CPSC 471 Final Report

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April 15, 2022

Abstract:

"YourStore" is a non-profit online shopping platform. Aside from its non-profit nature, its functionality is very similar to a retailer's online shopping website, for example, Best Buy and its bestbuy.ca. It provides small stores a website application that is easy to configure and maintain. The store owners will be given the permission to list other products, change the inventory, and track all the placed orders. All end users' data (products, orders, inventories) will be stored in the database that can be accessed and modified when needed. The project's core concept is providing an opportunity to store owners to sell their products online, which is realized by a series of core functions, such as customers' order placement, local stores' order acceptance and arrange delivery . Order status is also updated at different stages of the order and tracked by all end-users. Our project has similar functionalities to other commercial online shopping services. It facilitates a complete process of shopping order, realized by many core functions, such as customers' order placement, sellers' order acceptance and shipment. Order status is also updated at different stages of the order and tracked by all end-users. All CRUD (create, read, update and delete) functions can be realized via Postman, and our mobile-friendly web app can also visualize the entire user-flow from registration to order complete. "YourStore" is made with React framework, Redux, Node.js, MongoDB, Express. With Node.js MongoDB, and Express, we were able to develop back-end API in javascript language to implement all necessary CRUD functions, as well as connect our back-end API to a mobile-friendly front-end web app, which is developed with a combination of React, Redux, Bootstrap. All API endpoints are properly connected to our database.

Introduction:

Since the prolonged pandemic has forced people to increasingly move their works and life online, many small sized local stores are suffering a plummeting in the number of in store shoppers. Thus, they desire to seize the opportunity to develop online businesses like other large-chain retail stores. This problem is partially solved by online workshops like Amazon, Ebay, and StockX. Their business model allows business owners to sell other products on their website by charging a substantial percentage of commission. Since the pandemic has lasted for a long time and there is no sign of an end at present, many local small-sized store owners argue the current business model that they build on the online platforms becomes less economically viable and not commercially sustainable for them when a considerable part of their revenue is being taken by the platform provider.

Our System:

”YourStore” is a non-profit online shopping platform. Aside from its non-profit nature, its functionality is very similar to a retailer’s online shopping website, for example, Best Buy and its bestbuy.ca. It provides small stores a website application that is easy to configure and maintain. The store owners will be given the permission to list other products, change the inventory, and track all the placed orders. All end users, data (products, orders, inventories) will be stored in the database that can be accessed and modified when needed. The project’s core concept is providing an opportunity to store owners to sell their products online, which is realized by a series of core functions, such as customers’ order placement, local stores’ order acceptance and arrange delivery . Order status is also updated at different stages of the order and tracked by all end-users.

Project Design Description:

We have three types of users : **customer**, **seller**, and **administrator**. Each type of user needs to login first and receive an access token for future interactions with APIs. Note that **administrator** users are predefined and an user cannot register himself/herself as a type of **administrator**.

Customer: After a **customer** user logs in, he/she would be given a search bar which has a dropdown menu of category and a text input field.

The customer can choose a particular category from the categories or "All" and search products with the text input. After clicking "Search", the page would redirect customer to search results, a list of products that meet the searching conditions would be showed on the screen.

The products would be showed with their descriptions, images, prices and inventories information so that the customer can carefully exam.

After the customer decides what products he/she may want, he/she can choose to add the products by clicking "Add To Cart" button, and the product information would be added into his/her cart.

When the customer decides to checkout, he/she would goes to his/her cart page, and the list of products that the customer added would show on the screen.

The customer may want to delete some unwantted products by clicking the trashbin icon, thus the product would be remove from his/her cart.

In order to create orders and actually purchase the products in the cart, the customer must supply a receiver name and a receiver address to create orders. The receiver name and address would be stored in the database so that the seller can arrange shipping when the order is paid for.

After creating the products, the customer needs to goto his/her "Orders" page where he/she can find a list of all orders of his/her and do some actions, for example, "Pay" for the order or "Cancel" the order. While waiting for the products to arrive, the customer can follow the status in his/her order pages.

Seller: After a **seller** user logs in, he/she would be redirected to a page where he/she can find all his/her products that are listing in the site for sell.

If there are any products that the seller wants to sell, he/she can click "Add New Product" buttons, a modal input form would pop up. The seller must fill in the product details in all blank fields and click "Create Product" to insert the product information in the database so that a customer can find the product in the search result and potentially add it into the cart and purchase it.

Moreover, when the seller can closely mointor the product information especially the inventory status. The seller would want to add more inventory when he/she has more products avaiable arrived in stock. Or the product want to increase/decrease price of a particular product. Maybe he wants to change the description to attract more customers. All the updations can be done in the "My Products" page.

