A

PROJECT REPORT ON

E-KART

SHOPPING SYSTEM

SUBMITTED IN PARTIAL

FULFILLMENT OF

DIPLOMA IN ADVANCED COMPUTING (PG-DAC)

UNDER THE GUIDANCE OF

Mr. Sanket Bharsawade

PRESENTED BY

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AT

CENTER FOR DEVELOPMENT OF ADVANCED COMPUTING

C-DAC, PUNE

ACKNOWLEDGEMENT

The project “E-KART Shopping System” was a great learning experience for us and we are submitting this work to Advance Computing Training School (C-DAC ACTS, PUNE).

We are very glad to mention the name of Mr. Sanket Bharsawade for his valuable guidance and work on this project.

We are highly grateful to Ms. Risha P. R., Manager of ACTS Training Centre, CDAC, for her guidance and support whenever necessary during the course of our journey to acquire PG-Diploma in Advance Computing (PG-DAC) through CDAC ACTS, Pune.

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We would like to express our sincere gratitude towards Mrs. Madhura Anturkar, our faculty of J2SE and J2EE, who was always there for us. Her guidance and support helped us overcome various obstacles and intricacies during the course of our project work. Without her tremendous support, guidance and efforts this project would not have been possible.

From:

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ABSTRACT

E-commerce websites plays a big role in our daily lives, especially after the wake of Covid pandemic, as it’s not always feasible to visit brick and mortar stores to buy the necessities due to risk of infection. Such websites allow us to browse and shop for products at the comfort of our homes.

E-commerce website is currently one of the most important emerging and thriving sectors of web marketing. It has expanded faster over the past years and is expected to keep growing at an accelerating rate. Ecommerce websites enable businesses to grow faster, more convenient and less costly.

In our project, we aim to provide a similar implementation of such an E-commerce website for the specific case of an online grocery application wherein a user can browse and purchase from assorted catalogue of grocery products.

This project discussed the tool and technology used in developing the proposed system (the system has a front end by REACT to display the content structure and a back end of database using MySQL and Spring Boot i.e. J2EE). Two online grocery stores were compared to identify their similarities and differences. A number of development methodologies were discussed and why one of the methodologies was chosen for this project. Methods used to gather the requirement specification was also discussed and how the researcher will use this as a guideline in developing the proposed system.

1. INTRODUCTION

Electronic commerce (ecommerce) refers to companies and individuals that buy and sell goods and services over the Internet. Ecommerce operates in different types of market segments and can be conducted over computers, tablets, smartphones, and other smart devices. Nearly every imaginable product and service is available through ecommerce transactions, including books, music, plane tickets, and financial services such as stock investing and online banking. It allows customers to purchase everything from clothes and coffeemakers to toothpaste and action figures right from their homes.

Ecommerce has helped businesses (especially those with a narrow reach like small businesses) gain access to and establish a wider market presence by providing cheaper and more efficient distribution channels for their products or services. with

With more than 60% of people across the world jumping over the internet to buy things, choose services and attain goods, E-commerce has revolutionized the whole shopping experience. It allows people to buy things off from the ease of their office chair, home lounge’s couch and even while travelling around with just a simple click of their finger! It has become now that easy to buy anything off from anywhere and anytime through an online operating system of E-commerce. E-commerce doesn’t provide benefits to customers and consumers only; it is a holy grail for the retailers as well. With E-commerce they can now expand their business all across the world which otherwise physically is impossible and requires a lot of investment.

As name suggests web application “E-Kart” is an online solution that hosts a wide selection of grocery products. From a customer point of view customer can browse through wide range of products, search for any specific product, add the product to their cart and can place order. Also, customer can easily compare there prices and can get best deal on their purchase.

From an admin point of view, the admin can add new product, manage available product and can edit details for existing products. Admin can also manage details related to customer orders.

As in every application security is main concern and to tackle this challenge advance encryption protocol is used to store customer password.

2. PRODUCT OVERVIEW AND SUMMARY

2.1 PURPOSE

Our project, “E-Kart”, is a web based online grocery shopping application which aims to provide users with an ease to navigate and visually appealing medium to browse through a catalogue of various available grocery products and shop them as per there need. The main purpose is to provide sellers and their customer a new and efficient shopping experience.

2.2 SCOPE

- Build a user-friendly website in order purchase online grocery products
- Provide option Register for new user and Login for existing user
- Allow logged in customer to browse and search for products
- Allow customers to add products to their respective cart and to purchase them
- Store register customers details, orders and products using RDBMS
- Using technologies like React as frontend and J2EE for a backend application development
- Use of encryption technology for a secure login

2.3 OVERVIEW

A. Technologies Used

i. FRONT END

- HTML
- CSS
- JavaScript
- Bootstrap
- React
- Axios

ii. BACKEND

- Spring Boot
- Spring Data JPA
- Hibernate
- REST

iii. DATABASE MANAGEMENT SYSTEM

- MySQL

B. FEATURES PROVIDED

I. FOR CUSTOMERS

a. **Browse** - Customers can browse the homepage to explore the entire collection of products available, as well as view details for individual product.

b. **Search -** Customers can search for the product they like.

c. **Advanced Search by Criteria -** Customers can filter and search through products by advanced criteria like category, rating and price range.

d. **View & Give Feedback -** When a customer checks product details, they can also view the average star rating for that particular product. They can view feedback given by other customers. They can even add their own feedbacks.

e. **Register, Login & Logout -** New customers can register on the site. Existing customers can then login to access their account information and logout when the account is not in use.

f. **View & Update Profile -** When logged in, customers can view their profile and update their details.

g. **Add delivery address –** When purchasing product, a customer can add and choose delivery address associated with their account.

h. **Add to Cart & Place Orders –** If customer finds the products as per there requirements they can add and save it to the cart until they decide to purchase it. After finalizing, they can place order by selecting delivery address and payment method

II. FOR ADMINS

a. Login & Logout – Similar to customers, admins can login & logout to access their account.
b. Delete Users – The admins can delete a customer account if they required.
c. Add new products – Admins can add new products with all the necessary details like product name, price, image.
d. Manage Product Stock – If the admin finds that available stock of some product is depleted then they can replenish it by adding more to the stock.
e. Update Product details – Often details like price of the product may change over time. In such cases admin can update such details

2.4 FEASIBILITY STUDY

Feasibility is the determination of whether a project is worth undertaking or not. Before actually recommending the new system, it is important to investigate if it is feasible to develop it.

Before developing and implementing a system, we have to make sure that the system is feasible in the following ways:

A. TECHNICAL FEASIBILITY

In this type of feasibility study, the system analyst has to check whether it is possible or not to develop the requested system with the available manpower, software, hardware, etc.

This project makes use of cross-platform software and solutions like Java, and hence can run on any operating system. React, used in front-end, is swift and light weight framework when it comes to delivering the requested page as it doesn’t reload the entire page for every HTTP request. It only re-renders the components that need to fetch new data. Also, as React is modular in nature, it is easy to develop new components and scale up existing components in order to add new features to the system. The combination of Spring Boot, Spring Data JPA and Hibernate for backend makes for a fast, easy to set-up and reliable system to interact with the database, as they are secure and transactional in nature. Since the sensitive data of customers and admins need to be stored in a robust and secure database, MySQL database management system was chosen as it is an industry standard.

B. OPERATIONAL FEASIBILITY

In this type of feasibility study, the operation of the system is considered. An analysis is performed on whether it is feasible for the user department to use the application. Thus, the proposed system is said to be operationally feasible only if clients are able to understand the system clearly and correctly, and can use it with ease.

In the design of this project, we always kept user experience in mind. We made an effort to have a good user interface with consistent theme and alluring design to keep the users interested and engaged. In our project, the use of universally known icons and instructions that are easy to understand makes sure that the user will not need any special technical know-how to use the application. We made sure that the information available throughout the application is arranged in a logically coherent and consistent manner, guaranteeing that the users will have a smooth and effortless experience and even enjoy using the application.

C. ECONOMIC FEASIBILITY

In this type of feasibility study, the benefits of the system to the organization are considered by taking into consideration the cost-benefit analysis. All the software and technologies used in our project free, open-source, and widely available, with each of the technologies having an extensive community support. This makes “E-Kart” an economically feasible solution to the organizations that wish to implement it.

3.REQUIREMENTS FULFILLED

3.1. FUNCTIONAL REQUIREMENTS

The major functionality of this product is divided into two categories.

- Administrator Functions
- Customer Functions

In this application each and every user must have their own Email ID and Password, using these Email ID and Password only they can directly enter into their corresponding Login forms.

System analysis will perform certain checks to determine entered information by user is correct and following required standards. If every requirement is fulfilled user will directed to next page.

3.2. NON-FUNCTIONAL REQUIREMENTS

Following are the non-functional requirements fulfilled by our project:

- Since the application uses lightweight and established software components that are also cross-platform, it is remarkably performant and has good support for every operating system.

- The use of React for front end and Spring Boot, Spring Data JPA and Hibernate for back end delivers quick response times to admins and customers alike.

- Card-style UI and well-known icons and symbols used throughout the application provides a consistent theme and user-friendly interface that anyone can grasp easily, even without a technical background.

