## Experiment No. 02

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|---|---|
| Semester | B.E. Semester VII – Computer Engineering |
| Subject | Blockchain Lab (CSDL7022) |
| Subject Professor In-charge | Prof. Swapnil S. Sonawane |
| Academic Year | 2024-25 |

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|---|---|
| Student Name | Deep Salunkhe |
| Roll Number | 21102A0014 |

**Title**: Todo application in solidity

**Program Code:**

```
// SPDX-License-Identifier: MIT

pragma solidity ^0.8.3;


contract todo {



    // Receive function to receive Ether
   receive() external payable {
      // Optionally, you can log the received Ether amount or perform other actions
      // For example, emit an event to log the received Ether amount
      emit ReceivedEther(msg.sender, msg.value);
   }
```

```
// Fallback function to receive Ether and handle any other calls
fallback() external payable {
    // Optional: log the received Ether amount or perform other actions
    // This function is called when no other function matches the function signature
    emit FallbackCalled(msg.sender, msg.value);
}

event ReceivedEther(address indexed sender, uint256 amount);
event FallbackCalled(address indexed sender, uint256 amount);
// Define a struct to represent a Task
struct Task {
    uint256 id;           // Unique identifier for the task
    uint256 date;         // Date when the task was created (timestamp)
    string content;       // Content or description of the task
    bool done;            // Flag indicating if the task is completed
    uint256 dateComplete;   // Date when the task was marked as completed (timestamp)
}

// Events to log important contract actions
event TaskCreated(uint256 id, uint256 date, string content, bool done);
event TaskStatusToggled(uint256 id, bool done, uint256 dateComplete);
event TaskDeleted(uint256 id);

// Storage for tasks, indexed by their unique ids
mapping(uint256 => Task) private tasks;
```

```
// Store all task ids for iteration purposes
uint256 private lastTaskId = 1;     // Track the last assigned task id
uint256[] private taskIds;          // Array to store all task ids

// Function to create a new task
function createTask(string memory _content) public {
    uint256 theNow = block.timestamp;

    // Create a new task and store it in the tasks mapping
    tasks[lastTaskId] = Task(lastTaskId, theNow, _content, false, 0);

    // Add the task id to the taskIds array
    taskIds.push(lastTaskId);

    // Emit an event to log the creation of the task
    emit TaskCreated(lastTaskId, theNow, _content, false);

    // Increment the lastTaskId for the next task
    lastTaskId++;
}

// Function to get details of a specific task by id
function getTask(uint256 id)
    public
    view
```

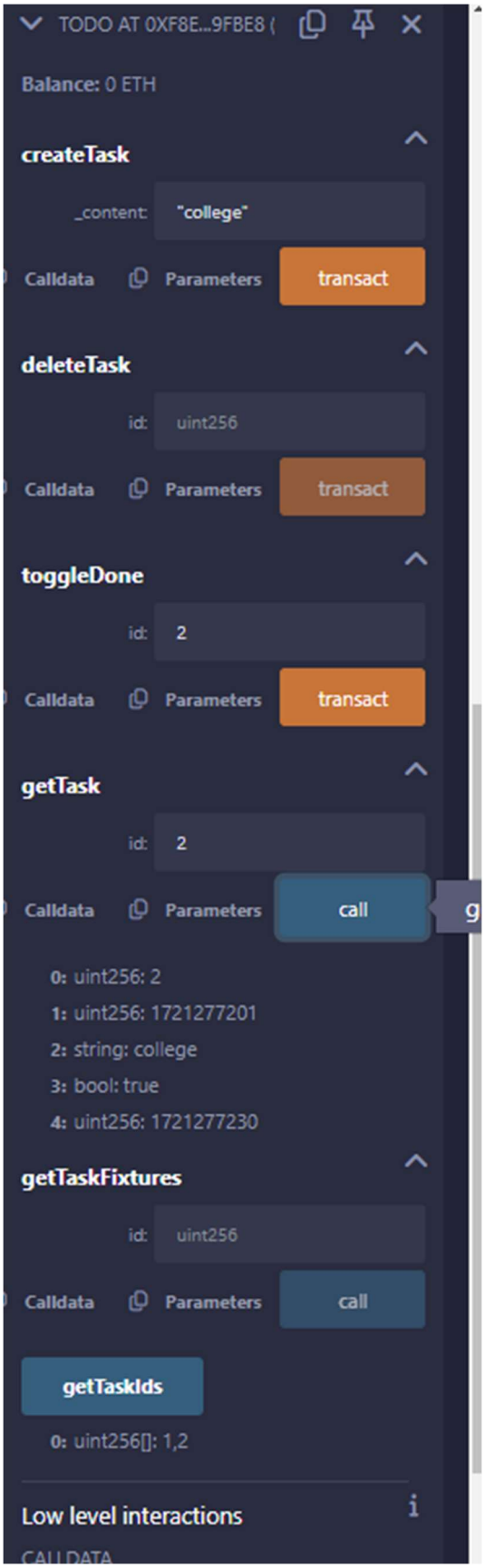
```
    taskExists(id)  // Modifier to check if task with given id exists
    returns (
        uint256,
        uint256,
        string memory,
        bool,
        uint256
    )
{
    // Return details of the task with the given id
    return (
        id,
        tasks[id].date,
        tasks[id].content,
        tasks[id].done,
        tasks[id].dateComplete
    );
}

// Function to return dummy data for testing purposes
function getTaskFixtures(uint256 id)
    public
    view
    returns (
        uint256,
        uint256,
```

