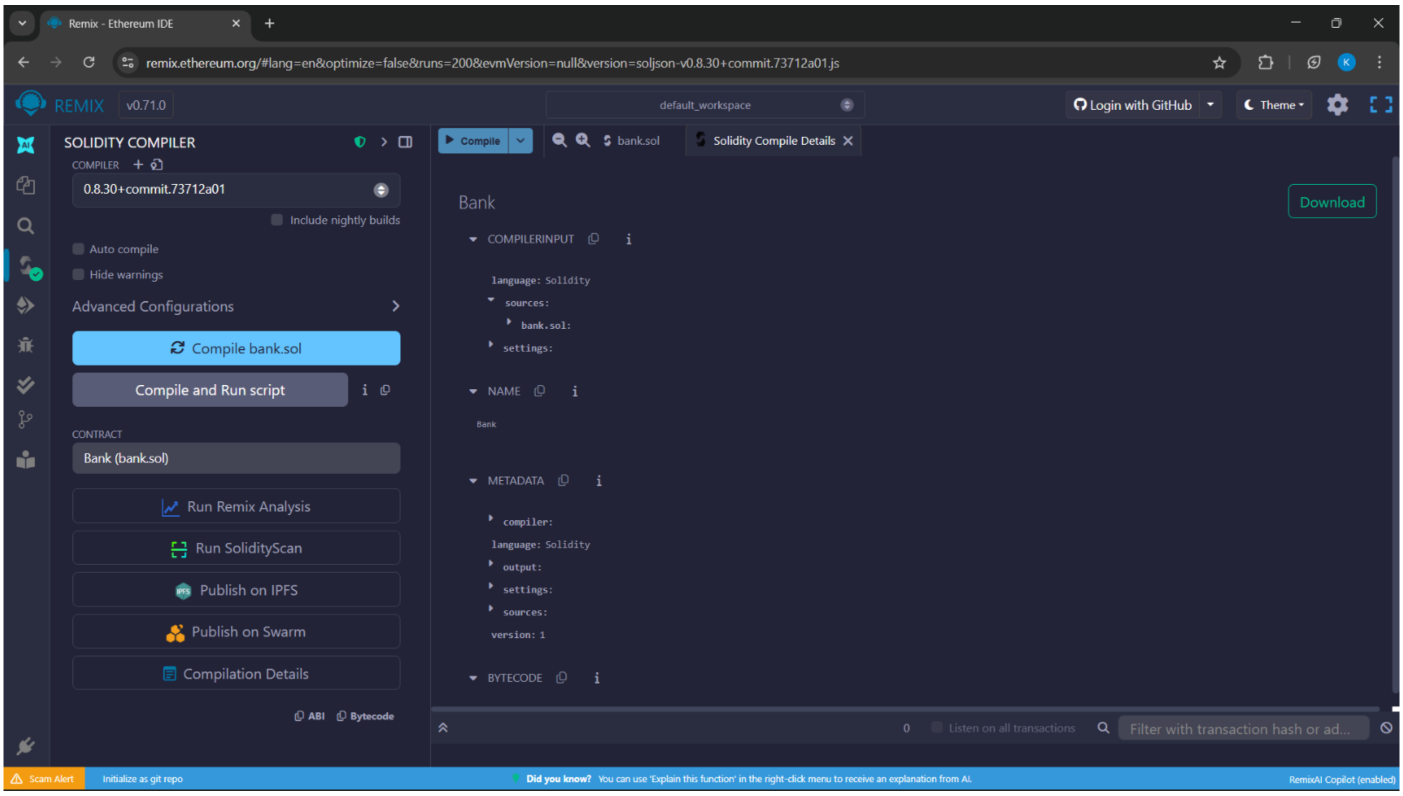
LAB ASSIGNMENT – 03

Program

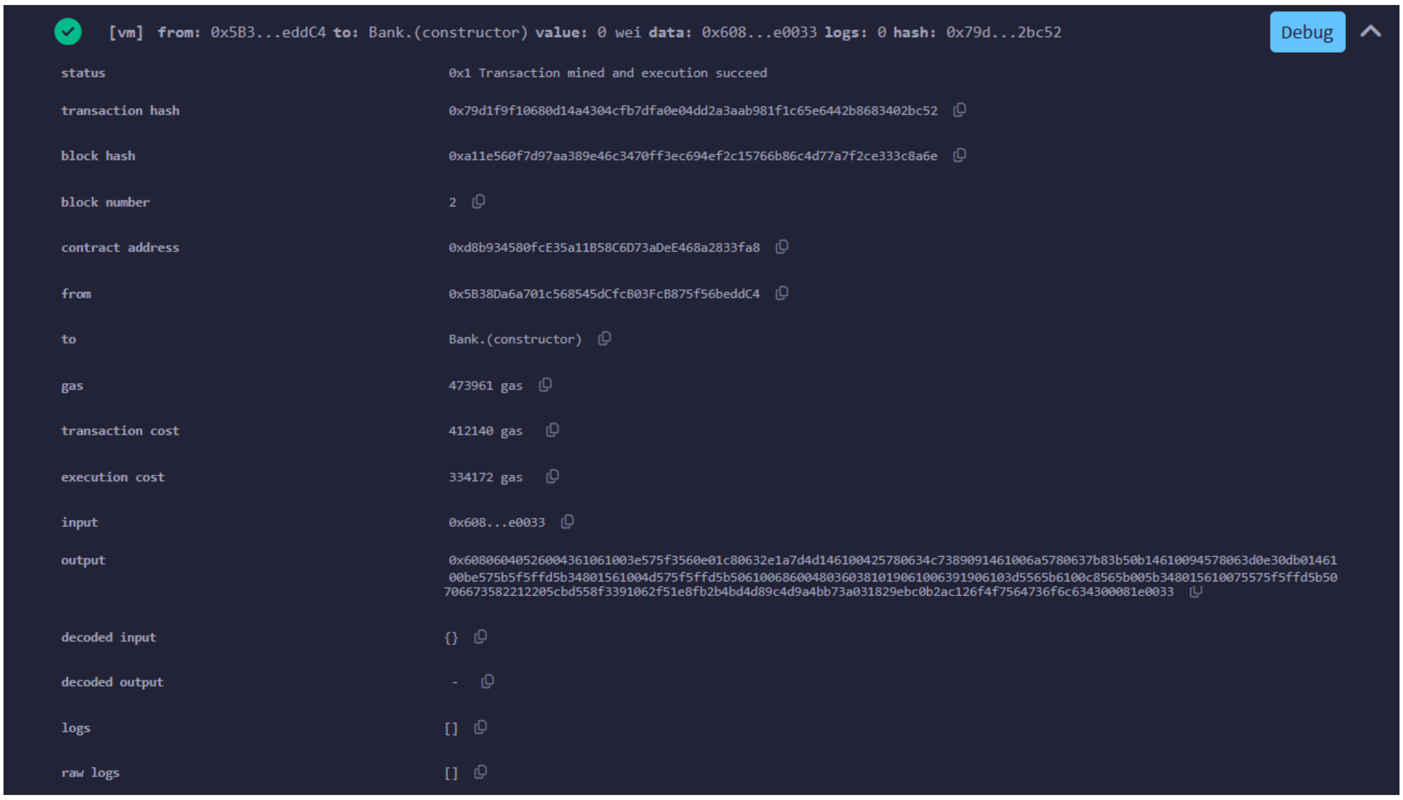
```
// SPDX-License-Identifier: MIT
pragma solidity ^0.8.20;

contract Bank {
    // Mapping to store user balances
    mapping(address => uint256) private balances;

    // Events for logging activities
    event Deposit(address indexed account, uint256 amount);
    event Withdrawal(address indexed account, uint256 amount);

    /**
     * @dev Allows a user to deposit Ether into the bank.
     * The deposited amount is added to the user's balance.
     */
    function deposit() external payable {
        require(msg.value > 0, "Deposit amount must be greater than zero");

        balances[msg.sender] += msg.value;

        emit Deposit(msg.sender, msg.value);
    }

    /**
     * @dev Allows a user to withdraw a specific amount of Ether from the bank.
     * @param amount The amount of Ether to withdraw (in wei).