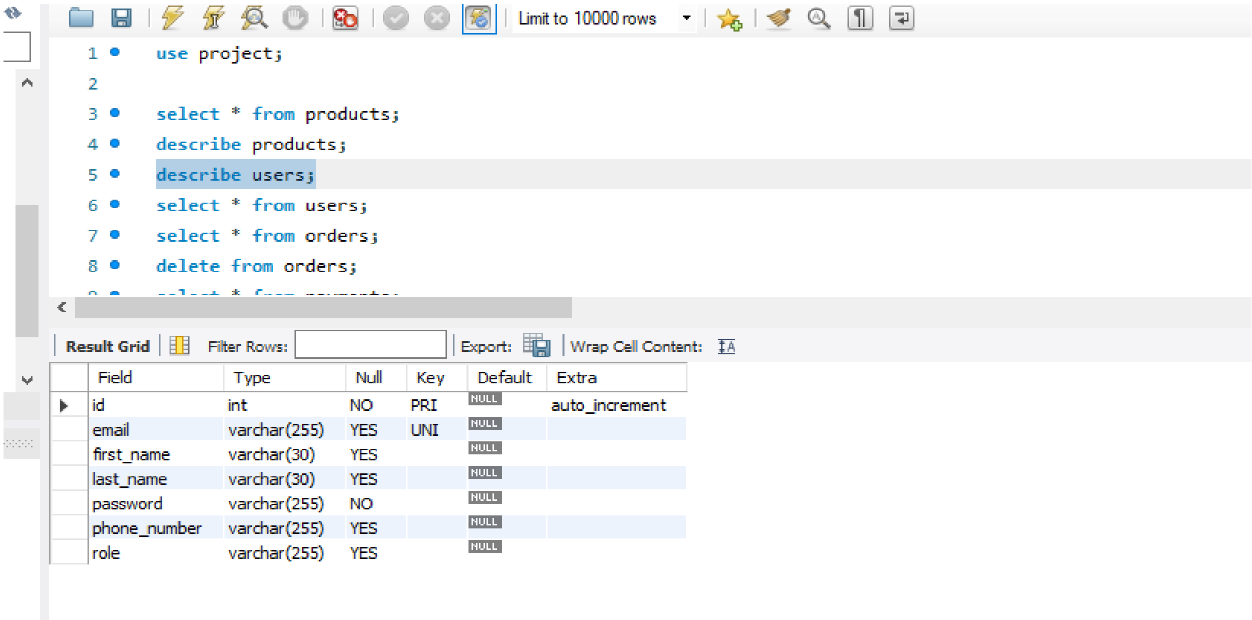
4. PROJECT DESIGN

4.1 DATA MODEL

The following tables depicts the database design used for “E-Kart” application

A. Tables related to Customer Details

a. Users Table

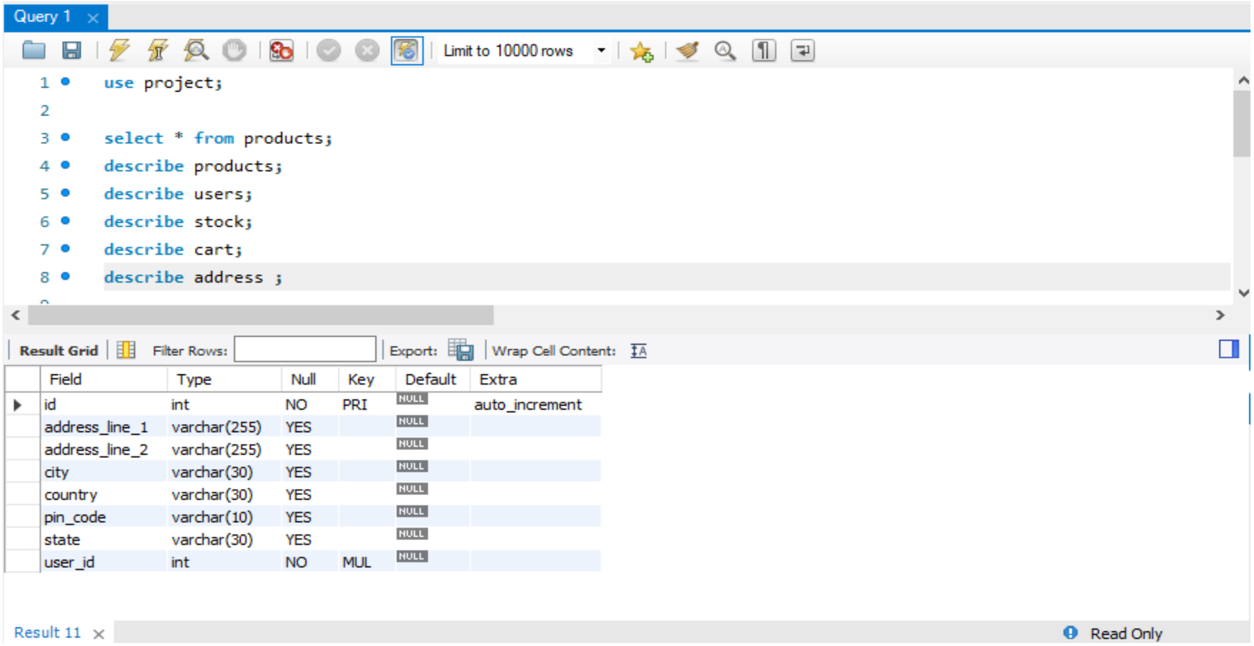


```
use project;

select * from products;
describe products;
describe users;
select * from users;
select * from orders;
delete from orders;
```

Field	Type	Null	Key	Default	Extra
id	int	NO	PRI	NULL	auto_increment
email	varchar(255)	YES	UNI	NULL	
first_name	varchar(30)	YES		NULL	
last_name	varchar(30)	YES		NULL	
password	varchar(255)	NO		NULL	
phone_number	varchar(255)	YES		NULL	
role	varchar(255)	YES		NULL	

E-Kart Image:4.1.1-User Information table

b. Addresses Table



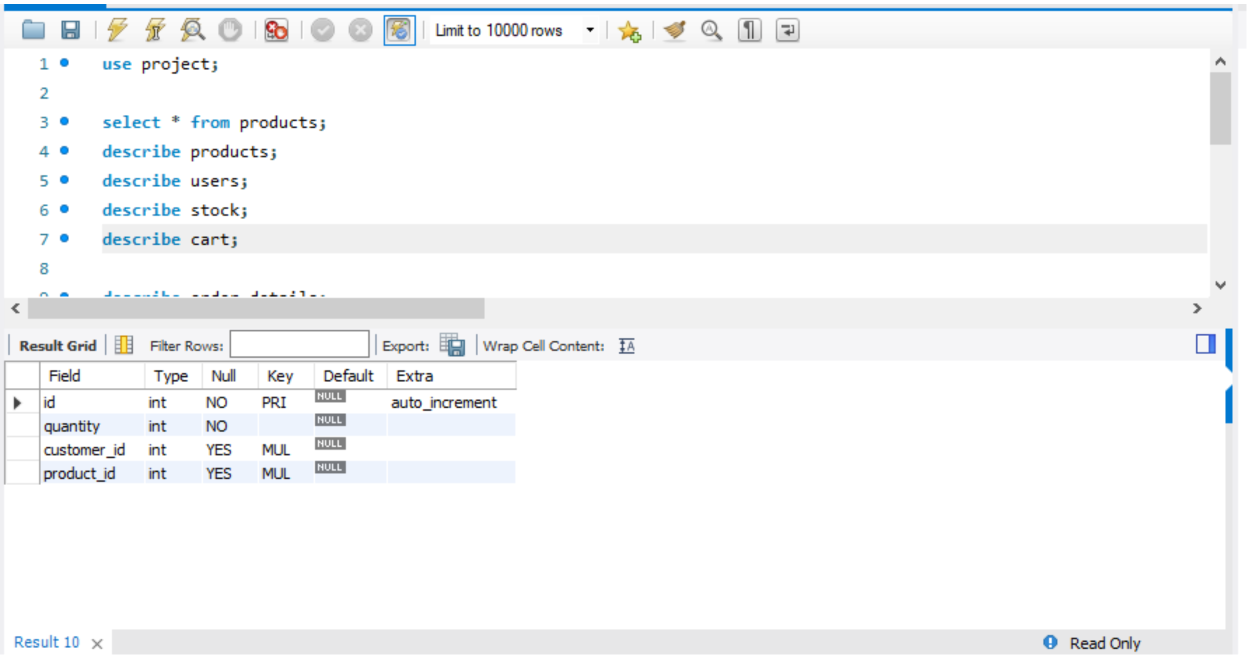
```
use project;

select * from products;
describe products;
describe users;
describe stock;
describe cart;
describe address ;
```

Field	Type	Null	Key	Default	Extra
id	int	NO	PRI	NULL	auto_increment
address_line_1	varchar(255)	YES		NULL	
address_line_2	varchar(255)	YES		NULL	
city	varchar(30)	YES		NULL	
country	varchar(30)	YES		NULL	
pin_code	varchar(10)	YES		NULL	
state	varchar(30)	YES		NULL	
user_id	int	NO	MUL	NULL	

E-Kart Image:4.1.2-User Address table Details

B. Tables related to Orders

a. Cart Items Table

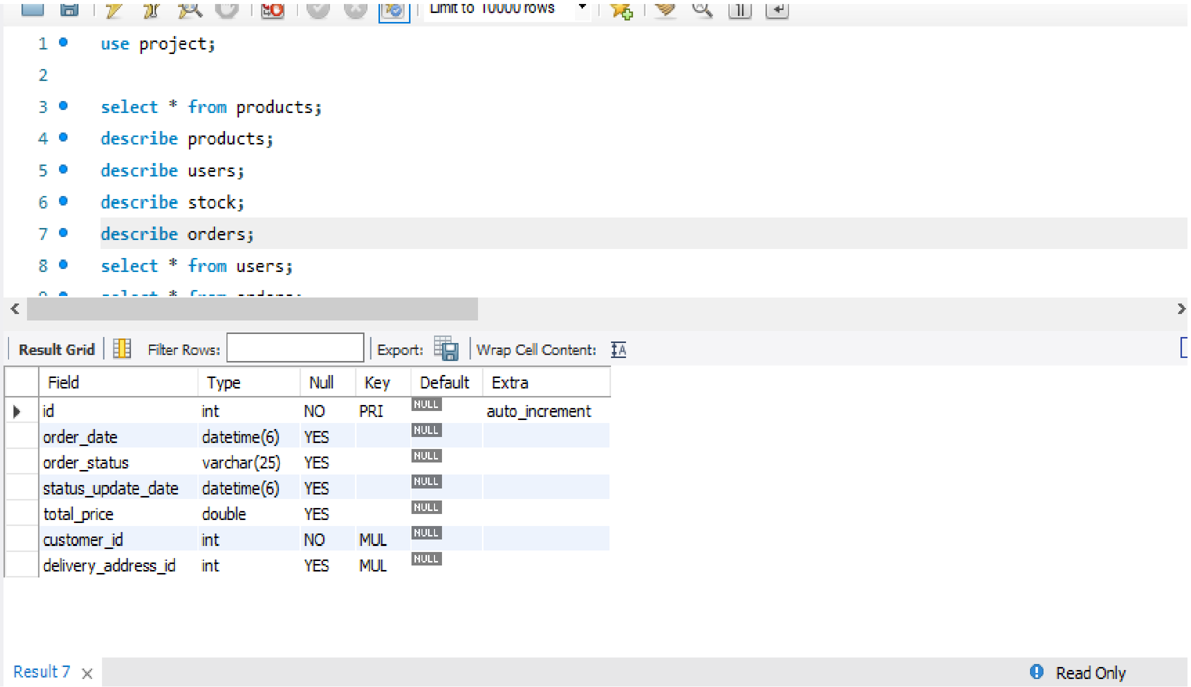


```
use project;

select * from products;
describe products;
describe users;
describe stock;
describe cart;

describe order_details;
```

Field	Type	Null	Key	Default	Extra
id	int	NO	PRI	NULL	auto_increment
quantity	int	NO		NULL	
customer_id	int	YES	MUL	NULL	
product_id	int	YES	MUL	NULL	

