

## **Blockchain Experiment 3**

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**AIM: Implement the embedding wallet (Metamask) and transaction using Solidity**

### **TASKS PERFORMED:**

Set Up MetaMask: -- Install MetaMask -- Create or Import an Account: -- Fund Your Wallet :  
Sepolia Testnet (0.5 ETH per day) / RSK Testnet (0.05 RBTC per day)

Connect the Sepolia Testnet / RSK Testnet to Remix IDE

Create a Simple Solidity Smart Contract based on the MiniProject chosen

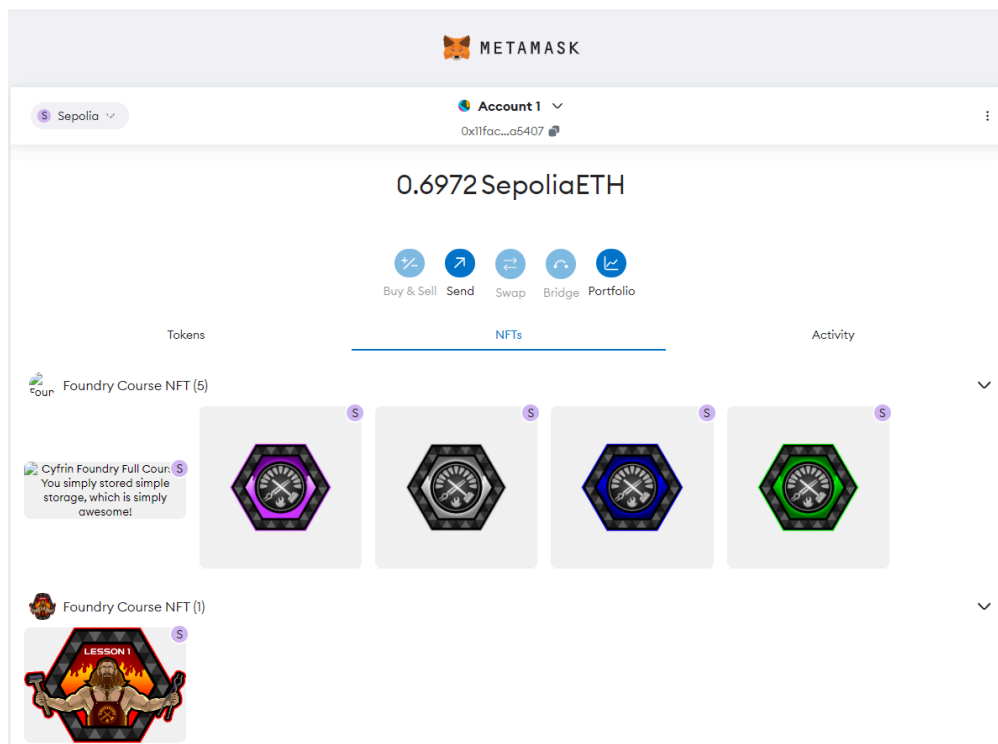
Compile and Deploy the Smart Contract.