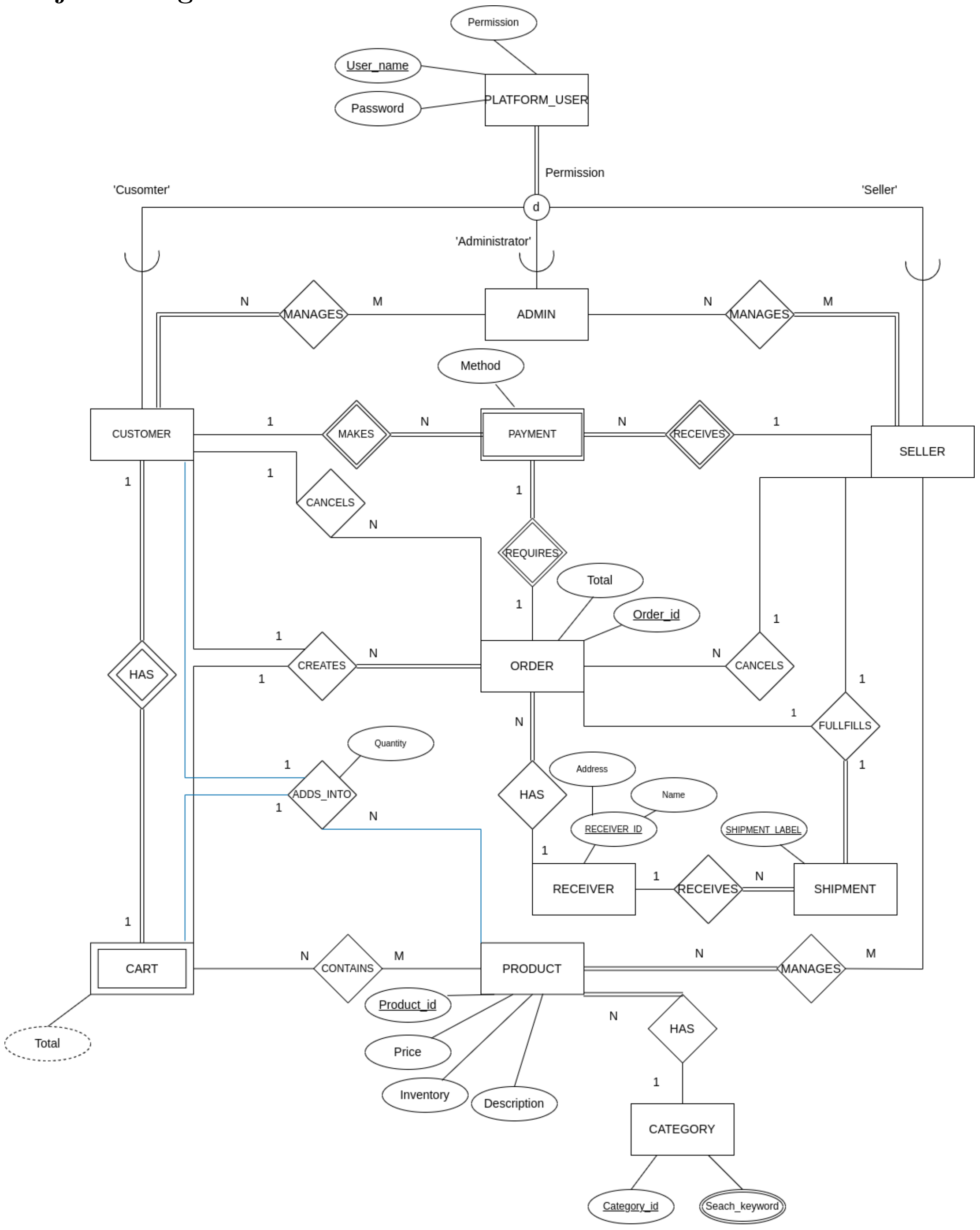
The seller can also see the list of orders that he/she is getting, and the status of the orders(unpaid, paid, unshipped, shipped) to plan the shipment. Both the seller and the customer of a order would have the same view on the status. When the customer paid for the order, the seller of the order can now upload shipping label and complete the order.

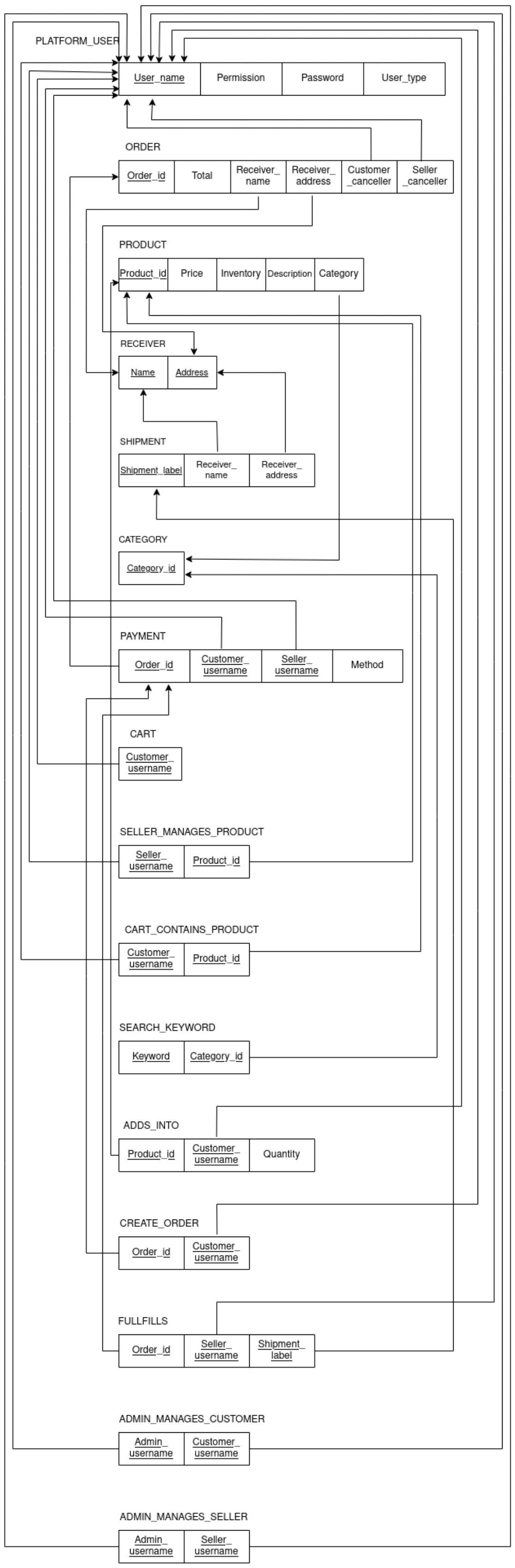
Administrator:

The **administrator** manages every part of the site, and a administrator user has absolutely full permissions to anything, for example, delete a user, delete a product, cancel a order.

Thus, the administrator account should be carefully protected and given to trusted ones.