E-Kart Image:4.1.3-Cart table Details

b. Orders Table

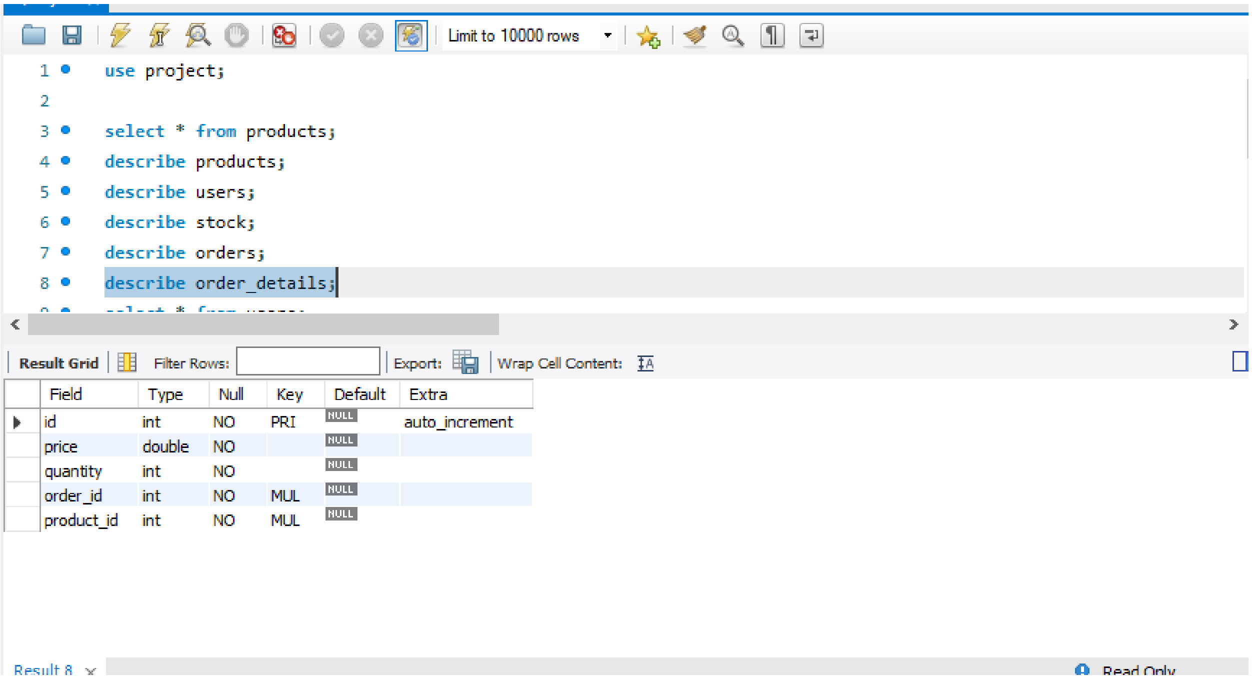


```
use project;

select * from products;
describe products;
describe users;
describe stock;
describe orders;
select * from users;
select * from orders;
```

Field	Type	Null	Key	Default	Extra
id	int	NO	PRI	NULL	auto_increment
order_date	datetime(6)	YES		NULL	
order_status	varchar(25)	YES		NULL	
status_update_date	datetime(6)	YES		NULL	
total_price	double	YES		NULL	
customer_id	int	NO	MUL	NULL	
delivery_address_id	int	YES	MUL	NULL	

E-Kart Image:4.1.4- Order table Details

c. Order Details



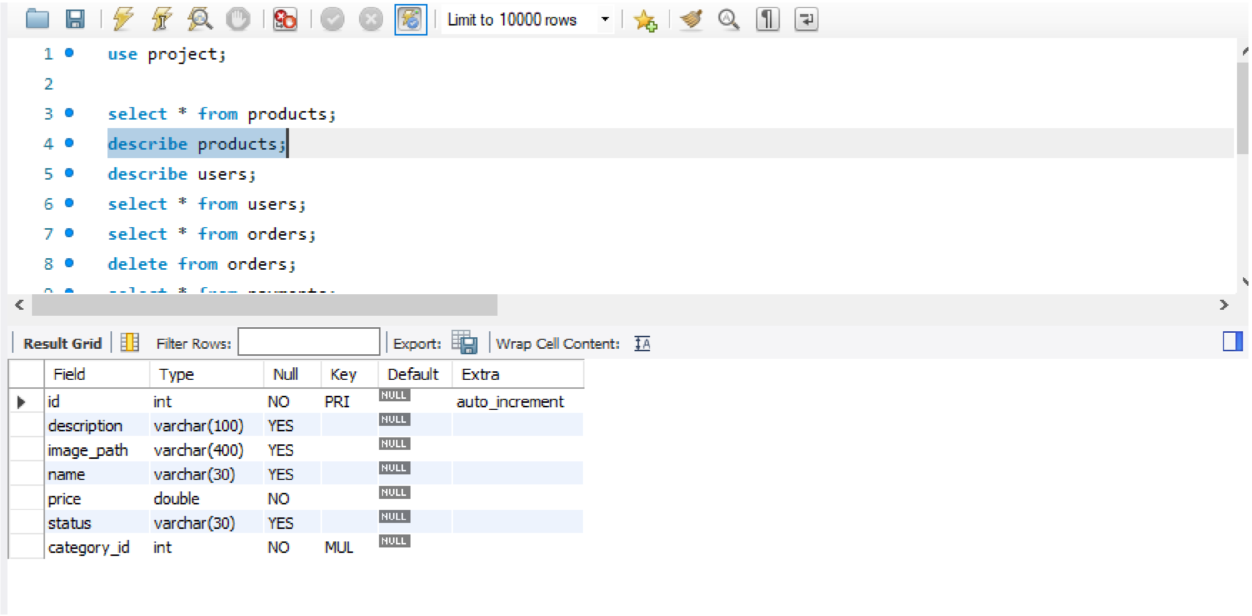
```
use project;

select * from products;
describe products;
describe users;
describe stock;
describe orders;
describe order_details;
```

Field	Type	Null	Key	Default	Extra
id	int	NO	PRI	NULL	auto_increment
price	double	NO		NULL	
quantity	int	NO		NULL	
order_id	int	NO	MUL	NULL	
product_id	int	NO	MUL	NULL	

E-Kart Image:4.1.5- Order table Details

C. Table related to Products

a. Product Details

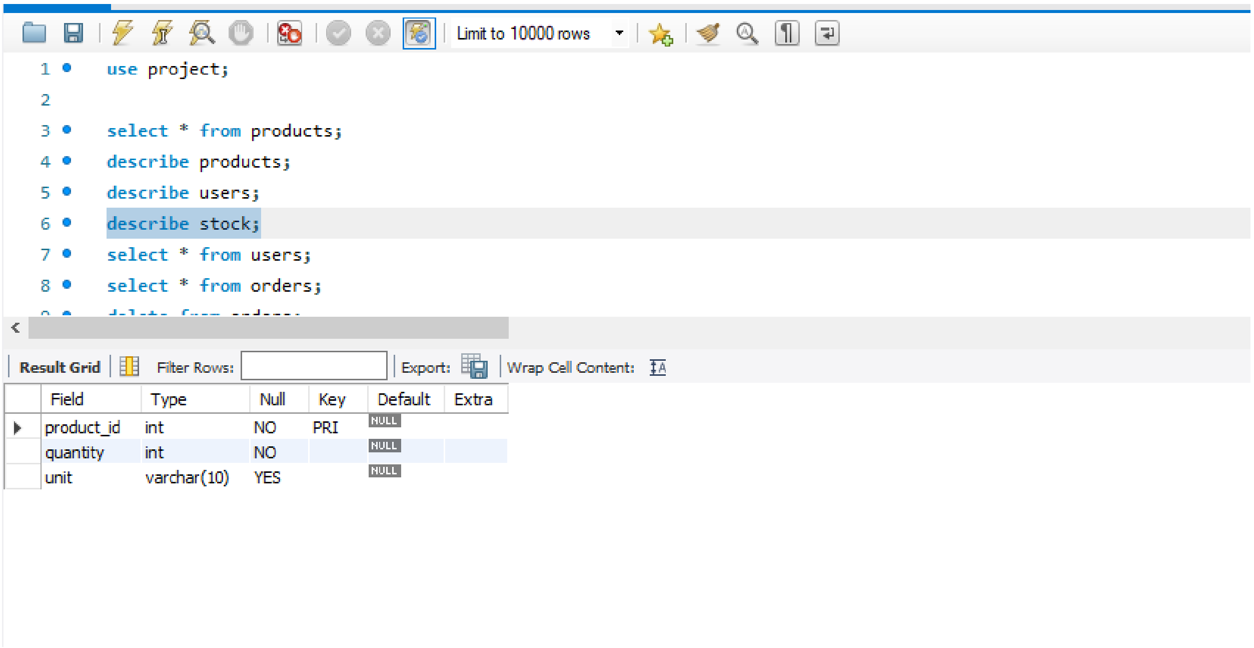


```
use project;

select * from products;
describe products;
describe users;
select * from users;
select * from orders;
delete from orders;
```

Field	Type	Null	Key	Default	Extra
id	int	NO	PRI	NULL	auto_increment
description	varchar(100)	YES		NULL	
image_path	varchar(400)	YES		NULL	
name	varchar(30)	YES		NULL	
price	double	NO		NULL	
status	varchar(30)	YES		NULL	
category_id	int	NO	MUL	NULL	

E-Kart Image:4.1.6-Products table Details

b. Stock Details

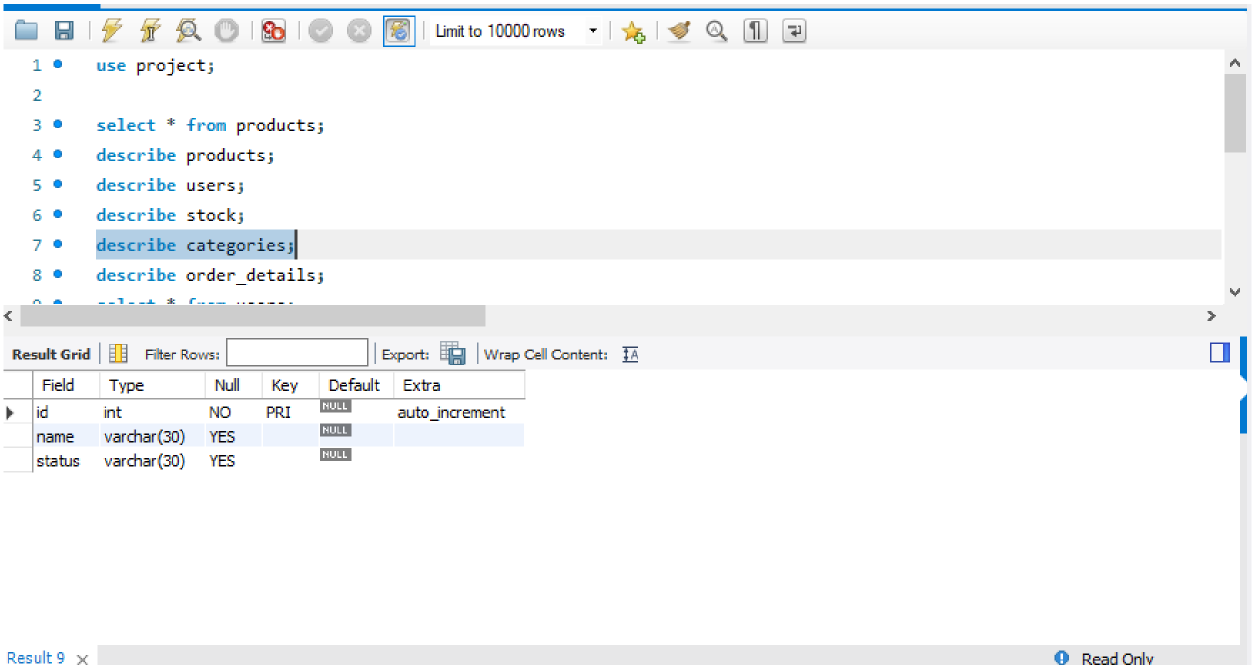


```
use project;

select * from products;
describe products;
describe users;
describe stock;
select * from users;
select * from orders;
```

