Roll No: 20BCE204

Course Code and Course Name: 2CSDE93 Blockchain Technology

Practical No. 5

Aim: To perform thorough study and installation of Remix IDE and Truffle IDE for deploying Smart Contracts and Decentralized Applications (dapps) and create and deploy a Smart Contract for any application such as finance, healthcare etc.

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:

