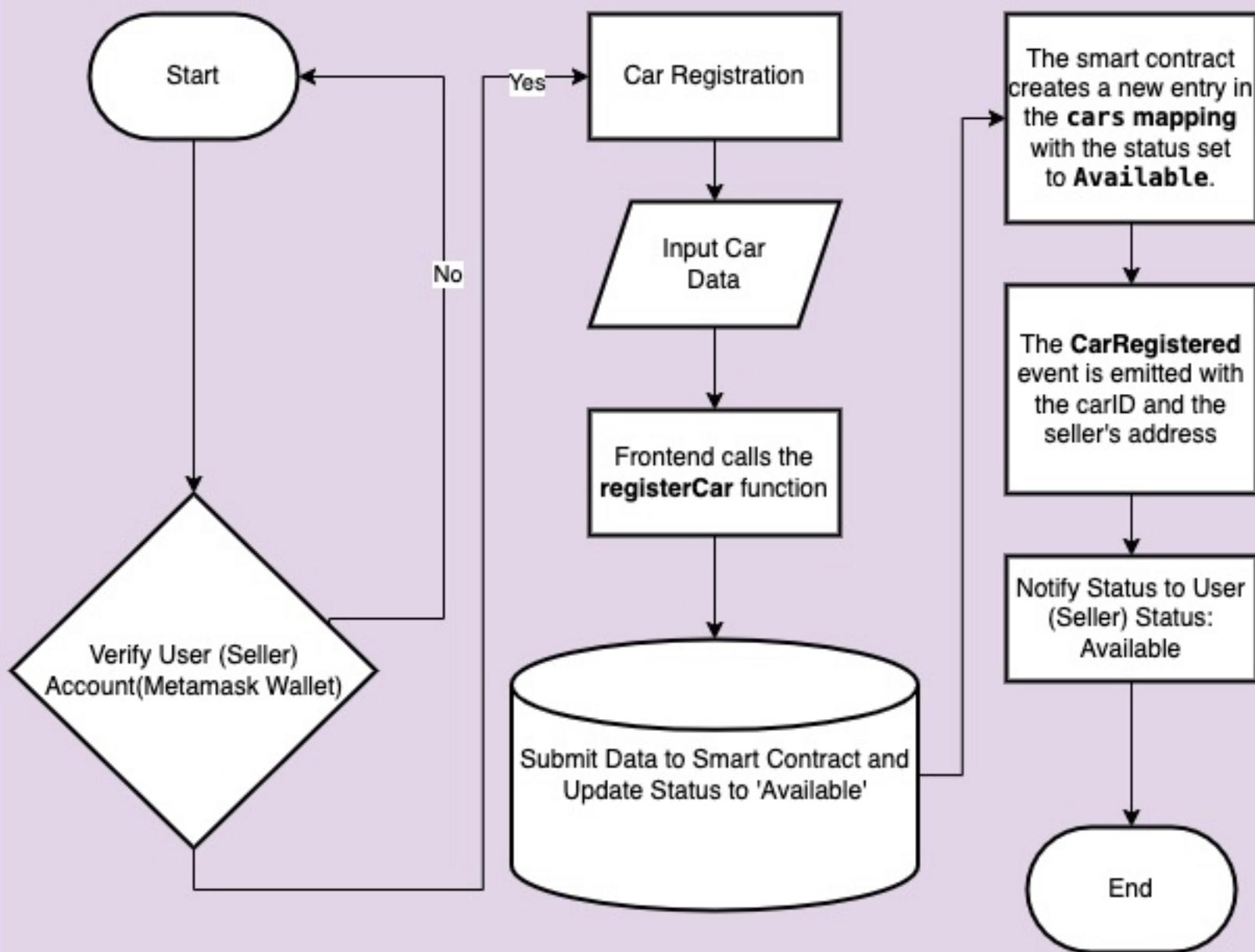
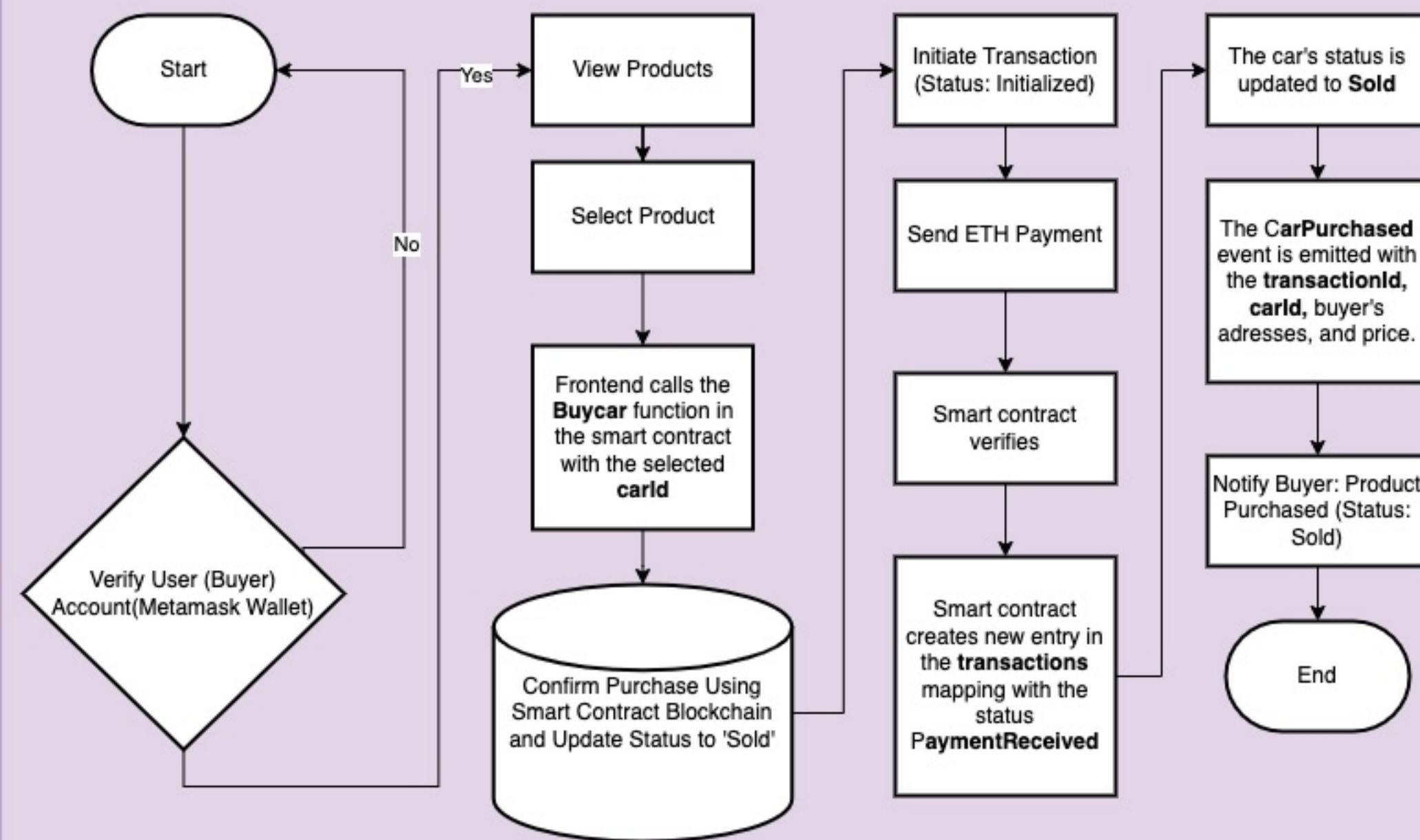


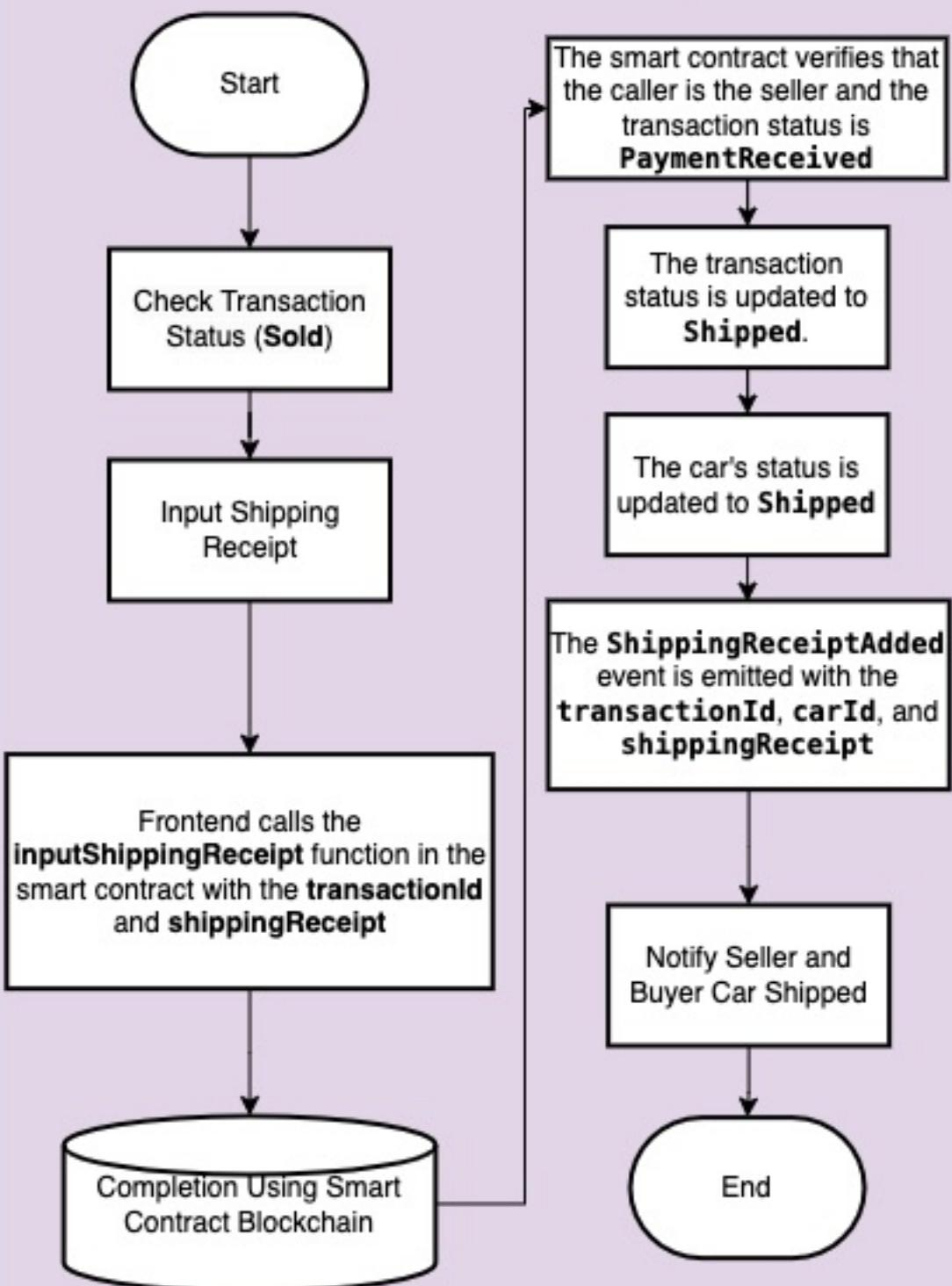
## Process: Product Registration by Seller



## Process: Product Purchase by Buyer



## Process: Payment and Transaction Completion



# UAS Submit GarageChain

Final Exam Odd Term 2024/2025

Course: DTSC6017001 - Advanced Blockchain Programming

Lecture: D3579 - Dr Alexander A S Gunawan

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[Newly Added Cars \(Simulasi Buyer Membeli\)](#)

[Manage Listing](#)

Link Youtube: [https://youtu.be/\\_WF8bEQA\\_g](https://youtu.be/_WF8bEQA_g)

Link Github: <https://s.id/irfan-hn-garage-chain-github>

## Flowchart [Nomor 1]

## Smart Contract [Nomor 2]

### Structure

```
// SPDX-License-Identifier: MIT
pragma solidity ^0.8.17;

contract GarageChain {
    // Enums for Car and Transaction statuses
    enum CarStatus { Available, Sold, Shipped, Cancelled }
    enum TransactionStatus { Initialized, PaymentReceived, Shipped, Cancelled }

    // Struct for Cars
    struct Car {
        uint carId;
        string name;
        string description;
        uint price;
        address seller;
        CarStatus status;
    }

    // Struct for Transactions
    struct Transaction {
        uint transactionId;
        uint carId;
        address buyer;
        address seller;
    }
```

```

        TransactionStatus status;
        string shippingReceipt;
    }

    // State variables
    mapping(uint => Car) public cars; // Stores all cars
    uint public carCounter; // Counter for unique car IDs
    mapping(uint => Transaction) public transactions; // Stores all transactions
    uint public transactionCounter; // Counter for unique transaction IDs

    // Events
    event CarRegistered(uint indexed carId, address indexed seller);
    event CarPurchased(uint indexed transactionId, uint indexed carId, address indexed buyer, uint price);
    event ShippingReceiptAdded(uint indexed transactionId, uint indexed carId, string shippingReceipt);
    event CarCancelled(uint indexed carId);

    // Modifiers
    modifier onlySeller(uint carId) {
        require(cars[carId].seller == msg.sender, "Only the seller can perform this action.");
        _;
    }

    modifier isAvailable(uint carId) {
        require(cars[carId].status == CarStatus.Available, "Car is not available.");
        _;
    }

    modifier validTransactionId(uint transactionId) {
        require(transactions[transactionId].transactionId == transactionId, "Invalid transaction ID.");
        _;
    }

    // Register a car for sale
    function registerCar(string memory name, string memory description, uint price) external returns (uint) {
        require(price > 0, "Price must be greater than zero.");
        uint carId = carCounter++;
        cars[carId] = Car(carId, name, description, price, msg.sender, CarStatus.Available);
        emit CarRegistered(carId, msg.sender);
        return carId;
    }

    // Purchase a car
    function buyCar(uint carId) external payable isAvailable(carId) returns (uint) {
        Car storage car = cars[carId];
        require(msg.value == car.price, "Incorrect payment amount.");

        uint transactionId = transactionCounter++;
        transactions[transactionId] = Transaction(
            transactionId,