Field	Type	Null	Key	Default	Extra
product_id	int	NO	PRI	NULL	
quantity	int	NO		NULL	
unit	varchar(10)	YES		NULL	

E-Kart Image:4.1.7- Stock table Details

c. Categories Details

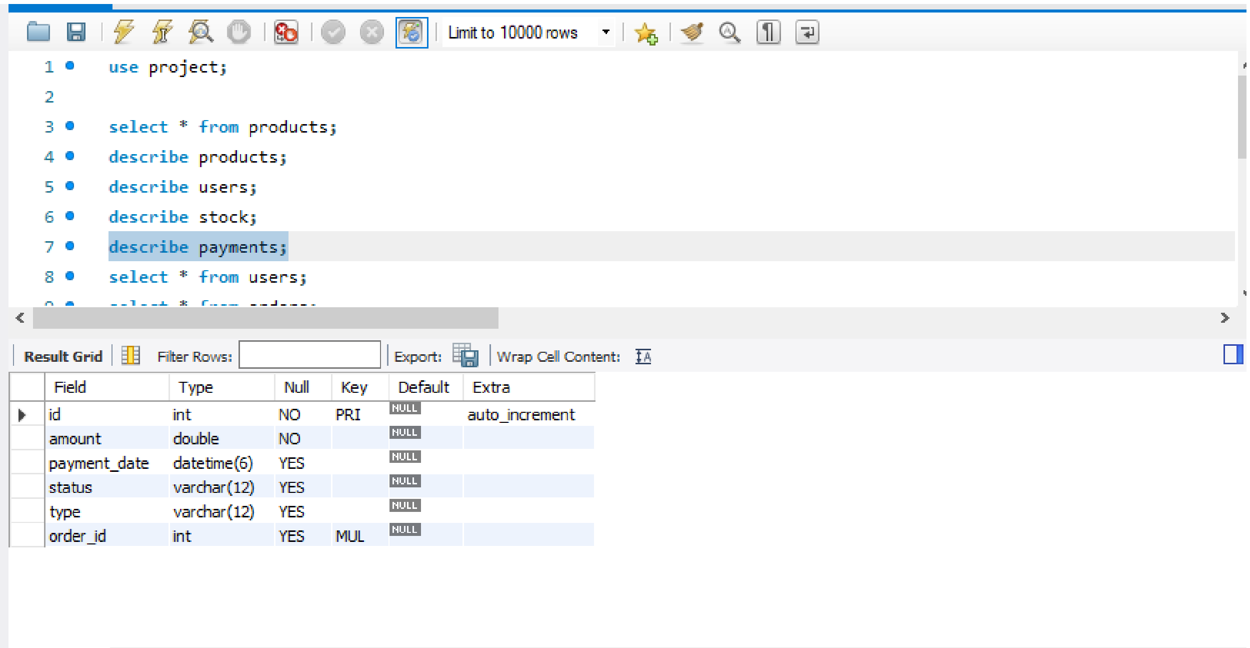


```
use project;

select * from products;
describe products;
describe users;
describe stock;
describe categories;
describe order_details;
```

Field	Type	Null	Key	Default	Extra
id	int	NO	PRI	NULL	auto_increment
name	varchar(30)	YES		NULL	
status	varchar(30)	YES		NULL	

E-Kart Image:4.1.8- Category table Details

d. Payments Table



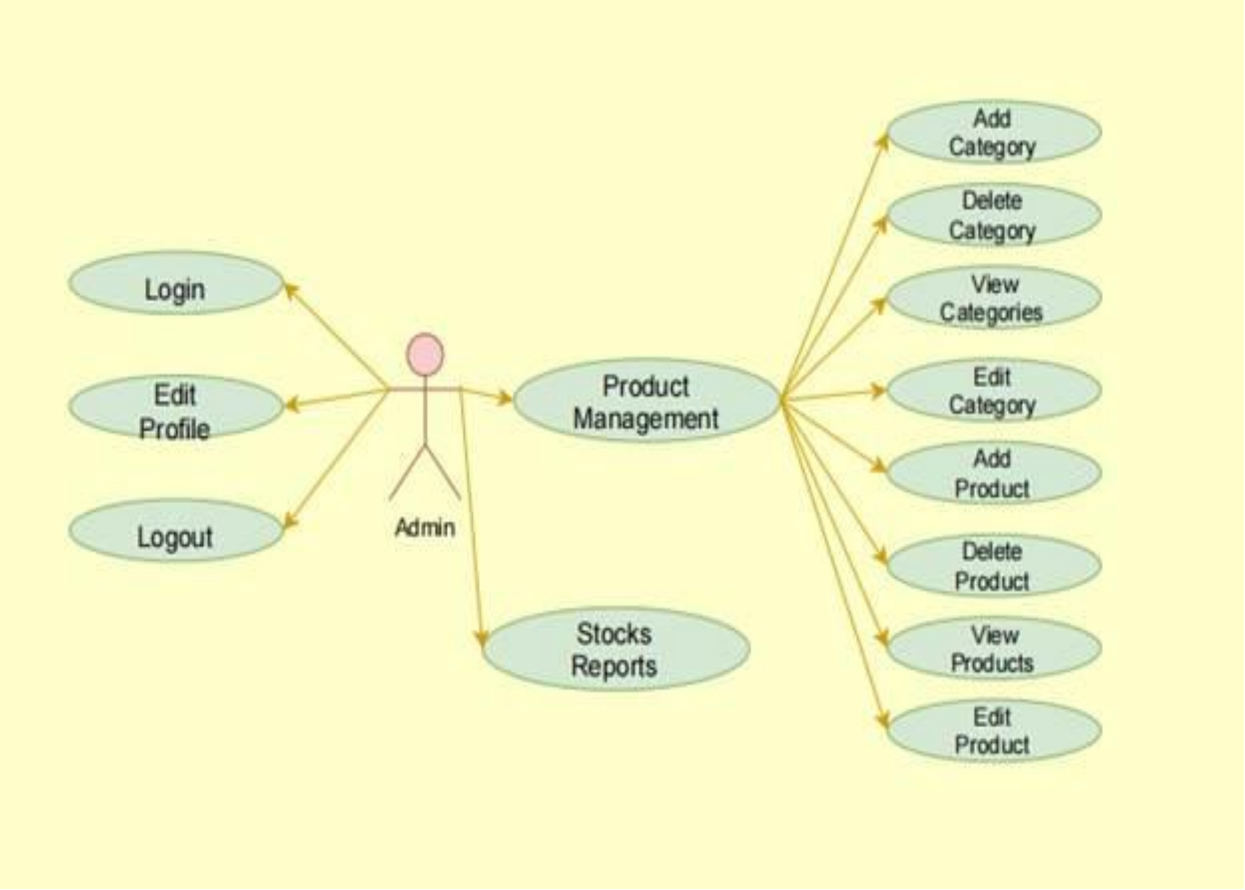
```
use project;

select * from products;
describe products;
describe users;
describe stock;
describe payments;
select * from users;
select * from orders;
```

Field	Type	Null	Key	Default	Extra
id	int	NO	PRI	NULL	auto_increment
amount	double	NO		NULL	
payment_date	datetime(6)	YES		NULL	
status	varchar(12)	YES		NULL	
type	varchar(12)	YES		NULL	
order_id	int	YES	MUL	NULL	

