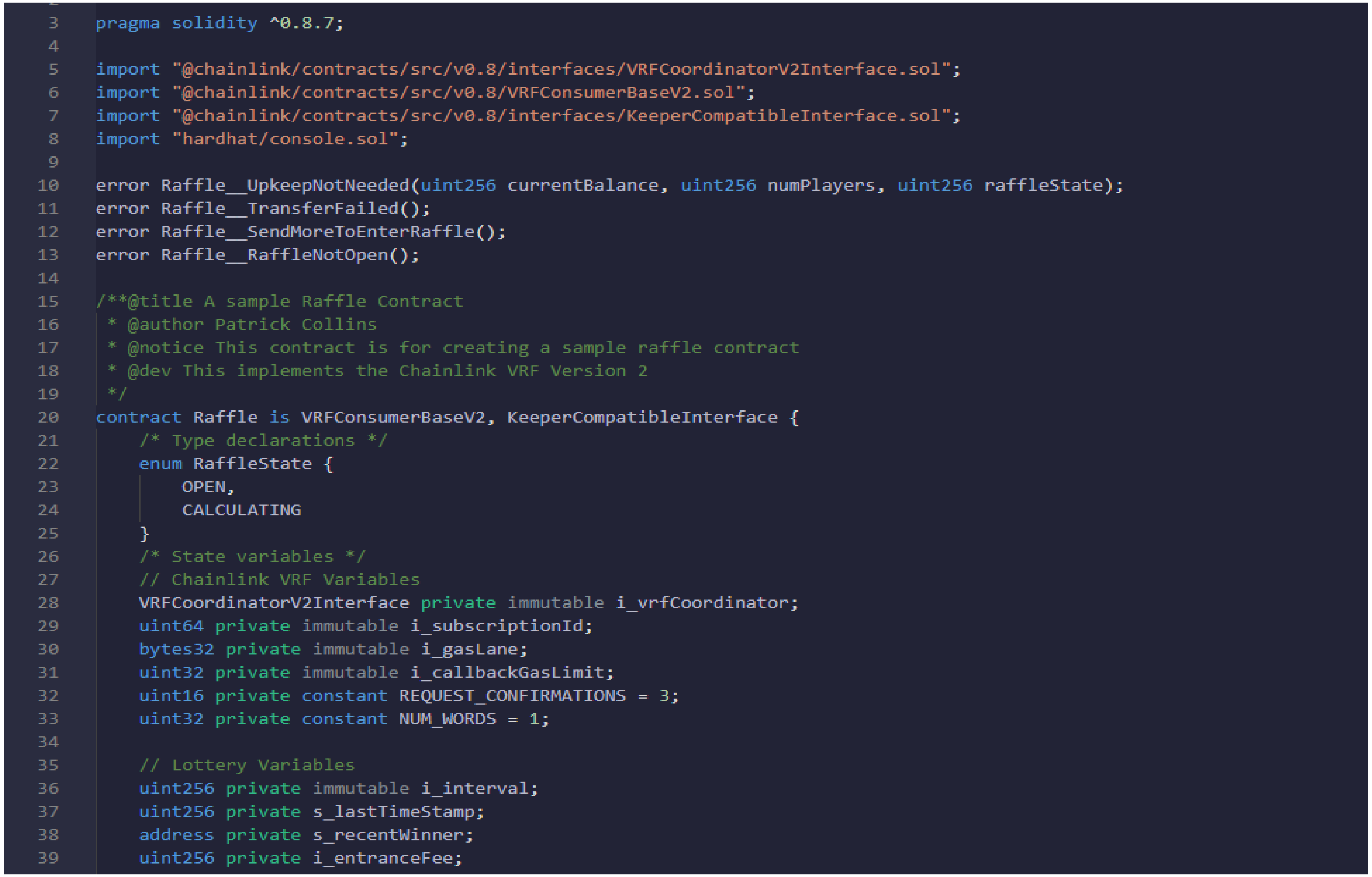
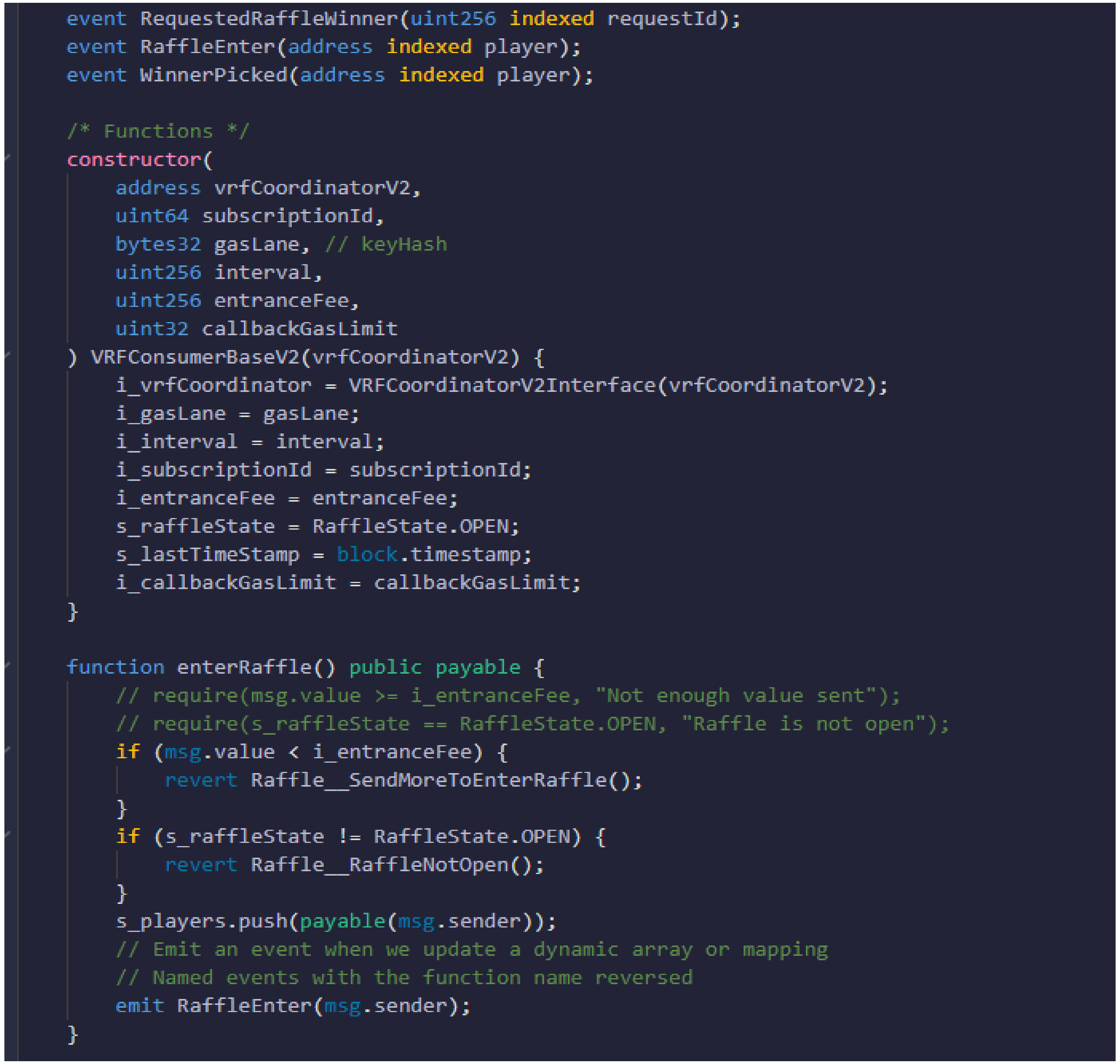
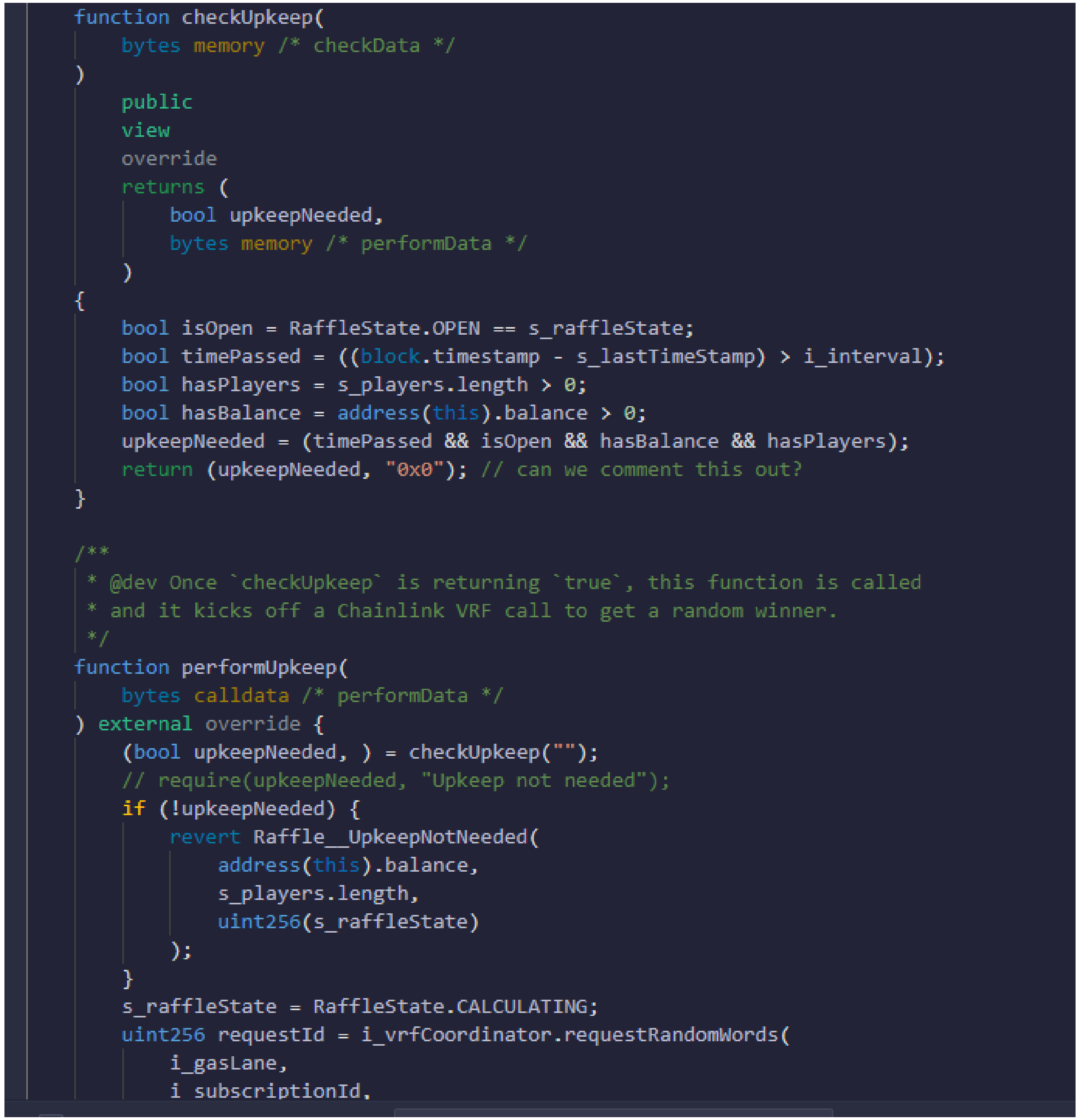
# Hardhat Smart Contract Lottery



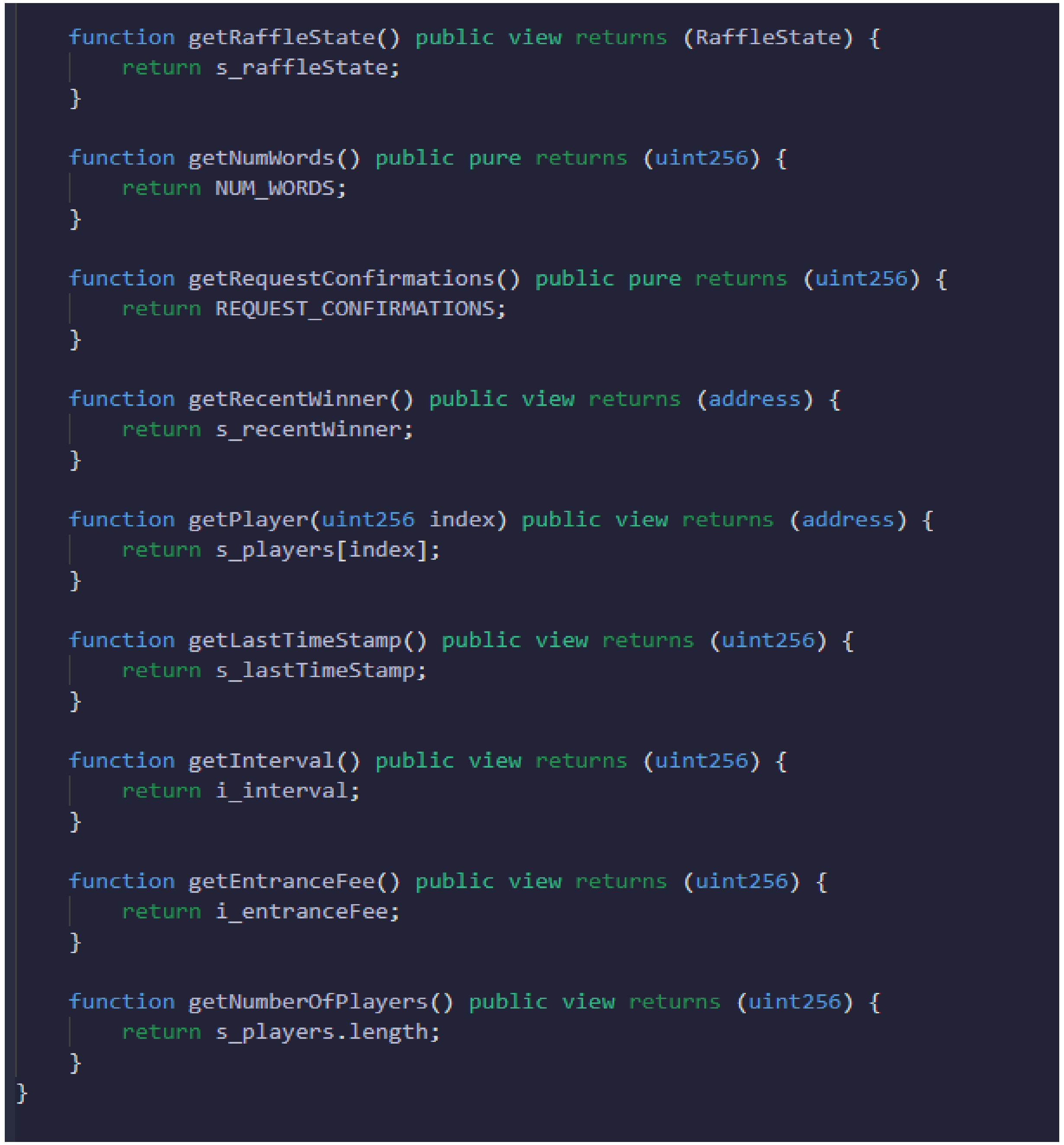
```solidity
pragma solidity ^0.8.7;

import "@chainlink/contracts/src/v0.8/interfaces/VRFCoordinatorV2Interface.sol";
import "@chainlink/contracts/src/v0.8/VRFConsumerBaseV2.sol";
import "@chainlink/contracts/src/v0.8/interfaces/KeeperCompatibleInterface.sol";
import "hardhat/console.sol";

error Raffle__UpkeepNotNeeded(uint256 currentBalance, uint256 numPlayers, uint256 raffleState);
error Raffle__TransferFailed();
error Raffle__SendMoreToEnterRaffle();
error Raffle__RaffleNotOpen();

/**@title A sample Raffle Contract
 * @author Patrick Collins
 * @notice This contract is for creating a sample raffle contract
 * @dev This implements the Chainlink VRF Version 2
 */
contract Raffle is VRFConsumerBaseV2, KeeperCompatibleInterface {
    /* Type declarations */
    enum RaffleState {
        OPEN,
        CALCULATING
    }
    /* State variables */