```

```

        carId,
        msg.sender,
        car.seller,
        TransactionStatus.PaymentReceived,
        ""
    );

    car.status = CarStatus.Sold;
    emit CarPurchased(transactionId, carId, msg.sender, car.price);
    return transactionId;
}

// Input shipping receipt
function inputShippingReceipt(uint transactionId, string memory shippingReceipt)
    external
    validTransactionId(transactionId)
    returns (bool)
{
    Transaction storage transaction = transactions[transactionId];
    require(transaction.seller == msg.sender, "Only the seller can input the shipping receipt.");
    require(transaction.status == TransactionStatus.PaymentReceived, "Payment not received yet.");

    transaction.status = TransactionStatus.Shipped;
    transaction.shippingReceipt = shippingReceipt;
    cars[transaction.carId].status = CarStatus.Shipped;

    emit ShippingReceiptAdded(transactionId, transaction.carId, shippingReceipt);
    return true;
}

// Cancel a car listing
function cancelCarListing(uint carId) external onlySeller(carId) isAvailable(carId) returns (bool) {
    cars[carId].status = CarStatus.Cancelled;
    emit CarCancelled(carId);
    return true;
}

// Retrieve car details
function getCar(uint carId) external view returns (Car memory) {
    return cars[carId];
}

// Retrieve transaction details
function getTransaction(uint transactionId) external view returns (Transaction memory) {
    return transactions[transactionId];
}
}

```

## Explanation of Key Components

### 1. Enums:

- Define car and transaction statuses to ensure clear, controlled state management.

## 2. State Variables:

- `cars` : Stores all car details.
- `transactions` : Tracks transactions for each purchase.

## 3. Functions:

- `registerCar` : Lists a car for sale.
- `buyCar` : Handles purchasing and manages payment.
- `inputShippingReceipt` : Allows the seller to provide proof of shipping.
- `cancelCarListing` : Allows sellers to cancel their listing.

## 4. Modifiers:

- Ensure only authorized users can perform specific actions, e.g., only the seller can input shipping receipts.

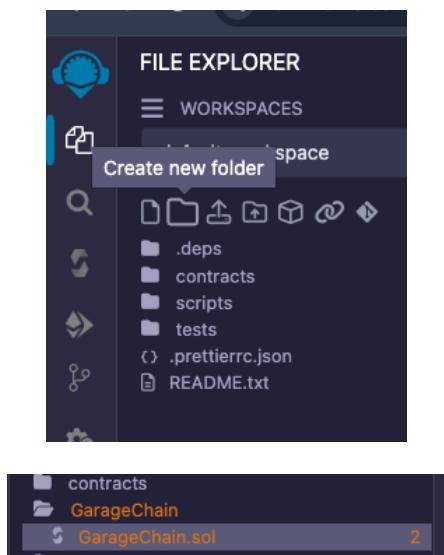
## 5. Events:

- Provide logs for key activities (e.g., car registration, purchase, shipping receipt) for tracking and transparency.

## Compile Smart Contract di Remix Solidity IDE

<https://remix.ethereum.org/>

1. Buat Folder Baru, GarageChain. Buat juga file solidity baru di dalam folder tersebut.



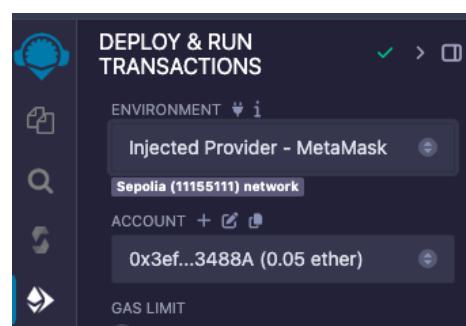
2. Compile file solidity tersebut. Pastikan menggunakan compiler yang sesuai. Dalam case saya, menggunakan 0.8.17

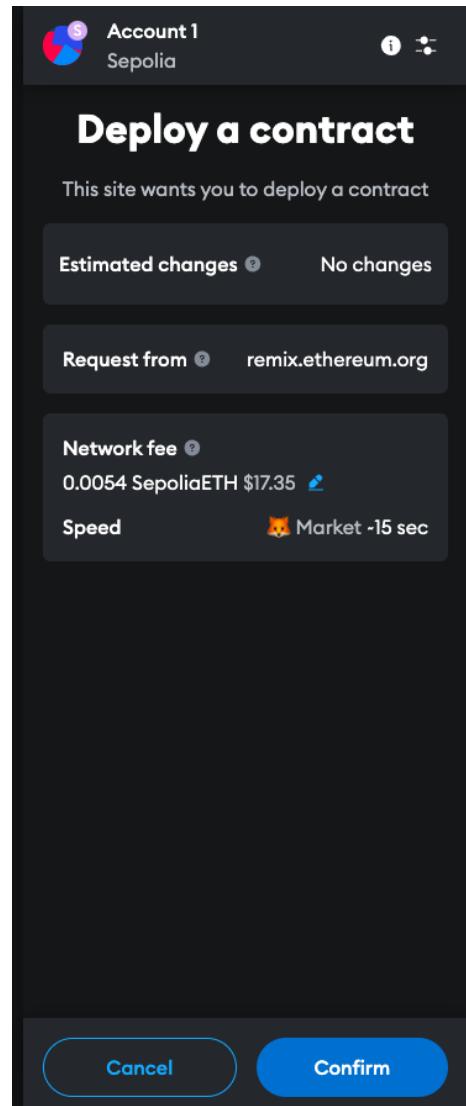
```
// SPDX-License-Identifier: MIT
pragma solidity ^0.8.17;

contract GarageChain {
    // Enums for Car and Transaction statuses
    enum CarStatus { Available, Sold, Shipped }
    enum TransactionStatus { Initialized, Paid }

    // Struct for Cars
    struct Car {
        uint carId;
        string name;
        string description;
        uint price;
        address payable seller;
        CarStatus status;
    }
}
```