E-Kart Image:4.1.9- Payments table Details

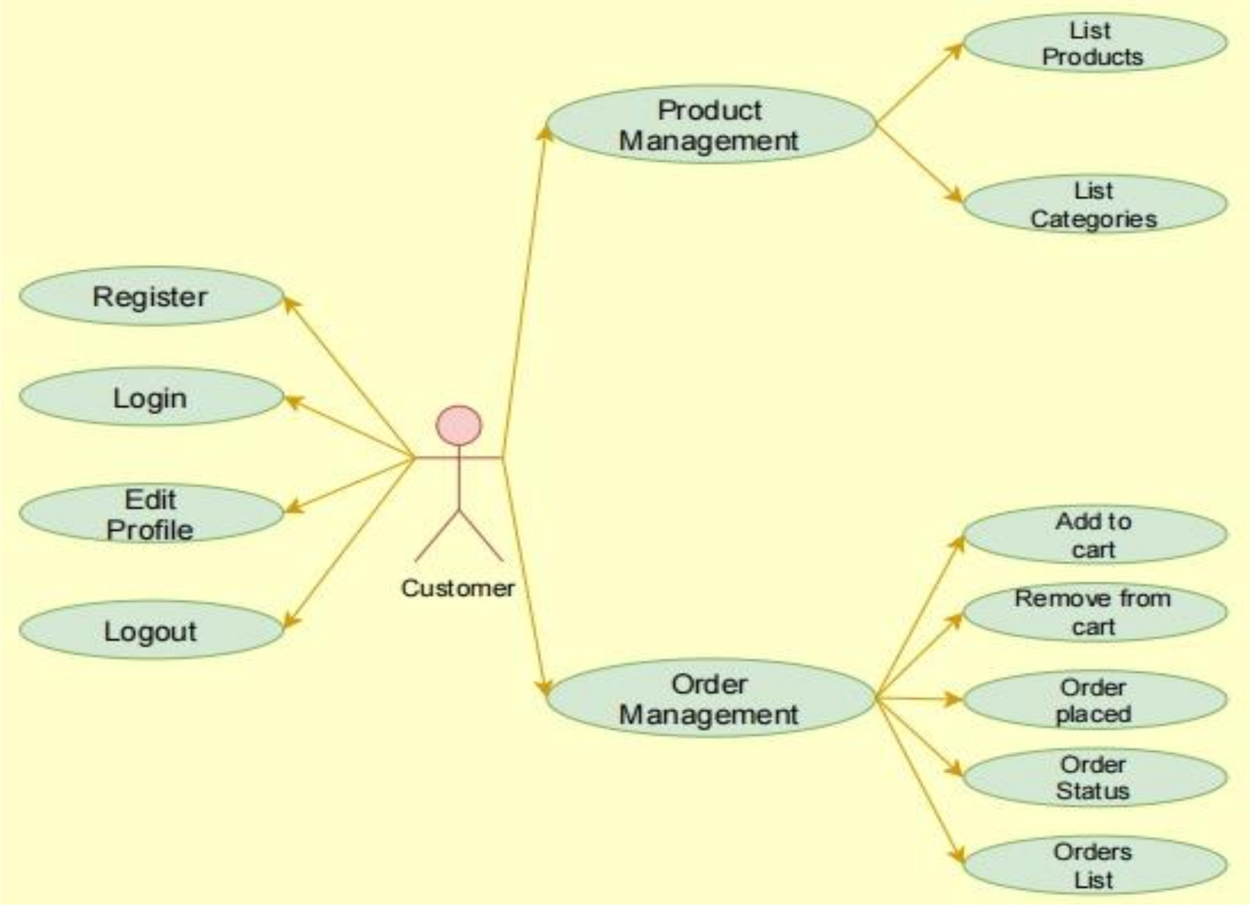
4.2 FUNCTIONAL DECOMPOSITION DIAGRAM

A. Administrative Function



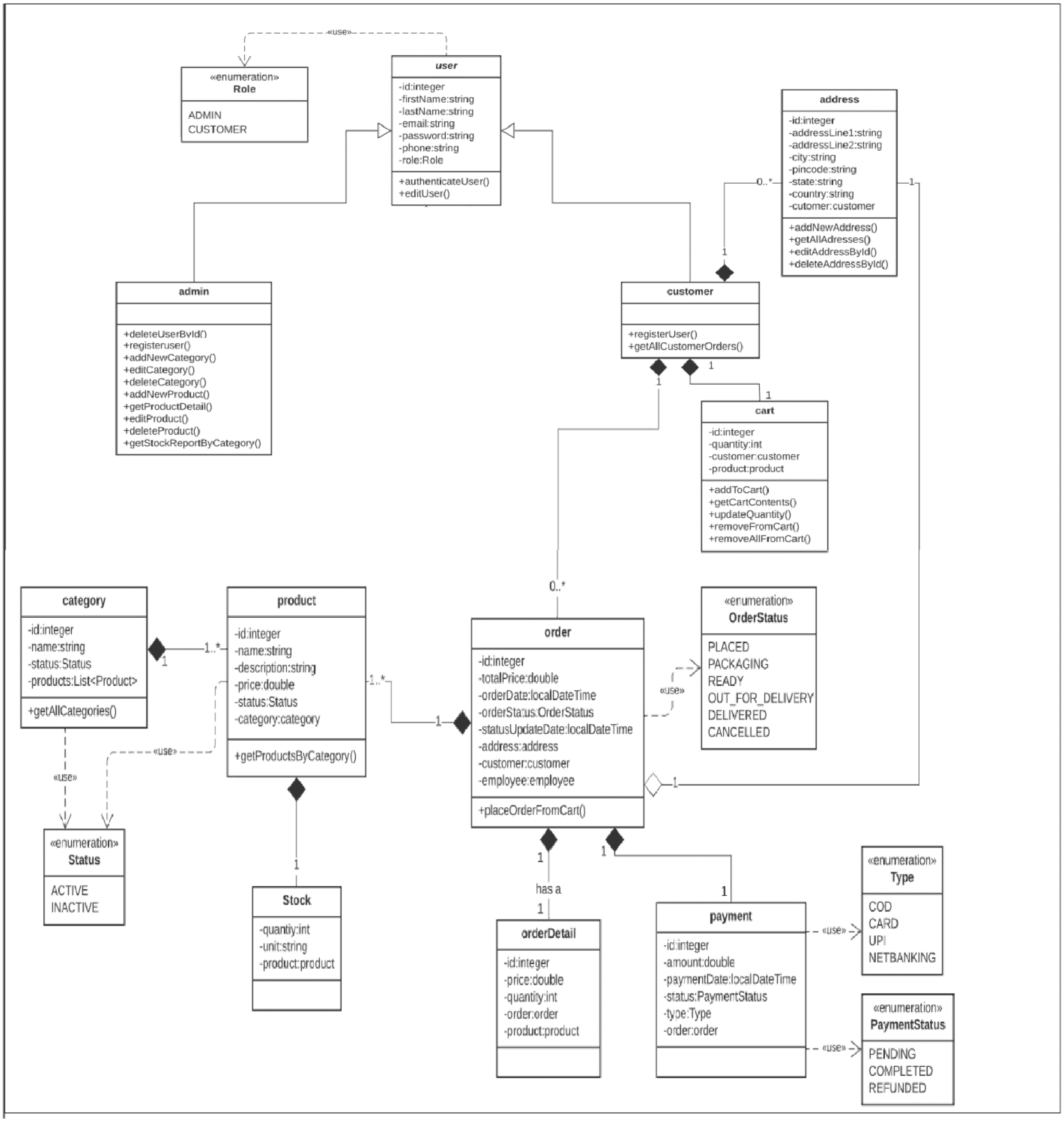
E-Kart Image:4.2.1-Admin Functional Diagram

B. Customer Function



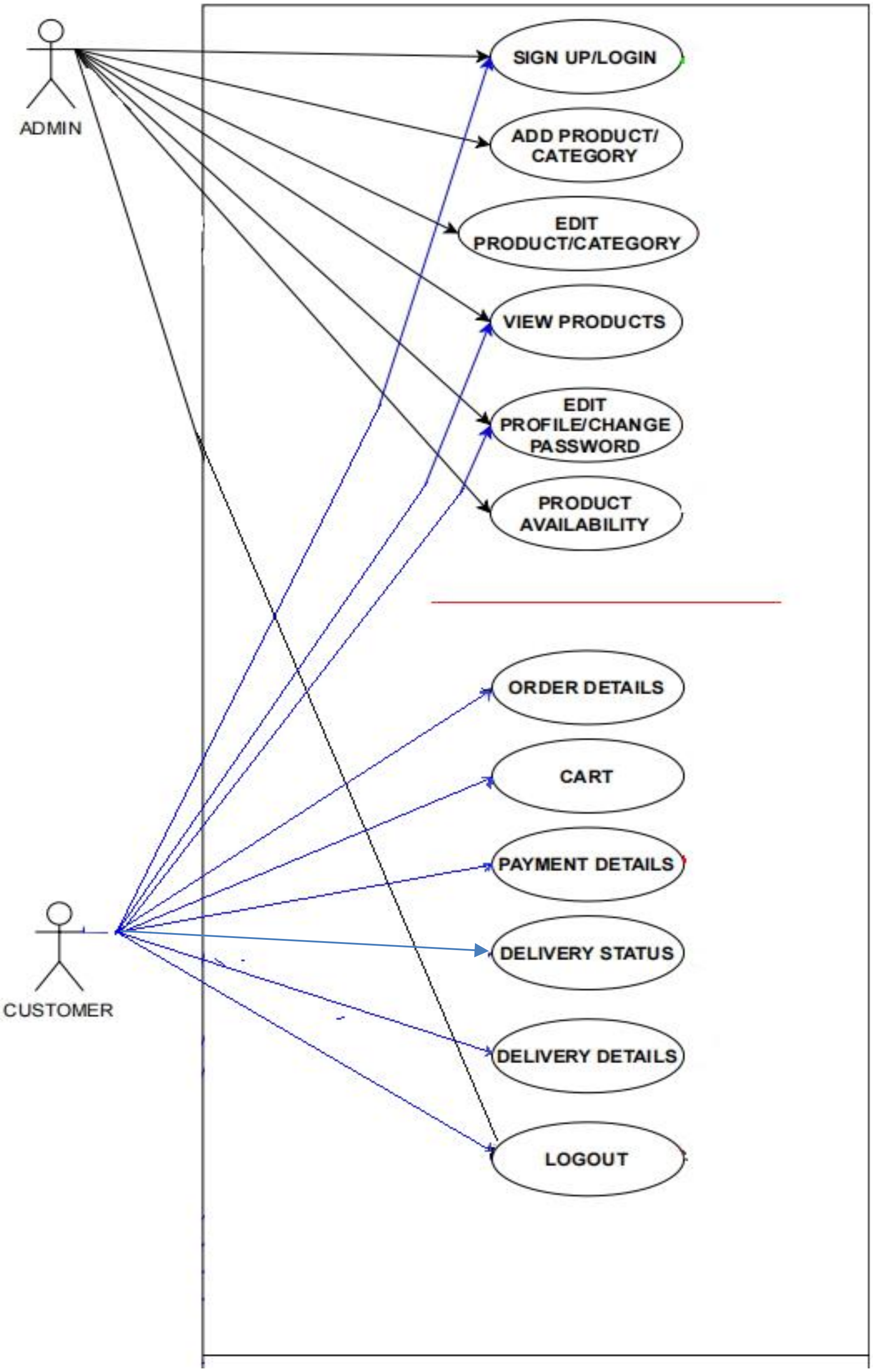
E-Kart Image:4.2.2-Customer Functional Diagram

4.3 CLASS DIAGRAM



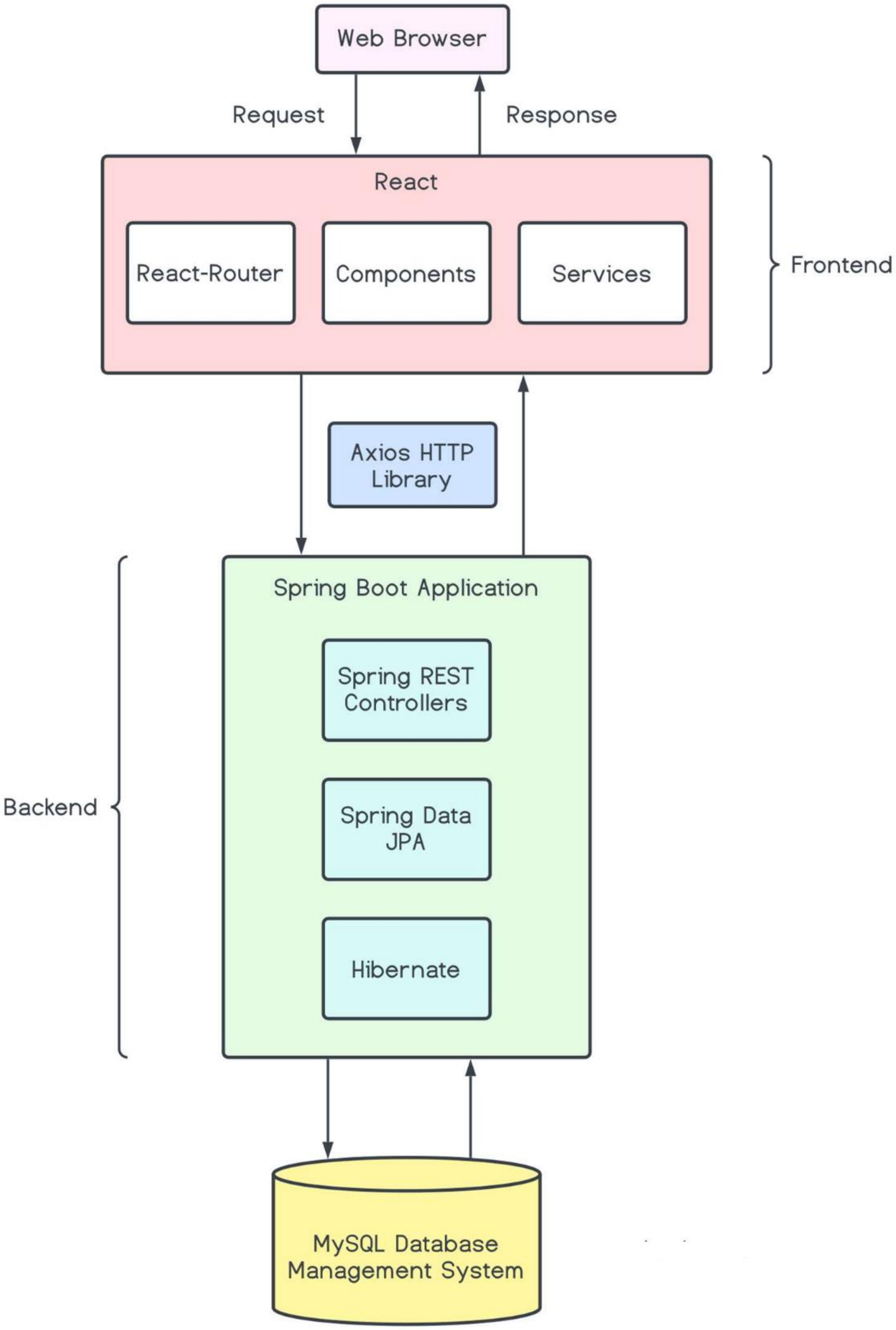
E-Kart Image:4.3-Class Implementation Diagram