Project Design EER:





Implementation RMD:

Implementation DBMS:

We have chosed **MongoDB** as our DBMS. MongoDB is an open source NoSQL database program that stores JSON-like documents.

```
Schemas:

const adminDB = new mongoose.Schema({
    UserName:{
        type:String,
        required:true
    },
    Password:{
        type:String,
        required:true
    },
})

const categoryDB = new mongoose.Schema({
    Title:{
        type:String,
        required:true
    },
    Products:[String]
})

const customerSchema = new mongoose.Schema({
    UserName:{
        type:String,
        required:true
    },
    Password:{
        type:String,
        required:true
    },
    Cart:{
        type:[String],
        required:true
    },
    Orders:{
        type:[String],
        required:true
    },
})
```

```
const orderDB = new mongoose.Schema({
    CustomerID:{
        type:String,
        required:true
    },
    SellerID:{
        type:String,
        required:true
    },
    Total:{
        type:Number,
        required:true
    },
    ReceiverName:{
        type:String,
        required:true
    },
    ReceiverAddress:{
        type:String,
        required:true
    },
    Payment:{
        type:Boolean,
        required:true,
    },
    Cancelled:{
        type:Boolean,
        required:true
    },
    Shipped:{
        type:Boolean,
        required:true
    },
    ShipmentLabel:{
        type:String,
        required:true
    },
    Product:{
        type:String,
        required:true
    }
})


const productDB = new mongoose.Schema({
    SellerID:{
        type:String,
        required:true
    },
    Title:{
        type:String,
        required:true
    },
    Price:{
        type:Number,
        required:true
    },
    Inventory:{
        type: Number,
        required:true
    },
    Description:{
        type:String,
        required:true
    },
    SearchKeys:{

    required:true
    },
    Category:{
        type: String,
        required:true
    },
    Owned:{
        type: Boolean,
        required:true
    }
})


const sellerDB = new mongoose.Schema({
    UserName: {
        type: String,
        required: true
    },
    Password: {
        type: String,
        required: true
    },
    CardNumber: {
        type: String,
        required: true
    },
    Orders: {
        type: [String],
        required: true
    },
    Products: {
        type: [String],
        required: true
    },
})



// find all products that are not being deleted
let allProducts = await productDB.find();
allProducts = allProducts.filter((product)=>{
return product.Owned;
});


// create new category
const newCategory = new categoryDB(
{               // parse JSON
        Title: req.body.Title
    })
await newCategory.save();


// find all orders information with derived order status
actualOrders = await orderDB.find();
let orderInfo;
orderInfo = await Promise.all(actualOrders.map(async (order) => {
let product = await productDB.findOne({ "_id": order.Product });
let status;
if (!order.Payment) {
        status = "Unpaid"
    }
else {
        if (order.Shipped) {
                status = "Shipped"
            }
        else {
                status = "Unshipped"
            }
    }
if (order.Cancelled) {
        status = "Cancelled";
    }
return {
        "Order":order,
        "Product":product,
        "Status":status
    }
}));

// find the list of all categories
const allCategories = await categoryDB.find()

// delete a category
await res.categoryInstance.remove()

// find a particular category
categoryInstance = await categoryDB.findOne({ "Title": req.params.id })


// find the list of all orders of a particular customer
const customerOrderIDs = res.customerInstance.Orders;
let actualOrders;
actualOrders = await Promise.all(customerOrderIDs.map(async (orderID) => {
return orderDB.findOne({ "_id": orderID });
}));
let orderInfo;
orderInfo = await Promise.all(actualOrders.map(async (order) => {
let product = await productDB.findOne({ "_id": order.Product });
let status;
if (!order.Payment) {
        status = "Unpaid"
    }
else {
        if (order.Shipped) {
                status = "Shipped"
            }
        else {
                status = "Unshipped"
            }
    }
if (order.Cancelled) {
        status = "Cancelled";
    }
return {
        "OrderNumber": order._id,
        "SellerID": order.SellerID,
        "ProductName": product.Title,
        "Price": order.Total,
        "ReceiverName": order.ReceiverName,
        "ReceiverAddress": order.ReceiverAddress,
        "Status": status,
        "ShipmentLabel": order.ShipmentLabel
    }
}));


// find the cart details of a customer
const cart = res.customerInstance.Cart;

let total = 0;

let products = await Promise.all(cart.map(async (productID) => {
const product = await productDB.findOne({ "_id": productID });
    return product;
}));


// add a product into the customer's cart
res.customerInstance.Cart.push(req.body.ProductID);
await res.customerInstance.save()


// delete a product from the customer's cart
var index = res.customerInstance.Cart.indexOf(req.body.ProductID);
if (index != -1) {
    res.customerInstance.Cart.splice(index, 1);
}
await res.customerInstance.save();


// delete all the orders of a customer
res.customerInstance.Orders = []
await res.customerInstance.save();



// create orders with respect to the customer's cart
```

```
for (const product of req.body.Products) {

    let productInstance;
    productInstance = await productDB.findOne({ "_id": product._id });
    if (productInstance.Inventory > 0) {

        productInstance.Inventory = productInstance.Inventory - 1;
        await productInstance.save();
    }
    else {
        outOfStock = true;
        continue;
    }

    let newOrder = new orderDB(
        {
            CustomerID: req.params.id,
            SellerID: product.SellerID,
            Total: product.Price,
            ReceiverName: req.body.ReceiverName,
            ReceiverAddress: req.body.ReceiverAddress,
            Payment: false,
            Cancelled: false,
            Shipped: false,
            ShipmentLabel: "None",
            Product: product._id
        });

    await newOrder.save();

    res.customerInstance.Orders.push(newOrder._id);