3. Deploy & Run Smart Contract tersebut. Jangan Lupa gunakan wallet yang berisi faucet Sepolia ETH.





4. Smart Contract berhasil dideploy. Bisa dicek di Etherscan juga contract address nya.

<https://sepolia.etherscan.io/tx/0x48345b33a5ea3d075464d1f6aeea63672be8a9a6b31fb23dff3e0cd2c2fc0f61>



## Sambungkan Front End dengan Smart Contract Web3.js

### 1. Install dependencies

```
npm install web3 @metamask/sdk-react react-hot-toast
```

### 2. Setting Metamask SDK

### 3. Gunakan web3.js

### 4. Aplikasi FE disambungkan/dikoneksikan dengan smart contract di folder utils potongan code constant.js

```

EXPLORER ... GARAGECHAIN-FINAL-E... JS constant.js U JS web3.js U JS index.js U
GARAGECHAIN-FINAL-E...
src > utils > JS constant.js > ...
1  export const address = '0x4c98d4680efe49bed5428d7c176ae443c40b1244';
2
3  export const abi = [
4    {
5      "anonymous": false,
6      "inputs": [
7        {
8          "indexed": true,
9          "internalType": "uint256",
10         "name": "carId",
11         "type": "uint256"
12       },
13     ],
14     "name": "CarCancelled",
15     "type": "event"
16   },
17   {
18     "anonymous": false,
19     "inputs": [
20       {
21         "indexed": true
22       }
23     ],
24     "name": "CarCancelled",
25     "type": "event"
26   }
27 ]
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garagechain-final-exam
JS constant.js U JS web3.js U X JS index.js U

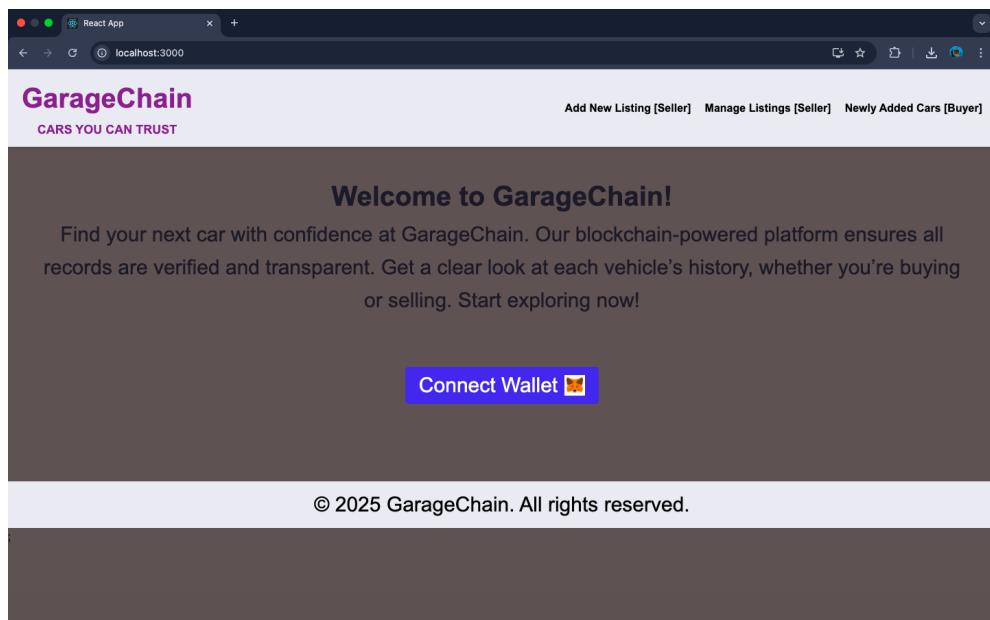
src > utils > JS web3.js > ...
1 import Web3 from 'web3';
2 import { abi, address } from './constant';
3
4 let web3;
5 let contractInstance;
6
7 if (window.ethereum) {
8     web3 = new Web3(window.ethereum); // Menggunakan MetaMask
9     contractInstance = new web3.eth.Contract(abi, address);
10 } else {
11     console.error("MetaMask is not installed. Please install")
12 }
13
14 export { web3, contractInstance };
15

```

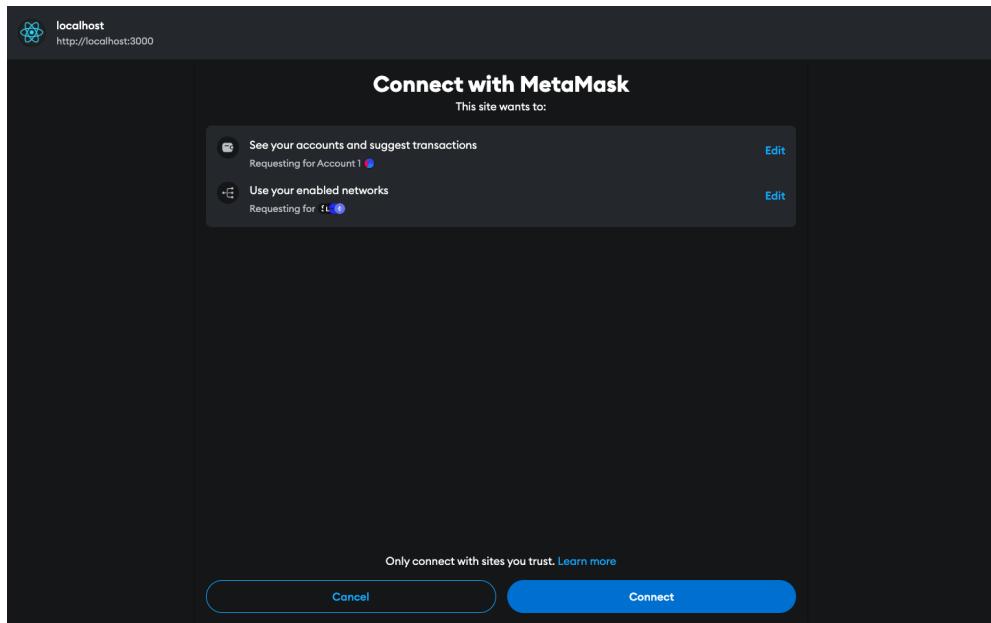
## Demo Aplikasi GarageChain [Nomor 3]

