Roll No: 20BCE204
Course Code and Course Name: 2CSDE93 Blockchain Technology
Practical No. 8
Aim: To design and develop end-to-end decentralized applications (Dapps)
Code:

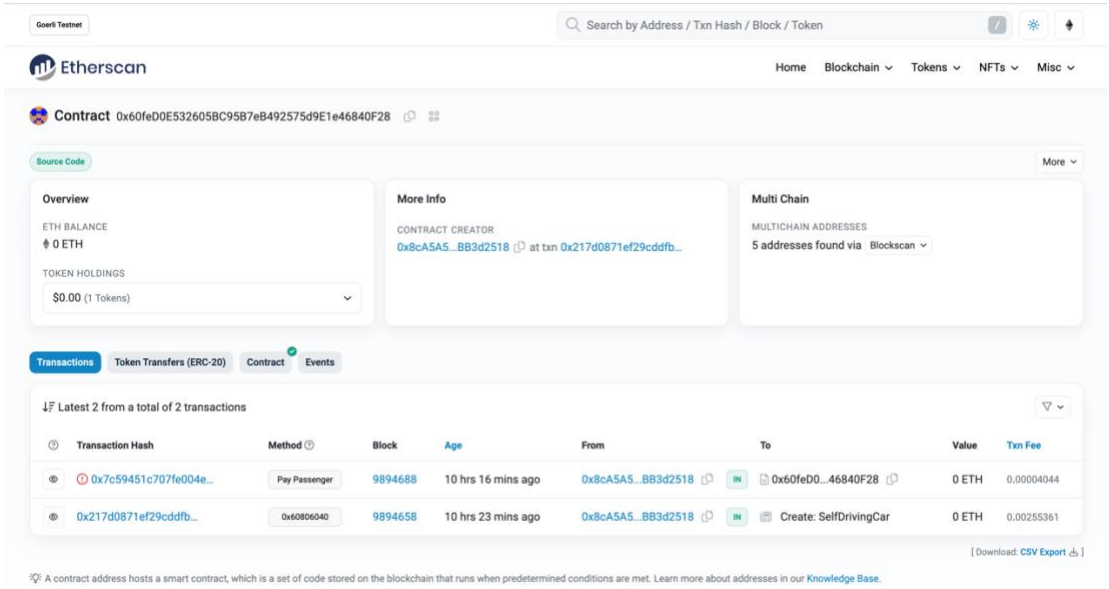
```
//SPDX-License-Identifier: GPL-3.0
pragma solidity ^0.8.18;

// Define a contract for the self-driving car
contract SelfDrivingCar {
    address public owner;
    address public carAddress;
    uint public carSpeed;
    uint public carBalance;
    bool public isDriving;
    mapping(address => uint) public passengerBalances;

    event OwnershipTransferred(address indexed previousOwner, address indexed newOwner);
    event CarSpeedUpdated(uint newSpeed);
    event CarBalanceUpdated(uint newBalance);
    event DrivingStatusUpdated(bool isDriving);
    event PassengerBalanceUpdated(address passenger, uint newBalance);

    constructor() {
        owner = msg.sender;
        carAddress = address(this);
        carSpeed = 0;
        carBalance = 0;
        isDriving = false;
    }

    modifier onlyOwner() {
        require(msg.sender == owner, "Only the owner can perform this action");
        _;
    }

    modifier notDriving() {
        require(!isDriving, "The car is currently in motion");
        _;
    }
```