Check the transaction details on the RSK Explorer

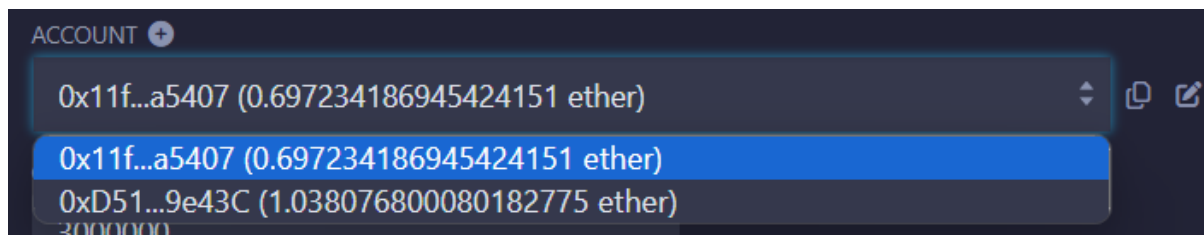
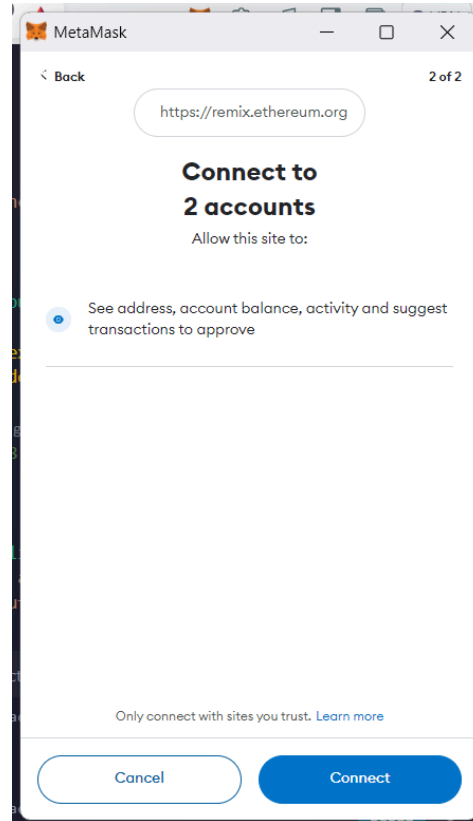
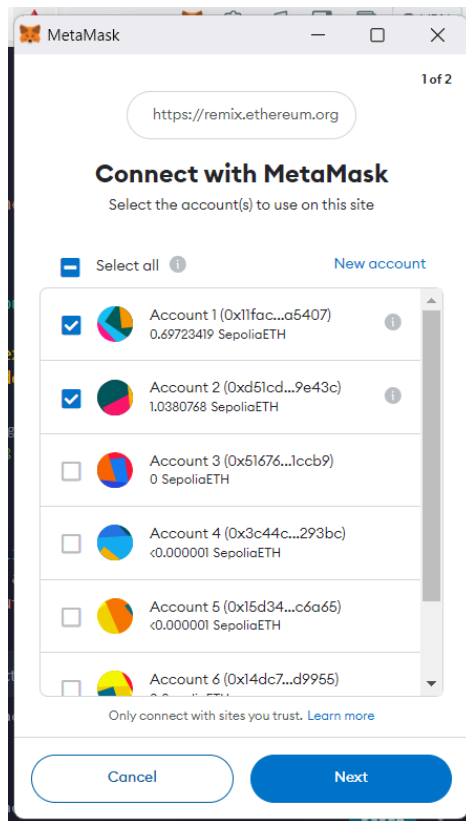
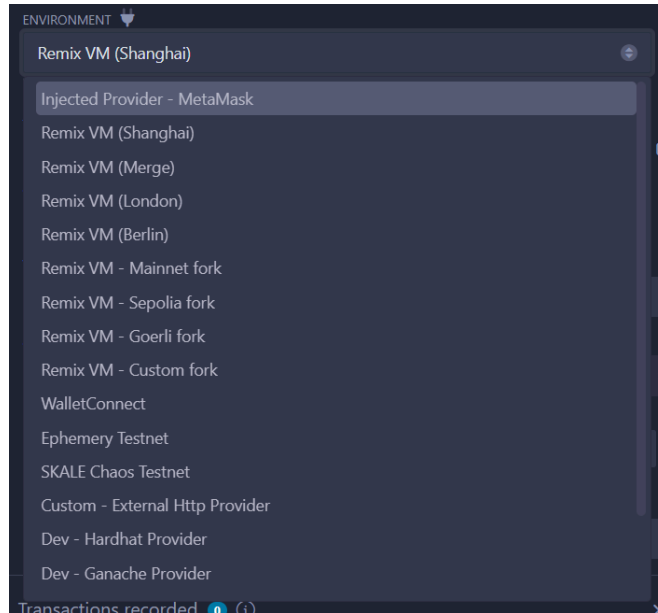
Interact with the smart contract