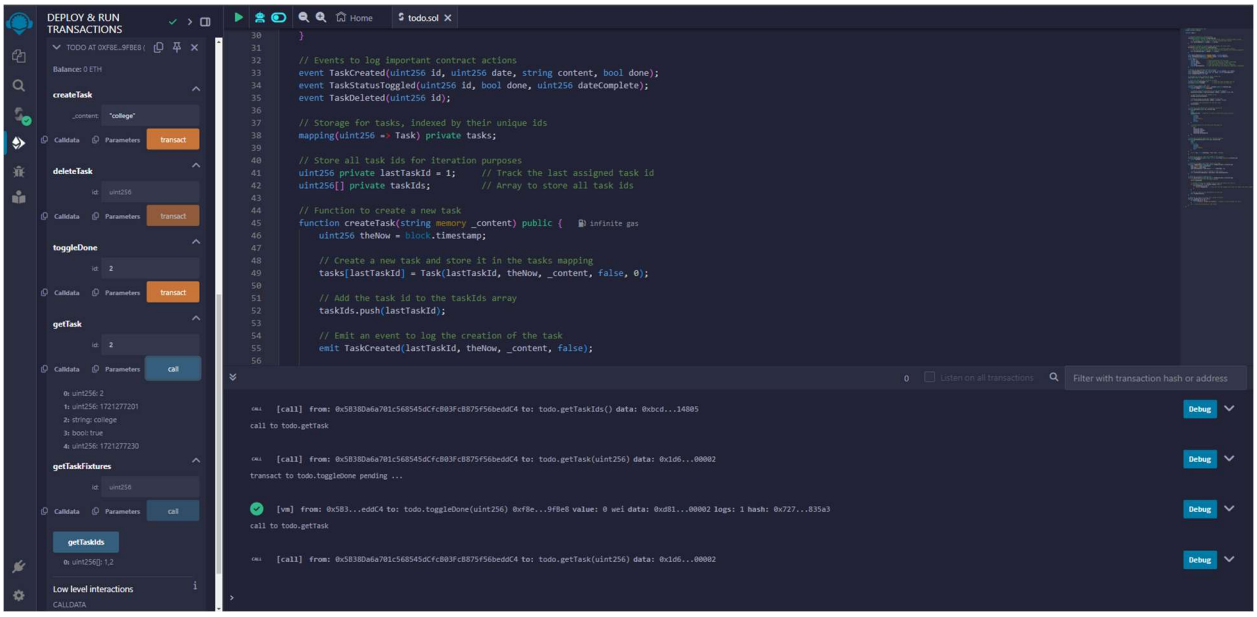
```
        string memory,
        bool
    )
{
    return (id, block.timestamp, "Test Task", false);
}

// Function to get all task ids stored in the contract
function getTaskIds() public view returns (uint256[] memory) {
    return taskIds;
}

// Function to toggle the 'done' status of a task
function toggleDone(uint256 id) public taskExists(id) {
    Task storage task = tasks[id];
    task.done = !task.done;
    task.dateComplete = task.done ? block.timestamp : 0;

    // Emit an event to log the change in task status
    emit TaskStatusToggled(id, task.done, task.dateComplete);
}

// Function to delete a task by id
function deleteTask(uint256 id) public taskExists(id) {
    // Delete the task from the tasks mapping
    delete tasks[id];
```

```
        // Iterate through the taskIds array to find and remove the task id
        for (uint256 i = 0; i < taskIds.length; i++) {
            if (taskIds[i] == id) {
                delete taskIds[i];  // This will set the element to 0, but not reduce the array length
            }
        }

        // Emit an event to log the deletion of the task
        emit TaskDeleted(id);
    }

    // Modifier to check if a task with a given id exists
    modifier taskExists(uint256 id) {
        if (tasks[id].id == 0) {
            revert("Revert: taskId not found");  // Revert if task id does not exist
        }
        _;  // Continue executing if task exists
    }
}
```