### Home Page

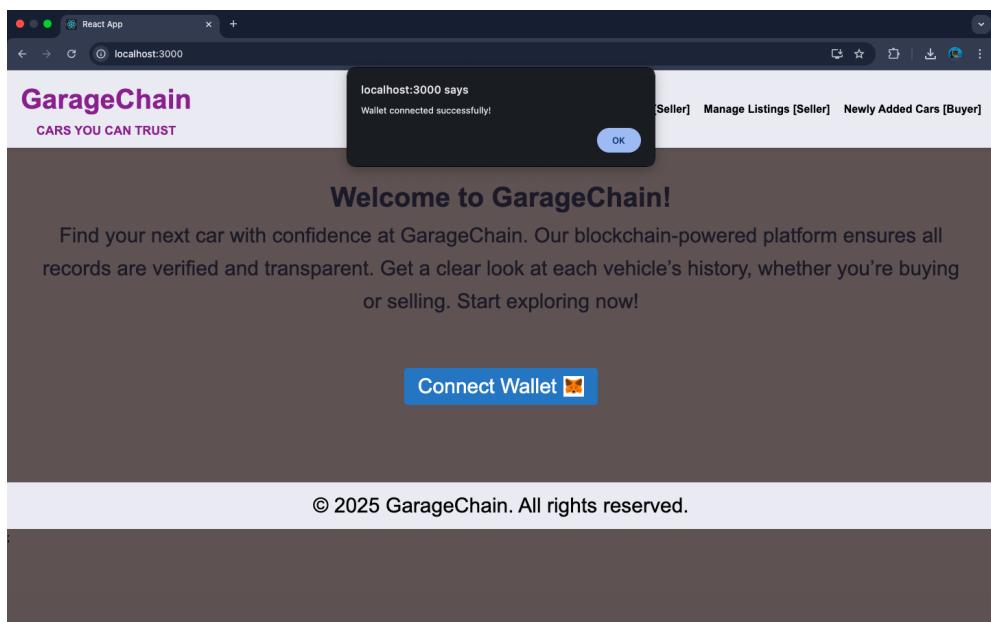
Sebelum connect wallet

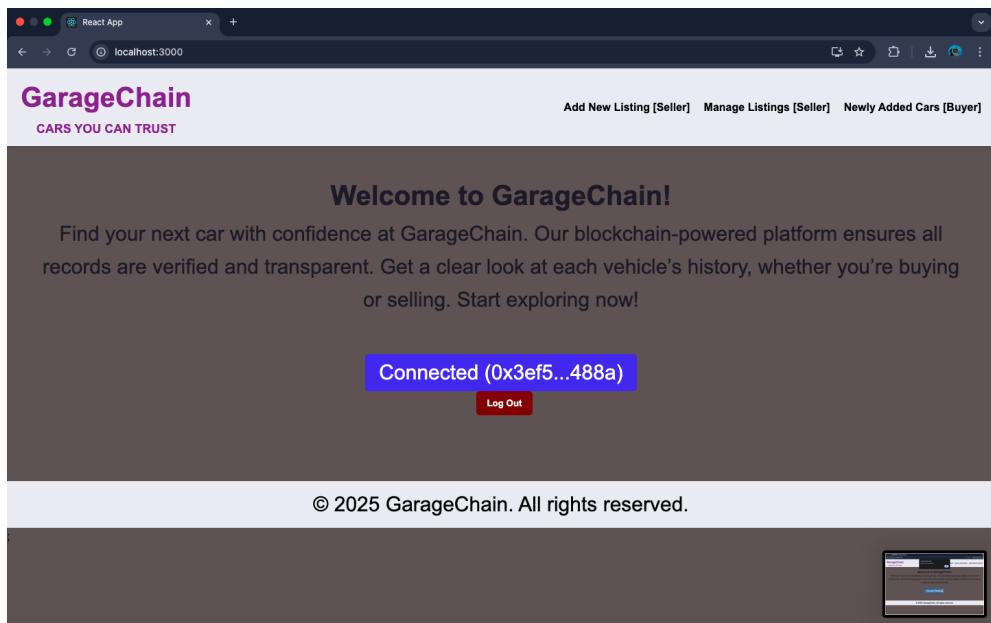


Proses Connect Wallet



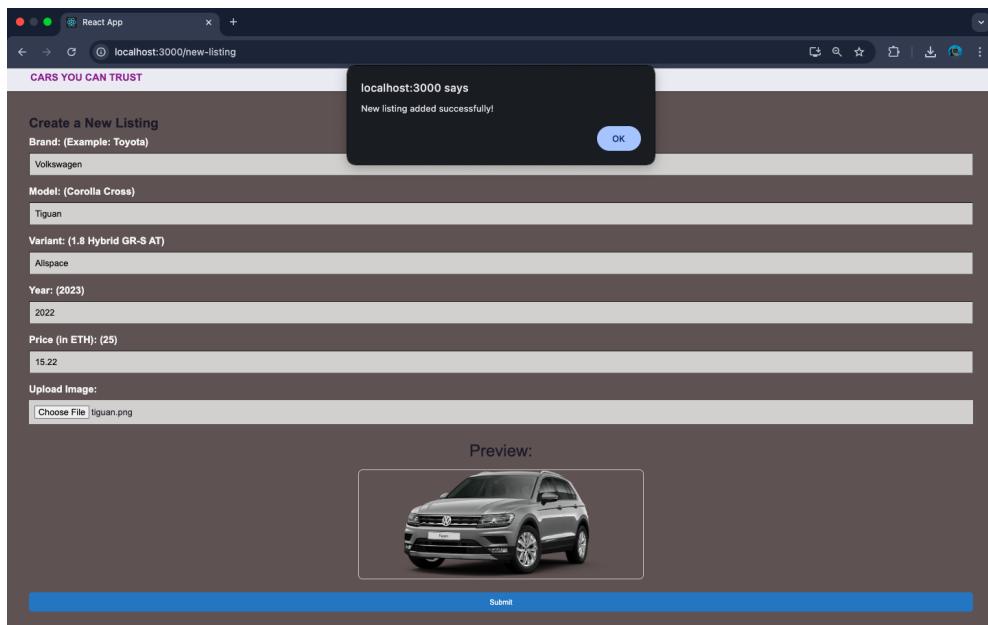
### Berhasil Connect Wallet



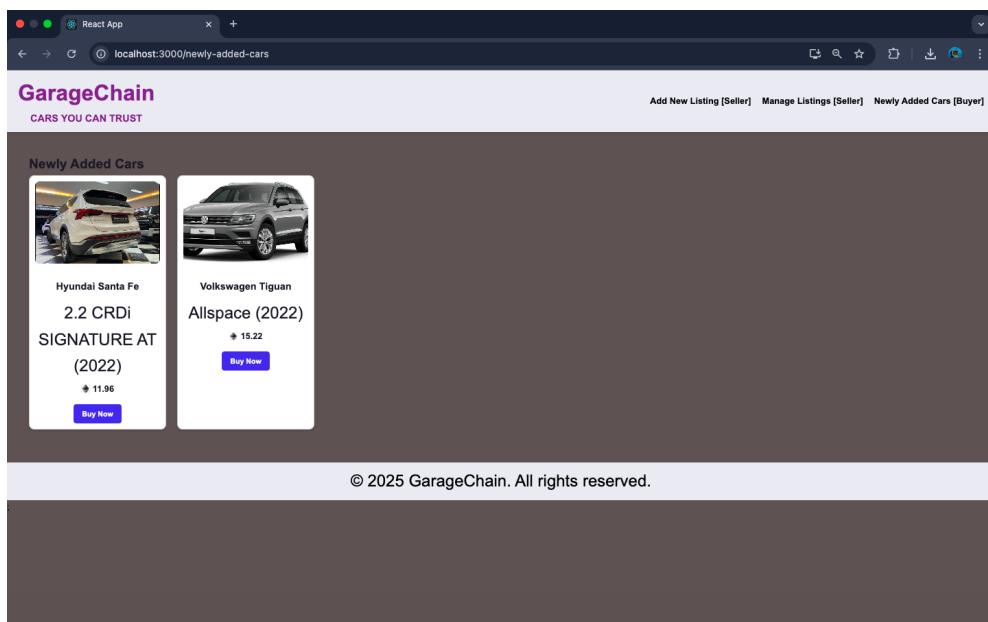


## Add New Listing (Simulasi Seller Menambah Iklan)

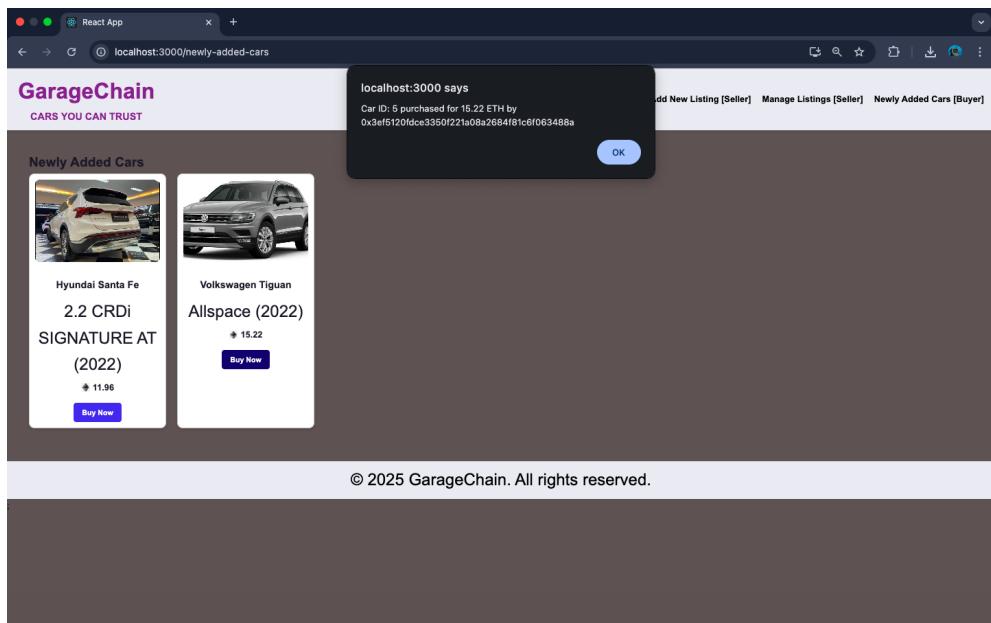
A screenshot of the "Add New Listing" form. The title is "Create a New Listing". It has several input fields: "Brand: (Example: Toyota)" with "Volkswagen" selected; "Model: (Corolla