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EXERCISE 4

SOLIDITY SMART CONTRACTS

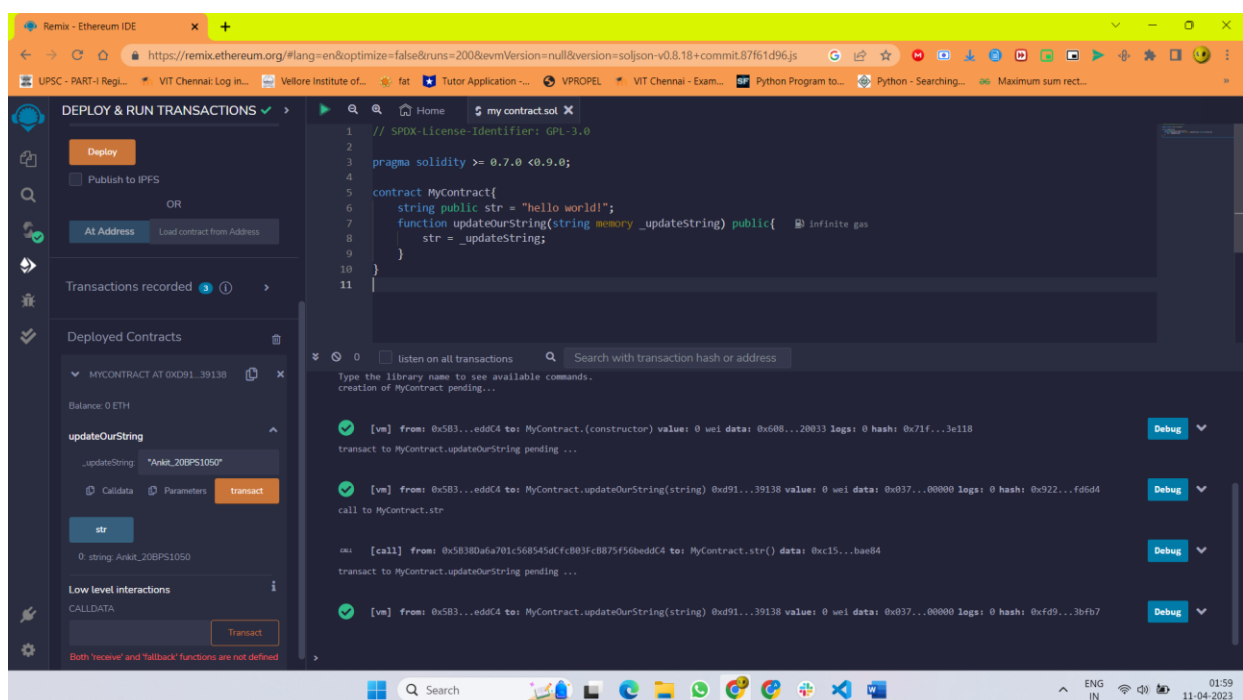
1.Creating functions, using datatypes, and performing transactions

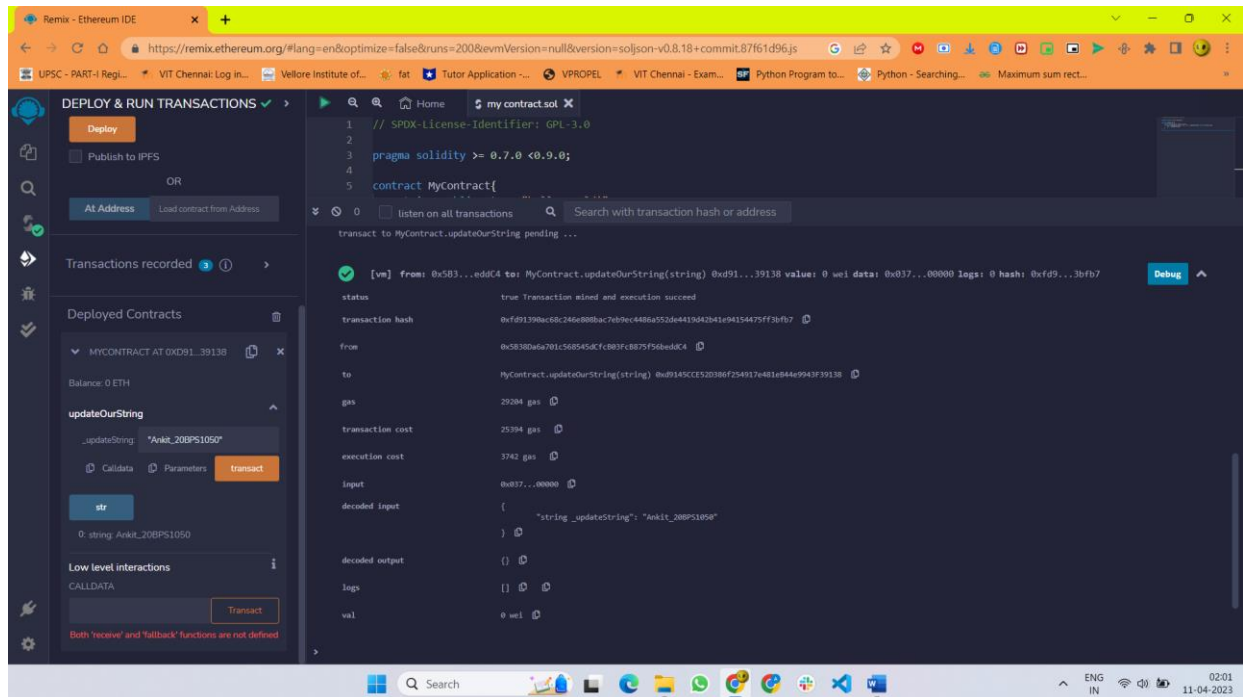
Code –

```
// SPDX-License-Identifier: GPL-3.0

pragma solidity >= 0.7.0 <0.9.0;

contract MyContract{
    string public str = "hello world!";
    function updateOurString(string memory _updateString) public{
        str = _updateString;
    }
}
```