## Output:


[call] from: 0x5B38Da6a701c568545dCfcB03FcB875f56beddC4 to: todo.getTaskIds() data: 0xbcd...14805
Debug
transact to todo.createTask pending ...
[vm] from: 0x5B3...eddC4 to: todo.createTask(string) 0xf8e...9fBe8 value: 0 wei data: 0x111...00000 logs: 1 hash: 0xcc9...eeca0
Debug
call to todo.getTaskIds
[call] from: 0x5B38Da6a701c568545dCfcB03FcB875f56beddC4 to: todo.getTaskIds() data: 0xbcd...14805
Debug
call to todo.getTask
[call] from: 0x5B38Da6a701c568545dCfcB03FcB875f56beddC4 to: todo.getTask(uint256) data: 0x1d6...00001
Debug
transact to todo.createTask pending ...
[vm] from: 0x5B3...eddC4 to: todo.createTask(string) 0xf8e...9fBe8 value: 0 wei data: 0x111...00000 logs: 1 hash: 0xb1d...126d6
Debug
call to todo.getTaskIds
[call] from: 0x5B38Da6a701c568545dCfcB03FcB875f56beddC4 to: todo.getTaskIds() data: 0xbcd...14805
Debug
call to todo.getTask
[call] from: 0x5B38Da6a701c568545dCfcB03FcB875f56beddC4 to: todo.getTask(uint256) data: 0x1d6...00002
Debug
transact to todo.toggleDone pending ...
[vm] from: 0x5B3...eddC4 to: todo.toggleDone(uint256) 0xf8e...9fBe8 value: 0 wei data: 0xd81...00002 logs: 1 hash: 0x727...835a3
Debug
call to todo.getTask
[call] from: 0x5B38Da6a701c568545dCfcB03FcB875f56beddC4 to: todo.getTask(uint256) data: 0x1d6...00002
Debug


TODO AT 0XF8E...9FBE8 (
Balance: 0 ETH
createTask
_content: "college"
Calldata
Parameters
transact
deleteTask
id: uint256
Calldata
Parameters
transact
toggleDone
id: 2
Calldata
Parameters
transact
getTask
id: 2
Calldata
Parameters
call
0: uint256: 2
1: uint256: 1721277201
2: string: college
3: bool: true
4: uint256: 1721277230
getTaskFixtures
id: uint256
Calldata
Parameters
call
getTaskIds
0: uint256[]: 1,2
Low level interactions
CALLDATA


DEPLOY & RUN TRANSACTIONS
Balance: 0 ETH
createTask
_content: "college"
transact
deleteTask
id: uint256
transact
toggleDone
id: 2
transact
getTask
id: 2
call
0: uint256: 2
1: uint256: 1721277201
2: string: college
3: bool: true
4: uint256: 1721277230
getTaskFixtures
id: uint256
call
getTaskIds
0: uint256[]: 1,2
Low level interactions
CALLDATA
Home
todo.sol
// Events to log important contract actions
event TaskCreated(uint256 id, uint256 date, string content, bool done);
event TaskStatusToggled(uint256 id, bool done, uint256 dateComplete);
event TaskDeleted(uint256 id);
// Storage for tasks, indexed by their unique ids
mapping(uint256 => Task) private tasks;
// Store all task ids for iteration purposes
uint256 private lastTaskId = 1; // Track the last assigned task id
uint256[] private taskIds; // Array to store all task ids
// Function to create a new task
function createTask(string memory _content) public {
infinite gas
uint256 theNow = block.timestamp;
// Create a new task and store it in the tasks mapping
tasks[lastTaskId] = Task(lastTaskId, theNow, _content, false, 0);
// Add the task id to the taskIds array
taskIds.push(lastTaskId);
// Emit an event to log the creation of the task
emit TaskCreated(lastTaskId, theNow, _content, false);
Listen on all transactions
Filter with transaction hash or address
[call] from: 0x5B38Da6a701c568545dCfcB03FcB875f56beddC4 to: todo.getTaskIds() data: 0xbcd...14805
call to todo.getTask
[call] from: 0x5B38Da6a701c568545dCfcB03FcB875f56beddC4 to: todo.getTask(uint256) data: 0x1d6...00002
transact to todo.toggleDone pending ...
[vm] from: 0x583...eddC4 to: todo.toggleDone(uint256) 0xf8e...9f8e8 value: 0 wei data: 0xd81...00002 logs: 1 hash: 0x727...835a3
call to todo.getTask
[call] from: 0x5B38Da6a701c568545dCfcB03FcB875f56beddC4 to: todo.getTask(uint256) data: 0x1d6...00002
Debug