Cross)" with "Tiguan" selected; "Variant: (1.8 Hybrid GR-S AT)" with "Allspace" selected; "Year: (2023)" with "2022" selected; "Price (in ETH): (25)" with "15.22" entered; and an "Upload Image:" field containing "Choose File | tiguan.png". Below the form is a "Preview:" section showing a thumbnail image of a silver Volkswagen Tiguan. At the bottom is a blue "Submit" button.



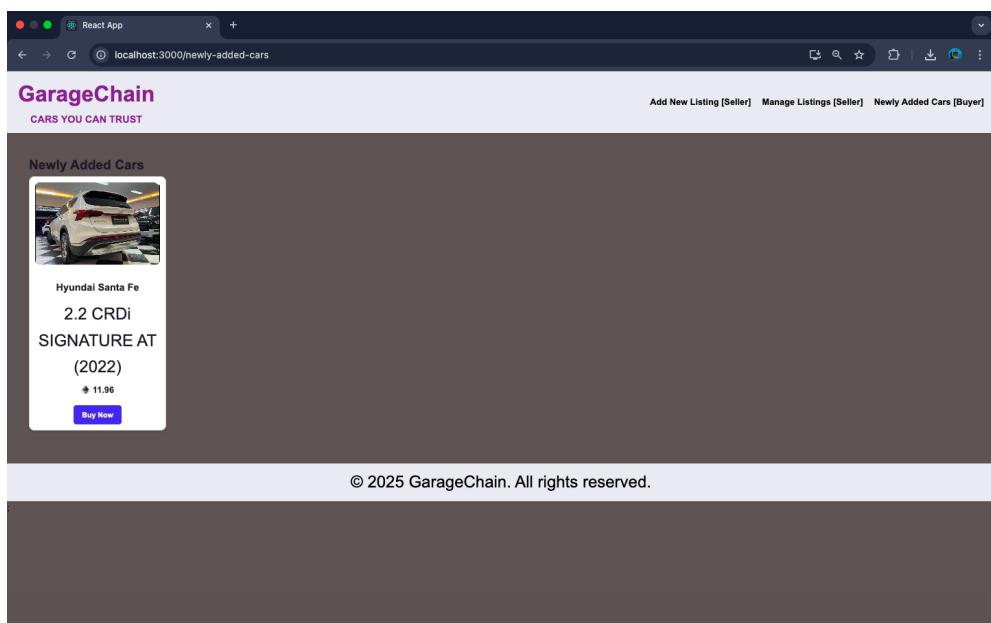
Sudah muncul tersedia di page newly added cars. Buyer bisa membeli



Newly Added Cars (Simulasi Buyer Membeli)