1.1

Code –

```
// SPDX-License-Identifier: GPL-3.0

pragma solidity >= 0.7.0 <0.9.0;

contract MyContract{
    bool public myBool;

    function setMyBool(bool _updateBool) public{
        myBool = _updateBool;
    }
}
```

Remix - Ethereum IDE

https://remix.ethereum.org/#lang=en&optimize=false&runs=200&evmVersion=null&version=soljson-v0.8.18+commit.87f61d96.js

UPSC - PART-I Regi... VIT Chennai: Log in... Vellore Institute of... fat Tutor Application... VPROPEL VIT Chennai - Exam... Python Program to... Python - Searching... Maximum sum rect...

DEPLOY & RUN TRANSACTIONS

CONTRACT (Compiled by Remix)

MyContract - contracts/my contract.sol

Deploy

Publish to IPFS

OR

At Address Load contract from Address

Transactions recorded

Deployed Contracts

MYCONTRACT AT 0x358...D5E3

Balance: 0 ETH

setMyBool false

myBool

0: bool: false

Low level interactions

CALLDATA

Transact

```
1 // SPDX-License-Identifier: GPL-3.0
2
3 pragma solidity >= 0.7.0 <0.9.0;
4
5 contract MyContract{
6
7     creation of MyContract pending...
8
9     [vm] from: 0x5B3...eddC4 to: MyContract.(constructor) value: 0 wei data: 0x608...20033 logs: 0 hash: 0x824...c388a
10    call to MyContract.myBool
11
12    OK: [call] from: 0x5B380a6a701c568545dCfC803FcB875f56beddC4 to: MyContract.myBool() data: 0x5de...ecdbe
13
14    from
15        0x5B380a6a701c568545dCfC803FcB875f56beddC4
16
17    to
18        MyContract.myBool() 0x3580A13c52544ECF680C0F081012AD05e3
19
20    execution cost
21        2446 gas (Cost only applies when called by a contract)
22
23    input
24        0x5de...ecdbe
25
26    decoded input
27        {}
28
29    decoded output
30        {
31            "0": "bool: false"
32        }
33
34    logs
35        {}
```

02:04 11-04-2023

Remix - Ethereum IDE

https://remix.ethereum.org/#lang=en&optimize=false&runs=200&evmVersion=null&version=soljson-v0.8.18+commit.87f61d96.js

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DEPLOY & RUN TRANSACTIONS

Transactions recorded

Deployed Contracts

MYCONTRACT AT 0x3D7...85E99

Balance: 0 ETH

incrementInt

increment256

increment8

myInt

myUint

myUint256

0: int256: -900

0: uint8: 250

0: uint256: 40000

Low level interactions

CALLDATA

Transact

```
1 // SPDX-License-Identifier: GPL-3.0
2
3 pragma solidity >= 0.7.0 <0.9.0;
4
5 contract MyContract{
6
7     OK: [call] from: 0x5B380a6a701c568545dCfC803FcB875f56beddC4 to: MyContract.myInt() data: 0x2cb...777a6
8
9    from
10        0x5B380a6a701c568545dCfC803FcB875f56beddC4
11
12    to
13        MyContract.myInt() 0x0777A68C4E726C9588A29e79a0129305E99
14
15    execution cost
16        2429 gas (Cost only applies when called by a contract)
17
18    input
19        0x2cb...777a6
20
21    decoded input
22        {}
23
24    decoded output
25        {
26            "0": "Int256: -900"
27        }
28
29    logs
30        {}
31
32    call to MyContract.myUint
33
34    OK: [call] from: 0x5B380a6a701c568545dCfC803FcB875f56beddC4 to: MyContract.myUint() data: 0x065...40f7e
35    call to MyContract.myUint256
36
37    OK: [call] from: 0x5B380a6a701c568545dCfC803FcB875f56beddC4 to: MyContract.myUint256() data: 0xa7d...bce1c
```

