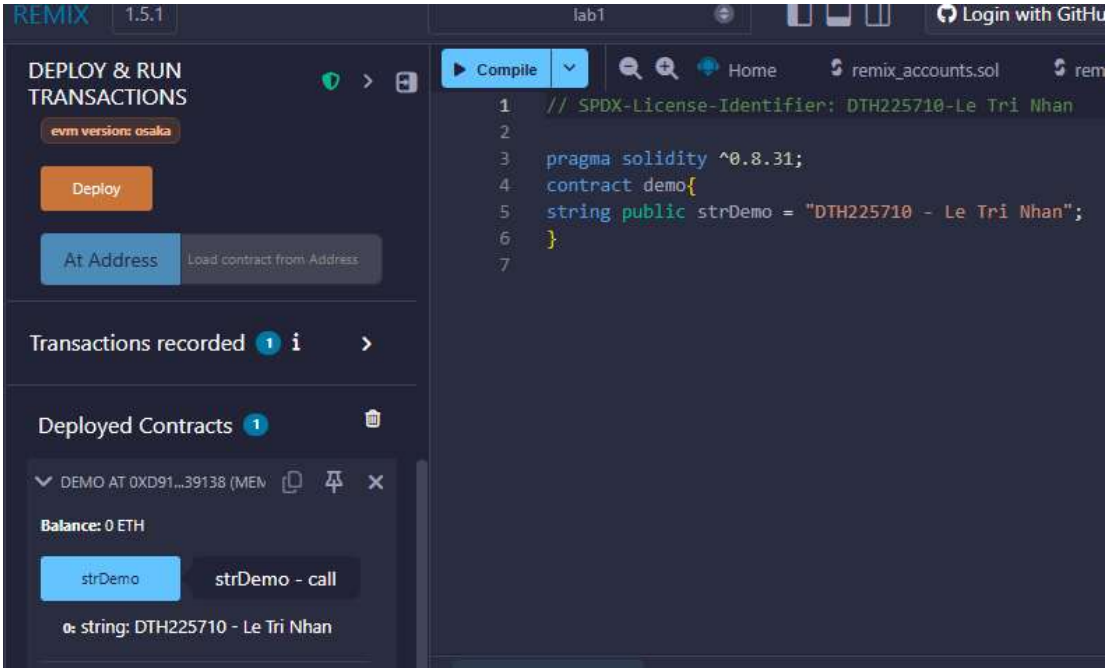
MSSV: DTH225710

Họ và tên: Lê Trí Nhàn

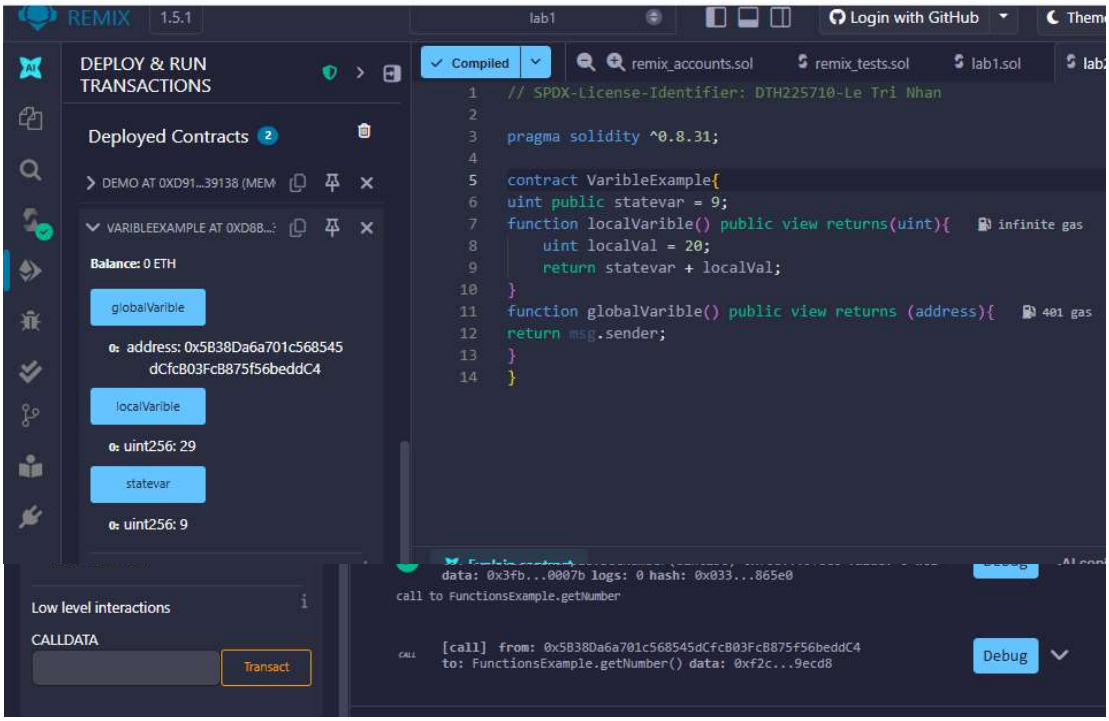
Lớp: DH23TH2

Ngày thực hiện: 22/01/2026

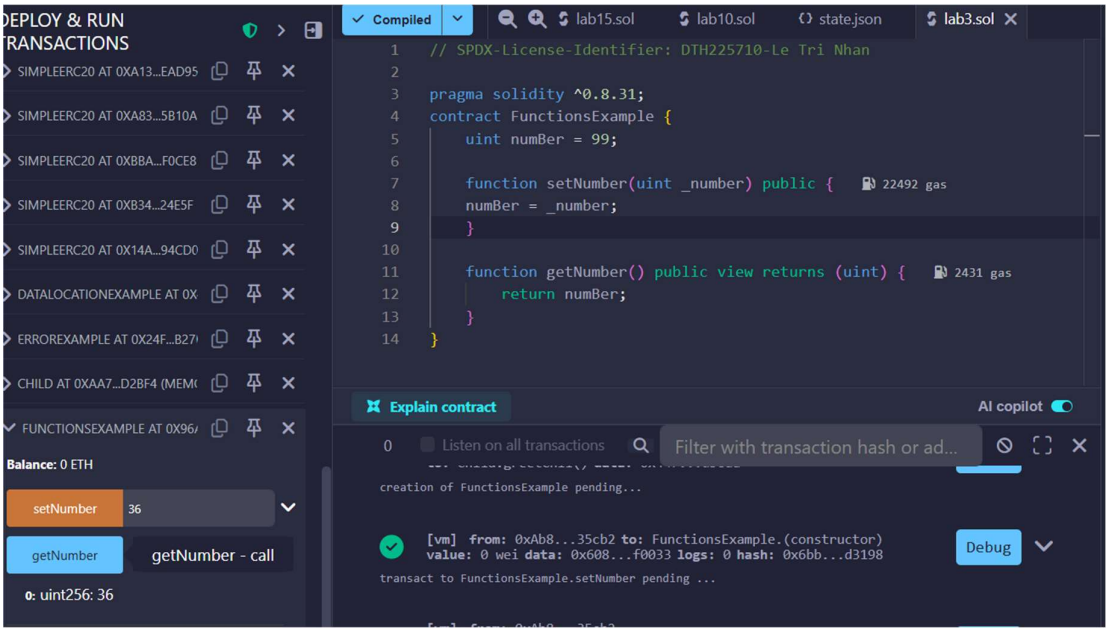
LAB 1:



LAB 2:

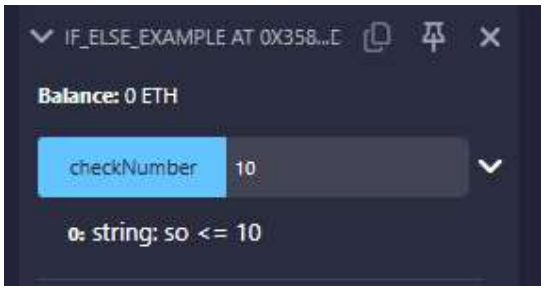

REMIX 1.5.1
lab1
Login with GitHub
DEPLOY & RUN TRANSACTIONS
Deployed Contracts 2
DEMO AT 0XD91...39138 (MEM
VARIBLEEXAMPLE AT 0XD88...
Balance: 0 ETH
globalVaribble
0: address: 0x5B38Da6a701c568545 dCfcB03FcB875f56beddC4
localVaribble
0: uint256: 29
statevar
0: uint256: 9
Low level interactions
CALLDATA
Transact
Compiled
remix_accounts.sol
remix_tests.sol
lab1.sol
// SPDX-License-Identifier: DTH225710-Le Tri Nhan
pragma solidity ^0.8.31;
contract VaribleExample{
uint public statevar = 9;
function localVaribble() public view returns(uint){ infinite gas
uint localVal = 20;
return statevar + localVal;
}
function globalVaribble() public view returns (address){ 401 gas
return msg.sender;
}
}
data: 0x3fb...0007b logs: 0 hash: 0x033...865e0
call to FunctionsExample.getNumber
[call] from: 0x5B38Da6a701c568545dCfcB03FcB875f56beddC4
