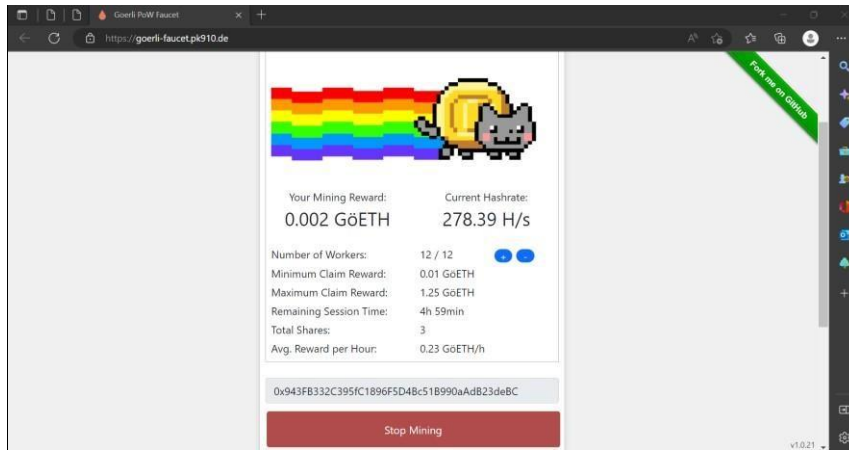


Practical No.04

1. Install the metamask in browser. Setup the metamask digital cryptocurrency wallet. Create multiple accounts in metamask and connect with one of the ethereum blockchain test network. Perform the task buy ethers and send ethers from one account to another. Take the screenshots of created accounts, account assets and account transactions which showing the details of transaction.(Use following url to get free ether for Goerli Test Network:



<https://goerlifaucet.pk910.de/>)

My accounts

Lock

✓

Account 1

0.19206959 GoerliETH

Account 2

0 GoerliETH

IMPORTED

+

Create account

↓

Import account

🔌

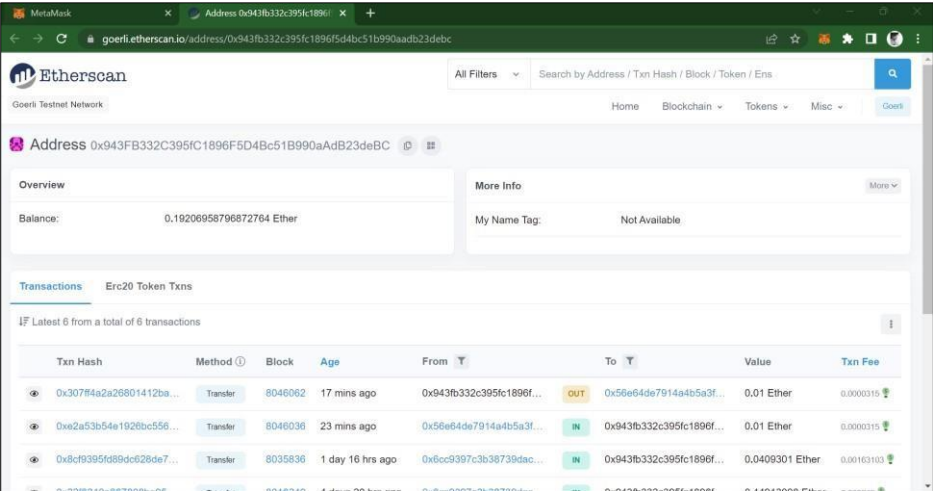
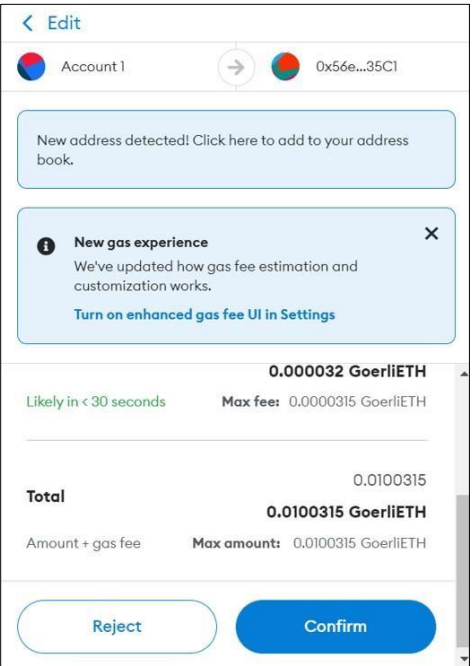
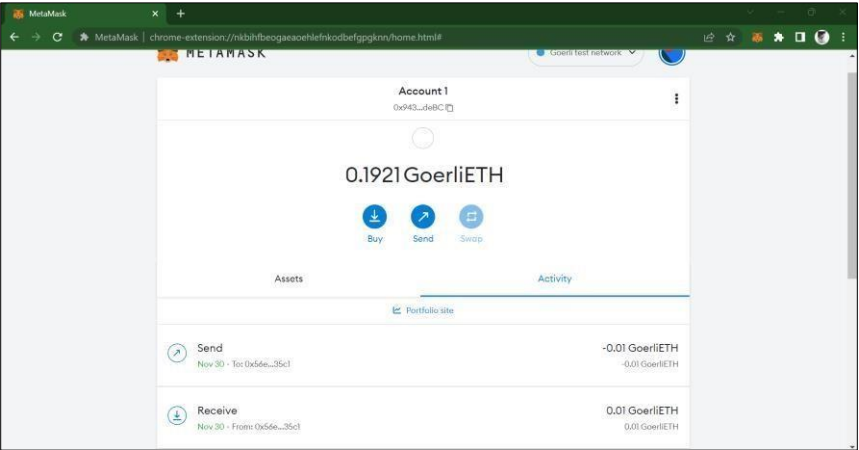
Connect hardware wallet

