development**.

ASSESSMENT

Rubrics	Full Mark	Marks Obtained	Remarks
Concept	10		
Planning and Execution/ Practical Simulation/ Programming	10		
Result and Interpretation	10		
Record of Applied and Action Learning	10		
Viva	10		
Total	**50**		

Signature of the Student:

Name :

Regn. No. :

Signature of the Faculty:

**As applicable according to the experiment. Two sheets per experiment (10-20) to be used.*