     */
    function withdraw(uint256 amount) external {
        require(amount > 0, "Withdrawal amount must be greater than zero");
        require(balances[msg.sender] >= amount, "Insufficient balance");

        balances[msg.sender] -= amount;
        // Transfer Ether safely to user
        payable(msg.sender).transfer(amount);

        emit Withdrawal(msg.sender, amount);
    }

    /**
     * @dev Returns the current balance of the caller.
     * @return The balance of the caller in wei.
     */
    function getMyBalance() external view returns (uint256) {
        return balances[msg.sender];
    }

    /**
     * @dev Returns the total balance of the Bank (all deposits).
     * @return The total Ether held by the contract in wei.
     */
    function getBankBalance() external view returns (uint256) {
        return address(this).balance;
    }
}
```

OUTPUT



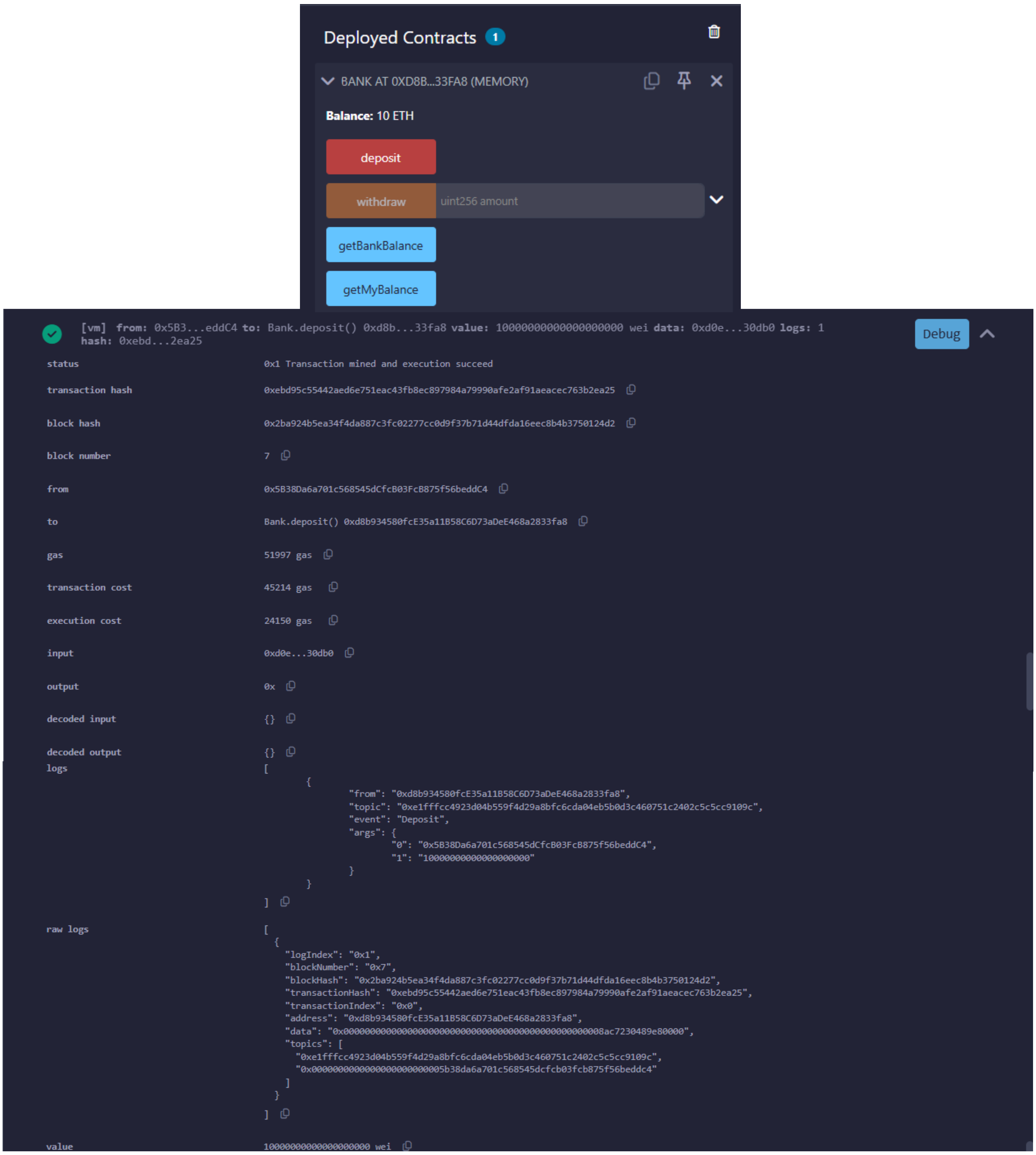
```
Bank

COMPILERINPUT
    language: Solidity
    sources:
        bank.sol:
    settings:

NAME
    Bank

METADATA
    compiler:
    language: Solidity
    output:
    settings:
    sources:
    version: 1

BYTECODE
```

Fig 1: Compiling the bank.sol - Solidity Program



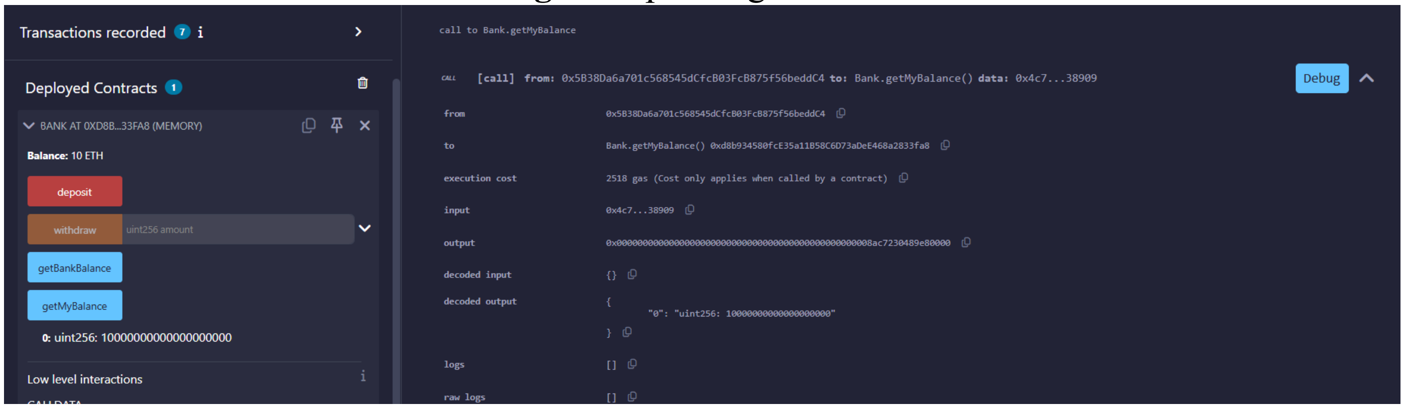
```
[vm] from: 0x5B3...eddC4 to: Bank.(constructor) value: 0 wei data: 0x608...e0033 logs: 0 hash: 0x79d...2bc52
status              0x1 Transaction mined and execution succeed
transaction hash    0x79d1f9f10680d14a4304cfb7dfa0e04dd2a3aab981f1c65e6442b8683402bc52
block hash          0xa11e560f7d97aa389e46c3470ff3ec694ef2c15766b86c4d77a7f2ce333c8a6e
block number        2
contract address    0xd8b934580fcE35a11B58C6D73aDeE468a2833fa8
from                0x5B38Da6a701c568545dCfcB03FcB875f56beddC4
to                  Bank.(constructor)
gas                 473961 gas