    // Chainlink VRF Variables
    VRFCoordinatorV2Interface private immutable i_vrfCoordinator;
    uint64 private immutable i_subscriptionId;
    bytes32 private immutable i_gasLane;
    uint32 private immutable i_callbackGasLimit;
    uint16 private constant REQUEST_CONFIRMATIONS = 3;
    uint32 private constant NUM_WORDS = 1;

    // Lottery Variables
    uint256 private immutable i_interval;
    uint256 private s_lastTimeStamp;
    address private s_recentWinner;
    uint256 private i_entranceFee;
```



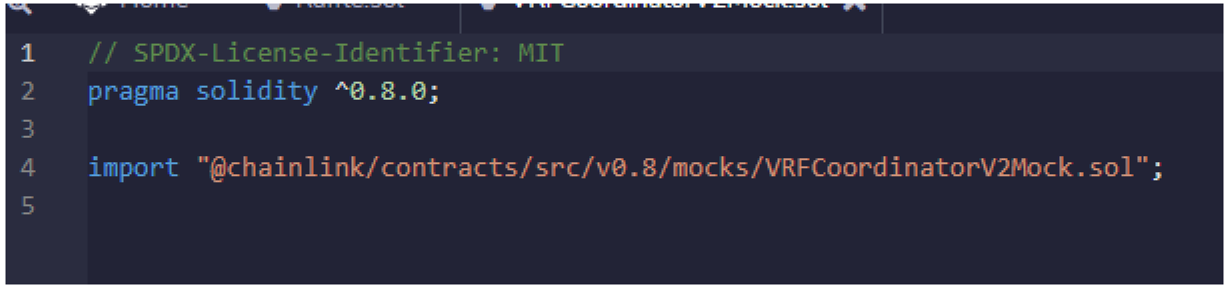
```
    event RequestedRaffleWinner(uint256 indexed requestId);
    event RaffleEnter(address indexed player);
    event WinnerPicked(address indexed player);

    /* Functions */
    constructor(
        address vrfCoordinatorV2,
        uint64 subscriptionId,
        bytes32 gasLane, // keyHash
        uint256 interval,
        uint256 entranceFee,
        uint32 callbackGasLimit
    ) VRFConsumerBaseV2(vrfCoordinatorV2) {
        i_vrfCoordinator = VRFCoordinatorV2Interface(vrfCoordinatorV2);