    await res.customerInstance.save();

    let sellerInstance;
    sellerInstance = await sellerDB.findOne({ "UserName": product.SellerID })
    sellerInstance.Orders.push(newOrder._id)
    await sellerInstance.save();

}
res.customerInstance.Cart = [];
await res.customerInstance.save();



// create a new customer
```

```
const newcustomer = new customerDB(
{
    UserName: req.body.UserName,
    Password: req.body.Password,
    Cart: []
})
const salt = await bcrypt.genSalt(10);
newcustomer.Password = await bcrypt.hash(newcustomer.Password, salt);
await newcustomer.save()


// get a particular customer’s detail
customerInstance = await customerDB.findOne({ UserName: req.params.id })



// arrange shipment for an order
res.orderInstance.Shipped = true;
res.orderInstance.ShipmentLabel = req.body.ShippingLabel;
await res.orderInstance.save();


// get the list of all orders
const allOrders = await orderDB.find();


// create a new order
const newOrder = new orderDB(
    {
        CustomerID: req.body.CustomerID,
        SellerID: req.body.SellerID,
        Total: req.body.Total,
        ReceiverName: req.body.ReceiverName,
        ReceiverAddress: req.body.ReceiverAddress,
        Payment: false,
        Cancelled: false,
        Shipped: false,
        ShipmentLabel: "None",
        Product: req.body.Product
    })
const savedOrder = await newOrder.save()


// delete a particular order
await res.orderInstance.remove()
```

```
// remove all orders
await orderDB.remove({});

// get a particular order instance
orderInstance = await orderDB.findOne({ "_id": req.params.id })


// get a list of products with category info
allProducts = await categoryDB.findOne({ "Title": category });
allProducts = allProducts.Products;
allProducts = await Promise.all(allProducts.map(async (productID) => {
    const product = await productDB.findOne({ "_id": productID });
    return product;
}));



// get a list of products with searchKey
allProducts = await categoryDB.find();
allProducts = allProducts.filter((product) => {
            return (product.Title == searchKey || product.SearchKeys.includes(search
});


// create a product
const newProduct = new productDB(
{
    SellerID: req.body.SellerID,
    Title: req.body.Title,
    Price: req.body.Price,
    Inventory: req.body.Inventory,
    Description: req.body.Description,
    SearchKeys: req.body.SearchKeys,
    Category: req.body.Category,
    Owned: true,
})

const savedproduct = await newProduct.save()

belongingCategory = await categoryDB.findOne({ "Title": req.body.Category });
belongingCategory.Products.push(savedproduct._id);
await belongingCategory.save();

let belongingSeller = await sellerDB.findOne({ "UserName": req.body.SellerID });
```

```
belongingSeller.Products.push(savedproduct._id);
await belongingSeller.save();


// update a product
if (req.body.Title) {
    res.productInstance.Title = req.body.Title
}
if (req.body.Price) {
    res.productInstance.Price = req.body.Price
}
if (req.body.Description) {
    res.productInstance.Description = req.body.Description
}
if (req.body.Category) {
    res.productInstance.Category = req.body.Category
}
if (req.body.SearchKeys) {
    res.productInstance.SearchKeys = req.body.SearchKeys
}
if (req.body.Inventory) {
    res.productInstance.Inventory = req.body.Inventory
}
const updatedProduct = await res.productInstance.save()


// delete a product
const sellerInstance = await sellerDB.findOne({ "UserName": res.productInstance.Sell

let index = sellerInstance.Products.indexOf(res.productInstance._id);
if (index > -1) {
    sellerInstance.Products.splice(index, 1); // 2nd parameter means remove one item
}

await sellerInstance.save();

res.productInstance.Owned = false;
await res.productInstance.save();

let categoryInstance = await categoryDB.findOne({ "Title": res.productInstance.Categ
index = categoryInstance.Products.indexOf(res.productInstance._id);
if (index > -1) {
    categoryInstance.Products.splice(index, 1); // 2nd parameter means remove one it
}
await categoryInstance.save();
```

```
// get a particular product
productInstance = await productDB.findOne({ "_id": req.params.id })



// get the list of all orders of a seller
const sellerOrderIDs = res.sellerInstance.Orders;
let actualOrders;
actualOrders = await Promise.all(sellerOrderIDs.map(async (orderID) => {
    return orderDB.findOne({ "_id": orderID });
}));
let orderInfo;
orderInfo = await Promise.all(actualOrders.map(async (order) => {
    let product = await productDB.findOne({ "_id": order.Product });
    let status;
    if (!order.Payment) {
        status = "Unpaid"
    }
    else {
        if (order.Shipped) {
            status = "Shipped"
        }
        else {
            status = "Unshipped"
        }
    }
    if (order.Cancelled) {
        status = "Cancelled";
    }
    return {
        "OrderNumber": order._id,
        "CustomerID": order.CustomerID,
        "ProductName": product.Title,
        "Price": order.Total,
        "ReceiverName": order.ReceiverName,
        "ReceiverAddress": order.ReceiverAddress,
        "Status": status,
        "ShipmentLabel": order.ShipmentLabel
    }
}));


// get the a particular order of a particular seller
```

```
const productIDs = res.sellerInstance.Products;
let allProducts = await Promise.all(productIDs.map(async (productID) => {
    let productInstance = await productDB.findOne({ "_id": productID });
    return {
        "ProductNumber": productInstance._id,
        "ProductTitle": productInstance.Title,
        "Inventory": productInstance.Inventory,
        "Description": productInstance.Description,
        "Price": productInstance.Price
    }
}));


// create a new seller
const newSeller = new sellerDB(
    {
        UserName: req.body.UserName,
        Password: req.body.Password,
        Orders: [],
        Products: []
    })

const salt = await bcrypt.genSalt(10);
newSeller.Password = await bcrypt.hash(newSeller.Password, salt);
await newSeller.save()


// delete a seller
await res.sellerInstance.remove()


// delete a particular seller's orders
res.sellerInstance.Orders = []
await res.sellerInstance.save();


// get a particular seller instance
sellerInstance = await sellerDB.findOne({ UserName: req.params.id })
```