transaction cost    412140 gas
execution cost      334172 gas
input               0x608...e0033
output              0x6080604052600436106100 3e575f3560e01c80632e1a7d4d146100425780634c7389091461006a5780637b83b50b14610094578063d0e30db01461
                    00be575b5f5ffd5b34801561004d575f5ffd5b50610068600480360381019061006391906103d5565b6100c8565b005b348015610075575f5ffd5b50
                    706673582212205cbd558f3391062f51e8fb2b4bd4d89c4d9a4bb73a031829ebc0b2ac126f4f7564736f6c634300081e0033
decoded input       {}
decoded output      -
logs                []
raw logs            []
```

Fig 2: Deploying Bank-bank.sol



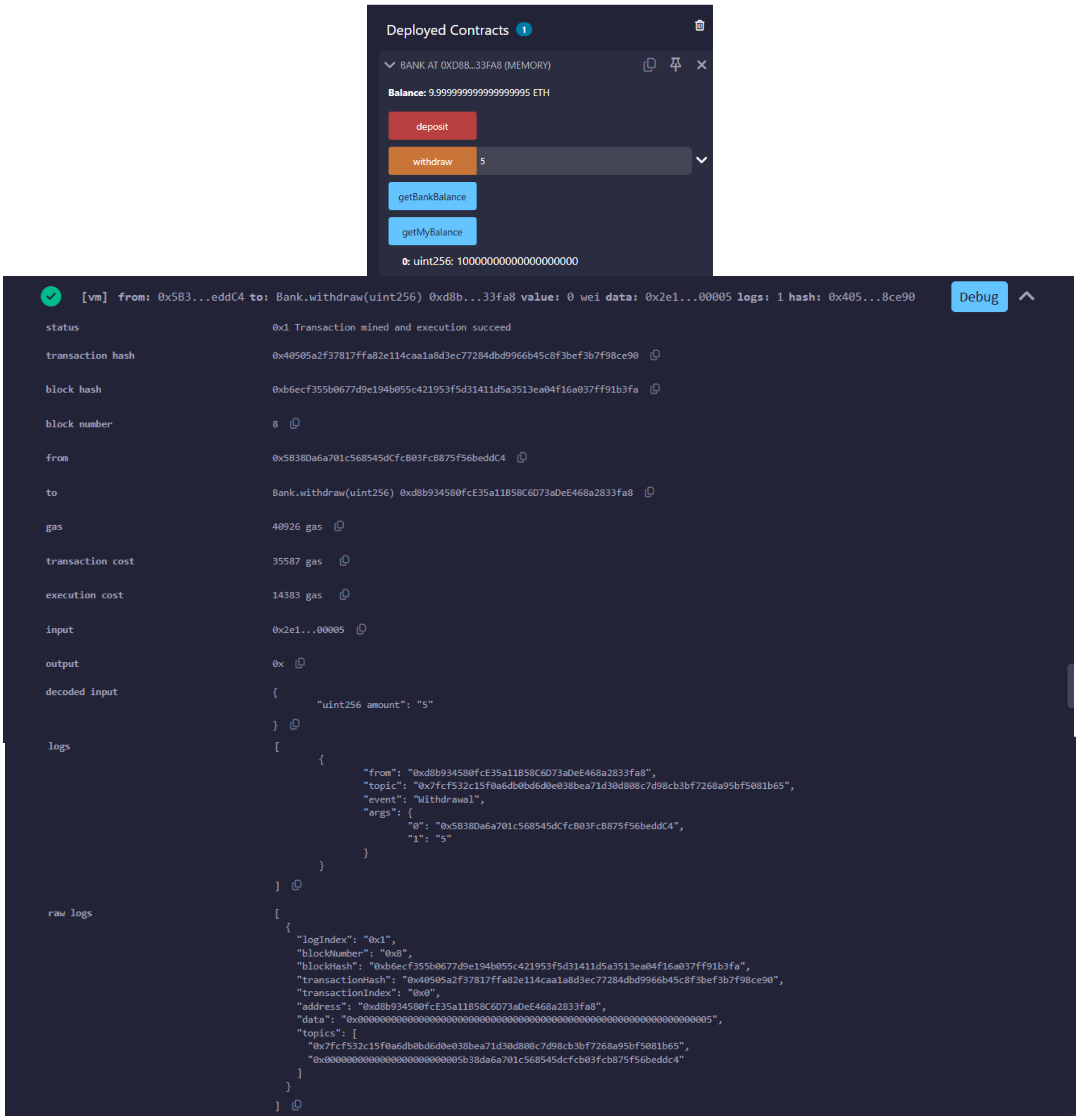
```
[vm] from: 0x5B3...eddC4 to: Bank.deposit() 0xd8b...33fa8 value: 10000000000000000000 wei data: 0xd0e...30db0 logs: 1
hash: 0xebd...2ea25

status                  0x1 Transaction mined and execution succeed
transaction hash        0xebd95c55442aed6e751eac43fb8ec897984a79990afe2af91aeacec763b2ea25
block hash              0x2ba924b5ea34f4da887c3fc02277cc0d9f37b71d44dfda16eec8b4b3750124d2
block number            7
from                    0x5B38Da6a701c568545dCfcB03FcB875f56beddC4
to                      Bank.deposit() 0xd8b934580fcE35a11B58C6D73aDeE468a2833fa8
gas                     51997 gas
transaction cost        45214 gas
execution cost          24150 gas
input                   0xd0e...30db0
output                  0x
decoded input           {}
decoded output          {}
logs                    [
                                {
                                        "from": "0xd8b934580fcE35a11B58C6D73aDeE468a2833fa8",
                                        "topic": "0xe1fffcc4923d04b559f4d29a8bfc6cda04eb5b0d3c460751c2402c5c5cc9109c",
                                        "event": "Deposit",
                                        "args": {