02:08 11-04-2023

1.2

Code –

```
// SPDX-License-Identifier: GPL-3.0

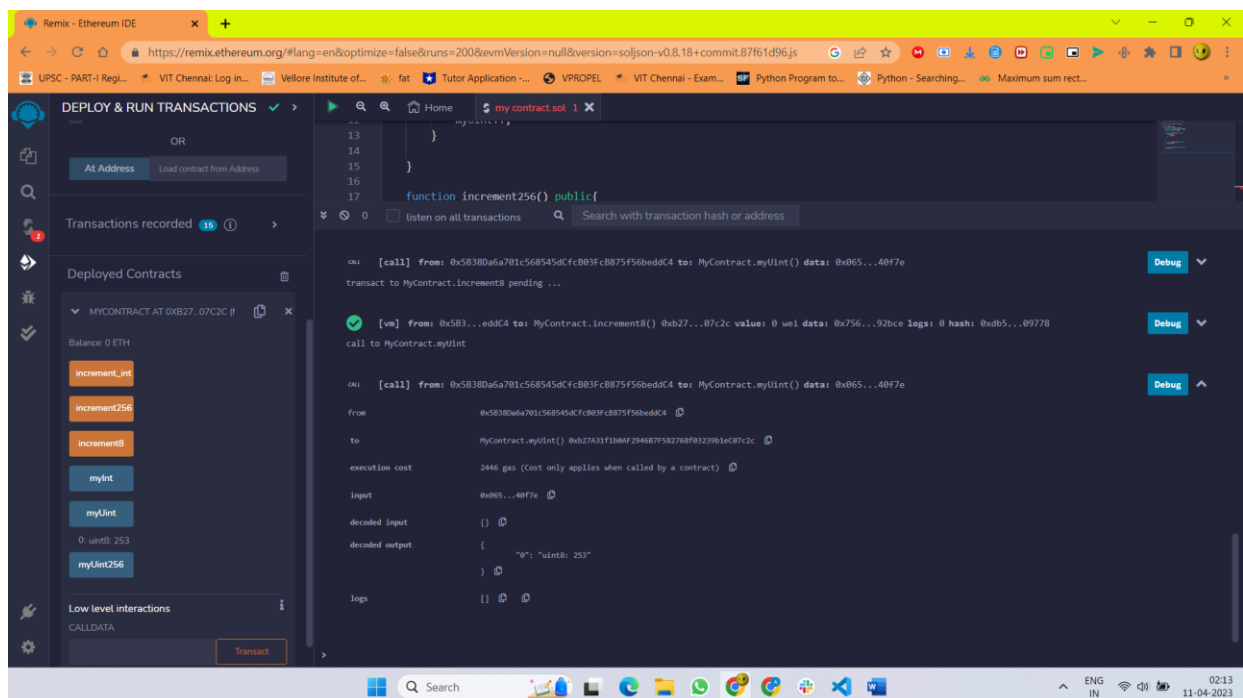
pragma solidity >= 0.7.0 <0.9.0;

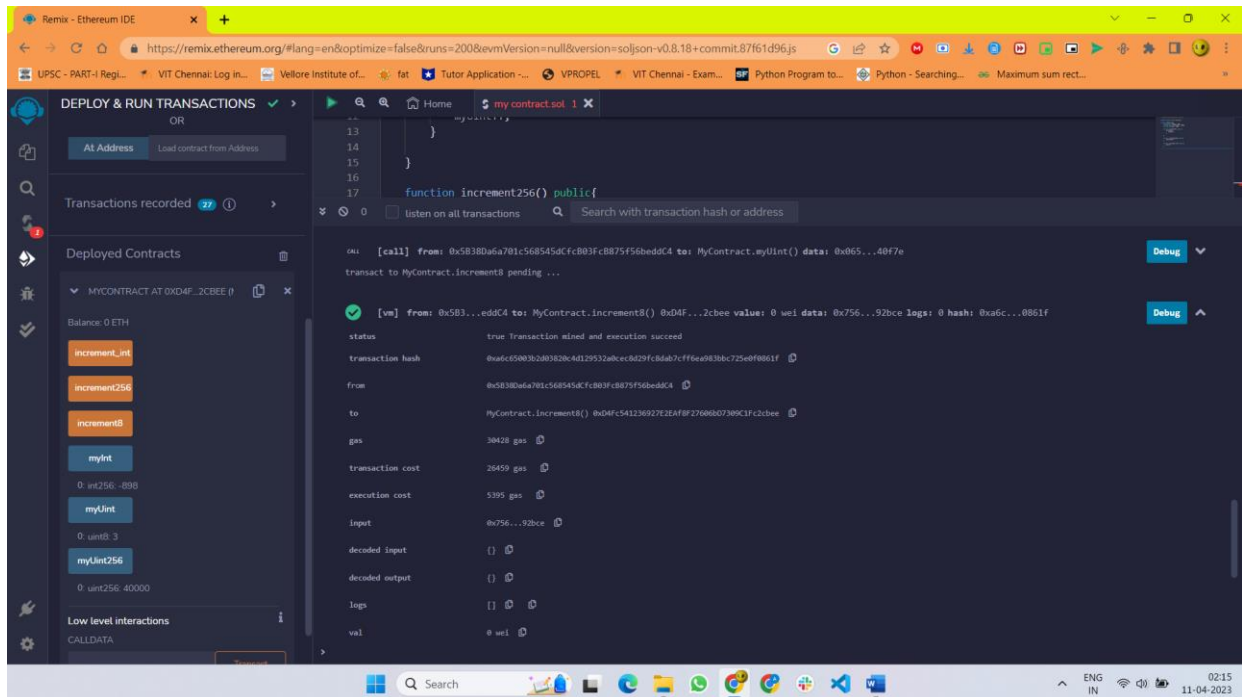
contract MyContract{
    uint8 public myUint = 250;
    uint256 public myUint256 = 40000;
    int public myInt = -900;

    function increment8() public{
        unchecked{
            myUint++;
        }
    }

    function increment256() public{
        myUint256++;
    }

    function increment_int() public{
        myInt++;
    }
}
```





2.String manipulation and performing transactions.

Code –

```
// SPDX-License-Identifier: GPL-3.0

pragma solidity >= 0.7.0 <0.9.0;

contract MyContract{
    string public string1 = "Hello";

    function updateString(string memory _string2) public{
        string1 = _string2;
    }

    function compareTwoHahes(string memory _string2) public view
    returns(bool) {
        return keccak256(abi.encodePacked(string1)) ==
        keccak256(abi.encodePacked(_string2));
    }
}
```

Remix - Ethereum IDE

https://remix.ethereum.org/#lang=en&optimize=false&runs=200&evmVersion=null&version=soljson-v0.8.18+commit.87f61d96.js

UPSC - PART-I Regi... VIT Chennai: Log in... Vellore Institute of... fat Tutor Application... VPROPEL VIT Chennai - Exam... Python Program to... Python - Searching... Maximum sum rect...

DEPLOY & RUN TRANSACTIONS

At Address Load contract from Address

Transactions recorded 36

Deployed Contracts

MYCONTRACT AT 0x081...ADF85

Balance: 0 ETH

updateString

_string2: Hello

Calldata Parameters **transact**

compareTwoHahes

_string2: Hello

Calldata Parameters **call**

0: bool: true

string1

Low level interactions

CALLDATA

Transact

```
contract MyContract{
  string public string1 = "Hello";
  function updateString(string memory _string2) public {
    string1 = _string2;
  }
}
```

transact to MyContract.updateString pending ...