4.4 USE CASE DIAGRAM



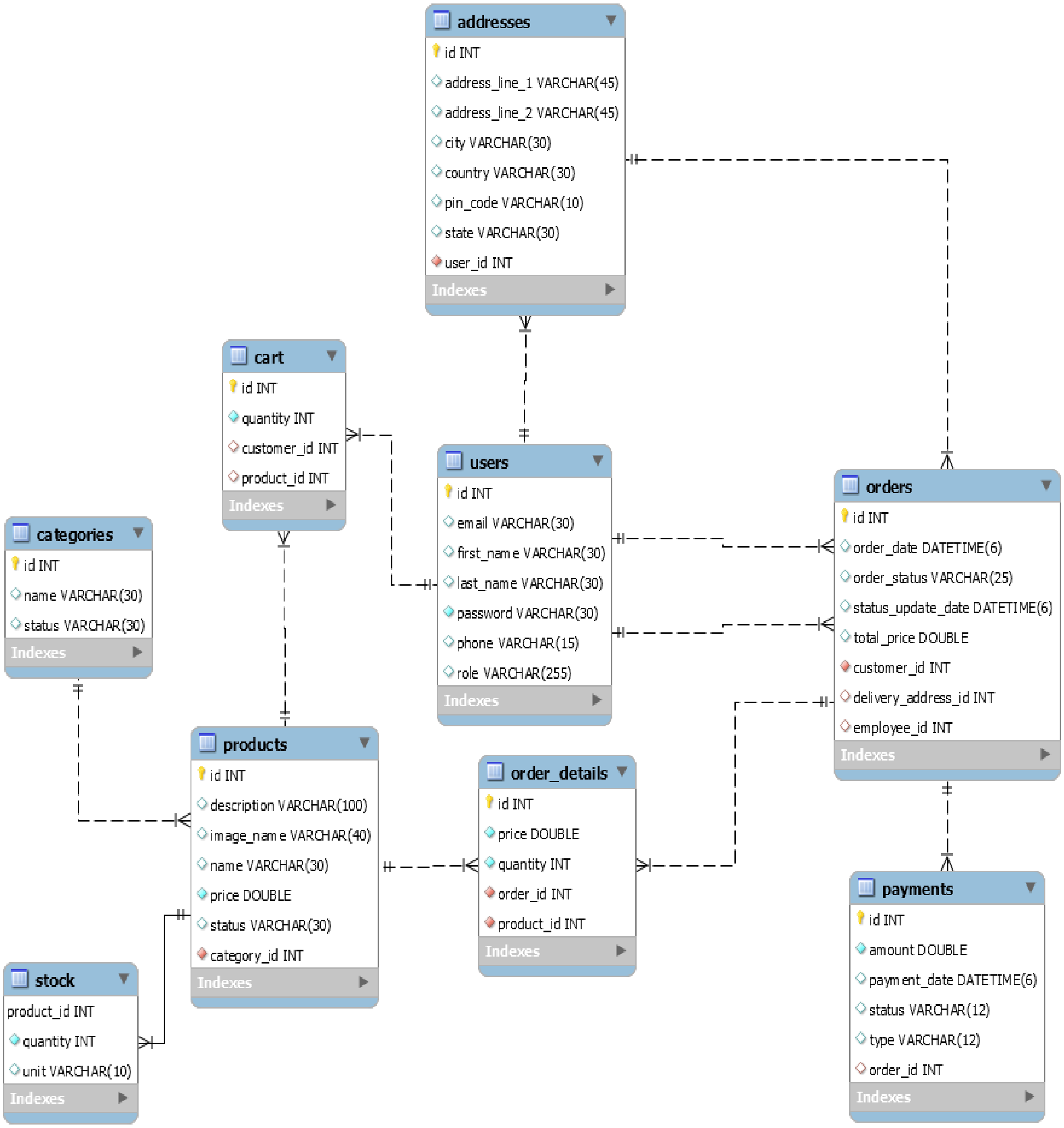
E-Kart Image:4.4-Use Case Diagram

4.5 Project Architecture



E-Kart Image:4.5-Detailed Project Architecture

4.6 ER-Diagram

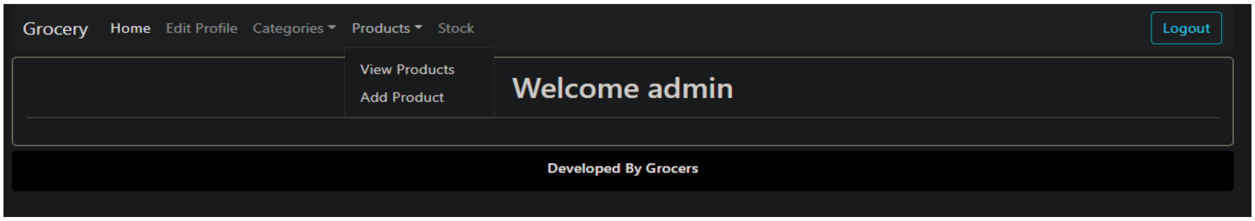


E-Kart Image:4.6-Database ER Diagram

5. PROJECT IMAGES

5.1 Admin

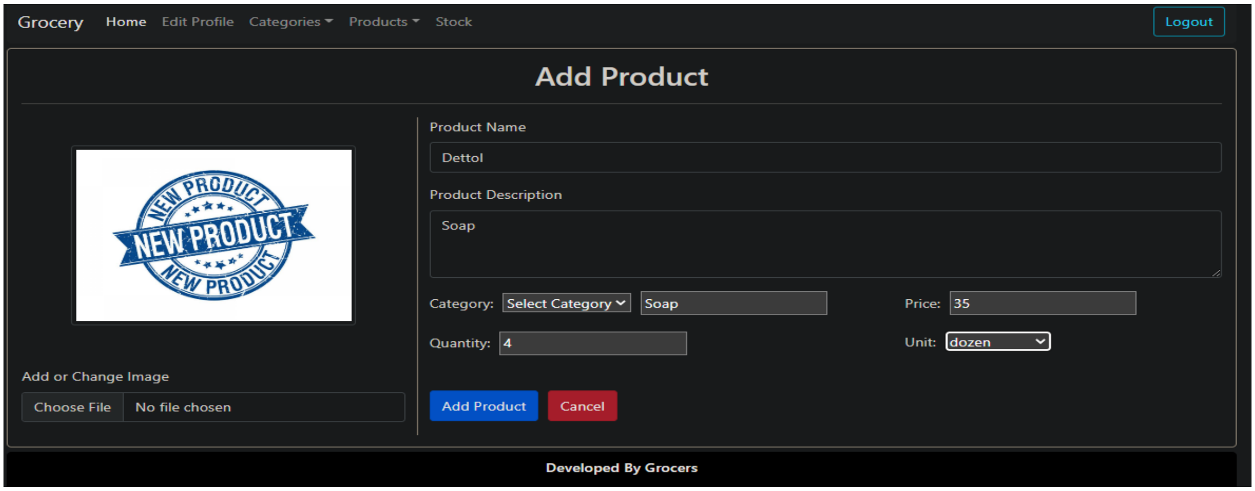
5.1.1 Admin Home page



Welcome admin

E-Kart Image:5.1.1-Admin Home page

5.1.2 Admin Add Product Function



Add Product

Product Name: Dettol

Product Description: Soap

Category: Select Category Soap

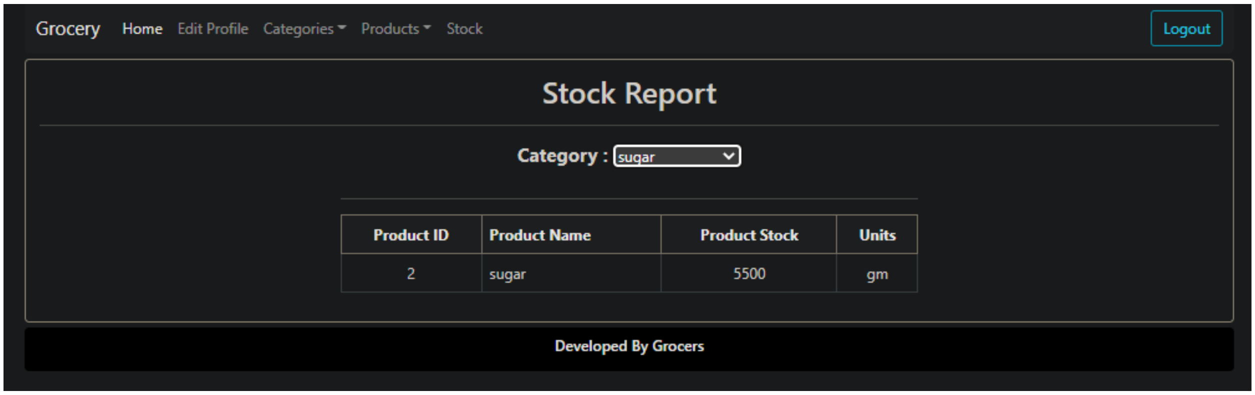
Price: 35

Quantity: 4

Unit: dozen

E-Kart Image:5.1.2-Admin Add Product page

5.1.3 Admin Stock Report Function



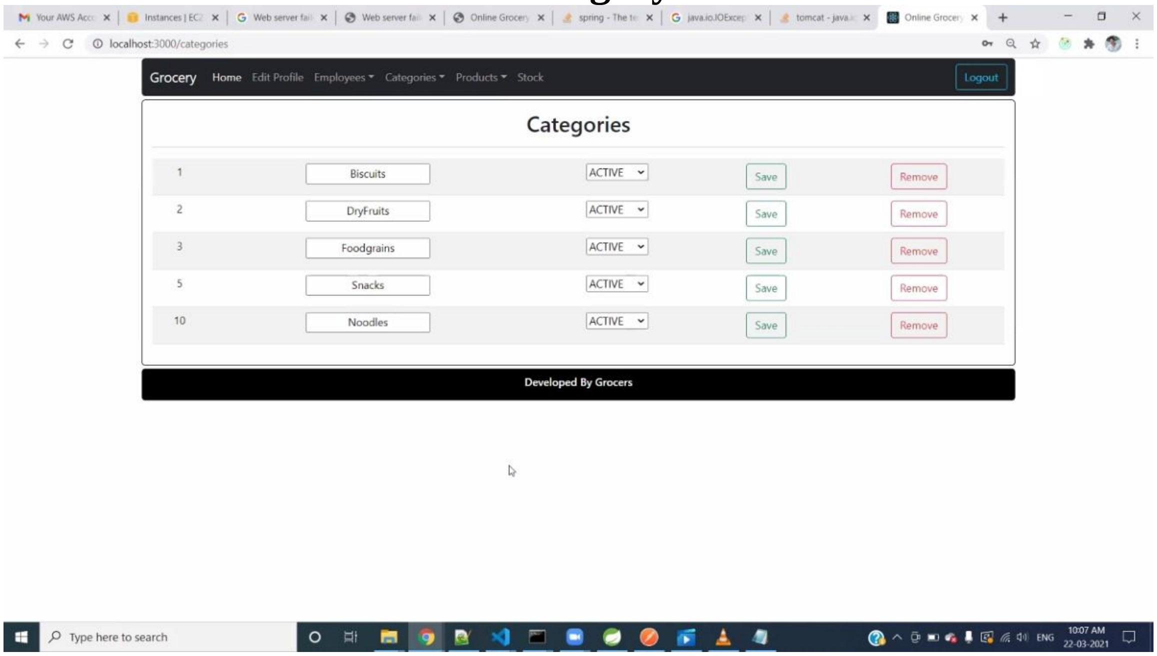
Stock Report

Category : sugar

Product ID	Product Name	Product Stock	Units
2	sugar	5500	gm

E-Kart Image:5.1.3-Admin Available Stock report by Category

5.1.4 Add- Remove Category



Categories

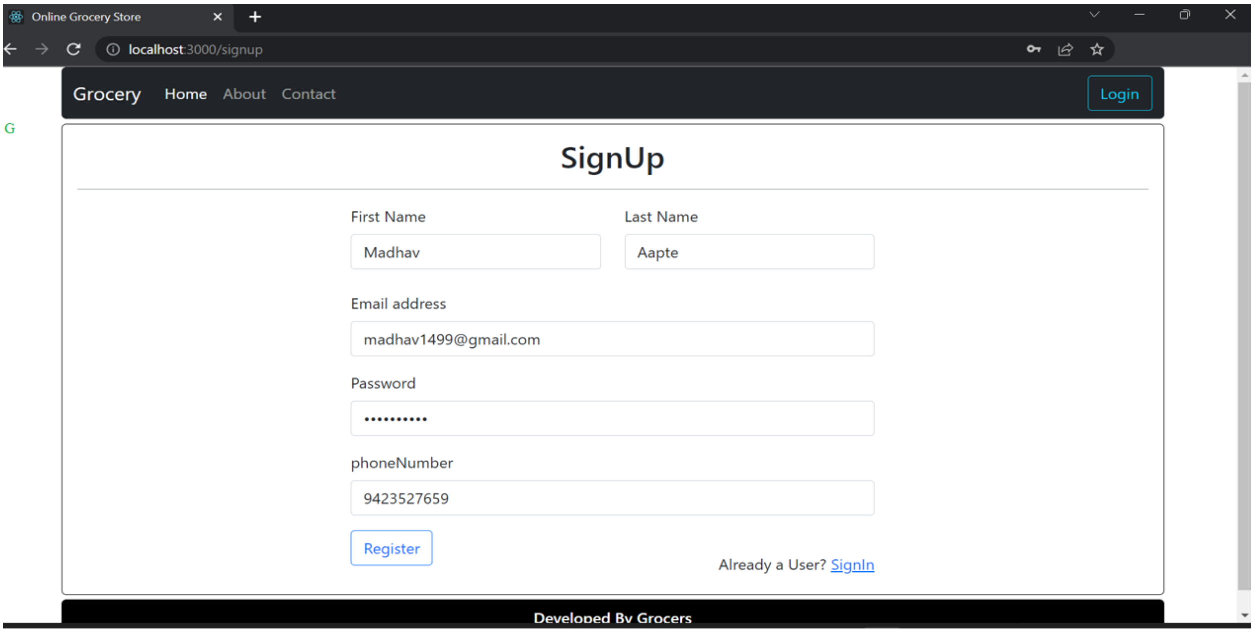