                                                "0": "0x5B38Da6a701c568545dCfcB03FcB875f56beddC4",
                                                "1": "10000000000000000000"
                                        }
                                }
                        ]

raw logs                [
                          {
                            "logIndex": "0x1",
                            "blockNumber": "0x7",
                            "blockHash": "0x2ba924b5ea34f4da887c3fc02277cc0d9f37b71d44dfda16eec8b4b3750124d2",
                            "transactionHash": "0xebd95c55442aed6e751eac43fb8ec897984a79990afe2af91aeacec763b2ea25",
                            "transactionIndex": "0x0",
                            "address": "0xd8b934580fcE35a11B58C6D73aDeE468a2833fa8",
                            "data": "0x0000000000000000000000000000000000000000000000008ac7230489e80000",
                            "topics": [
                              "0xe1fffcc4923d04b559f4d29a8bfc6cda04eb5b0d3c460751c2402c5c5cc9109c",
                              "0x0000000000000000000000005b38da6a701c568545dcfcb03fcb875f56beddc4"
                            ]
                          }
                        ]

value                   10000000000000000000 wei
```

Fig 3: Depositing 10 ETH.



```
call to Bank.getMyBalance

CALL  [call] from: 0x5B38Da6a701c568545dCfcB03FcB875f56beddC4 to: Bank.getMyBalance() data: 0x4c7...38909

from                 0x5B38Da6a701c568545dCfcB03FcB875f56beddC4
to                   Bank.getMyBalance() 0xd8b934580fcE35a11B58C6D73aDeE468a2833fa8
execution cost       2518 gas (Cost only applies when called by a contract)
input                0x4c7...38909
output               0x0000000000000000000000000000000000000000000000008ac7230489e80000
