Blockchain Experiment 7

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

Theory:

MetaMask:

MetaMask is a popular cryptocurrency wallet and gateway to the Ethereum blockchain. It's a browser extension or mobile app that allows users to manage Ethereum-based cryptocurrencies and interact with decentralized applications (DApps). MetaMask provides a secure and convenient way to store Ether and other tokens, as well as to interact with Ethereum-based smart contracts and DApps. It also allows users to switch between Ethereum's main network and various test networks.

Test Network (Testnet):

A test network, often referred to as a testnet, is a separate blockchain that replicates the functionalities of a real blockchain (mainnet) but uses tokens with no real-world value. Testnets are used for testing and development purposes. They allow developers and users to experiment with applications, smart contracts, and transactions without using real cryptocurrency, reducing the risk of making costly mistakes.

Steps to Connect MetaMask with Remix IDE for Performing Transactions:

1. Install MetaMask:
   - Install the MetaMask browser extension for your web browser or the mobile app for your device.

2. Create or Import an Account:
   - Launch MetaMask and create a new Ethereum account or import an existing one. Remember to securely store your seed phrase.

3. Fund Your Wallet (On a Testnet):
   - For testing, switch to a testnet within MetaMask (e.g., Ropsten, Rinkeby, RSK Testnet) and obtain test Ether (or test RBTC for RSK) from a faucet. This test cryptocurrency is used exclusively for development and has no real value.

4. Open Remix IDE:
   - Open the Remix IDE in your web browser.

5. Connect to Remix:
   - Remix should automatically detect MetaMask if it's installed and active in your browser. Remix will use MetaMask for transaction signing and interaction.

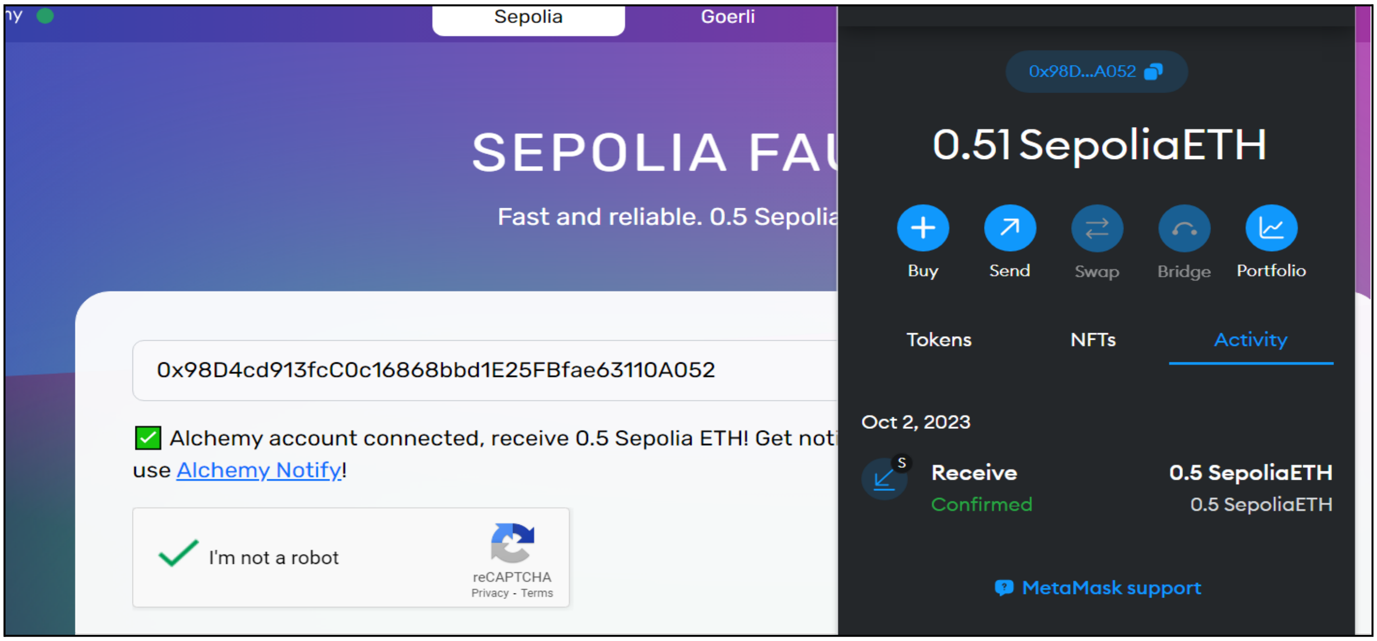
6. Create or Import a Smart Contract:
   - In Remix, you can create a new Solidity smart contract or import an existing one.