[vm] from: 0x583...eddC4 to: MyContract.updateString(string) 0x081...ADF85 value: 0 wei data: 0xc3c...00000 logs: 0 hash: 0xd13...2728d

call to MyContract.compareTwoHahes

[call] from: 0x58380a6a701c568545dCfcB83fCB875f56beddC4 to: MyContract.compareTwoHahes(string) data: 0x727...00000

from 0x58380a6a701c568545dCfcB83fCB875f56beddC4

to MyContract.compareTwoHahes(string) 0x0813d4a15b06784f0848123448968281a0f85

execution cost 4197 gas (Cost only applies when called by a contract)

input 0x727...00000

decoded input { "string_string2": "hello" }

decoded output { "0": "bool: true" }

logs []

02:22 11-04-2023

Remix - Ethereum IDE

https://remix.ethereum.org/#lang=en&optimize=false&runs=200&evmVersion=null&version=soljson-v0.8.18+commit.87f61d96.js

UPSC - PART-I Regi... VIT Chennai: Log in... Vellore Institute of... fat Tutor Application... VPROPEL VIT Chennai - Exam... Python Program to... Python - Searching... Maximum sum rect...

DEPLOY & RUN TRANSACTIONS

At Address Load contract from Address

Transactions recorded 36

Deployed Contracts

MYCONTRACT AT 0x081...ADF85

Balance: 0 ETH

updateString

_string2: Aak1 208PS1050

Calldata Parameters **transact**

compareTwoHahes

_string2: Aak1 208PS1050

Calldata Parameters **call**

0: bool: false

string1

Low level interactions

CALLDATA

Transact

```
contract MyContract{
  string public string1 = "Hello";
  function updateString(string memory _string2) public {
    string1 = _string2;
  }
}
```

transact to MyContract.updateString pending ...

[vm] from: 0x583...eddC4 to: MyContract.updateString(string) 0x081...ADF85 value: 0 wei data: 0xc3c...00000 logs: 0 hash: 0xf4c...9f852

call to MyContract.compareTwoHahes

[call] from: 0x58380a6a701c568545dCfcB83fCB875f56beddC4 to: MyContract.compareTwoHahes(string) data: 0x727...00000

from 0x58380a6a701c568545dCfcB83fCB875f56beddC4

to MyContract.compareTwoHahes(string) 0x0813d4a15b06784f0848123448968281a0f85

execution cost 4197 gas (Cost only applies when called by a contract)

input 0x727...00000

decoded input { "string_string2": "Aak1 208PS1050" }

decoded output { "0": "bool: false" }

logs []

02:23 11-04-2023

3. Getting balance of Ethereum address

Code –

```
// SPDX-License-Identifier: GPL-3.0

pragma solidity >= 0.7.0 <0.9.0;

contract MyContract{
    address public address1;

    function setAddress(address _address2) public{
        address1 = _address2;
    }

    function getBalance() public view returns(uint){
        return address1.balance;
    }
}
```

The screenshot displays the Remix Ethereum IDE interface. The top panel shows the source code of the `MyContract` Solidity contract, which includes a `setAddress` function and a `getBalance` function. The middle panel shows the deployment process, with the contract `MYCONTRACT` deployed at address `0x339...78492`. The bottom panel shows the execution of the `getBalance` function, which returns a balance of `0 wei`. The right panel shows the transaction details, including the transaction cost, execution cost, input, decoded input, decoded output, logs, and the transaction status.

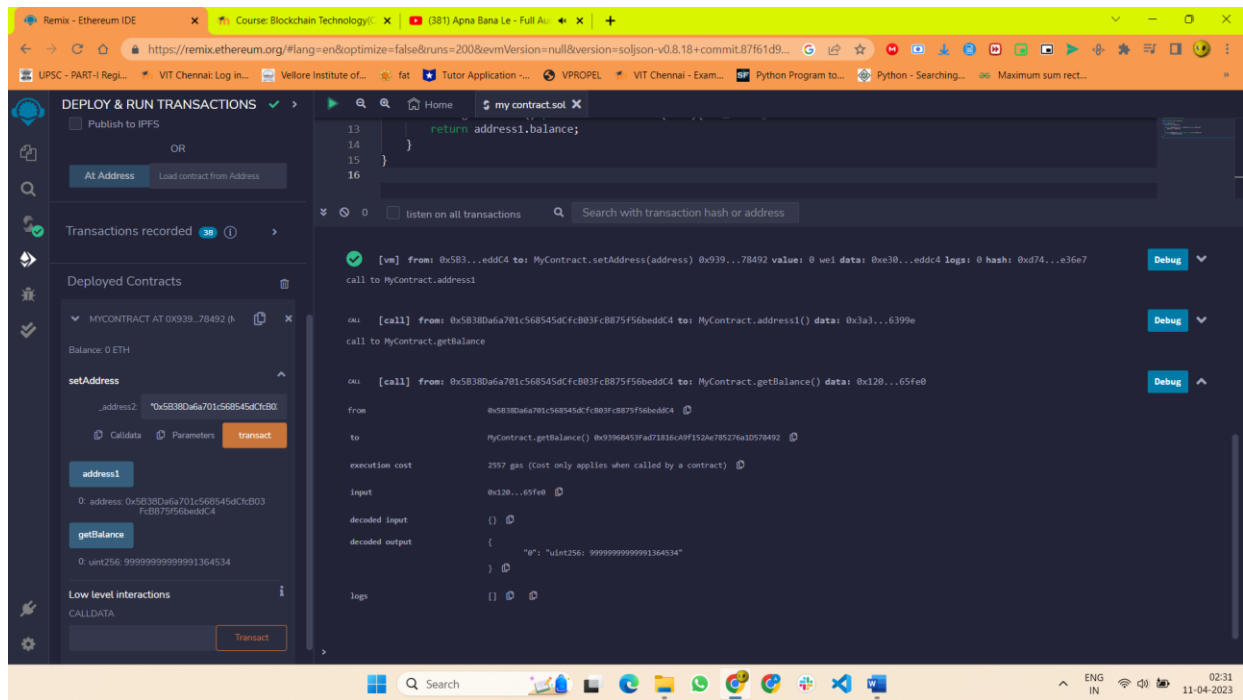
Transaction details:

- transaction cost: 186415 gas
- execution cost: 123571 gas
- input: `0x608...20033`
- decoded input: `()`
- decoded output: `-`
- logs: `[]`
- val: `0 wei`

Transaction status: `transaction to MyContract.setAddress pending ...`

Logs:

- `[vm] from: 0x583...eddC4 to: MyContract.setAddress(address) 0x939...78492 value: 0 wei data: 0xe30...eddC4 logs: 0 hash: 0xd74...e36e7`
- `call to MyContract.address1`
- `[call] from: 0x5838Daf6a701c568545dCf803FcB875f56beddC4 to: MyContract.address1() data: 0x3a3...6399e`
- `call to MyContract.getBalance`
- `[call] from: 0x5838Daf6a701c568545dCf803FcB875f56beddC4 to: MyContract.getBalance() data: 0x120...65fe0`



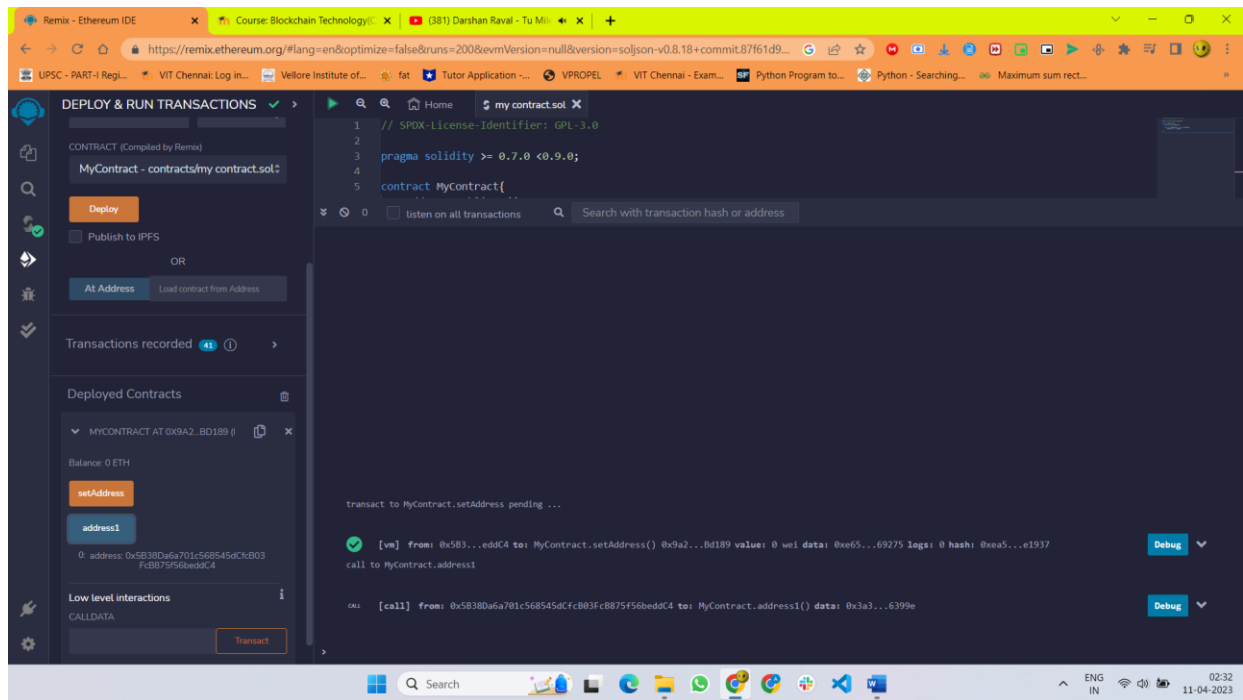
3.1 Code –

```
// SPDX-License-Identifier: GPL-3.0
```

```
pragma solidity >= 0.7.0 <0.9.0;
```

```
contract MyContract{
    address public address1;

    function setAddress() public{
        address1 = msg.sender;
    }
}
```

4. Blockchain messenger

Code –

```
// SPDX-License-Identifier: GPL-3.0

pragma solidity >= 0.7.0 <0.9.0;

contract MyContract{
    address public address1;
    address public owner;
    uint public counter;
    string public myMsg;

    constructor() {
        owner = msg.sender;
    }

    function updateTheMsg(string memory _msg1) public{
        if (msg.sender == owner){
            myMsg = _msg1;
            counter++;
        }
    }
}
```

The screenshot shows the Remix Ethereum IDE interface. On the left, the 'DEPLOY & RUN TRANSACTIONS' panel is active, displaying 'Deployed Contracts' with 'MYCONTRACT AT 0xD40A...5D3DF'. Below this, the 'updateTheMsg' function is selected, showing its parameters: 'msg1' (string: 'Ankitha_20BPS1050'). The 'address1' field is set to '0 address: 0x00'. The 'counter' field is set to '0 uint256: 1'. The 'myMsg' field is set to '0 string: Ankitha_20BPS1050'. The 'owner' field is set to '0 address: 0x58380a6a701c568545dcfcb03fc8b75f56beddca'. The 'Low level interactions' section shows 'CALLDATA' and a 'Transact' button.