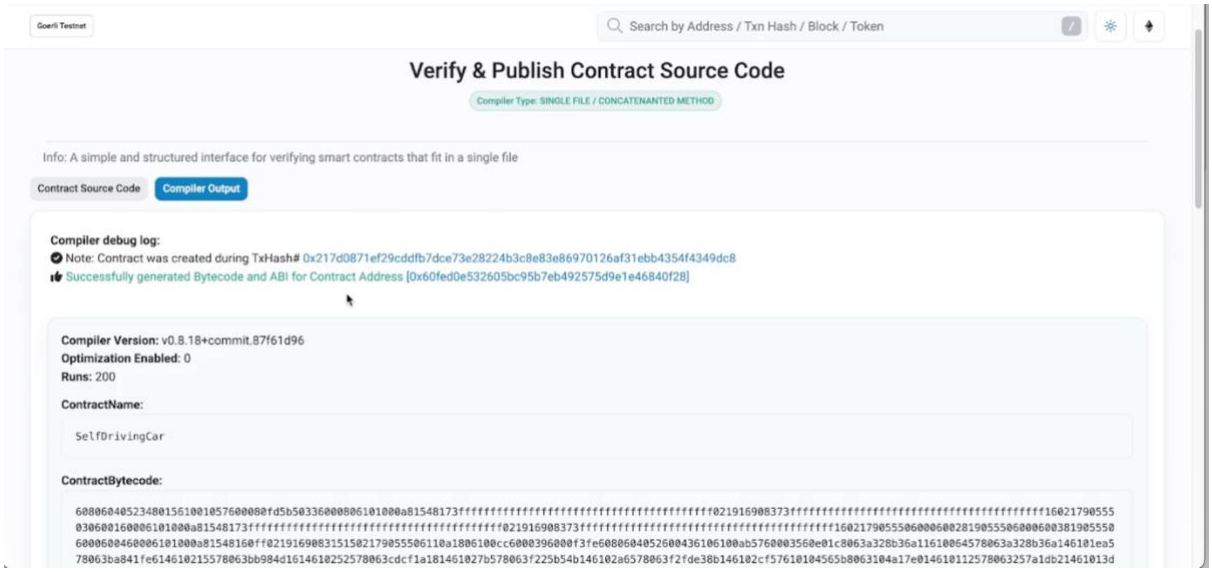
```
receive() external payable {
    // Handle incoming Ether (e.g., refilling car balance)
    carBalance += msg.value;
    emit CarBalanceUpdated(carBalance);
}

fallback() external {
    // Handle unexpected transactions
}

function transferOwnership(address newOwner) public onlyOwner {
    require(newOwner != address(0), "Invalid address");
    emit OwnershipTransferred(owner, newOwner);
    owner = newOwner;
}

function updateCarSpeed(uint newSpeed) public onlyOwner notDriving {
    carSpeed = newSpeed;
    emit CarSpeedUpdated(newSpeed);
}

function startDriving() public onlyOwner notDriving {
    isDriving = true;
    emit DrivingStatusUpdated(true);
}

function stopDriving() public onlyOwner {
    isDriving = false;
    emit DrivingStatusUpdated(false);
}

function addPassenger(address passenger, uint balance) public onlyOwner {
    require(passenger != address(0), "Invalid address");
    passengerBalances[passenger] = balance;
    emit PassengerBalanceUpdated(passenger, balance);
}

function payPassenger(address passenger, uint amount) public onlyOwner {
    require(passengerBalances[passenger] >= amount, "Insufficient funds for the passenger");
```

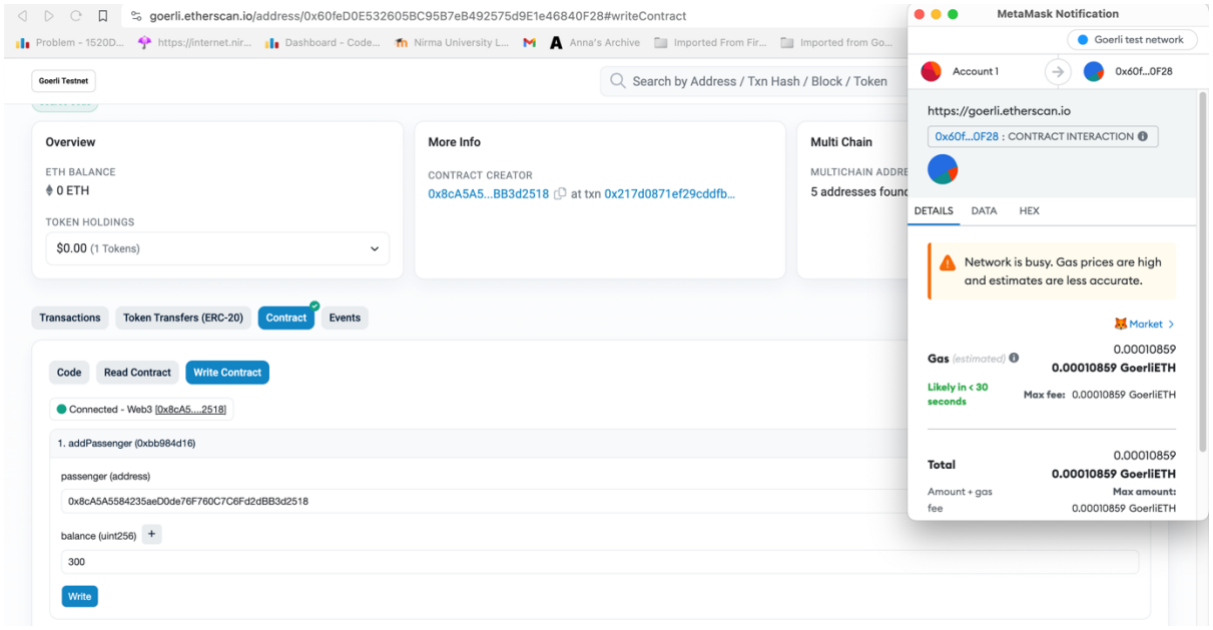
```
        passengerBalances[passenger] -= amount;
        carBalance -= amount;
        emit PassengerBalanceUpdated(passenger, passengerBalances[passenger]);
    }
}
```