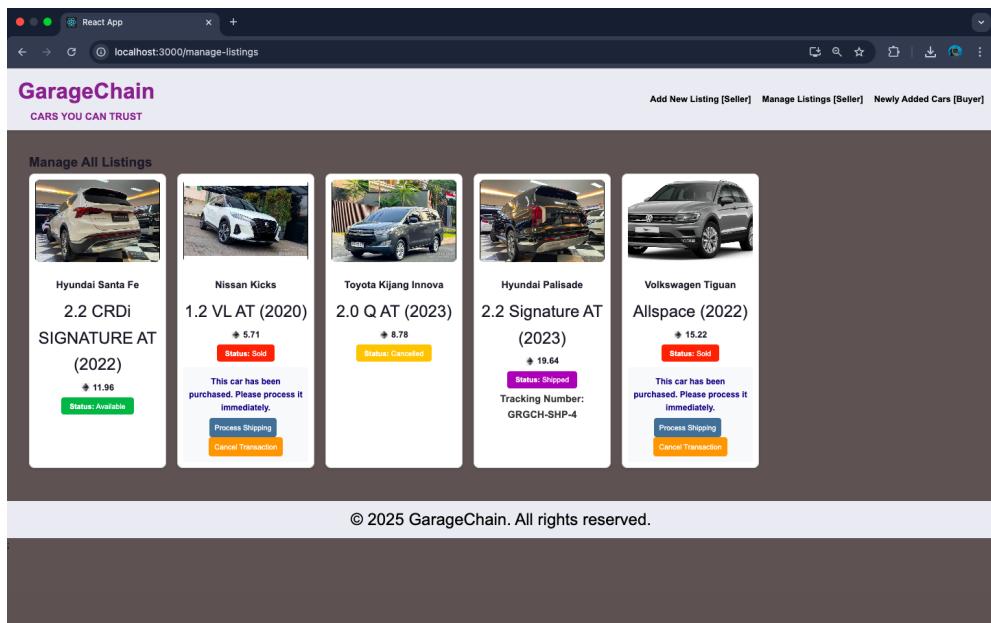


Sesudah mobil VW Tiguan Allspace dibeli oleh buyer. Iklan tidak muncul lagi di page ini, karena statusnya sudah tidak available, tapi sold.

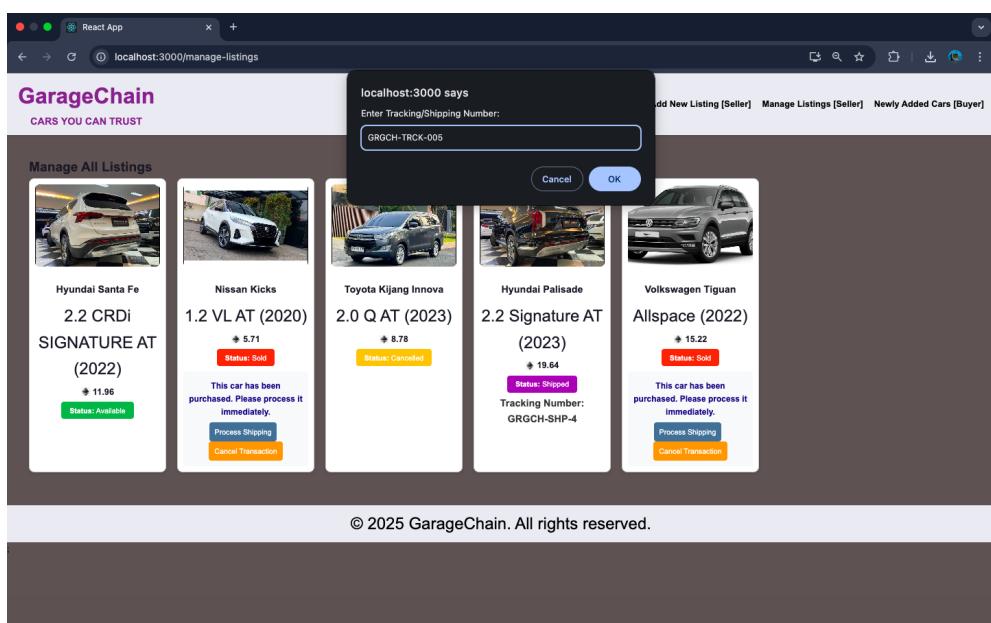


## Manage Listing

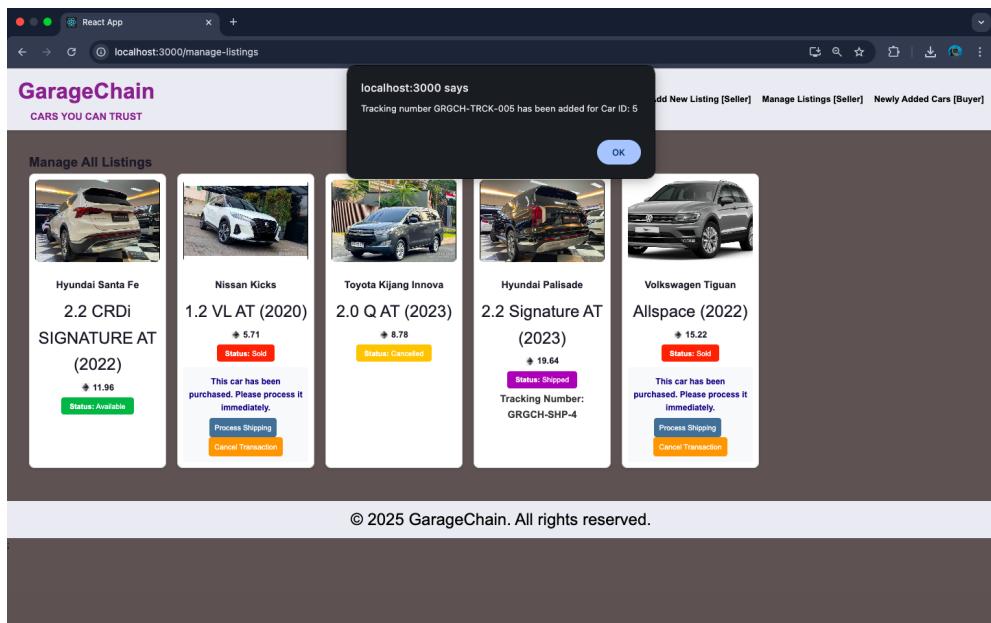
Kondisi page awal. VW Tiguan terlihat sold dan harus segera diproses oleh seller.