The main editor displays the Solidity code for 'my contract.sol'. The code includes a 'counter' variable and a 'myMsg' array. The 'updateTheMsg' function is defined as follows:

```

19   }
20   }
21   }
22   }

[call] from: 0x58380a6a701c568545dcfcb03fc8b75f56beddca to: MyContract.counter() data: 0x51b...c221a
call to MyContract.myMsg

[call] from: 0x58380a6a701c568545dcfcb03fc8b75f56beddca to: MyContract.myMsg() data: 0x450...b2fad

from
    0x58380a6a701c568545dcfcb03fc8b75f56beddca
to
    MyContract.myMsg() 0xD40A716504F7c84EEfa7aF439a838E7925d3dF
execution cost
    3423 gas (Cost only applies when called by a contract)
input
    0x450...b2fad
decoded input
    {}
decoded output
    {
      "0": "string: Ankitha_20BPS1050"
    }
logs
    []
call to MyContract.owner

[call] from: 0x58380a6a701c568545dcfcb03fc8b75f56beddca to: MyContract.owner() data: 0xBda...5cb5b

```

The bottom status bar shows the system clock as 02:34 on 11-04-2023.

The screenshot shows the Remix Ethereum IDE interface. On the left, the 'DEPLOY & RUN TRANSACTIONS' panel is active, displaying 'Deployed Contracts' with 'MYCONTRACT AT 0xD40A...5D3DF'. Below this, the 'owner' function is selected, showing its parameters: 'address1' (address: 0x58380a6a701c568545dcfcb03fc8b75f56beddca). The 'counter' field is set to '0 uint256: 1'. The 'myMsg' field is set to '0 string: Ankitha_20BPS1050'. The 'owner' field is set to '0 address: 0x58380a6a701c568545dcfcb03fc8b75f56beddca'. The 'Low level interactions' section shows 'CALLDATA' and a 'Transact' button.

The main editor displays the Solidity code for 'my contract.sol'. The code includes a 'counter' variable and a 'myMsg' array. The 'owner' function is defined as follows:

```

19   }
20   }
21   }
22   }

[call] from: 0x58380a6a701c568545dcfcb03fc8b75f56beddca to: MyContract.counter() data: 0x51b...c221a
call to MyContract.myMsg

[call] from: 0x58380a6a701c568545dcfcb03fc8b75f56beddca to: MyContract.myMsg() data: 0x450...b2fad
call to MyContract.owner


[call] from: 0x58380a6a701c568545dcfcb03fc8b75f56beddca to: MyContract.owner() data: 0xBda...5cb5b

from
    0x58380a6a701c568545dcfcb03fc8b75f56beddca
to
    MyContract.owner() 0xD40A716504F7c84EEfa7aF439a838E7925d3dF
execution cost
    2558 gas (Cost only applies when called by a contract)
input
    0xBda...5cb5b
decoded input
    {}
decoded output
    {
      "0": "address: 0x58380a6a701c568545dcfcb03fc8b75f56beddca"
    }
logs
    []


```

The bottom status bar shows the system clock as 02:35 on 11-04-2023.

5.Smart Money deposit and withdrawals - Meta mask


 METAMASK

Goerli test network




Goerli Testnet

Search by Address / Txn Hash / Block / Token

 Etherscan

HomeBlockchainTokensNFTsMisc

 Address 0x74321097054F4B05dc9Aa8f0Abd61AC55F4A488

Overview

ETH BALANCE
0.1 ETH

More info

NO TXNS SENT FROM THIS ADDRESS

Multi Chain

MULTICHAIN ADDRESSES
N/A

More


TransactionsToken Transfers (ERC-20)

Latest 2 from a total of 2 transactions


Transaction Hash	Method	Block	Age	From	To	Value	Txn Fee
0xe02ea3adae182f979...	Transfer	8776278	1 day 12 hrs ago	0x1B7aA4...46Bf7d8f	0x743210...55F4A488	0.05 ETH	0.00489454
0x4b7ac3f0329bc7500...	Transfer	8769103	2 days 18 hrs ago	0x1B7aA4...46Bf7d8f	0x743210...55F4A488	0.05 ETH	0.00294279

[Download: CSV Export]

A wallet address is a publicly available address that allows its owner to receive funds from another party. To access the funds in an address, you must have its private key. Learn more about addresses in our [Knowledge Base](#).

 METAMASK

Goerli test network



Send

Account 2
0xd897e50BD5aEaC74i283D93Df210627f959bF4e4

Asset: GoerliETH
Balance: 0.1 GoerliETH

Amount: 0.001 GoerliETH
Max

Gas (estimated) 0.0015908 Goerli
Likely in < 30 seconds Max fee: 0.00213655 Goerli