7. Compile the Smart Contract:
   - In Remix, use the "Solidity Compiler" tab to compile your smart contract.

8. Deploy the Smart Contract:
   - In Remix, use the "Deploy & Run Transactions" tab to deploy your smart contract. Select the contract, specify constructor parameters if required, and confirm the deployment using MetaMask.

9. Interact

Implementation:



0x98D4cd913fcC0c16868bbd1E25FBfae63110A052

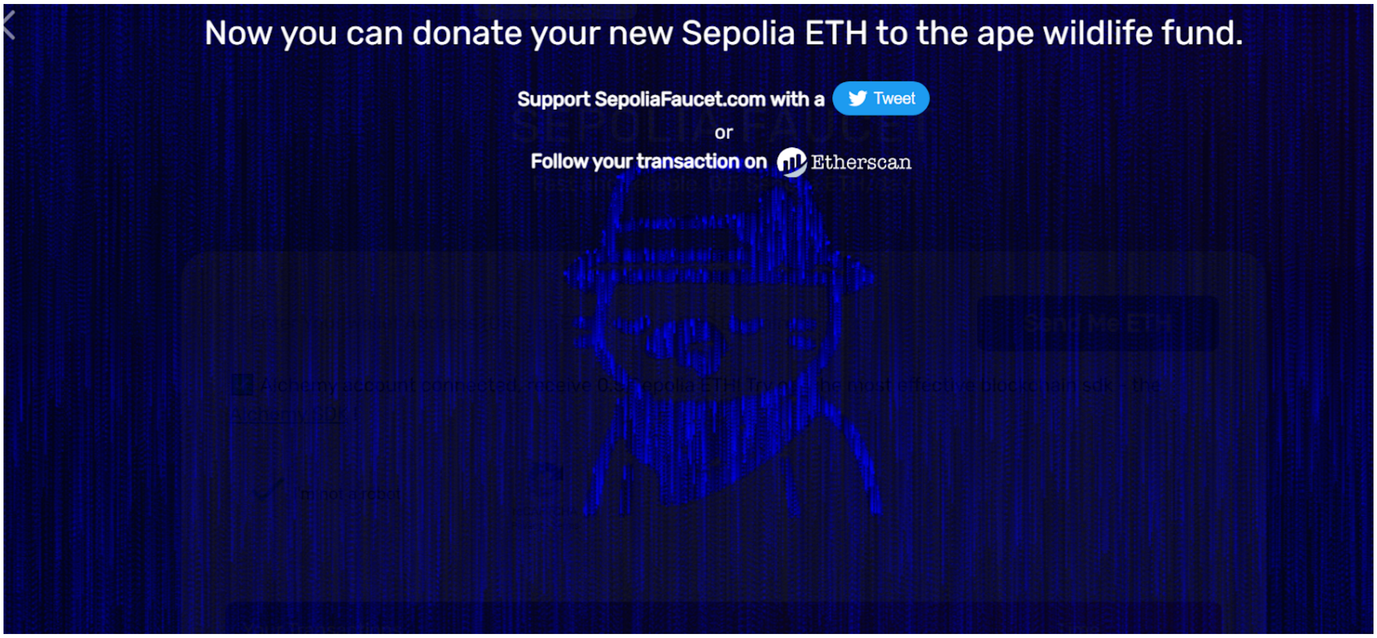
☑ Alchemy account connected, receive 0.5 Sepolia ETH! Get noti
use Alchemy Notify!

