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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 :** UI for DApps – Building a DApp Frontend

## Objective/Aim:

To design and implement a **frontend interface** for a Decentralized Application (DApp) using **React.js** and connect it to the Ethereum blockchain through **Web3.js** or **Ethers.js**.

## Apparatus/Software Used:

1. **React.js (Frontend Framework)**
2. **Node.js & NPM (for package management)**
3. **MetaMask Wallet (browser extension)**
4. **Web3.js / Ethers.js (Blockchain interaction library)**
5. **Solidity Smart Contract (deployed on testnet)**
6. **VS Code (IDE)**

## 1. Theory/Concept:

A **Decentralized Application (DApp)** consists of:

1. **Frontend (UI)** – built using web technologies like React, HTML, CSS, JavaScript.
2. **Smart Contract (Backend)** – written in Solidity and deployed on blockchain.
3. **Wallet Connection** – using MetaMask to authenticate users and handle transactions.

The frontend interacts with the blockchain via Web3.js or Ethers.js to:

- Read smart contract data
- Execute transactions
- Display blockchain states dynamically

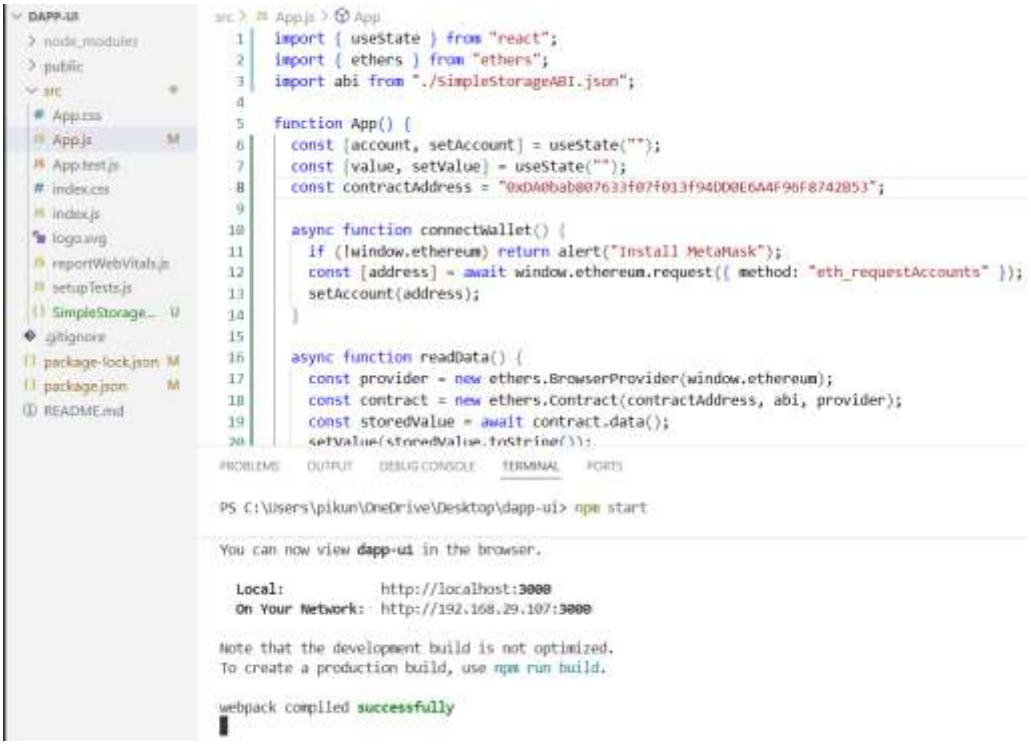
# procedure

## Setup React Project

```
C:\Users\pikun\OneDrive\Desktop>npx create-react-app dapp-ui

Creating a new React app in C:\Users\pikun\OneDrive\Desktop\dapp-ui.

Installing packages. This might take a couple of minutes.
Installing react, react-dom, and react-scripts with cra-template...


added 1324 packages in 2m

271 packages are looking for funding
  run `npm fund` for details

Initialized a git repository.

Installing template dependencies using npm...

added 17 packages, and changed 1 package in 10s

271 packages are looking for funding
  run `npm fund` for details
Removing template package using npm...


C:\Users\pikun\OneDrive\Desktop>cd dapp-ui

C:\Users\pikun\OneDrive\Desktop\dapp-ui>npm install ethers

added 9 packages, and audited 1350 packages in 7s

274 packages are looking for funding
  run `npm fund` for details

9 vulnerabilities (3 moderate, 6 high)

To address all issues (including breaking changes), run:
  npm audit fix --force
```

## Create Smart Contract Connection

Inside src/App.js, connect MetaMask and smart contract:

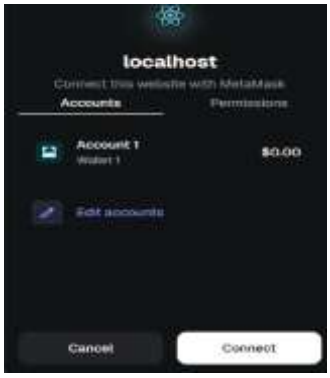


**Connect MetaMask**

- Open MetaMask → Connect to **Sepolia Test Network**.
- Approve site connection when prompted.

**Run the App**

- The DApp will launch in the browser at http://localhost:3000.





## Observation Table:

| Step | Action Taken | Output/Result |
|---|---|---|
| React project setup | npx create-react-app dapp-ui | Frontend project initialized |
| MetaMask connection | Click "Connect Wallet" | Account address displayed |
| Smart contract read | Click "Read Value" | On-chain data displayed in UI |
| Browser console log | Shows RPC calls to blockchain | Successful connection logs |

## 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:***