to: FunctionsExample.getNumber() data: 0xf2c...9ecd8
Debug

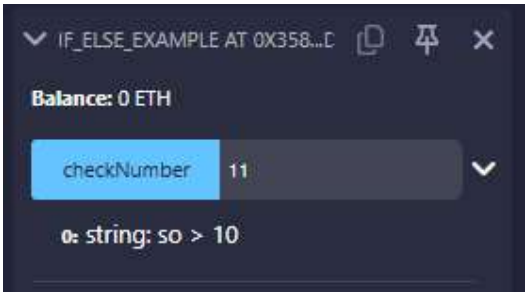
LAB 3:


DEPLOY & RUN TRANSACTIONS
SIMPLEERC20 AT 0XA13...EAD95
SIMPLEERC20 AT 0XA83...5B10A
SIMPLEERC20 AT 0XBBA...F0CE8
SIMPLEERC20 AT 0XB34...24E5F
SIMPLEERC20 AT 0X14A...94CD0
DATALOCATIONEXAMPLE AT 0X
ERROREXAMPLE AT 0X24F...B27
CHILD AT 0XAA7...D2BF4 (MEM
FUNCTIONSEXAMPLE AT 0X96
Balance: 0 ETH
setNumber 36
getNumber
getNumber - call
0: uint256: 36
Compiled
lab15.sol
lab10.sol
state.json
lab3.sol
// SPDX-License-Identifier: DTH225710-Le Tri Nhan
pragma solidity ^0.8.31;
contract FunctionsExample {
uint numBer = 99;
function setNumber(uint _number) public { 22492 gas
numBer = _number;
}
function getNumber() public view returns (uint) { 2431 gas
return numBer;
}
}
Explain contract
AI copilot
Listen on all transactions
Filter with transaction hash or ad...
creation of FunctionsExample pending...
[vm] from: 0xAb8...35cb2 to: FunctionsExample.(constructor)
value: 0 wei data: 0x608...f0033 logs: 0 hash: 0x6bb...d3198
Debug
transact to FunctionsExample.setNumber pending ...