CancelNext

My accounts

Lock

Account 1
0.1 GoerliETH

Account 2
0 GoerliETH

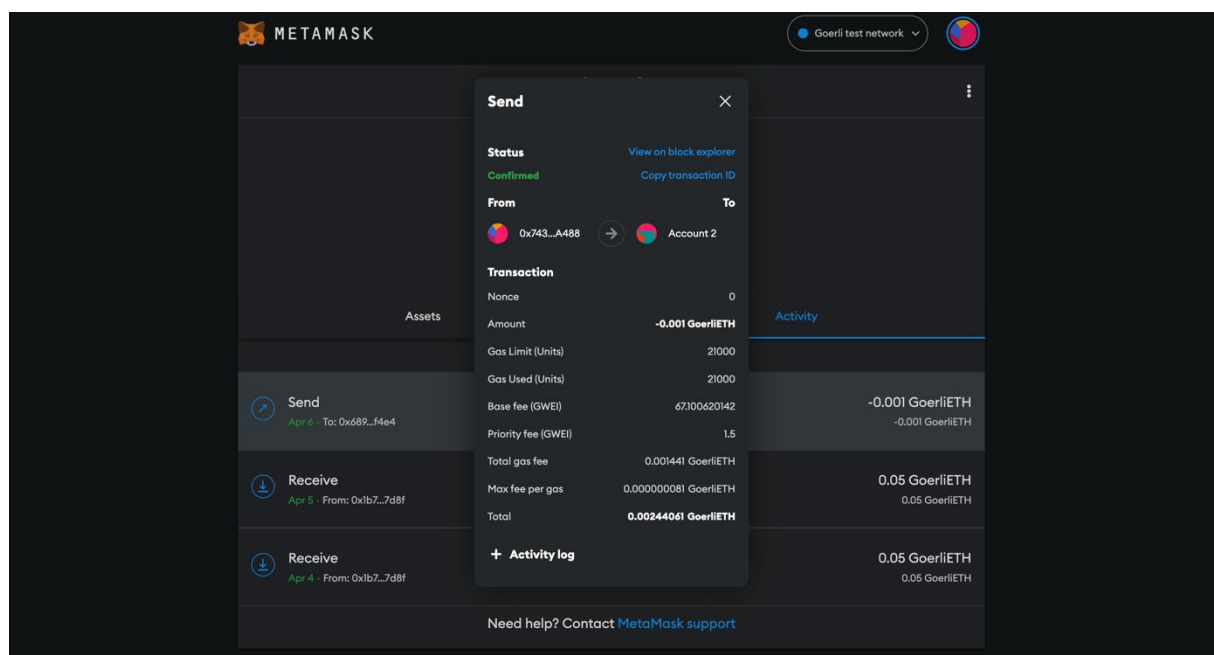
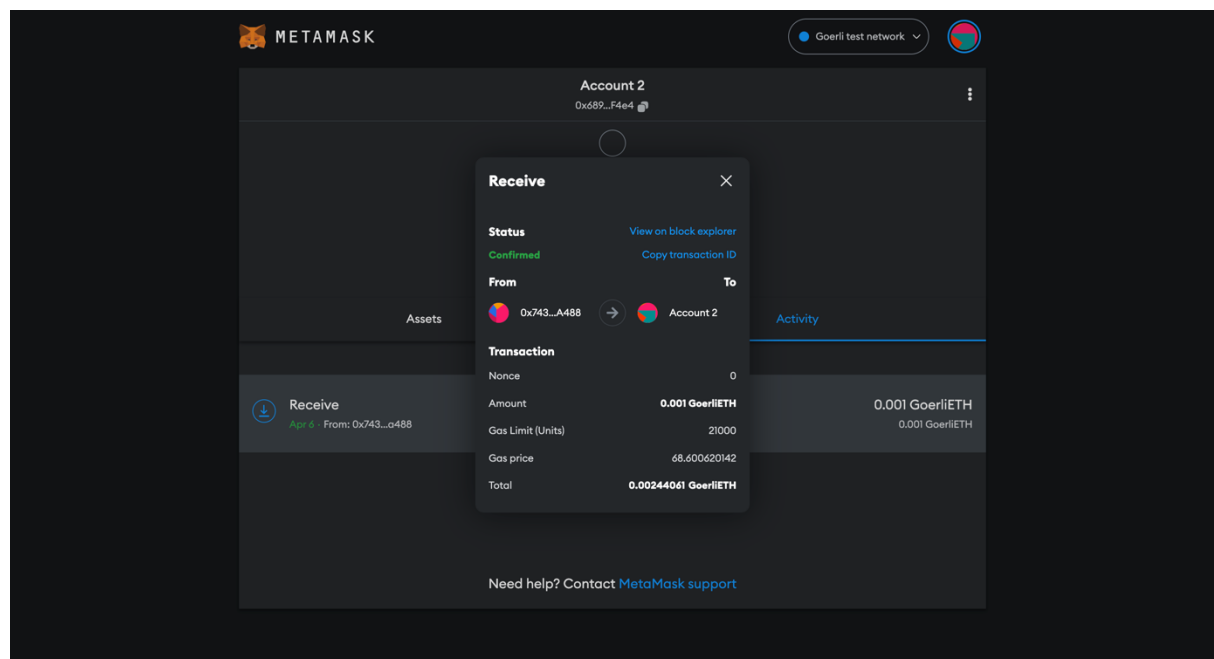
Create account