### **PROGRAM & OUTPUT :**

#### **1. Metamask Account Setup**



#### **2. Connecting the metamask account to Remix IDE**



### 3. Creating the Solidity Smart Contract

```
// SPDX-License-Identifier: MIT
```

```
pragma solidity ^0.8.0;
```

```
contract CBDC {
    string public name = "Central Bank Digital Currency";
    string public symbol = "CBDC";
    uint256 public totalSupply;
    mapping(address => uint256) public balanceOf;
    mapping(address => mapping(address => uint256)) public allowance;

    event Transfer(address indexed from, address indexed to, uint256
value);
    event Approval(address indexed owner, address indexed spender,
uint256 value);

    constructor(uint256 initialSupply) {
        totalSupply = initialSupply * 10 ** 18; // 18 decimals
        balanceOf[msg.sender] = totalSupply;
    }

    function transfer(address to, uint256 value) public returns
(bool) {
        require(to != address(0), "Invalid recipient address");
        require(balanceOf[msg.sender] >= value, "Insufficient
balance");

        balanceOf[msg.sender] -= value;
        balanceOf[to] += value;
        emit Transfer(msg.sender, to, value);

        return true;
    }

    function approve(address spender, uint256 value) public returns
(bool) {
        allowance[msg.sender][spender] = value;
        emit Approval(msg.sender, spender, value);
        return true;
    }

    function transferFrom(address from, address to, uint256 value)
public returns (bool) {
        require(to != address(0), "Invalid recipient address");
        require(balanceOf[from] >= value, "Insufficient balance");
```

```

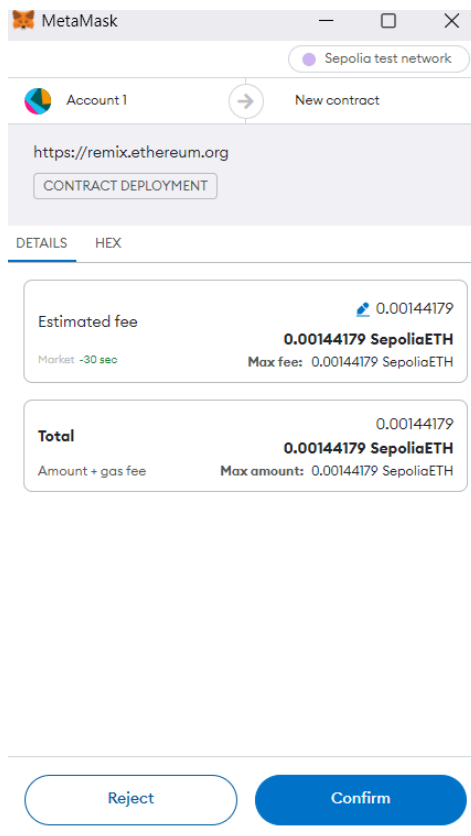
        require(allowance[from][msg.sender] >= value, "Allowance
exceeded");

        balanceOf[from] -= value;
        balanceOf[to] += value;
        allowance[from][msg.sender] -= value;
        emit Transfer(from, to, value);

    return true;
}
}

```

#### 4. Compile and Deploy the smart contract



## 5. Interacting with the contract

balanceOf

0x11fac33125aDbA1419BE146191c84E202caa5407

0: uint256: 10000000000000000000

name

0: string: Central Bank Digital Currency

symbol

0: string: CBDC

totalSupply

0: uint256: 10000000000000000000

## Approving the below address to transact with tokens

approve

spender: 0xD51CD7068F8c27b3486894ed77fDd35000b9e43C

value: 5

CalldataParameters

transact

## Signing the txn

MetaMask

Edit

Sepolia test network

Account 1Account 2

https://remix.ethereum.org

0xe8055...35d8B : TRANSFER

0

DETAILSHEX

Network is busy. Gas prices are high and estimates are less accurate.

Estimated fee

0.00007966

0.00007966 SepoliaETH

Max fee: 0.00007966 SepoliaETH

Total

\$0.27

undefined + 0.00008

SepoliaETH

Amount + gas fee

Max amount: undefined + 0.000079659

SepoliaETH

RejectConfirm

transferFrom

from:

0xD51CD7068F8c27b3486B94ed77fDd35000b9e43C

to:

0x11fac33125aDbA1419BE146191c84E202caa5407

value:

1

Calldata

Parameters

transact

MetaMask

Edit

Sepolia test network

Account 2

Account 1

https://remix.ethereum.org

0xe8056...35d8B : TRANSFER FROM

0

DETAILS

HEX

Network is busy. Gas prices are high and estimates are less accurate.

Estimated fee

0.00006237

0.00006237 SepoliaETH

Market -30 sec

Max fee: 0.00006237 SepoliaETH

Total

undefined + 0.000062

\$0.21

Amount + gas

Max amount: undefined + 0.000062375

fee

0.000062375

0.000062375 SepoliaETH

Reject

Confirm

## 6. Confirmation on Etherscan Block Explorer

[ This is a Sepolia Testnet transaction only ]

Transaction Hash:

0x90b520936a8959e771c4ec3776634181f2450195faf2e5ca04a28987f1b6da45

Status:

Success

Block:

5544651 11 Block Confirmations

Timestamp:

2 mins ago (Mar-23-2024 12:37:12 PM +UTC)

Transaction Action:

Call Transfer From Function by 0xD51CD706...000b9e43C on 0xe8055eb4...0ae735d8B

From:

0xD51CD7068F8c27b3486B94ed77fDd35000b9e43C

Interacted With (To):

0xe8055eb4D73B1f0DB612f9D57cdE25B0ae735d8B

ERC-20 Tokens Transferred:

All Transfers

Net Transfers

From 0xD51CD706...000b9e43C To 0x11fac331...02caa5407 For 1 Central Bank... (CBDC)

Value:

0 ETH (\$0.00)

Transaction Fee:

0.000055068001211496 ETH (\$0.00)

Gas Price:

1.500000033 Gwei (0.000000001500000033 ETH)

The transactions can be viewed on etherscan website as well (Sepolia Testnet)  
[Link to this](#)

**CONCLUSION:**

Understood the steps for embedding the Metamask wallet with Remix IDE and perform transactions

Successfully performed the transactions on the Remix IDE via the account from Metamask Wallet