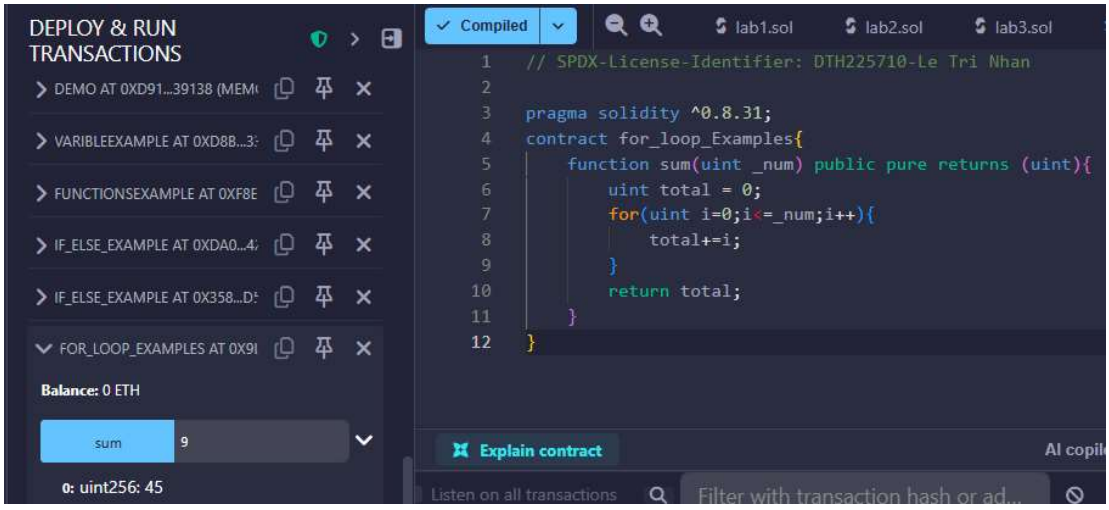
LAB 4:

```
// SPDX-License-Identifier: DTH225710-Le Tri Nhan

pragma solidity ^0.8.31;
contract if_else_Example {
    function checkNumber(uint _number) public pure returns(string memory){
        if(_number > 10){
            return "so > 10";
        }else{
            return "so <= 10";
        }
    }
}
```





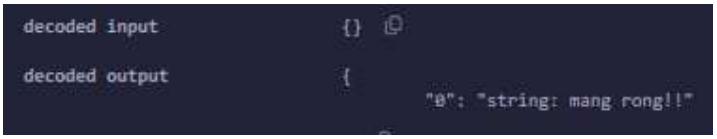
LAB 5:



LAB 6:

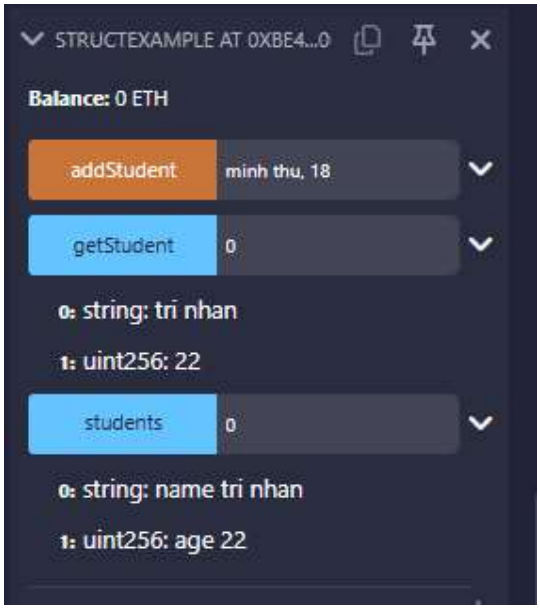
```
// SPDX-License-Identifier: DTH225710-Le Tri Nhan

pragma solidity ^0.8.31;
contract array_Example{
    uint[] public arrayNumber;

    function addNumber(uint _num) public {    46864 gas
        arrayNumber.push(_num);
    }

    function getNumber(uint index) public view returns(uint){
        return arrayNumber[index];
    }

    function popNumber() public returns (string memory) {
        if (arrayNumber.length == 0) {
            return "mang rong!!";
        } else {
            arrayNumber.pop();
            return "da xoa phan tu cuoi";
        }
    }
}
```

Xóa mảng



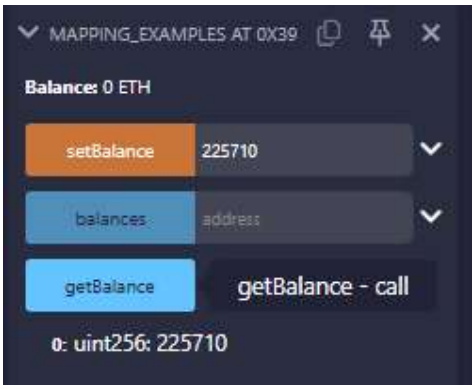
LAB 7:

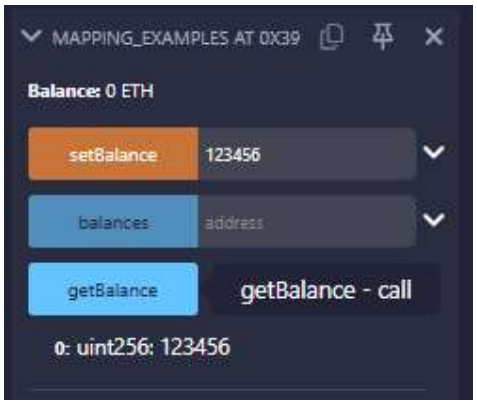
```solidity
// SPDX-License-Identifier: DTH225710-Le Tri Nhan

pragma solidity ^0.8.31;
contract StructExample{
    struct Student {
        string name;
        uint age;
    }

    Student[] public students;

    function addStudent(string memory _name, uint _age) public {    infinite gas
        students.push(Student(_name, _age));
    }

    function getStudent(uint index) public view returns(string memory,uint){
        Student memory s = students[index];
        return (s.name, s.age);
    }
}
```