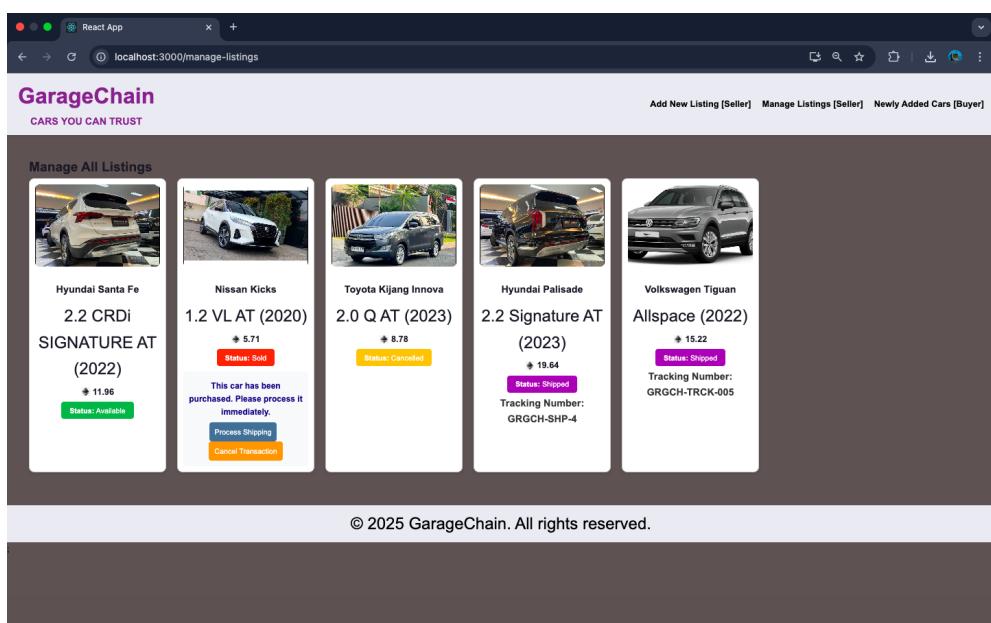
Proses input shipping/track number oleh seller pada mobil VW Tiguan



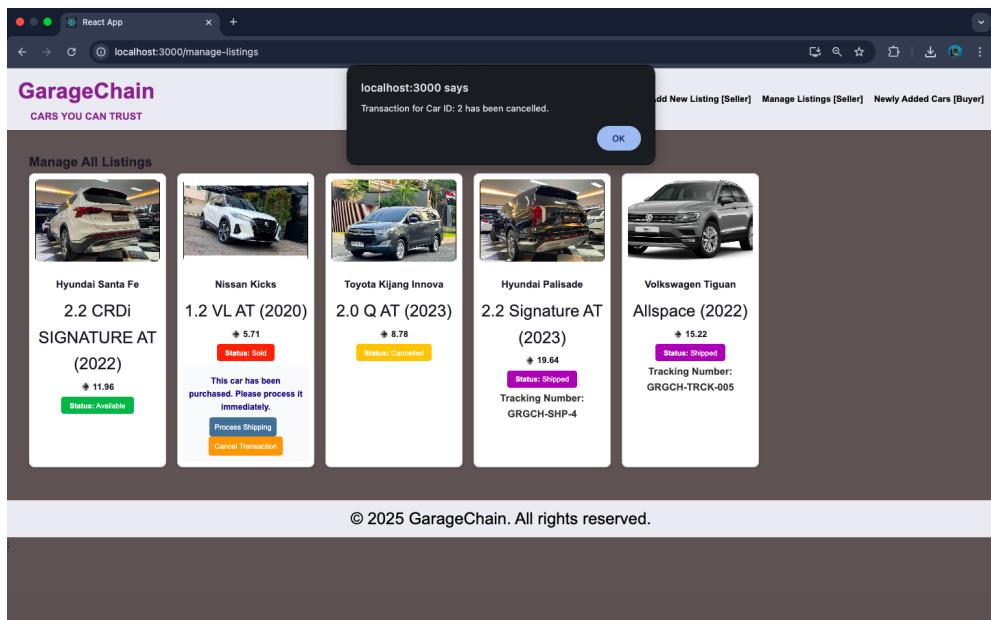
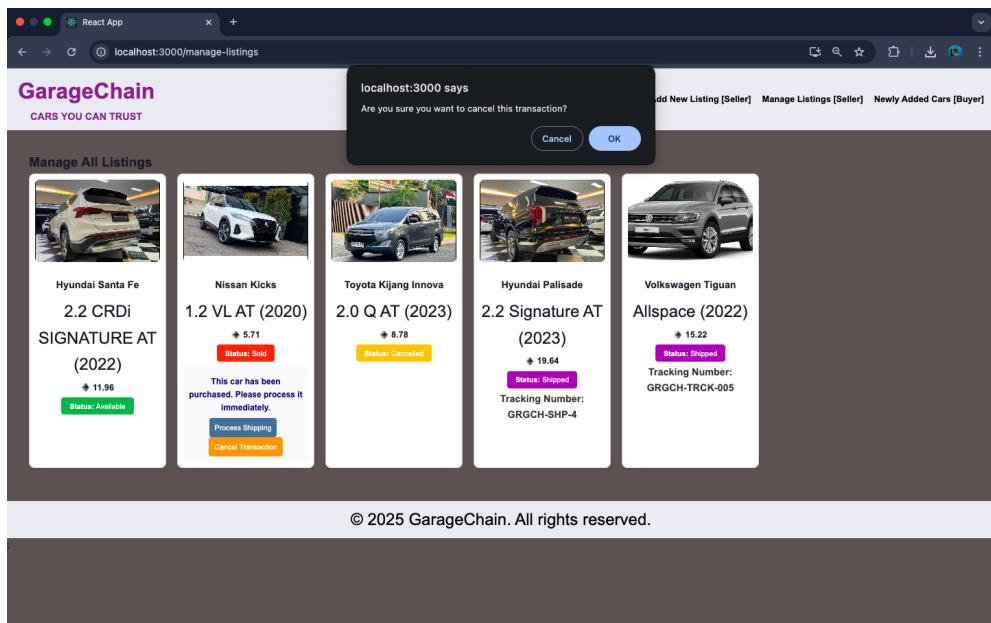
Berhasil input tracking number



Status Tiguan berubah jadi Shipped dan ada info tracking numbernya berapa



Simulasi Seller Cancel Transaksi yang sudah dibeli oleh Buyer pada mobil Nissan Kicks



React App

localhost:3000/manage-listings

## GarageChain

CARS YOU CAN TRUST

Add New Listing [Seller] Manage Listings [Seller] Newly Added Cars [Buyer]

Manage All Listings

Car Model	Year	Price	Status
Hyundai Santa Fe 2.2 CRDi SIGNATURE AT (2022)	2022	11.96	Status: Available
Nissan Kicks 1.2 VL AT (2020)	2020	5.71	Status: Canceled
Toyota Kijang Innova 2.0 Q AT (2023)	2023	8.78	Status: Canceled
Hyundai Palisade 2.2 Signature AT (2023)	2023	19.64	Status: Shipped
Volkswagen Tiguan Allspace (2022)	2022	15.22	Status: Shipped Tracking Number: GRGCH-TRCK-005

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