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 : Web3 Connect _ Contract Calls via Frontend

* Coding Phase: Pseudo Code / Flow Chart / Algorithm

☐ Open **Remix IDE** and create the SimpleStorage.sol smart contract.

☐ Compile the smart contract using the **Solidity compiler**.

☐ Copy the **ABI** generated after successful compilation.

☐ Deploy the contract on the **Sepolia Testnet** using **MetaMask (Injected Provider)**.

☐ Copy and save the **deployed contract address**.

☐ Create a new **React frontend project** using create-react-app.

☐ Configure the .env file with the **contract address** and **network details**.

☐ Install necessary packages:

▯ ethers.js (for blockchain interaction)
▯ web3.js (if required for compatibility)

☐ Import ABI and contract address to connect the frontend with the smart contract.

☐ Design the **UI in App.js** to allow storing and retrieving data through wallet connection.

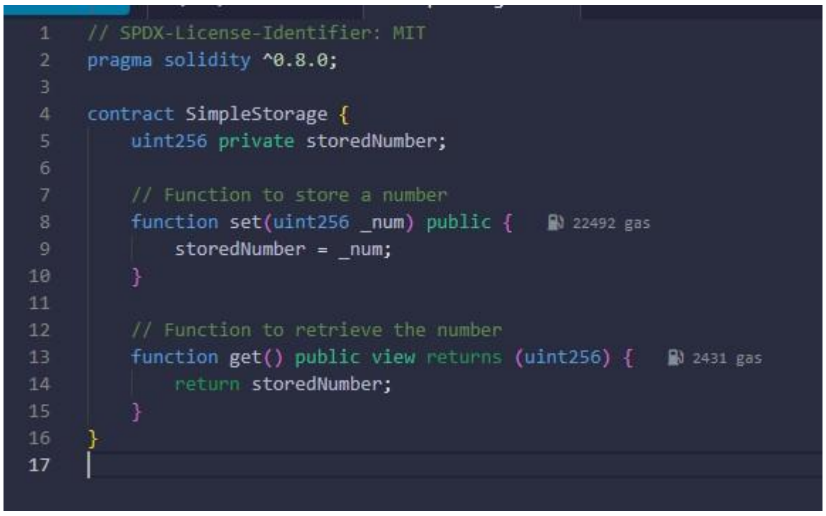
Software used

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

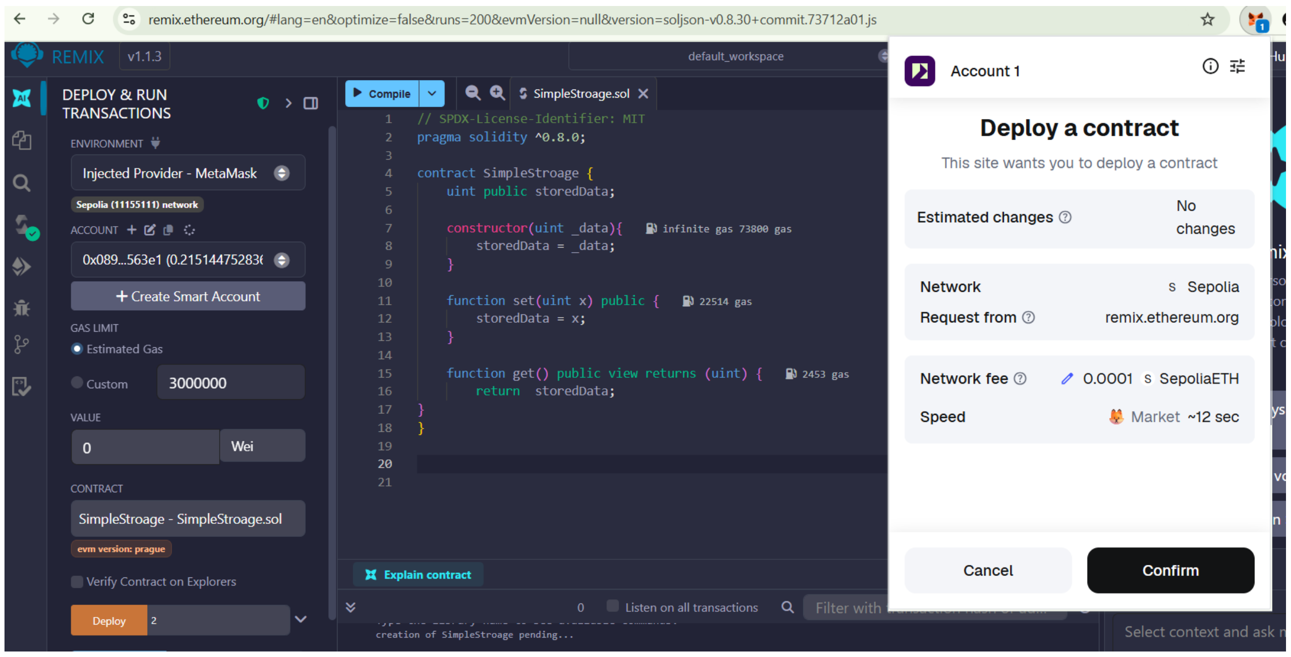
* according to the experiment.
per experiment (10-20) to be used.