1	Biscuits	ACTIVE	Save	Remove
2	DryFruits	ACTIVE	Save	Remove
3	Foodgrains	ACTIVE	Save	Remove
5	Snacks	ACTIVE	Save	Remove
10	Noodles	ACTIVE	Save	Remove

Developed By Grocers

E-Kart Image:5.1.4-Admin Add or remove product category function

5.2 Customer

5.2.1 Customer Signup page



SignUp

First Name: Madhav

Last Name: Aapte

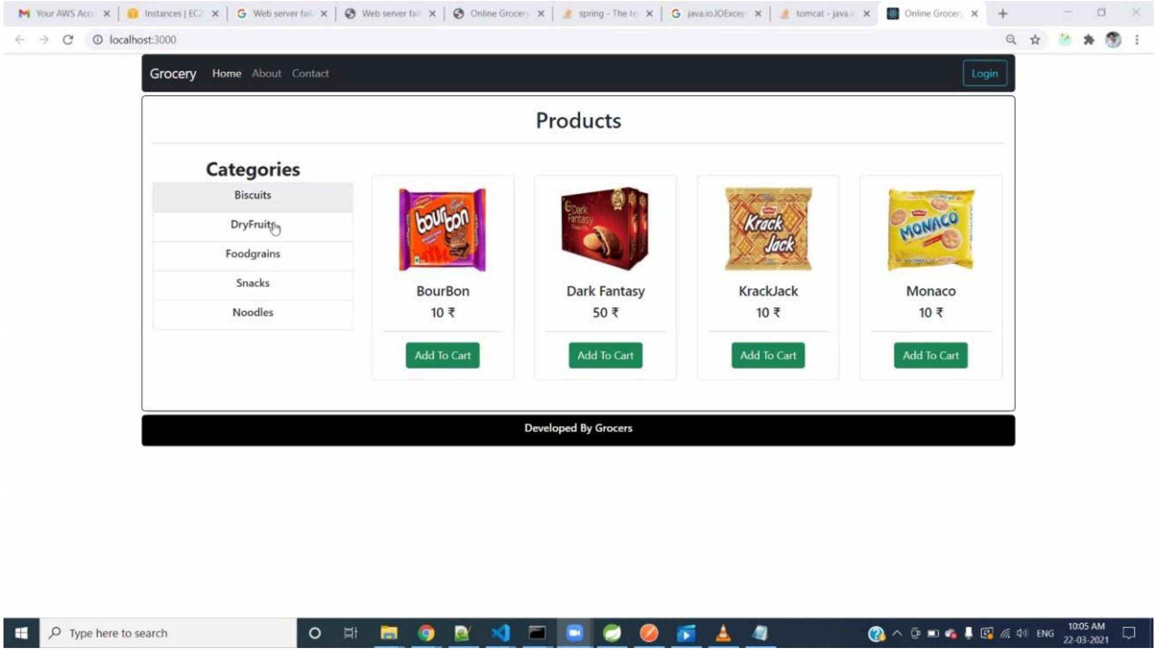
Email address: madhav1499@gmail.com

Password: ••••••••••

phoneNumber: 9423527659

E-Kart Image:5.2.1-User Signup page for Customer

5.2.2 Customer Available Products View



Products

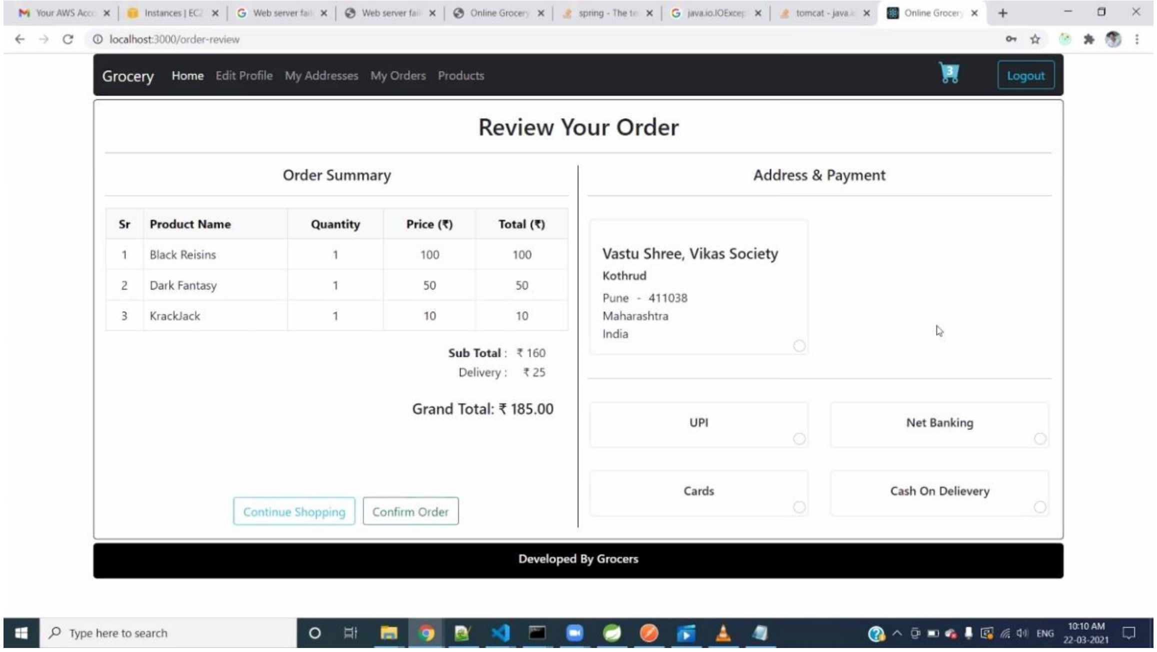
Categories

- Biscuits
- DryFruits
- Foodgrains
- Snacks
- Noodles

BourBon	Dark Fantasy	KrackJack	Monaco
10 ₹	50 ₹	10 ₹	10 ₹
Add To Cart	Add To Cart	Add To Cart	Add To Cart

E-Kart Image:5.2.2-User Category and Product view

5.2.3 Customer Order Review



Review Your Order

Order Summary

Sr	Product Name	Quantity	Price (₹)	Total (₹)
1	Black Reisins	1	100	100
2	Dark Fantasy	1	50	50
3	KrackJack	1	10	10