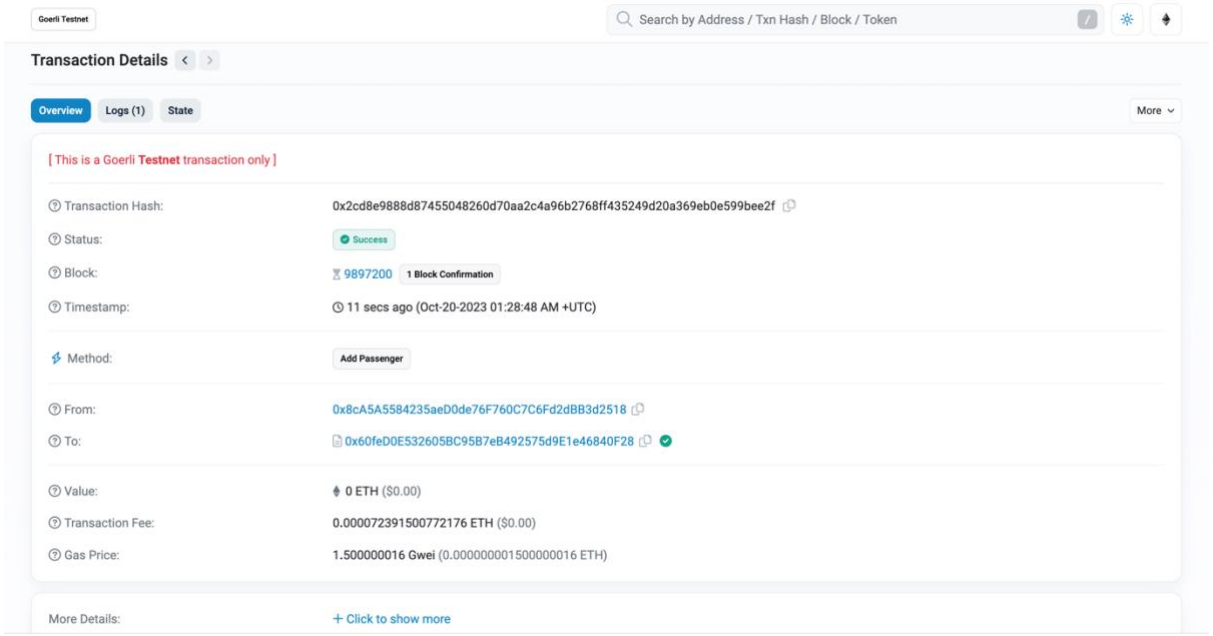
Output:

Deploying it in goerli etherscan:






goerli.etherscan.io/address/0x60feD0E532605BC95B7eB492575d9E1e46840F28#writeContract
Goerli Testnet
Search by Address / Txn Hash / Block / Token
Overview
ETH BALANCE
0 ETH
TOKEN HOLDINGS
$0.00 (1 Tokens)
More Info
CONTRACT CREATOR
0x8cA5A5...BB3d2518 at txn 0x217d0871ef29cddfb...
Multi Chain
MULTICHAIN ADDRE
5 addresses found
Transactions
Token Transfers (ERC-20)
Contract
Events
Code
Read Contract
Write Contract
Connected - Web3 [0x8cA5....2518]
1. addPassenger (0xbb984d16)
passenger (address)
0x8cA5A5584235aeD0de76F760C7C6Fd2dBB3d2518
balance (uint256)
300
Write
MetaMask Notification
Goerli test network
Account 1
0x60f...0F28
https://goerli.etherscan.io
0x60f...0F28 : CONTRACT INTERACTION
DETAILS
DATA
HEX
Network is busy. Gas prices are high and estimates are less accurate.
Market
Gas (estimated)
0.00010859
0.00010859 GoerliETH
Likely in < 30 seconds
Max fee: 0.00010859 GoerliETH
Total
0.00010859
0.00010859 GoerliETH
Amount + gas fee
Max amount:
0.00010859 GoerliETH


Goerli Testnet
Search by Address / Txn Hash / Block / Token
Transaction Details
Overview
Logs (1)
State
More
[This is a Goerli Testnet transaction only]
Transaction Hash:
0x2cd8e9888d87455048260d70aa2c4a96b2768ff435249d20a369eb0e599bee2f
Status:
Success
Block:
9897200
1 Block Confirmation
Timestamp:
11 secs ago (Oct-20-2023 01:28:48 AM +UTC)
Method:
Add Passenger
From:
0x8cA5A5584235aeD0de76F760C7C6Fd2dBB3d2518
To:
0x60feD0E532605BC95B7eB492575d9E1e46840F28
Value:
0 ETH ($0.00)
Transaction Fee:
0.000072391500772176 ETH ($0.00)
Gas Price:
1.500000016 Gwei (0.000000001500000016 ETH)
More Details:
+ Click to show more