0.51 SepoliaETH

Oct 2, 2023

Receive 0.5 SepoliaETH
Confirmed 0.5 SepoliaETH

Fund Your Wallet : Sepolia Testnet (0.5 ETH per day)



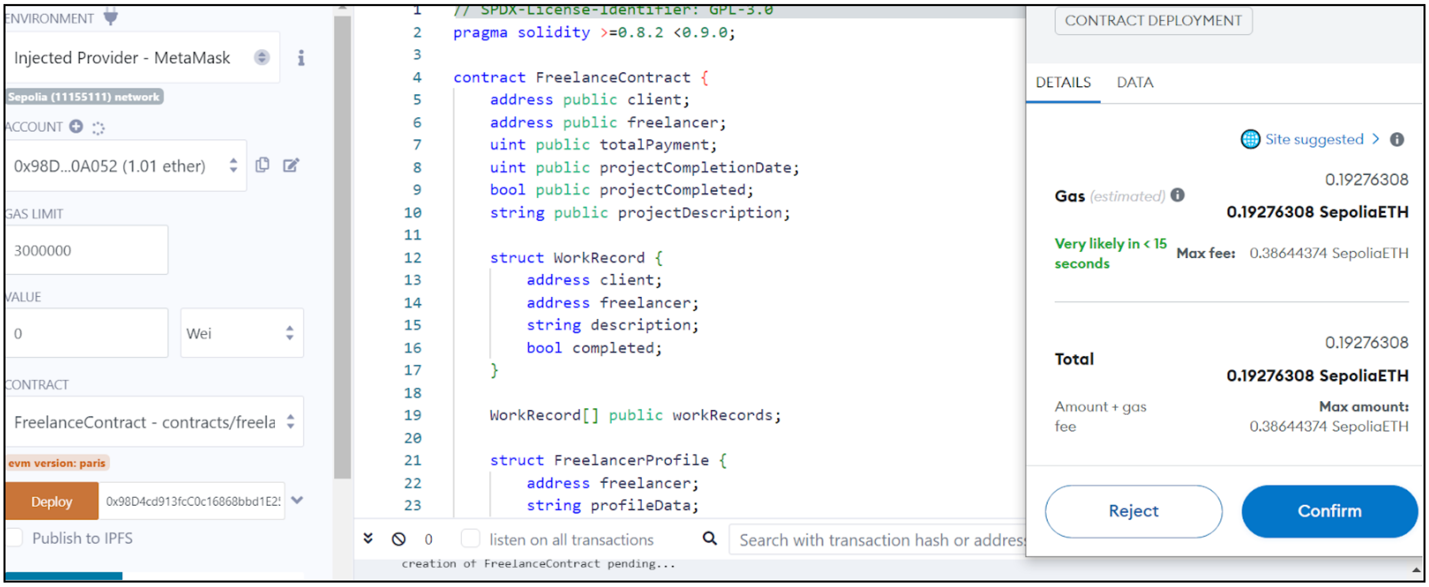
Now you can donate your new Sepolia ETH to the ape wildlife fund.

Support SepoliaFaucet.com with a Tweet

or

Follow your transaction on Etherscan

Received 0.5 ETH in my MetaMask Account



ENVIRONMENT
Injected Provider - MetaMask
Sepolia (11155111) network
ACCOUNT
0x98D...0A052 (1.01 ether)
GAS LIMIT
3000000
VALUE
0
Wei
CONTRACT
FreelanceContract - contracts/freela
evm version: paris
Deploy
0x98D4cd913fcC0c16868bbd1E2!
Publish to IPFS

```
// SPDX-License-Identifier: GPL-3.0
pragma solidity >=0.8.2 <0.9.0;

contract FreelanceContract {
    address public client;
    address public freelancer;
    uint public totalPayment;
    uint public projectCompletionDate;
    bool public projectCompleted;
    string public projectDescription;

    struct WorkRecord {
        address client;
        address freelancer;
        string description;
        bool completed;
    }

    WorkRecord[] public workRecords;

    struct FreelancerProfile {
        address freelancer;
        string profileData;
```

0
listen on all transactions
Search with transaction hash or addres

```
creation of FreelanceContract pending...
```