decoded input        {}
decoded output       {
                             "0": "uint256: 10000000000000000000"
                     }
logs                 []
raw logs             []
```

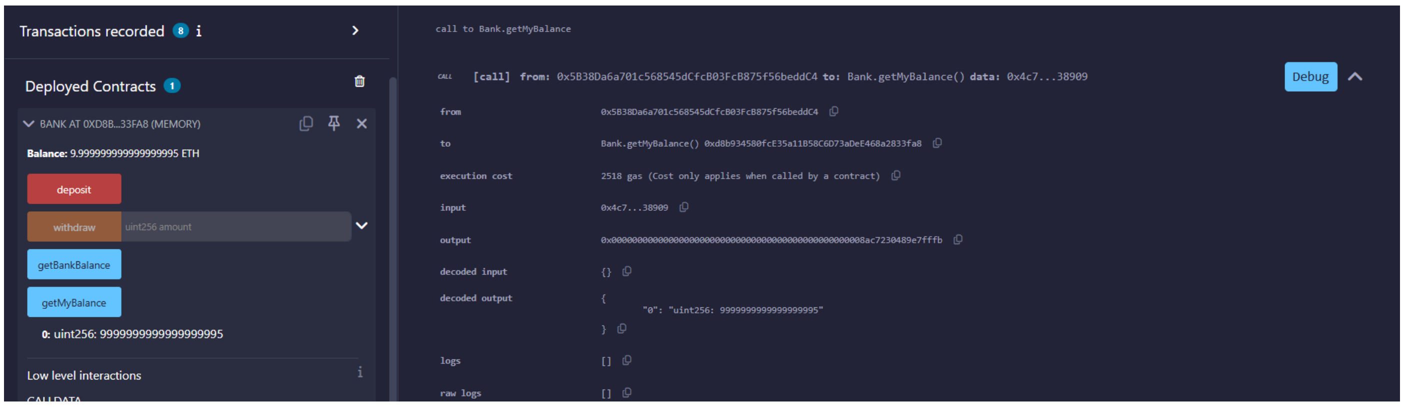
Fig 4: User’s Balance after Depositing 10ETHs



```
BANK AT 0XD8B...33FA8 (MEMORY)
Balance: 9.999999999999999995 ETH
withdraw  5
0: uint256: 10000000000000000000
```

```
[vm] from: 0x5B3...eddC4 to: Bank.withdraw(uint256) 0xd8b...33fa8 value: 0 wei data: 0x2e1...00005 logs: 1 hash: 0x405...8ce90
status                0x1 Transaction mined and execution succeed
transaction hash      0x40505a2f37817ffa82e114caa1a8d3ec77284dbd9966b45c8f3bef3b7f98ce90
block hash            0xb6ecf355b0677d9e194b055c421953f5d31411d5a3513ea04f16a037ff91b3fa
block number          8
from                  0x5B38Da6a701c568545dCfcB03FcB875f56beddC4
to                    Bank.withdraw(uint256) 0xd8b934580fcE35a11B58C6D73aDeE468a2833fa8
gas                   40926 gas
transaction cost      35587 gas
execution cost        14383 gas
input                 0x2e1...00005
output                0x
decoded input         {
                              "uint256 amount": "5"
                      }
logs                  [
                              {
                                      "from": "0xd8b934580fcE35a11B58C6D73aDeE468a2833fa8",
                                      "topic": "0x7fcf532c15f0a6db0bd6d0e038bea71d30d808c7d98cb3bf7268a95bf5081b65",
                                      "event": "Withdrawal",
                                      "args": {
                                              "0": "0x5B38Da6a701c568545dCfcB03FcB875f56beddC4",
                                              "1": "5"
                                      }
                              }
                      ]