* 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;
    }
}
```



remix.ethereum.org/#lang=en&optimize=false&runs=200&evmVersion=null&version=soljson-v0.8.30+commit.73712a01.js

REMIX v1.1.3 — default_workspace

DEPLOY & RUN TRANSACTIONS

ENVIRONMENT: Injected Provider - MetaMask
Sepolia (11155111) network
ACCOUNT: 0x089...563e1 (0.21514475283
+ Create Smart Account
GAS LIMIT: Estimated Gas / Custom 3000000
VALUE: 0 Wei
CONTRACT: SimpleStroage - SimpleStroage.sol
evm version: prague
Verify Contract on Explorers
Deploy 2

Compile — SimpleStroage.sol

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

contract SimpleStroage {
    uint public storedData;

    constructor(uint _data){    infinite gas 73800 gas
        storedData = _data;
    }

    function set(uint x) public {    22514 gas
        storedData = x;
    }

    function get() public view returns (uint) {    2453 gas
        return  storedData;
    }
}
```

Explain contract

```
creation of SimpleStroage pending...
```

Account 1

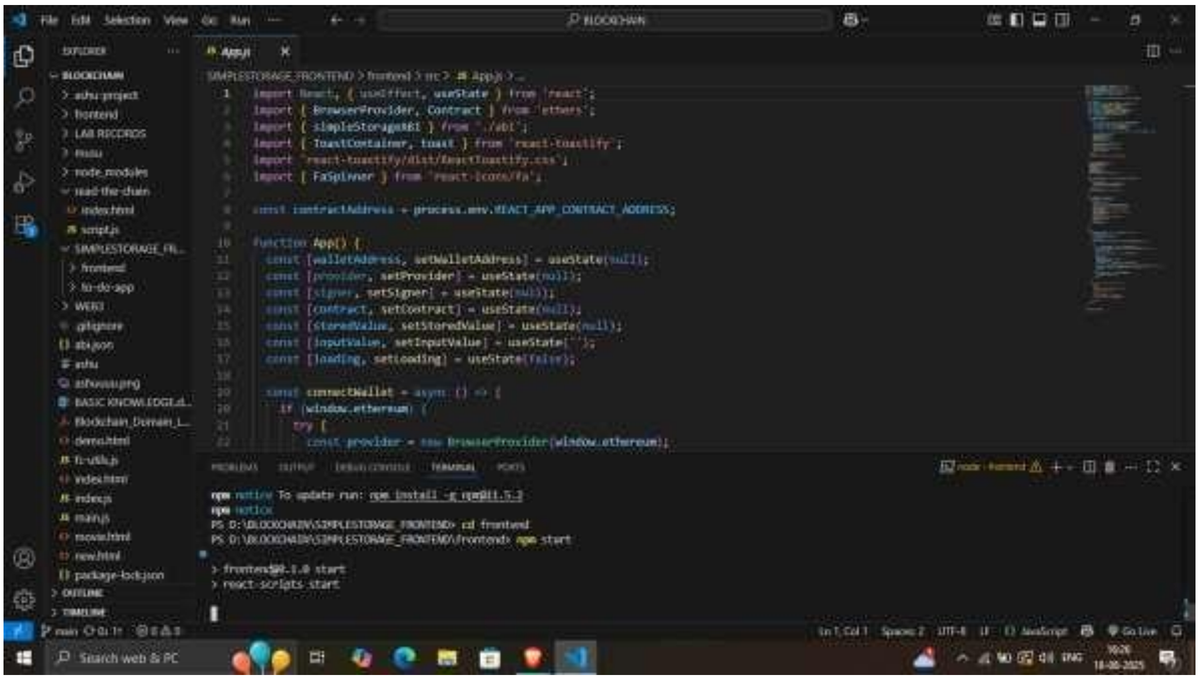
Deploy a contract

This site wants you to deploy a contract

Estimated changes	No changes
Network	Sepolia
Request from	remix.ethereum.org
Network fee	0.0001 SepoliaETH
Speed	Market ~12 sec

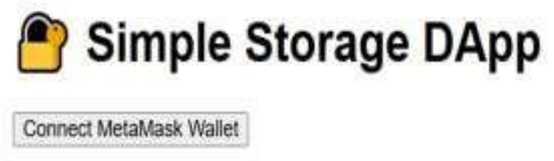
*As applicable according to the experiment.
Two sheets per experiment (10-20) to be used.*