💬

Support

⚙️

Settings



2. Write a solidity smart contract to transfer funds (ethers) from user account to contract account using remixIDE and JavaScriptVM environment.

Program:

```
pragma solidity ^0.5.2; contract Financialcontract2{
    address owner;

    constructor() public{
        owner=msg.sender;
    }

    modifier ifOwner(){
        if(owner!=msg.sender){
            revert();
        } else{
            _;
        }
    }

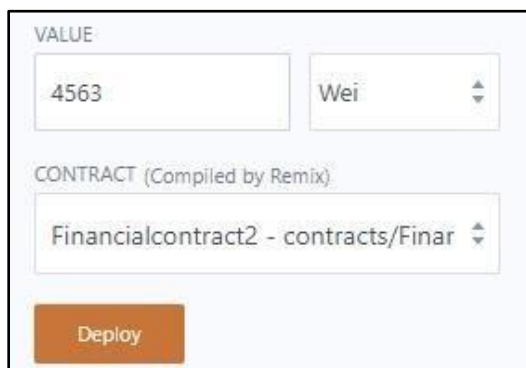
    function receiveDeposit() payable public{

    }

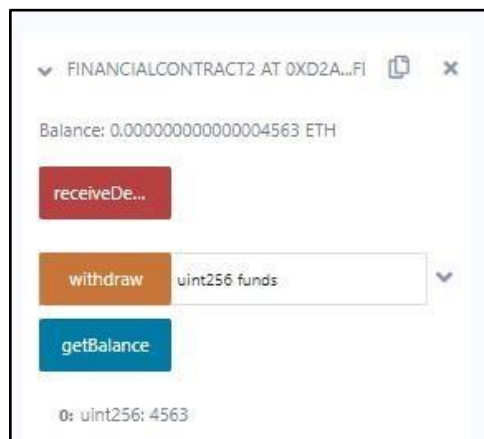
    function getBalance() public view returns(uint)
    {
        return address(this).balance;
    }

    function withdraw(uint funds)public ifOwner{
        msg.sender.transfer(funds);
    }
}
```

Output:



The screenshot shows the Remix IDE interface. At the top, there is a 'VALUE' section with a text input containing '4563' and a dropdown menu set to 'Wei'. Below this is the 'CONTRACT (Compiled by Remix)' section, which contains a dropdown menu showing 'Financialcontract2 - contracts/Finar'. At the bottom of this section is a blue 'Deploy' button.