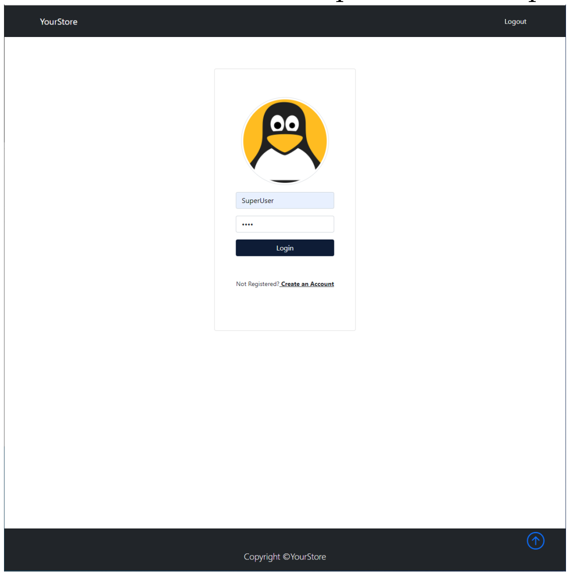
Postman Docuementation:

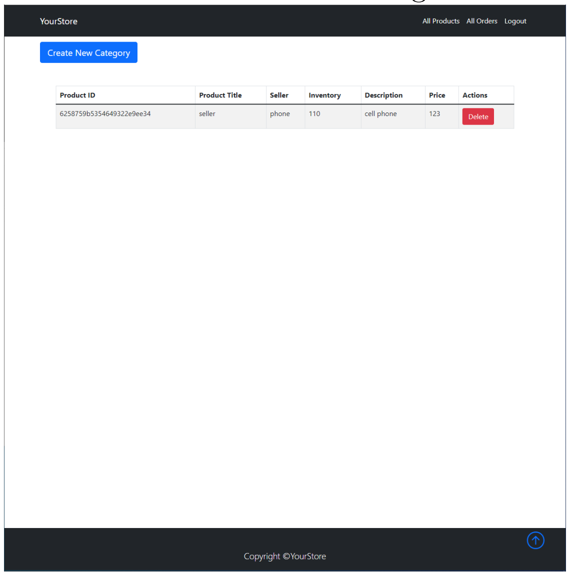
https://documenter.getpostman.com/view/20517678/Uyr4LftC

User Guide:

1: Sign in as admin

Fill in user name as “SuperUser” and password “sodu”. Then click “Login”.



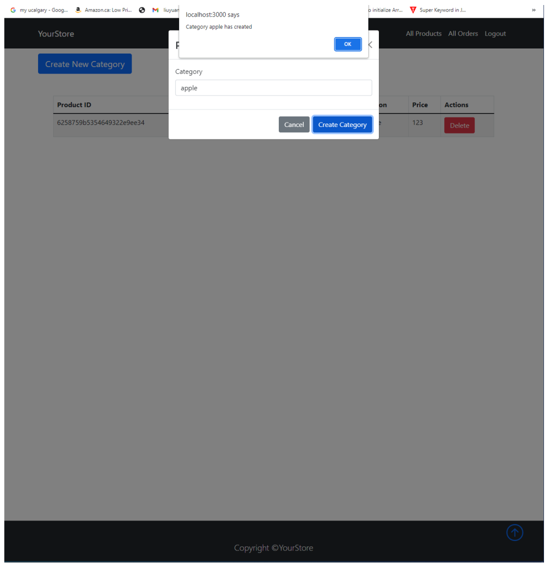


Product ID	Product Title	Seller	Inventory	Description	Price	Actions
6258759b5354649322e9ee34	seller	phone	110	cell phone	123	Delete

2: Admin manage products

2.1: Create a new category

You can access “All Products” page by automatically sign in as admin or click “All Products” at nav bar. In “All Products” page, admin can create a new category as below.



localhost:3000 says

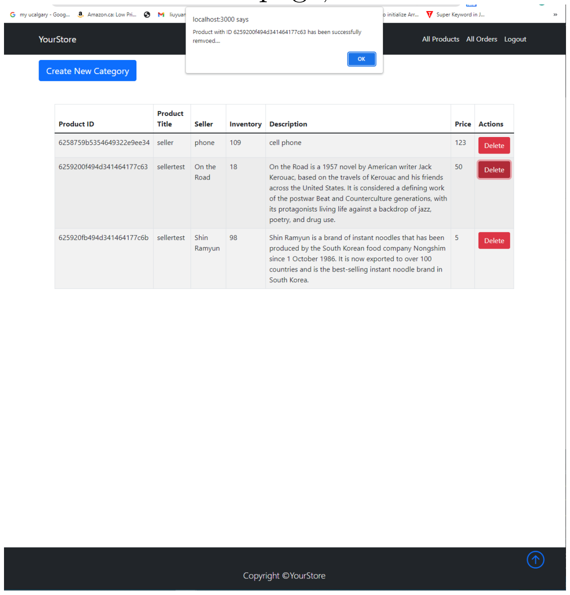
Category apple has created

Category: apple

Product ID	on	Price	Actions
6258759b5354649322e9ee34	e	123	Delete

2.2: Delete products

In “All Products” page, admin can delete any existing products as below.



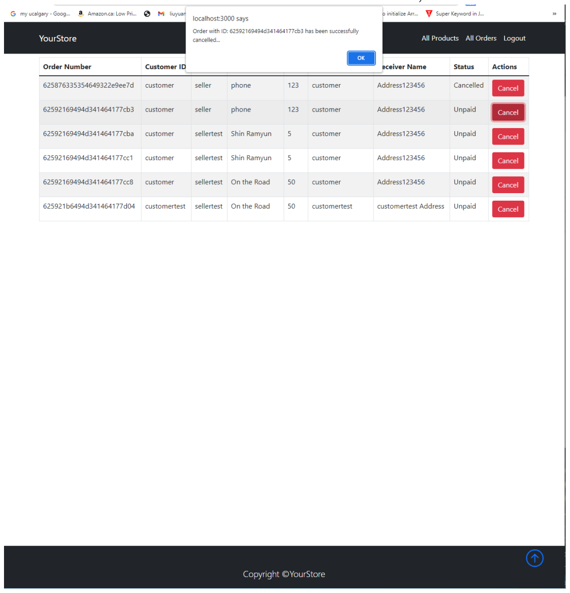
localhost:3000 says

Product with ID 6259200f494d341464177c63 has been successfully remvoed....

Product ID	Product Title	Seller	Inventory	Description	Price	Actions
6258759b5354649322e9ee34	seller	phone	109	cell phone	123	Delete
6259200f494d341464177c63	sellertest	On the Road	18	On the Road is a 1957 novel by American writer Jack Kerouac, based on the travels of Kerouac and his friends across the United States. It is considered a defining work of the postwar Beat and Counterculture generations, with its protagonists living life against a backdrop of jazz, poetry, and drug use.	50	Delete
625920fb494d341464177c6b	sellertest	Shin Ramyun	98	Shin Ramyun is a brand of instant noodles that has been produced by the South Korean food company Nongshim since 1 October 1986. It is now exported to over 100 countries and is the best-selling instant noodle brand in South Korea.	5	Delete

3: Admin manage orders

Click “All Orders” on nav bar, admin can delete any existing orders as below.