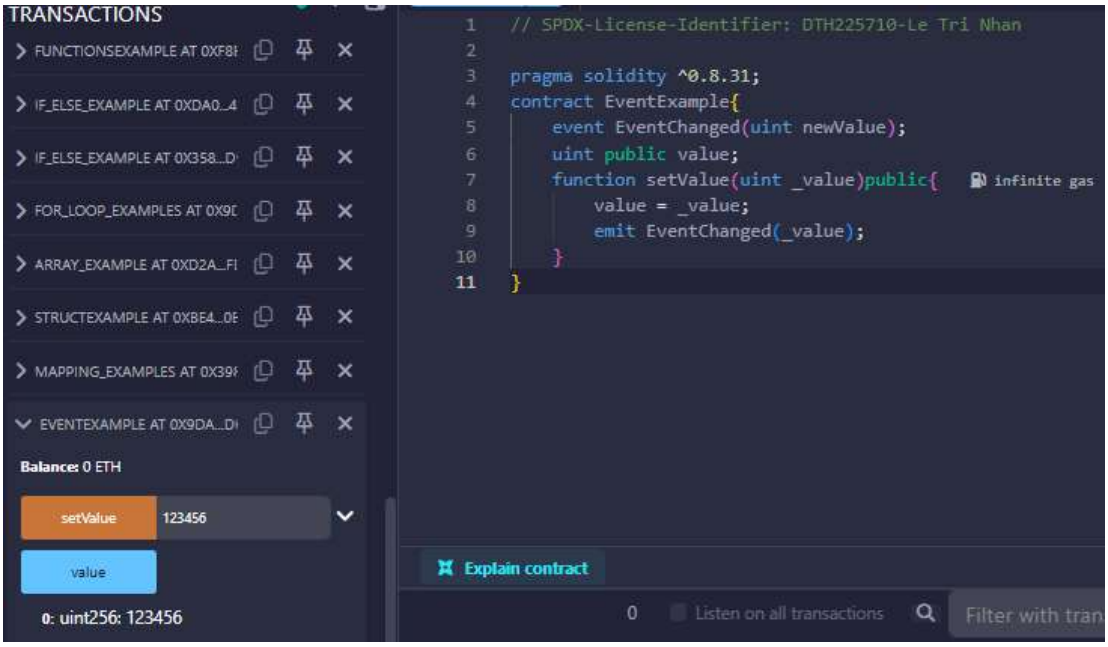
LAB 8:

```
1  // SPDX-License-Identifier: DTH225710-Le Tri Nhan
2
3  pragma solidity ^0.8.31;
4  contract Mapping_Examples{
5      mapping(address=>uint) public balances;
6
7      function setBalance(uint _value) public{    22623 g
8          balances[msg.sender] = _value;
9      }
10
11     function getBalance() public  view returns(uint){
12         return balances[msg.sender];
13     }
14 }
```



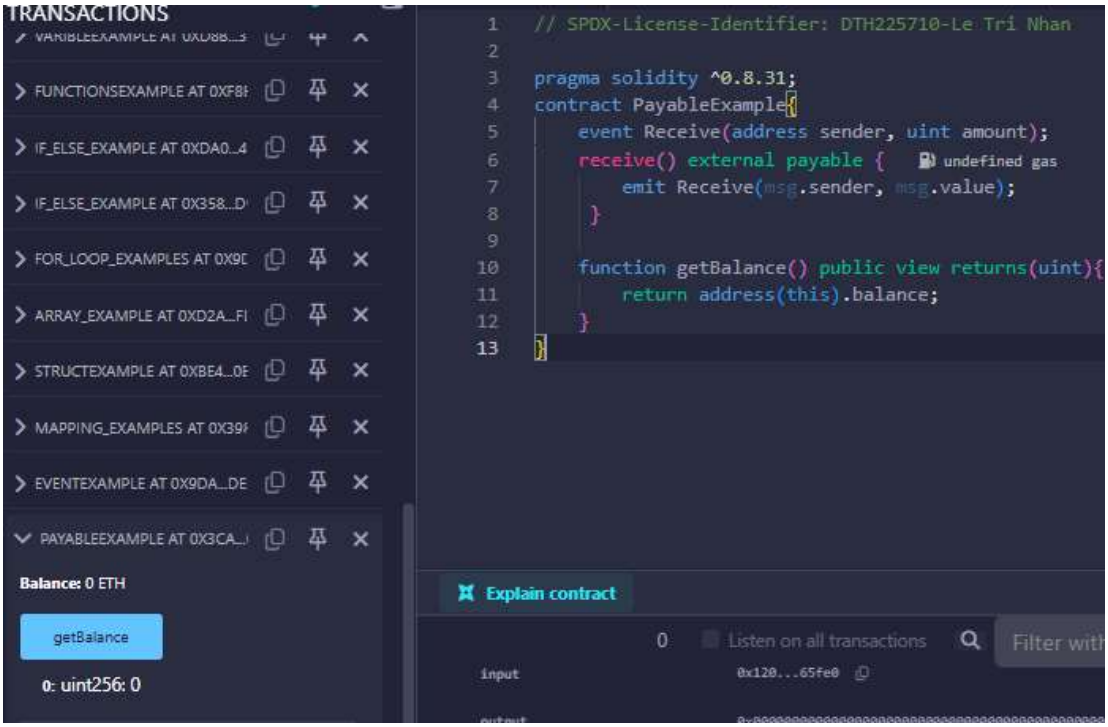


LAB 9:

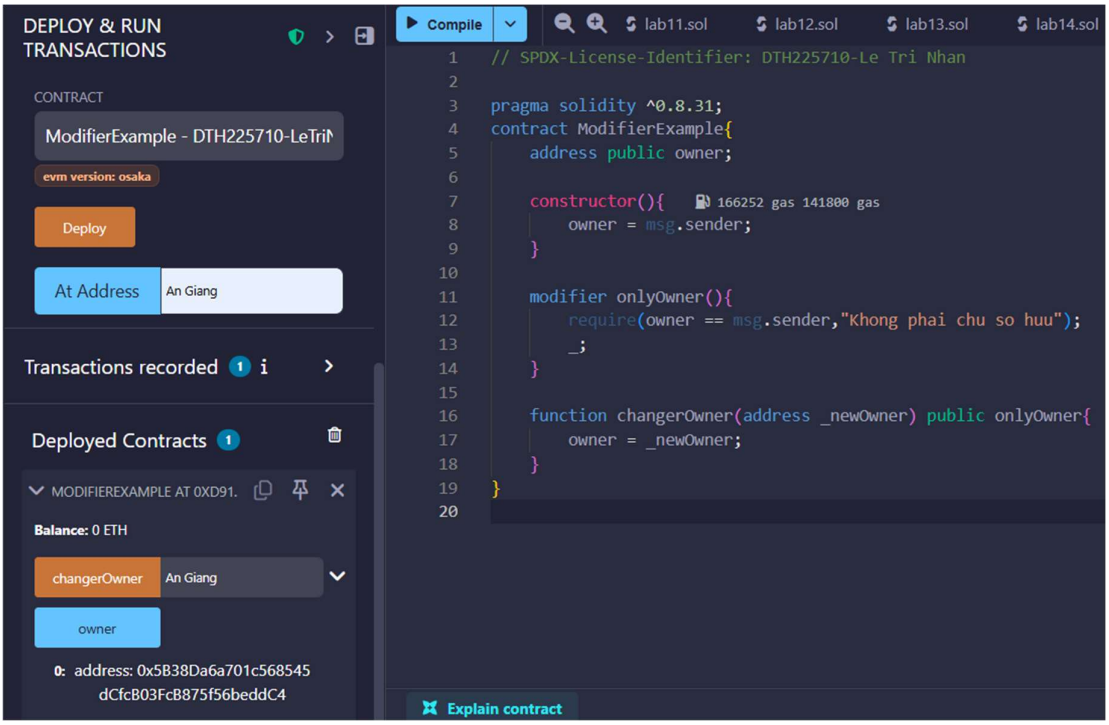

TRANSACTIONS
FUNCTIONSEXAMPLE AT 0XF8
IF_ELSE_EXAMPLE AT 0XDA0...4
IF_ELSE_EXAMPLE AT 0X358...D
FOR_LOOP_EXAMPLES AT 0X9
ARRAY_EXAMPLE AT 0XD2A...FI
STRUCTEXAMPLE AT 0XBE4...0E
MAPPING_EXAMPLES AT 0X39
EVENTEXAMPLE AT 0X9DA...D
Balance: 0 ETH
setValue
123456
value
0: uint256: 123456
// SPDX-License-Identifier: DTH225710-Le Tri Nhan
pragma solidity ^0.8.31;
contract EventExample{
event EventChanged(uint newValue);
uint public value;
function setValue(uint _value)public{
infinite gas
value = _value;
emit EventChanged(_value);
}
}
Explain contract
0
Listen on all transactions
Filter with tran


decoded input
{
"uint256 _value": "123456"
}
decoded output
{}
logs
[
{
"from": "0x9dAf7c849c20Be671315E77CB689811bD5EDefe6",
"topic":
"0xc3bb07d672a05c6f9c6b4e49e118c0a87683d02b54f1536ff2c05f23acd8fd3a",
"event": "EventChanged",
"args": {
"0": "123456"
}
}
]

LAB 10:


TRANSACTIONS
FUNCTIONSEXAMPLE AT 0XF8
IF_ELSE_EXAMPLE AT 0XDA0...4
IF_ELSE_EXAMPLE AT 0X358...D
FOR_LOOP_EXAMPLES AT 0X9D
ARRAY_EXAMPLE AT 0XD2A...FI
STRUCTEXAMPLE AT 0XBE4...0E
MAPPING_EXAMPLES AT 0X39
EVENTEXAMPLE AT 0X9DA...DE
PAYABLEEXAMPLE AT 0X3CA...
Balance: 0 ETH
getBalance
0: uint256: 0
// SPDX-License-Identifier: DTH225710-Le Tri Nhan
pragma solidity ^0.8.31;
contract PayableExample{
event Receive(address sender, uint amount);
receive() external payable { undefined gas
emit Receive(msg.sender, msg.value);
}
function getBalance() public view returns(uint){
return address(this).balance;
}
}
Explain contract
0
Listen on all transactions
Filter with
input
0x120...65fe0