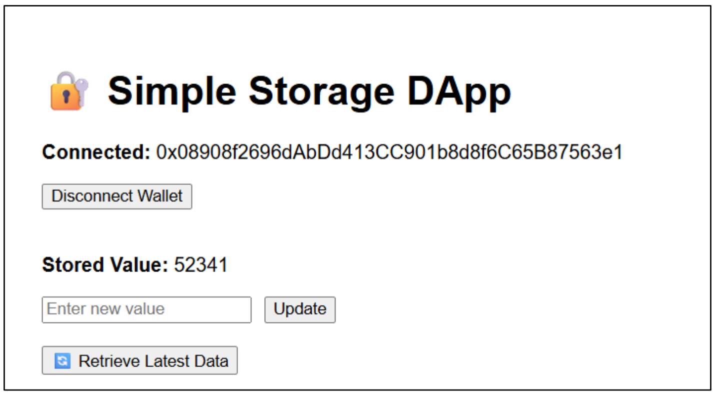
* Implementation Phase: Final Output (no error)



```
import React, { useEffect, useState } from 'react';
import { BrowserProvider, Contract } from 'ethers';
import { simpleStorageABI } from './abi';
import { ToastContainer, toast } from 'react-toastify';
import 'react-toastify/dist/ReactToastify.css';
import { FaSpinner } from 'react-icons/fa';

const contractAddress = process.env.REACT_APP_CONTRACT_ADDRESS;

function App() {
  const [walletAddress, setWalletAddress] = useState(null);
  const [provider, setProvider] = useState(null);
  const [signer, setSigner] = useState(null);
  const [contract, setContract] = useState(null);
  const [storedValue, setStoredValue] = useState(null);
  const [inputValue, setInputValue] = useState('');
  const [loading, setLoading] = useState(false);

  const connectWallet = async () => {
    if (window.ethereum) {
      try {
        const provider = new BrowserProvider(window.ethereum);
```

```
npm notice To update run: npm install -g npm@11.5.2
npm notice
PS D:\BLOCKCHAIN\SIMPLESTORAGE_FRONTEND> cd frontend
PS D:\BLOCKCHAIN\SIMPLESTORAGE_FRONTEND\frontend> npm start

> frontend@0.1.0 start
> react-scripts start
```





Simple Storage DApp

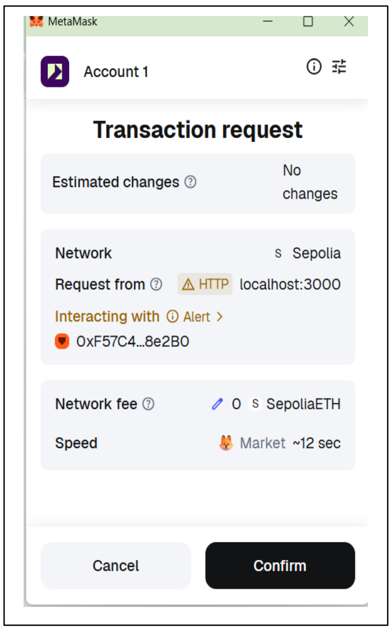
Connected: 0x08908f2696dAbDd413CC901b8d8f6C65B87563e1

Disconnect Wallet

Stored Value: 52341

Enter new value | Update

Retrieve Latest Data



MetaMask

Account 1

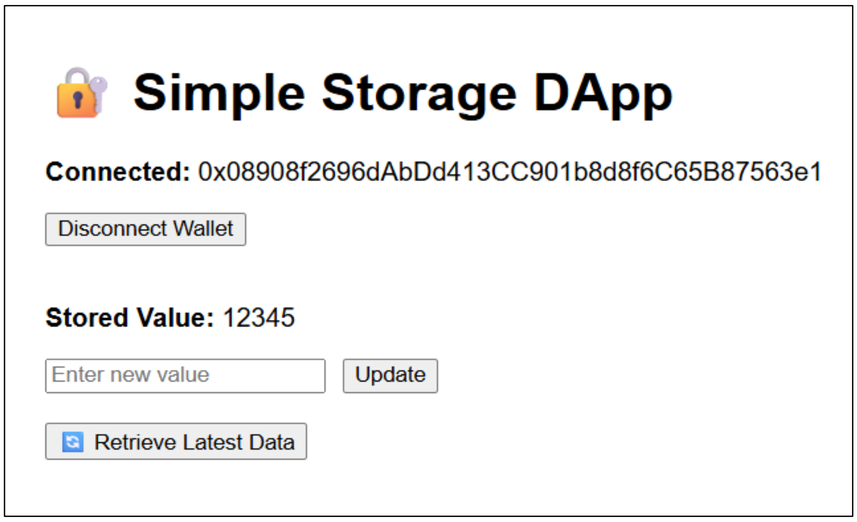
Transaction request

Estimated changes: No changes

Network: Sepolia
Request from: HTTP localhost:3000
Interacting with: Alert
0xF57C4...8e2B0

Network fee: 0 SepoliaETH
Speed: Market ~12 sec

Cancel | Confirm



Simple Storage DApp

Connected: 0x08908f2696dAbDd413CC901b8d8f6C65B87563e1

Disconnect Wallet

Stored Value: 12345

Enter new value | Update

Retrieve Latest Data

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

* Observations:

 The smart contract was successfully deployed on the Sepolia Testnet.

 The frontend connected with the contract using ethers.js.

 Users were able to store and retrieve values through the UI.

 ethers.js provided a simpler and more secure interface compared to web3.js.

 The project demonstrated the complete flow of smart contract deployment, frontend integration, and blockchain interaction.

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.