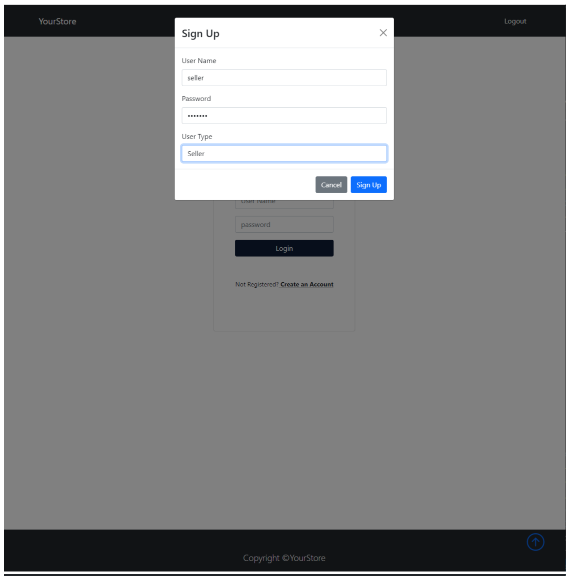
localhost:3000 says

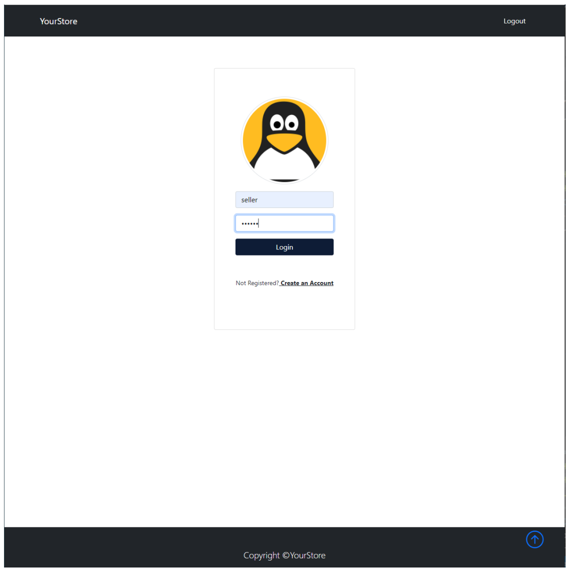
Order with ID: 62592169494d341464177cb3 has been successfully cancelled...

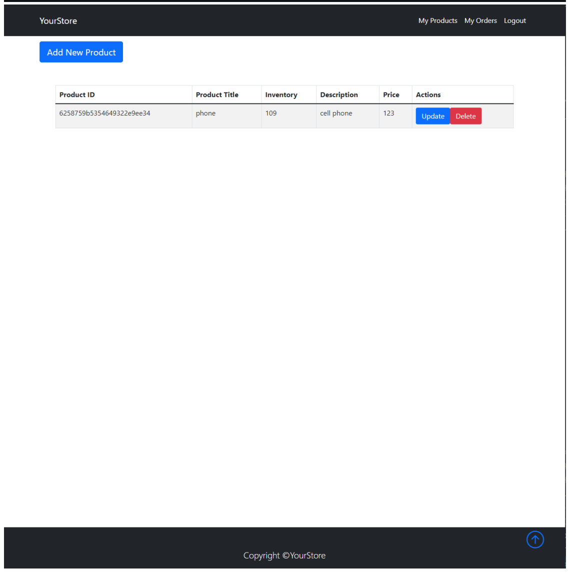
Order Number	Customer ID					eceiver Name	Status	Actions
6258763353546649322e9ee7d	customer	seller	phone	123	customer	Address123456	Cancelled	Cancel
62592169494d341464177cb3	customer	seller	phone	123	customer	Address123456	Unpaid	Cancel
62592169494d341464177cba	customer	sellertest	Shin Ramyun	5	customer	Address123456	Unpaid	Cancel
62592169494d341464177cc1	customer	sellertest	Shin Ramyun	5	customer	Address123456	Unpaid	Cancel
62592169494d341464177cc8	customer	sellertest	On the Road	50	customer	Address123456	Unpaid	Cancel
625921b6494d341464177d04	customertest	sellertest	On the Road	50	customertest	customertest Address	Unpaid	Cancel

4: Sign in as seller

Register a seller account and then sign in with the information that used for account registration.







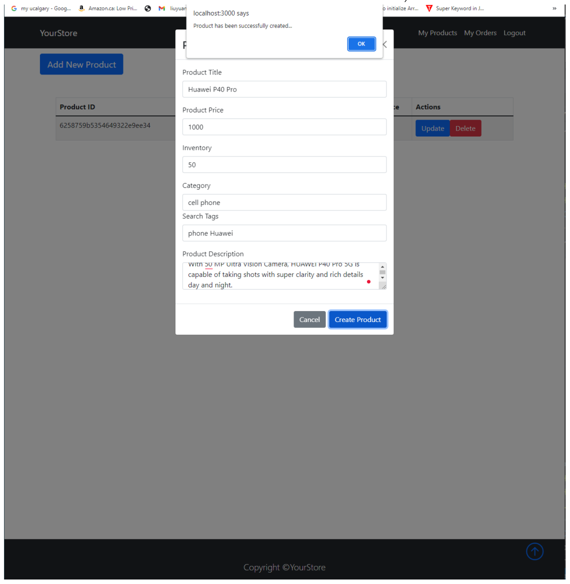
Product ID	Product Title	Inventory	Description	Price	Actions
6258759b5354649322e9ee34	phone	109	cell phone	123	Update Delete

5: Seller manage products

You can access “My Products” page by automatically sign in as seller or click “My Products” at nav bar. In “My Products” page, seller can create a new product as below by clicking ”Add New Product”.

5.1: Create a new product

Filled in all the blanked fields, and click ”Create Product” to actually create the product.



localhost:3000 says

Product has been successfully created...