The screenshot shows the interface for the 'FINANCIALCONTRACT2 AT 0XD2A...FI' contract. It displays the 'Balance: 0.0000000000000004563 ETH'. There are three main buttons: a red 'receiveDe...' button, an orange 'withdraw' button with a text input field containing 'uint256 funds', and a blue 'getBalance' button. At the bottom, it shows '0: uint256: 4563'.

}

3. Write a solidity smart contract to withdraw funds (ethers) from contract account to user account using remixIDE and JavaScriptVM environment. Program:

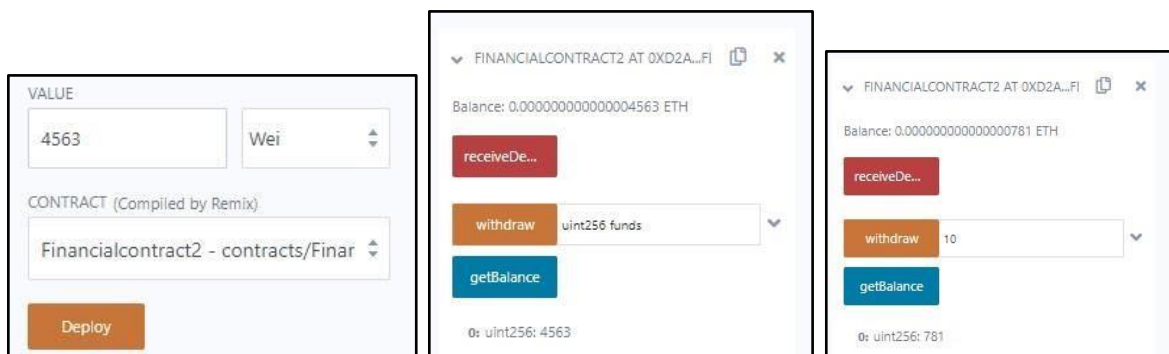
```
pragma solidity ^0.5.2;
contract Financialcontract2{  address
owner;  constructor()
public{
    owner=msg.sender;
}
modifier ifOwner(){
    if(owner!=msg.sender){
        revert();
    }    else{
        _;
    }
}
function receiveDeposit() payable public{

}
function getBalance() public view returns(uint)
{
    return address(this).balance;
}

function withdraw(uint funds)public ifOwner{
    msg.sender.transfer(funds);
}
function getMoney(){

}
}
```

Output:



4. Write a solidity smart contract to apply restriction that only owner of the contract can withdraw funds (ethers) from contract account to his/her user account using remixIDE and JavaScriptVM environment.

Program:

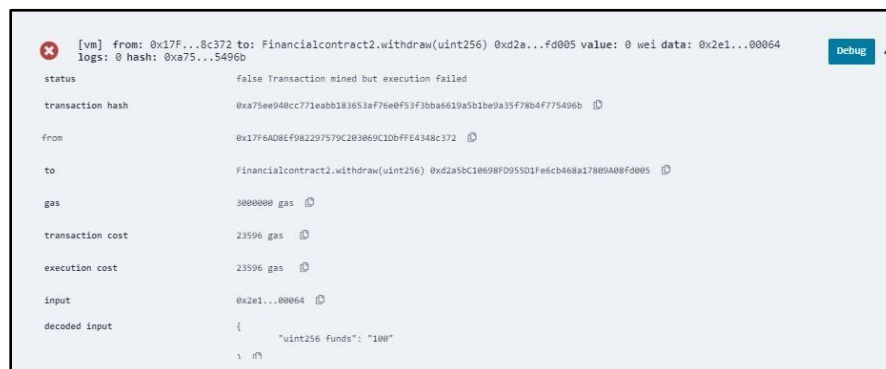
```
pragma solidity ^0.5.2;
contract Financialcontract2{  address
owner;  constructor()
public{
    owner=msg.sender;
}
modifier ifOwner(){
    if(owner!=msg.sender){
        revert();
    }    else{
        _;
    }
}
function receiveDeposit() payable public{

}
function getBalance() public view returns(uint)
{
    return address(this).balance;
}

function withdraw(uint funds)public ifOwner{
    msg.sender.transfer(funds);
}
function getMoney(){

}
}}
```