CONTRACT DEPLOYMENT

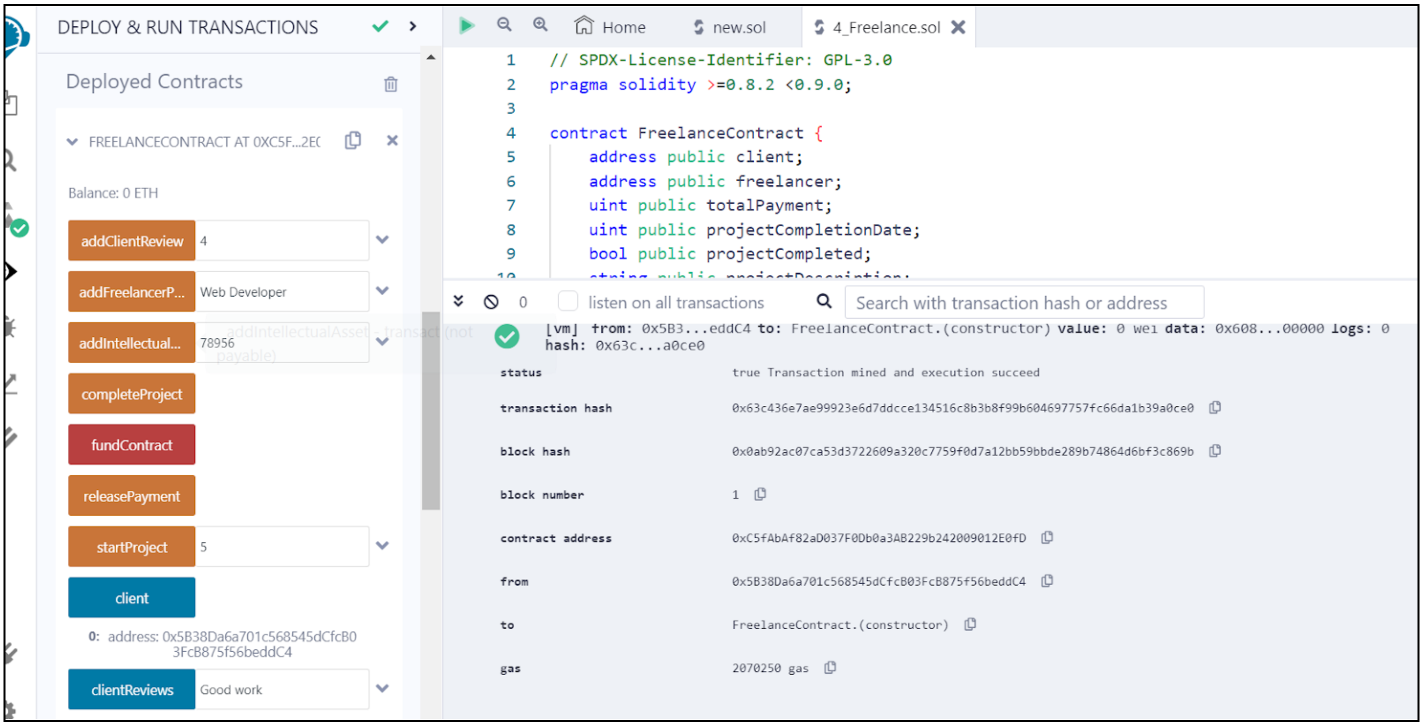
Gas (estimated) 0.19276308
0.19276308 SepoliaETH