raw logs              [
                        {
                          "logIndex": "0x1",
                          "blockNumber": "0x8",
                          "blockHash": "0xb6ecf355b0677d9e194b055c421953f5d31411d5a3513ea04f16a037ff91b3fa",
                          "transactionHash": "0x40505a2f37817ffa82e114caa1a8d3ec77284dbd9966b45c8f3bef3b7f98ce90",
                          "transactionIndex": "0x0",
                          "address": "0xd8b934580fcE35a11B58C6D73aDeE468a2833fa8",
                          "data": "0x0000000000000000000000000000000000000000000000000000000000000005",
                          "topics": [
                            "0x7fcf532c15f0a6db0bd6d0e038bea71d30d808c7d98cb3bf7268a95bf5081b65",
                            "0x0000000000000000000000005b38da6a701c568545dcfcb03fcb875f56beddc4"
                          ]
                        }
                      ]
```

Fig 5: Withdrawing 5ETH.



```
BANK AT 0XD8B...33FA8 (MEMORY)
Balance: 9.999999999999999995 ETH
withdraw  uint256 amount
0: uint256: 9999999999999999995
```

```
call to Bank.getMyBalance

CALL  [call] from: 0x5B38Da6a701c568545dCfcB03FcB875f56beddC4 to: Bank.getMyBalance() data: 0x4c7...38909
from                  0x5B38Da6a701c568545dCfcB03FcB875f56beddC4
to                    Bank.getMyBalance() 0xd8b934580fcE35a11B58C6D73aDeE468a2833fa8
execution cost        2518 gas (Cost only applies when called by a contract)
input                 0x4c7...38909
output                0x0000000000000000000000000000000000000000000000008ac7230489e7fffb
decoded input         {}
decoded output        {
                              "0": "uint256: 9999999999999999995"
                      }
logs                  []
raw logs              []
```

Fig 6: Updated Balance after Withdrawal of 5ETH.