Output:



5. **Create Ethereum node using Geth and create genesis block and create your personal private Ethereum blockchain. And use IPC to interact with Geth node to perform following task: create account, transfer funds using send transaction, mine the block, show the account balance before and after the mining the block, show the specific block details and access chain details.**

```
C:\Users\HP>geth attach ipc:\\.\pipe\geth.ipc
Welcome to the Geth JavaScript console!

instance: Geth/v1.10.26-stable-e5eb32ac/windows-amd64/go1.18.5
at block: 0 (Thu Jan 01 1970 05:30:00 GMT+0530 (IST))
datadir: D:\MCA\sem3\Blockchain\Private_Chain\chaindata
modules: admin:1.0 debug:1.0 engine:1.0 eth:1.0 ethash:1.0 miner:1.0 net
t:1.0 personal:1.0 rpc:1.0 txpool:1.0 web3:1.0

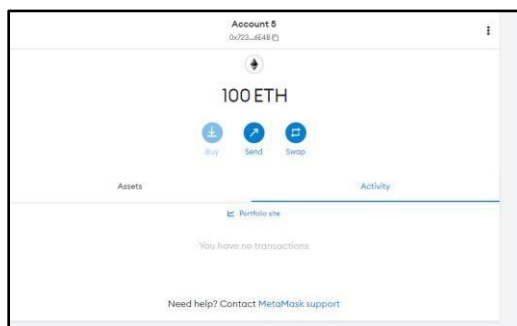
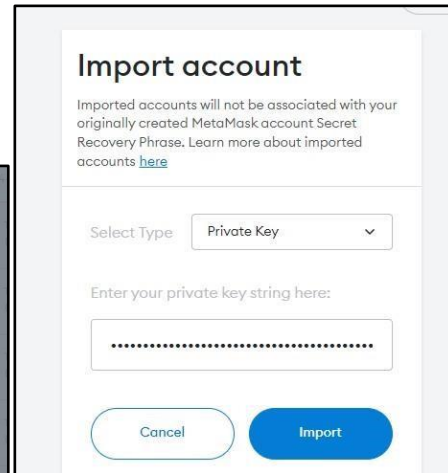
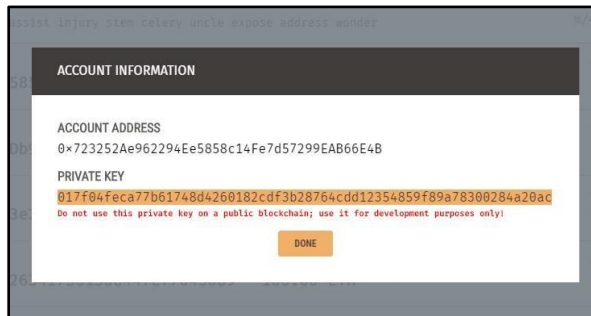
To exit, press ctrl-d or type exit
> personal.newAccount()
Passphrase:
Repeat passphrase:
"0x2c2cacffc7c74a77b000461838042125db1203e487"
> eth.accounts
["0x2c2cacffc7c74a77b000461838042125db1203e487"]
> eth.coinbase
"0x2c2cacffc7c74a77b000461838042125db1203e487"
> eth.getBalance(eth.accounts[0])
0
> miner.start()
null
> miner.stop()
null
> eth.getBalance(eth.accounts[0])
23000000000000000000000000
> personal.newAccount()
Passphrase:
Repeat passphrase:
"0x6680bf98a5b24a5f56cfd77c10fcd8d7a299bd88"
```

[illegible]

[illegible]

6. Start Ganache your personal private blockchain network. Connect Ganache with MetaMask and import the account from Ganache to MetaMask. Transfer funds from imported account to other account of MetaMask. Take the screenshots of created accounts, account assets and account transactions which showing the details of transaction from MetaMask and Ganache interface.