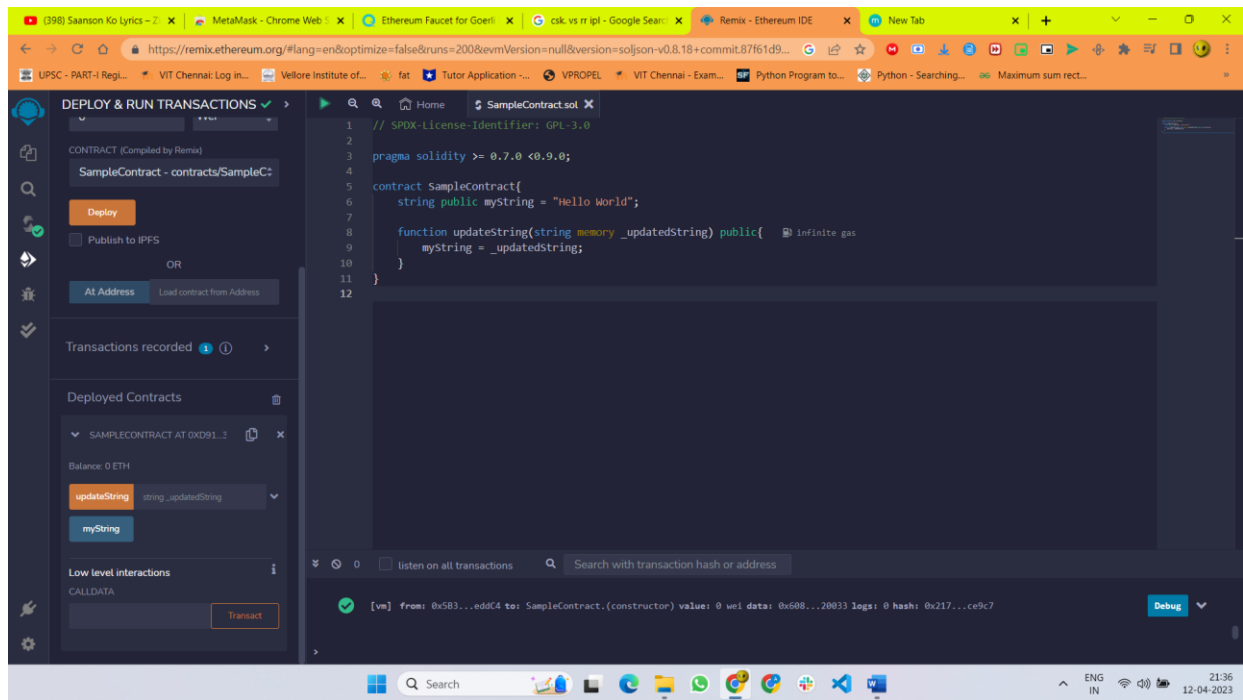
Import account

Connect hardware wallet

Support

Settings





Code –

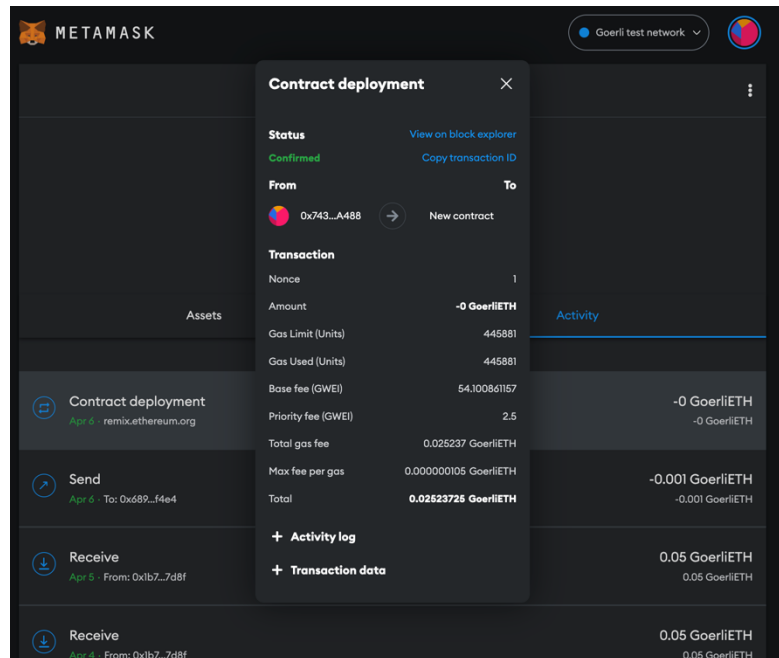
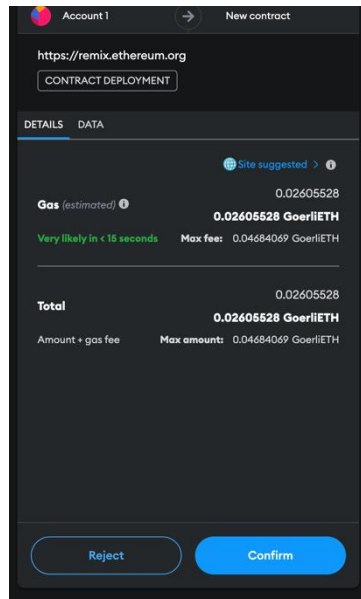
```
// SPDX-License-Identifier: GPL-3.0

pragma solidity >= 0.7.0 <0.9.0;

contract SampleContract{
    string public myString = "Hello World";

    function updateString(string memory _updatedString) public{
        myString = _updatedString;
    }
}
```

After clicking Deploy -



Remix - Ethereum IDE interface showing a Solidity contract deployment and transaction execution.

Contract: SampleContract.sol

```
1 // SPDX-License-Identifier: GPL-3.0
2
3 pragma solidity >= 0.7.0 <0.9.0;
4
5 contract SampleContract{
```

Deployed Contracts: SAMPLECONTRACT AT 0xD91...3

updateString

myString

Transaction details:

- status: true Transaction mined and execution succeed
- transaction hash: 0x75fc020508252417670f60806956e13154ef6abf104f2c99c1182b380b44be
- from: 0x583806a701c568545dcf803fc8875f56bedc4
- to: SampleContract.updateString(string) 0xd9145cc520366f254017481e044e9943f39138
- gas: 32587 gas
- transaction cost: 28336 gas
- execution cost: 6564 gas
- input: 0xc3c...00000
- decoded input: { "string_updatedString": "Ankit Kumar Jha 208PS1050" }
- decoded output: {}
- logs: []
- val: 0 wei

Remix - Ethereum IDE interface showing a Solidity contract deployment and transaction execution.

Contract: SampleContract.sol

```
1 // SPDX-License-Identifier: GPL-3.0
2
3 pragma solidity >= 0.7.0 <0.9.0;
4
5 contract SampleContract{
6     string public myString = "Hello World";
7
8     function updateString(string memory _updatedString) public {
9         myString = _updatedString;
10    }
11 }
12
```

Deployed Contracts: SAMPLECONTRACT AT 0xD91...3

updateString

myString

Transaction details:

- status: true Transaction mined and execution succeed
- transaction hash: 0x217f2a1dfcd6d86a781a46d4e7fa0b1ffabaa40948f6c22959ace9c7
- from: 0x583806a701c568545dcf803fc8875f56bedc4
- to: SampleContract.(constructor)
- gas: 512573 gas
- transaction cost: 445715 gas
- execution cost: 394347 gas
- input: 0x00...20033
- decoded input: {}
- decoded output: -