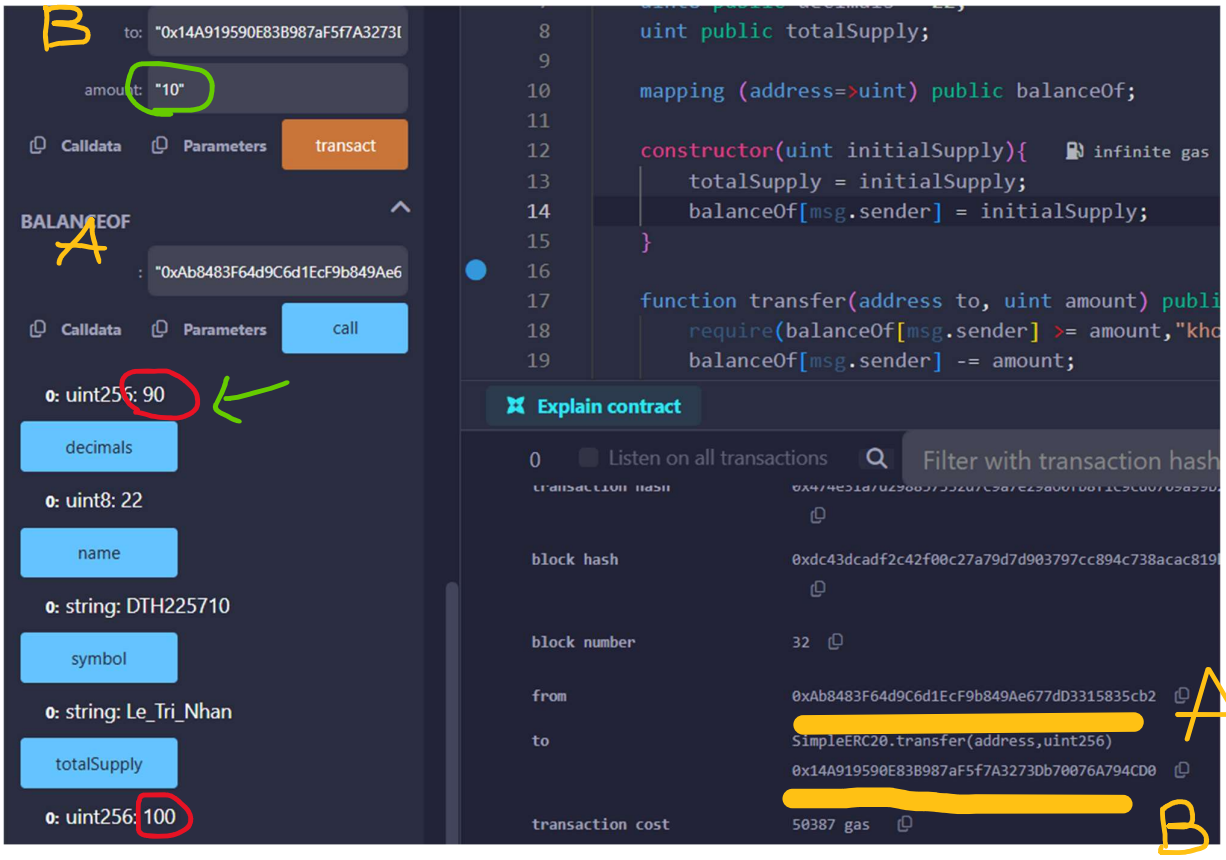
LAB 11:


DEPLOY & RUN TRANSACTIONS
CONTRACT
ModifierExample - DTH225710-LeTriN
evm version: osaka
Deploy
At Address
An Giang
Transactions recorded 1
Deployed Contracts 1
MODIFIEREXAMPLE AT 0XD91.
Balance: 0 ETH
changerOwner
An Giang
owner
0: address: 0x5B38Da6a701c568545 dCfcB03FcB875f56beddC4
Compile
lab11.sol
lab12.sol
lab13.sol
lab14.sol
// SPDX-License-Identifier: DTH225710-Le Tri Nhan
pragma solidity ^0.8.31;
contract ModifierExample{
address public owner;
constructor(){ 166252 gas 141800 gas
owner = msg.sender;
}
modifier onlyOwner(){
require(owner == msg.sender,"Khong phai chu so huu");
_;
}
function changerOwner(address _newOwner) public onlyOwner{
owner = _newOwner;
}
}
Explain contract

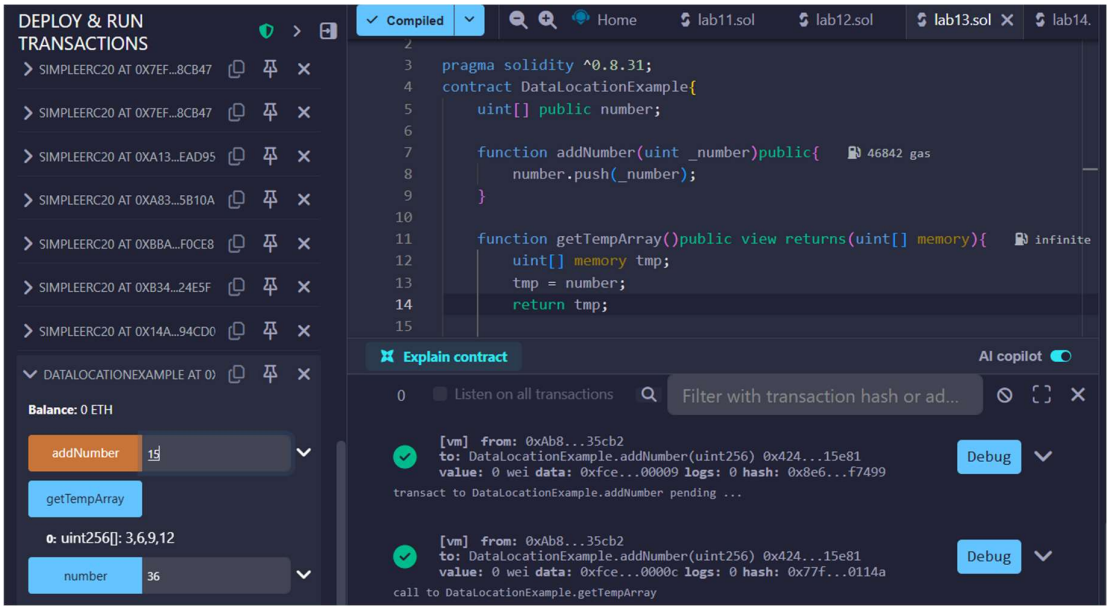
1 transact to ModifierExample.changerOwner errored: Error encoding arguments: TypeError: invalid address (argument="address", value="An Giang", code=INVALID_ARGUMENT, version=6.14.0) (argument="", value="An Giang", code=INVALID_ARGUMENT, version=6.14.0)