Import Account



Transfer Ether to another Account

Send

✓

Sid Rasal

0x2FDf72c48D5bF992347Ad5499e8D6062Bffe3F7

✕

Asset:

ETH

Balance: 100 ETH

Amount:

35 ETH

No conversion rate available

↺↻

Max

Gas price (GWEI)

20

Gas limit

21000

Cancel

Next

<

Edit

Account 5

→

Sid Rasal

SENDING ETH

35

EDIT

Estimated gas fee ⓘ

0.00042 0.00042 ETH

Max fee: 0.00042 ETH

Total

35.00042 35.00042 ETH

Amount + gas fee

Max amount: 35.00042 ETH

Reject

Confirm

Send

Pending • To: 0x2fd...e3f7

Speed up

Cancel

-35 ETH

-35 ETH

Ether Transferred Successfully

METAMASK

my_ganache_network

Account 5

0x723...6E4B

64.9996 ETH

Buy

Send

Swap

Assets

Activity

Send

Nov 29 • To: 0x2fd...e3f7

-35 ETH

-35 ETH

Need help? Contact MetaMask support

Send

✕

Status

View on block explorer

Confirmed

Copy transaction ID

From

To

0x723...6E4B

0x2fd...e3f7

Transaction

Nonce: 0

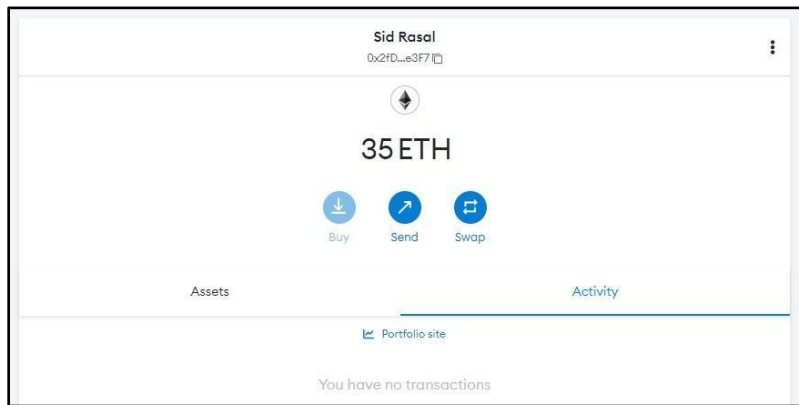
Amount: -35 ETH

Gas Limit (Units): 21000

Gas Used (Units): 21000

Gas price: 20

Total: 35.00042 ETH



7. Create new truffle project with migration script, smart contract and configuration file. First compile it using truffle suite. Then connect it with personal private blockchain i.e. Ganache and deploy (migrate) smart contract on Ganache. Open truffle console and create instance of deployed (migrated) contract of Ganache. Then interact with smart contract using created instance. Take screenshots of all transaction's details and block details from Ganache. Truffle-config.js

```
module.exports =
{
  networks:
    {
      development:
        {
          host:
            "127.0.0.1",
          port:
            7545,
          network_id: "*" // Match any
network id
        },
    },
  solc:
    {
      optimizer:
        {
          enabled: true,
          runs: 200
        }
    }
}
```