Very likely in < 15 seconds — Max fee: 0.38644374 SepoliaETH

Total 0.19276308
0.19276308 SepoliaETH

Amount + gas fee — Max amount: 0.38644374 SepoliaETH

Connect the Sepolia Testnet / RSK Testnet to Remix IDE



addClientReview: 4

addFreelancerP...: Web Developer

addIntellectual...: 78956

startProject: 5

client

0: address: 0x5B38Da6a701c568545dCfcB03FcB875f56beddC4

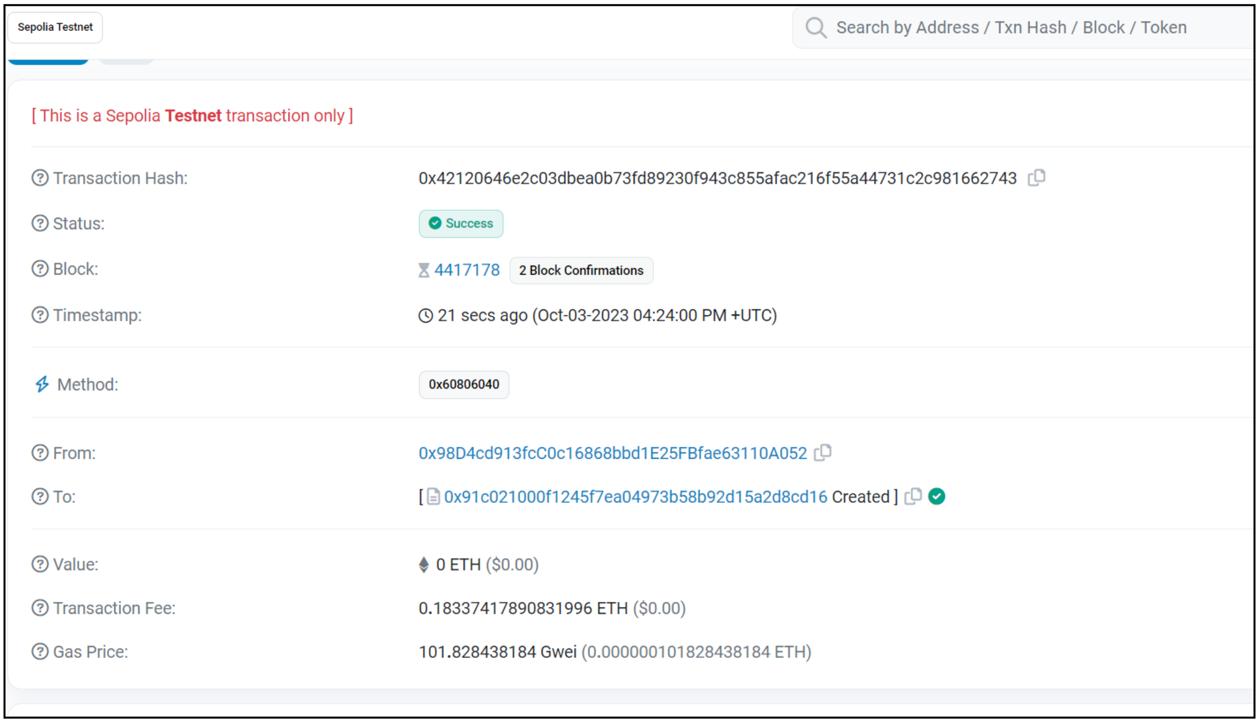
clientReviews: Good work

```
// SPDX-License-Identifier: GPL-3.0
pragma solidity >=0.8.2 <0.9.0;

contract FreelanceContract {
    address public client;
    address public freelancer;
    uint public totalPayment;
    uint public projectCompletionDate;
    bool public projectCompleted;
    string public projectDescription;
```

```
[vm] from: 0x5B3...eddC4 to: FreelanceContract.(constructor) value: 0 wei data: 0x608...00000 logs: 0
hash: 0x63c...a0ce0
status              true Transaction mined and execution succeed
transaction hash    0x63c436e7ae99923e6d7ddcce134516c8b3b8f99b604697757fc66da1b39a0ce0
block hash          0x0ab92ac07ca53d3722609a320c7759f0d7a12bb59bbde289b74864d6bf3c869b
block number        1
contract address    0xC5fAbAf82aD037F0Db0a3AB229b242009012E0fD
from                0x5B38Da6a701c568545dCfcB03FcB875f56beddC4
to                  FreelanceContract.(constructor)
gas                 2070250 gas
```

Compile and Deploy the Smart Contract.



[This is a Sepolia **Testnet** transaction only]

Transaction Hash: 0x42120646e2c03dbea0b73fd89230f943c855afac216f55a44731c2c981662743

Status: Success

Block: 4417178 2 Block Confirmations

Timestamp: 21 secs ago (Oct-03-2023 04:24:00 PM +UTC)

Method: 0x60806040

From: 0x98D4cd913fcC0c16868bbd1E25FBfae63110A052

To: [0x91c021000f1245f7ea04973b58b92d15a2d8cd16 Created] ✓

Value: 0 ETH ($0.00)

Transaction Fee: 0.18337417890831996 ETH ($0.00)

Gas Price: 101.828438184 Gwei (0.000000101828438184 ETH)

Check the transaction details on the RSK Explorer