6258759b5354649322e9ee34

Product Title: Huawei P40 Pro

Product Price: 1000

Inventory: 50

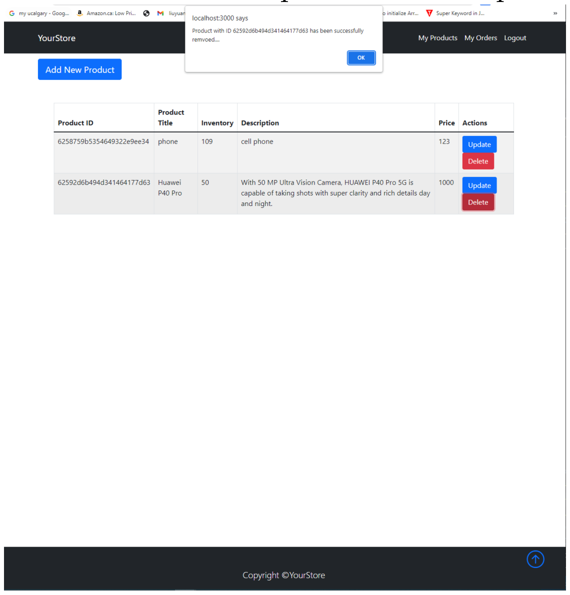
Category: cell phone

Search Tags: phone Huawei

Product Description: With 50 MP Ultra Vision Camera, HUAWEI P40 Pro 5G is capable of taking shots with super clarity and rich details day and night.

5.2: Update/Delete products

You can choose to update or delete product by click corresponding buttons.



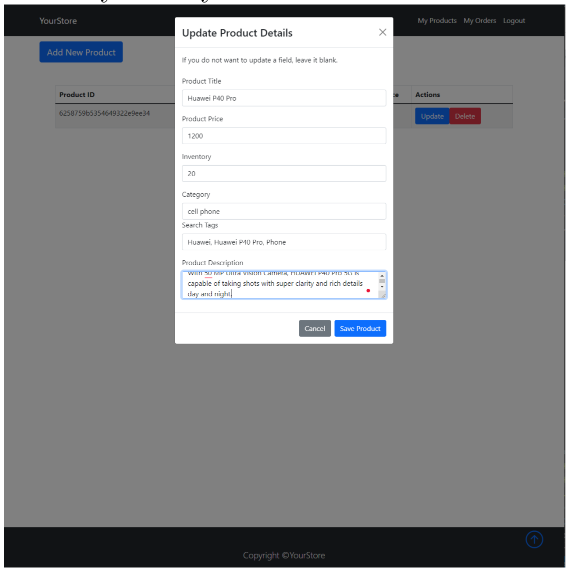
localhost:3000 says

Product with ID 62592d6b494d341464177d63 has been successfully remvoed....

Product ID	Product Title	Inventory	Description	Price	Actions
6258759b5354649322e9ee34	phone	109	cell phone	123	Update Delete
62592d6b494d341464177d63	Huawei P40 Pro	50	With 50 MP Ultra Vision Camera, HUAWEI P40 Pro 5G is capable of taking shots with super clarity and rich details day and night.	1000	Update Delete

6: Seller manage orders

Click “My Orders” on nav bar, seller can update/delete any existing orders as below. Note that you only need to fill in the fields that need to be updated.



Update Product Details

If you do not want to update a field, leave it blank.

Product Title: Huawei P40 Pro

Product Price: 1200

Inventory: 20

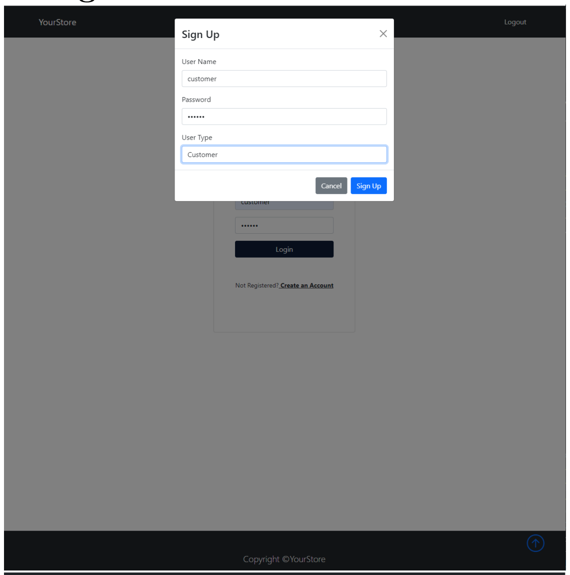
Category: cell phone

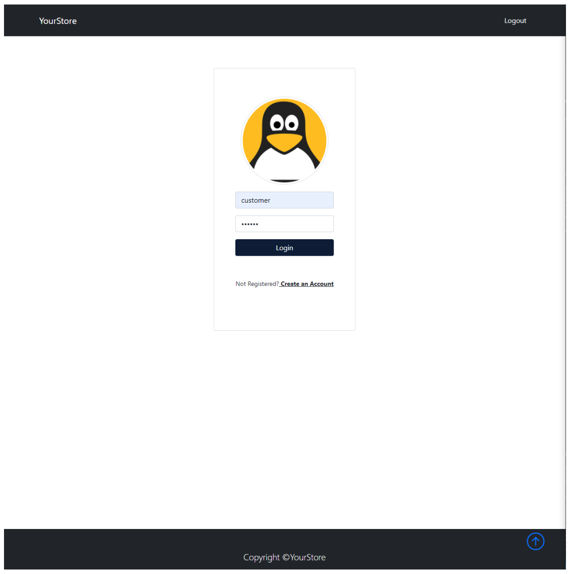
Search Tags: Huawei, Huawei P40 Pro, Phone

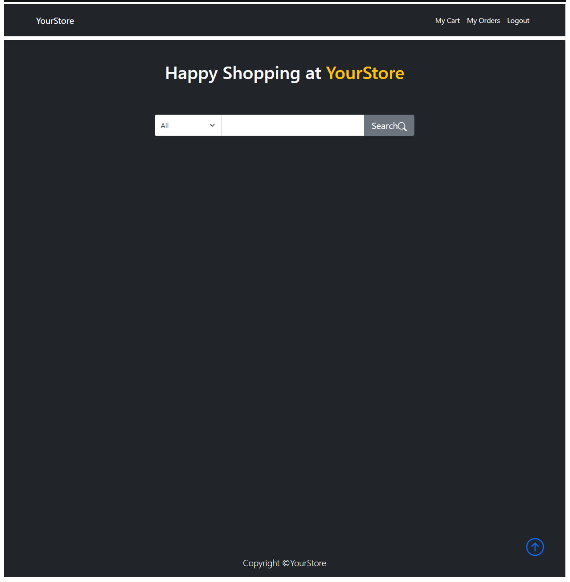
Product Description: With 50 MP Ultra Vision Camera, HUAWEI P40 Pro 5G is capable of taking shots with super clarity and rich details day and night.