        i_gasLane = gasLane;
        i_interval = interval;
        i_subscriptionId = subscriptionId;
        i_entranceFee = entranceFee;
        s_raffleState = RaffleState.OPEN;
        s_lastTimeStamp = block.timestamp;
        i_callbackGasLimit = callbackGasLimit;
    }

    function enterRaffle() public payable {
        // require(msg.value >= i_entranceFee, "Not enough value sent");
        // require(s_raffleState == RaffleState.OPEN, "Raffle is not open");
        if (msg.value < i_entranceFee) {
            revert Raffle__SendMoreToEnterRaffle();
        }
        if (s_raffleState != RaffleState.OPEN) {
            revert Raffle__RaffleNotOpen();
        }
        s_players.push(payable(msg.sender));
        // Emit an event when we update a dynamic array or mapping
        // Named events with the function name reversed
        emit RaffleEnter(msg.sender);
    }
```



```
function checkUpkeep(
    bytes memory /* checkData */
)
    public
    view
    override
    returns (
        bool upkeepNeeded,
        bytes memory /* performData */
    )
{
    bool isOpen = RaffleState.OPEN == s_raffleState;
    bool timePassed = ((block.timestamp - s_lastTimeStamp) > i_interval);
    bool hasPlayers = s_players.length > 0;
    bool hasBalance = address(this).balance > 0;
    upkeepNeeded = (timePassed && isOpen && hasBalance && hasPlayers);
    return (upkeepNeeded, "0x0"); // can we comment this out?
}

/**
 * @dev Once `checkUpkeep` is returning `true`, this function is called
 * and it kicks off a Chainlink VRF call to get a random winner.
 */
function performUpkeep(
    bytes calldata /* performData */
) external override {
    (bool upkeepNeeded, ) = checkUpkeep("");
    // require(upkeepNeeded, "Upkeep not needed");
    if (!upkeepNeeded) {
        revert Raffle__UpkeepNotNeeded(
            address(this).balance,
            s_players.length,
            uint256(s_raffleState)
        );
    }
    s_raffleState = RaffleState.CALCULATING;
    uint256 requestId = i_vrfCoordinator.requestRandomWords(
        i_gasLane,
        i_subscriptionId,
```



```
    function getRaffleState() public view returns (RaffleState) {
        return s_raffleState;
    }

    function getNumWords() public pure returns (uint256) {
        return NUM_WORDS;
    }

    function getRequestConfirmations() public pure returns (uint256) {
        return REQUEST_CONFIRMATIONS;
    }

    function getRecentWinner() public view returns (address) {
        return s_recentWinner;
    }

    function getPlayer(uint256 index) public view returns (address) {
        return s_players[index];
    }

    function getLastTimeStamp() public view returns (uint256) {
        return s_lastTimeStamp;
    }

    function getInterval() public view returns (uint256) {
        return i_interval;
    }

    function getEntranceFee() public view returns (uint256) {
        return i_entranceFee;
    }

    function getNumberOfPlayers() public view returns (uint256) {
        return s_players.length;
    }
}
```



```solidity
// SPDX-License-Identifier: MIT
pragma solidity ^0.8.0;

import "@chainlink/contracts/src/v0.8/mocks/VRFCoordinatorV2Mock.sol";

```