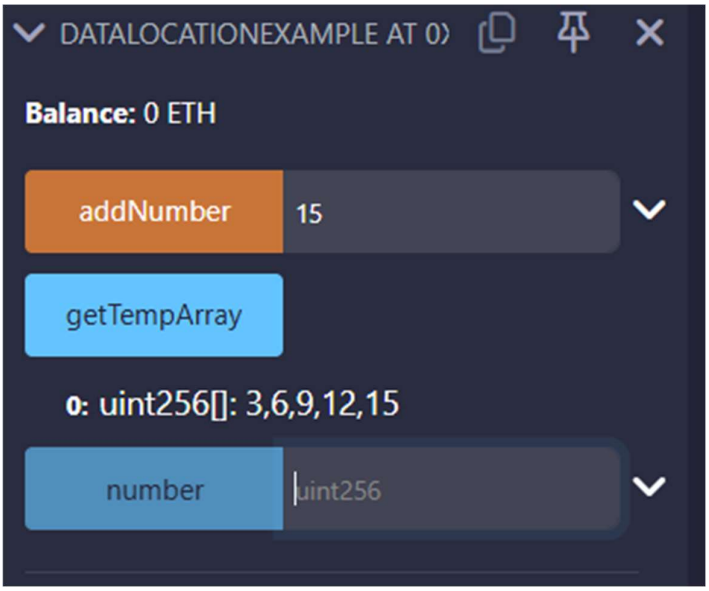
2 transact to ModifierExample.changerOwner errored: Error encoding arguments: TypeError: invalid address (argument="address", value="Long Xuyên", code=INVALID_ARGUMENT, version=6.14.0) (argument="", value="Long Xuyên", code=INVALID_ARGUMENT, version=6.14.0

LAB 12:



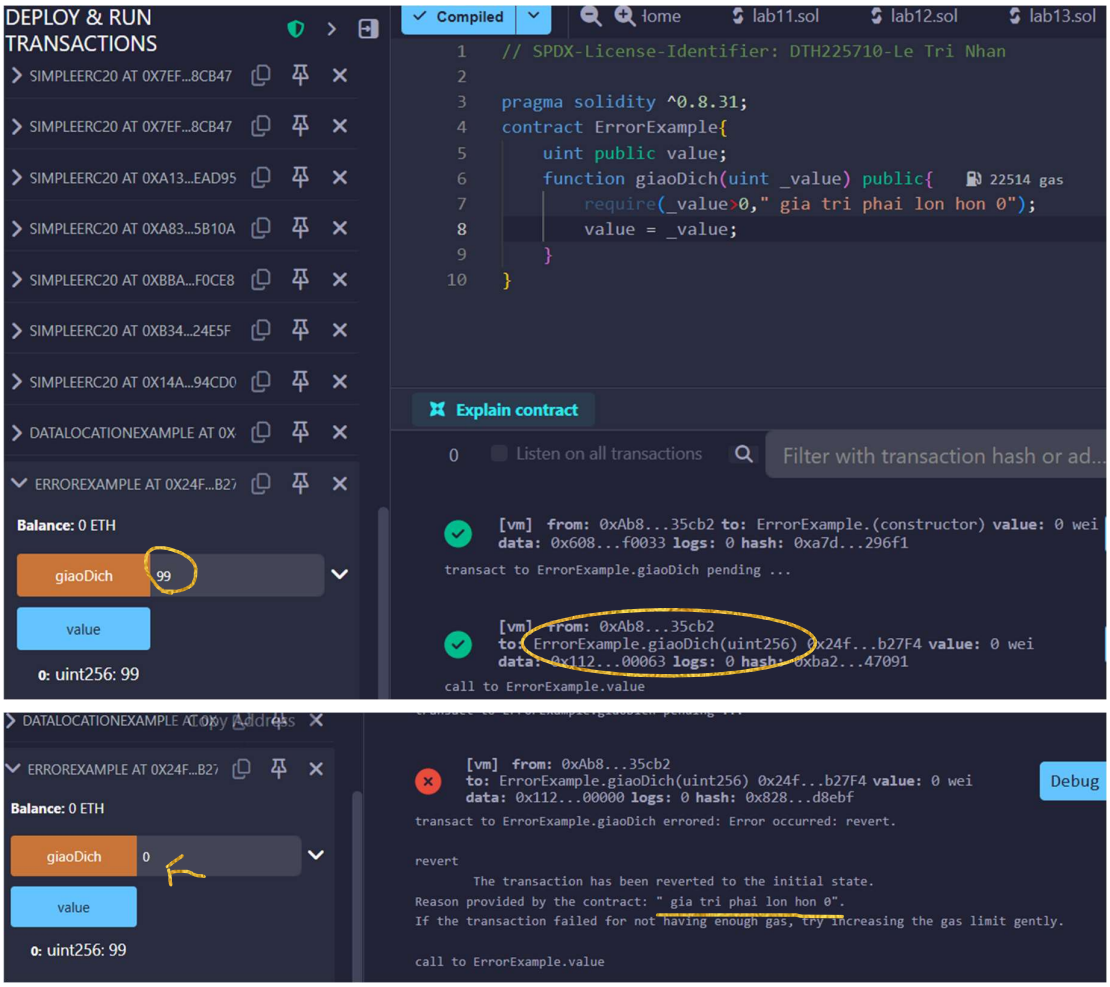
LAB 13:



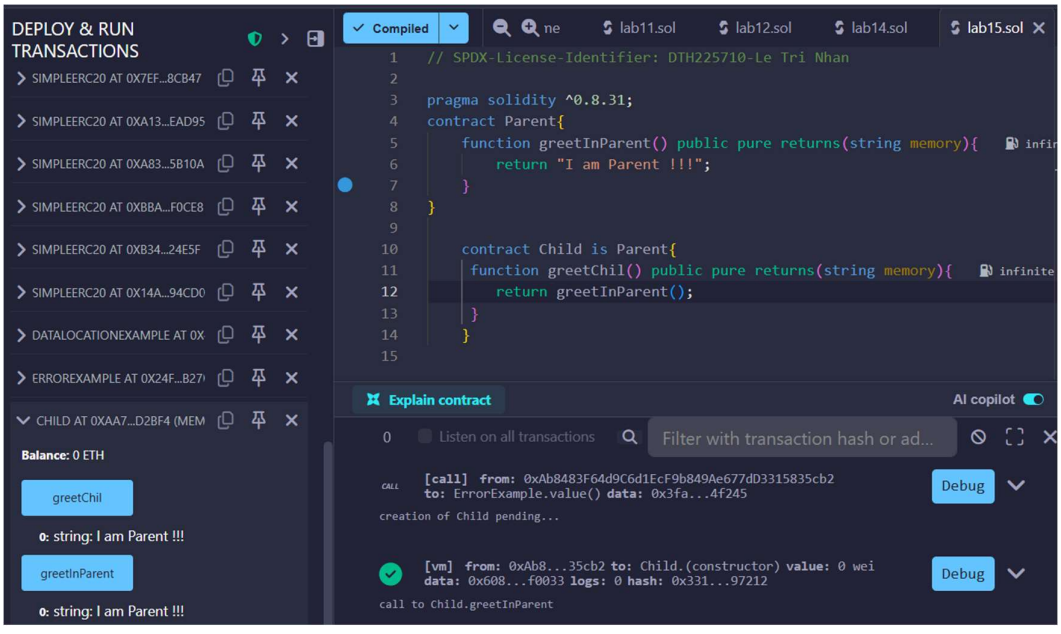


Thêm 15 vào chuỗi

LAB 14:


DEPLOY & RUN TRANSACTIONS
SIMPLEERC20 AT 0X7EF...8CB47
SIMPLEERC20 AT 0X7EF...8CB47
SIMPLEERC20 AT 0XA13...EAD95
SIMPLEERC20 AT 0XA83...5B10A
SIMPLEERC20 AT 0XBBA...F0CE8
SIMPLEERC20 AT 0XB34...24E5F
SIMPLEERC20 AT 0X14A...94CD0
DATALOCATIONEXAMPLE AT 0X
ERROREXAMPLE AT 0X24F...B27
Balance: 0 ETH
giaoDich
99
value
0: uint256: 99
Compiled
lab11.sol
lab12.sol
lab13.sol
// SPDX-License-Identifier: DTH225710-Le Tri Nhan
pragma solidity ^0.8.31;
contract ErrorExample{
uint public value;
function giaoDich(uint _value) public{
22514 gas
require(_value>0," gia tri phai lon hon 0");
value = _value;
}
}
Explain contract
0
Listen on all transactions
Filter with transaction hash or ad...
[vm] from: 0xAb8...35cb2 to: ErrorExample.(constructor) value: 0 wei
data: 0x608...f0033 logs: 0 hash: 0xa7d...296f1
transact to ErrorExample.giaoDich pending ...
[vm] from: 0xAb8...35cb2
to: ErrorExample.giaoDich(uint256) 0x24f...b27F4 value: 0 wei
data: 0x112...00063 logs: 0 hash: 0xba2...47091
call to ErrorExample.value
DATALOCATIONEXAMPLE AT 0X
ERROREXAMPLE AT 0X24F...B27
Balance: 0 ETH
giaoDich
0
value
0: uint256: 99
[vm] from: 0xAb8...35cb2
to: ErrorExample.giaoDich(uint256) 0x24f...b27F4 value: 0 wei
data: 0x112...00000 logs: 0 hash: 0x828...d8ebf
Debug
transact to ErrorExample.giaoDich errored: Error occurred: revert.
revert
The transaction has been reverted to the initial state.
Reason provided by the contract: " gia tri phai lon hon 0".
If the transaction failed for not having enough gas, try increasing the gas limit gently.
call to ErrorExample.value

LAB 15:


DEPLOY & RUN TRANSACTIONS
SIMPLEERC20 AT 0X7EF...8CB47
SIMPLEERC20 AT 0XA13...EAD95
SIMPLEERC20 AT 0XA83...5B10A
SIMPLEERC20 AT 0XBBA...F0CE8
SIMPLEERC20 AT 0XB34...24E5F
SIMPLEERC20 AT 0X14A...94CD0
DATALOCATIONEXAMPLE AT 0X
ERROREXAMPLE AT 0X24F...B27
CHILD AT 0XAA7...D2BF4 (MEM
Balance: 0 ETH
greetChil
0: string: I am Parent !!!
greetInParent
0: string: I am Parent !!!
Compiled
lab11.sol
lab12.sol
lab14.sol
lab15.sol
// SPDX-License-Identifier: DTH225710-Le Tri Nhan
pragma solidity ^0.8.31;
contract Parent{
function greetInParent() public pure returns(string memory){
return "I am Parent !!!";
}
}
contract Child is Parent{
function greetChil() public pure returns(string memory){
return greetInParent();
}
}
Explain contract
AI copilot
0
Listen on all transactions
Filter with transaction hash or ad...
[call] from: 0xAb8483F64d9C6d1EcF9b849Ae677dD3315835cb2
to: ErrorExample.value() data: 0x3fa...4f245
Debug
creation of Child pending...
[vm] from: 0xAb8...35cb2 to: Child.(constructor) value: 0 wei
data: 0x608...f0033 logs: 0 hash: 0x331...97212
Debug
call to Child.greetInParent