Product ID	Actions
6258759b5354649322e9ee34	Update Delete

7: Sign in as customer

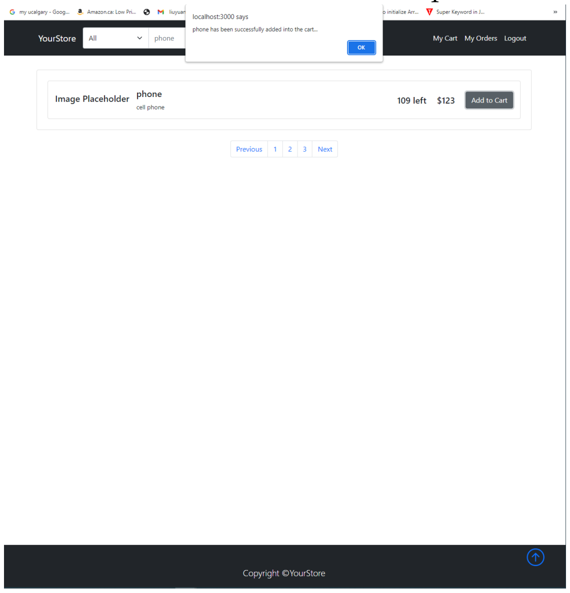






8: Customer add product to cart

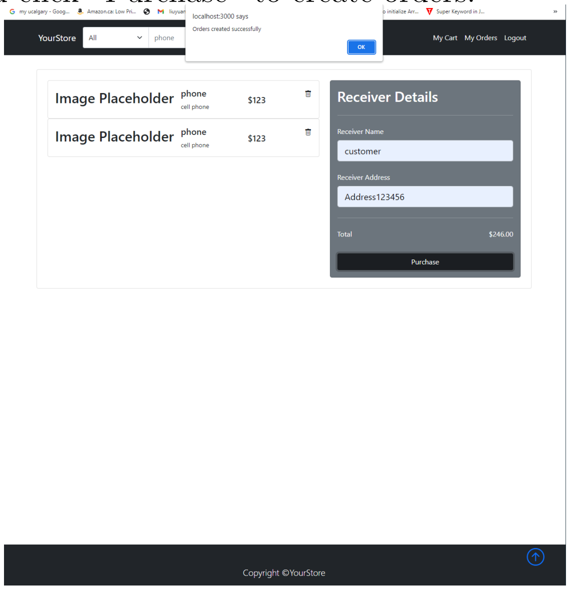
After searching the products, the customer can choose his/her favorite product and click ”Add To Cart” button to add the product into the cart.


localhost:3000 says

phone has been successfully added into the cart...

9: Customer place order

The customer can navigate to his/her cart by clicking ”My Cart” on the navigation bar. After examing the cart carefully, the customer can fill in the receiver details in the grey box and click ”Purchase” to create orders.


localhost:3000 says

Orders created successfully

Receiver Details

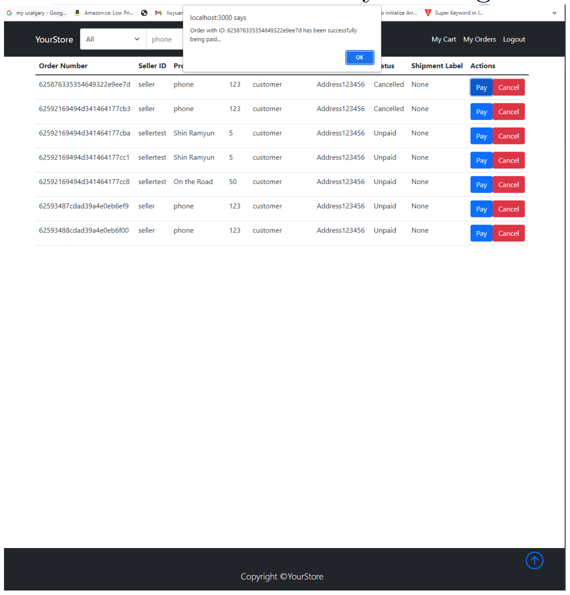
Receiver Name: customer

Receiver Address: Address123456

Total $246.00

10: Customer manage order

After click "My Orders" link in the navigation bar, the customer should be redirected to a page that he/she can manage his/her orders. The customer can choose to "Pay" for the order or "Cancel" the order by clicking the corresponding buttons.



localhost:3000 says

Order with ID: 625876335354649322e9ee7d has been successfully being paid...

Order Number	Seller ID	Pro				atus	Shipment Label	Actions
625876335354649322e9ee7d	seller	phone	123	customer	Address123456	Cancelled	None	Pay Cancel
62592169494d341464177cb3	seller	phone	123	customer	Address123456	Cancelled	None	Pay Cancel
62592169494d341464177cba	sellertest	Shin Ramyun	5	customer	Address123456	Unpaid	None	Pay Cancel
62592169494d341464177cc1	sellertest	Shin Ramyun	5	customer	Address123456	Unpaid	None	Pay Cancel
62592169494d341464177cc8	sellertest	On the Road	50	customer	Address123456	Unpaid	None	Pay Cancel
62593487cdad39a4e0eb6ef9	seller	phone	123	customer	Address123456	Unpaid	None	Pay Cancel
62593488cdad39a4e0eb6f00	seller	phone	123	customer	Address123456	Unpaid	None	Pay Cancel