Package.json

```
{
  "name": "blockchain-toolkit",
  "version": "1.0.0",
```

```

"description": "The Complete Blockchain Developer Toolkit for 2019 & Beyond", "main":
"truffle-config.js",
"directories": {
"test": "test"
},
"scripts": {
"dev": "lite-server",
"test": "echo `Error: no test specified`" && exit 1"
},
"author": "gregory@dappuniversity.com",
"license": "ISC",
"devDependencies": {
"bootstrap": "4.1.3",
"chai": "^4.1.2",
"chai-as-promised": "^7.1.1",
"chai-bignumber": "^2.0.2",
"dotenv": "^4.0.0",
"ganache-cli": "^6.1.8",
"lite-server": "^2.3.0",
"nodemon": "^1.17.3",
"solidity-coverage": "^0.4.15",
"truffle": "5.0.0-beta.0",
"truffle-contract": "3.0.6",
"truffle-hdwallet-provider": "^1.0.0-web3one.0"
}
}

```

2_deploy_contracts.js

```

var MyContract = artifacts.require("./MyContract.sol"); module.exports =
function(deployer)
{
  deployer.deploy(MyContract);
};

```

```

MyContract.sol: pragma solidity
>=0.4.22 <0.9.0; contract
MyContract { string value;
constructor() public { value =
"myValue"; }
function get() public view returns(string memory) { return
value; }
function set(string memory _value) public { value
= _value; }

```

```
}
```

Output:

```
PS D:\MCA\sem3\Blockchain\blockchain-toolkit> truffle compile

Compiling your contracts...
=====
> Compiling .\contracts\MyContract.sol
> Artifacts written to D:\MCA\sem3\Blockchain\blockchain-toolkit\build\contracts
> Compiled successfully using:
   - solc: 0.5.16+commit.9c3226ce.Emscripten.clang
```

```
Windows PowerShell X + v

PS D:\MCA\sem3\Blockchain\blockchain-toolkit> truffle migrate
This version of μWS is not compatible with your Node.js build:

Error: Cannot find module './uws_win32_x64_102.node'
Falling back to a NodeJS implementation; performance may be degraded.

Compiling your contracts...
=====
> Compiling .\contracts\MyContract.sol
> Artifacts written to D:\MCA\sem3\Blockchain\blockchain-toolkit\build\contracts
> Compiled successfully using:
   - solc: 0.5.16+commit.9c3226ce.Emscripten.clang

Starting migrations...
=====
> Network name:    'development'
> Network id:     5777
> Block gas limit: 6721975 (0x6691b7)

2_deploy_contracts.js
=====

Replacing 'MyContract'

> transaction hash:  0x402059cf3919e4eb823059bac8f559afde523f22dc76b54a050497640f5ec998
> Blocks: 0         Seconds: 0
> contract address: 0x8C96710AEE25DfA16338d392d08B5392968829FB
> block number:     3
> block timestamp:  1669730810
> account:          0xcB9e4F83c8dEa86D6c23931AB55eC8368D8a47EF
> balance:          99.98588032
> gas used:         235328 (0x39740)
> gas price:        20 gwei
> value sent:       0 ETH
> total cost:       0.00470656 ETH

> Saving artifacts
=====
> Total cost:       0.00470656 ETH

Summary
=====
> Total deployments: 1
> Final cost:       0.00470656 ETH

PS D:\MCA\sem3\Blockchain\blockchain-toolkit>
```

ACCOUNTS

BLOCKS

TRANSACTIONS

CONTRACTS

EVENTS

LOGS

SEARCH FOR BLOCK NUMBERS OR TX HASHES

CURRENT BLOCK
3

GAS PRICE
20000000000

GAS LIMIT
6721975

HARDFORK
MUIRGLACIER

NETWORK ID
5777

RPC SERVER
HTTP://127.0.0.1:7545

MINING STATUS
AUTOMINING

WORKSPACE
QUICKSTART

SAVE

SWITCH

MNEMONIC ?
obscure science trade obey position donkey anxiety rather alert true rubber wing

HD PATH
m/44'/60'/0'/0/account_index

ADDRESS
0xcB9e4F83c8dEa86D6c23931AB55eC8368D8a47EF

BALANCE
99.99 ETH

TX COUNT
3

INDEX
0