Sub Total : ₹ 160
Delivery : ₹ 25

Grand Total: ₹ 185.00

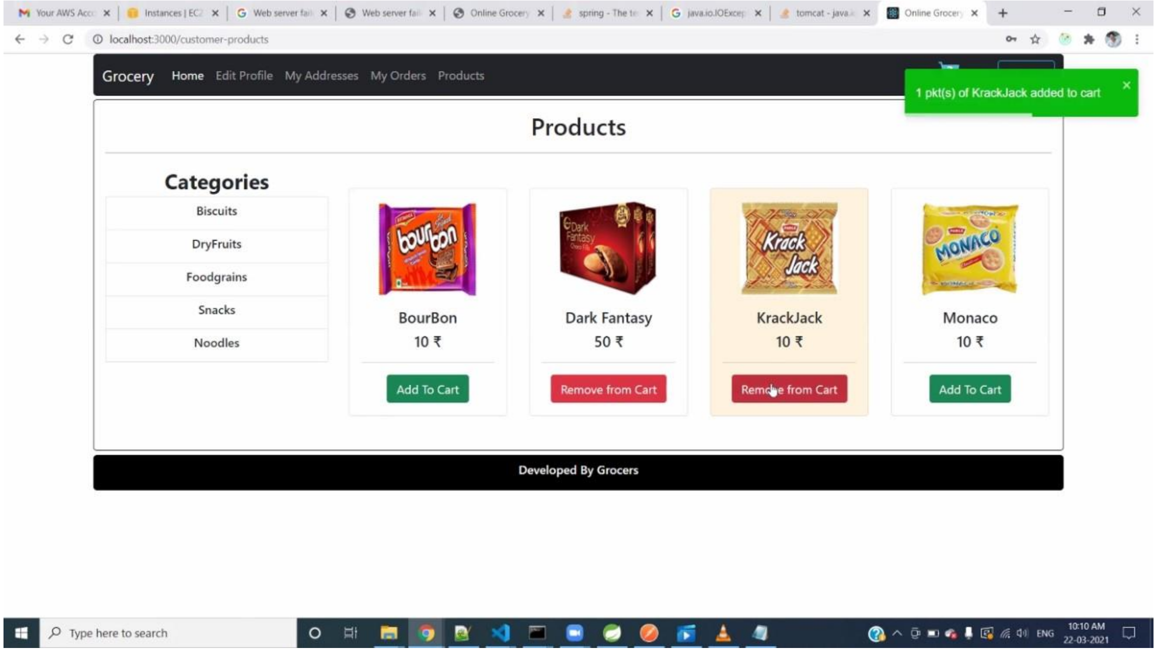
Address & Payment

Vastu Shree, Vikas Society
Kothrud
Pune - 411038
Maharashtra
India

UPI ○
Net Banking ○
Cards ○
Cash On Delievery ○

E-Kart Image:5.2.3-User Order details with Delivery and Payment options

5.2.4 Product Add-to-Cart Function



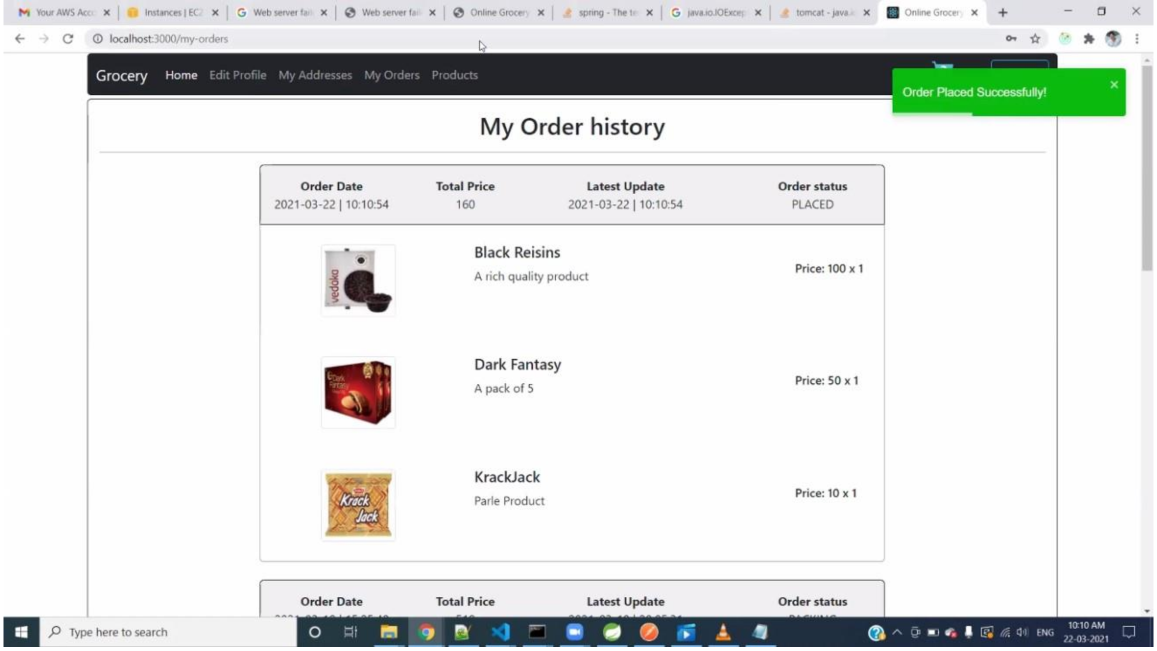
1 pkt(s) of KrackJack added to cart

Products

BourBon 10 ₹
Dark Fantasy 50 ₹
KrackJack 10 ₹
Monaco 10 ₹

E-Kart Image:5.2.4-Products added to cart and its confirmation

5.2.5 Customer Order History



Order Placed Successfully!

My Order history

Order Date	Total Price	Latest Update	Order status
2021-03-22 | 10:10:54	160	2021-03-22 | 10:10:54	PLACED

Black Reisins
A rich quality product
Price: 100 x 1

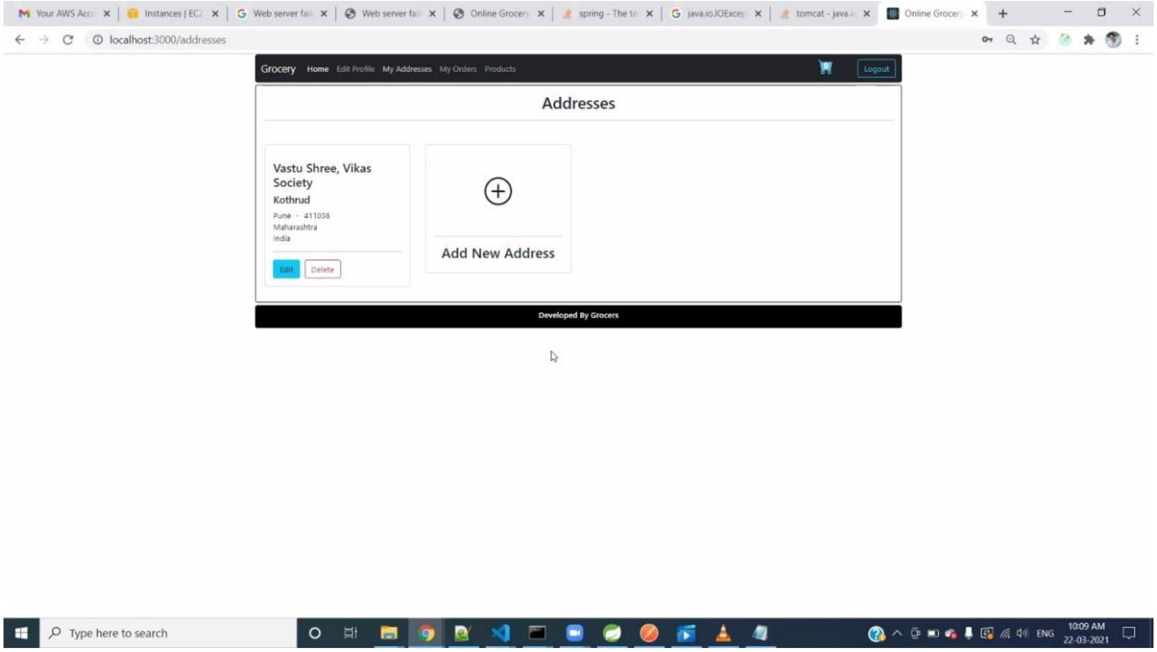
Dark Fantasy
A pack of 5
Price: 50 x 1

KrackJack
Parle Product
Price: 10 x 1

Order Date	Total Price	Latest Update	Order status

E-Kart Image:5.2.5-Customer Order History View

5.2.6 Customer Address Details



Addresses

Vastu Shree, Vikas Society
Kothrud
Pune - 411038
Maharashtra
India

Developed By Grocers

E-Kart Image:5.2.6-Customer Add and Modify address details option

6. TESTING

Software testing is a process of running with the intent of finding errors in application software. Software testing assures the quality of software and represents final review of other phases like specification, design, implementation. However, if we implement the system without proper testing, then it may lead to bad user experience.

Following are the testing techniques we used to test our product

6.1 Unit testing

It emphasizes the verification effort on the smallest unit of software design.

We have tested each view/module of the application individually with there functionalities.

6.2 Integration testing

In integration testing different modules are tested while components interaction.

6.3 Validation Testing

It assures that software meets all functional, behavioral and performance requirement.

Test cases we used like

1. Addition of a new product to the cart should create a new row in the shopping cart.
2. Addition of an existing product to the cart has to update the quantity of the product.

A. Admin Feature Test

Test Case Id	Description	Outcome	Result
A01	Sign In as Admin	Fetch for authenticated user details saved in database	Pass
A02	Add new product	Product added in database	Pass
A03	Update Product details	Product details changed to newly entered details	Pass
A04	Delete Product	Product with entered details got removed from database	Pass
A05	Delete Product from empty database	Given error as No product available	Pass
A06	Sign in as Admin with Wrong Credentials	Sign in failed. Asked to enter credential again	Pass
A07	Delete customer	Customer with all related details deleted from database	Pass
A08	Logout from admin profile	The Session was cleared	Pass

B. Customer Feature Test

Test Case Id	Description	Outcome	Result
C01	Sign In as Customer	Fetch for authenticated user details saved in database	Pass
C02	Add product to cart	Product added in cart	Pass
C03	Update Customer details	Customer details changed to newly entered details	Pass
C04	Remove product from cart	Product removed from Cart and number of items in cart reduced by 1	Pass
C05	Delete Product from empty cart	Given error as No product added in cart	Pass
C06	Sign in as with wrong credentials	Sign in failed. Asked to enter credential again	Pass
C07	Delete customer	Customer with all related details deleted from database	Pass

7. CONCLUSION

The “E-Kart Shopping System” is designed to provide a web-based application that would make viewing and purchasing of product easier. We developed this application with the latest technologies which are cross-platform and robust. The software we used are open source in nature which kept cost of production at minimum.

In conclusion “E-Kart” as an application would definitely be a good choice for grocery shopping for all kind of people also it will be helpful for small business vendors for selling their products.

8. FUTURE SCOPE

The following things can be added in the future

- The current system can be extended to allow the users to create accounts and save products in to wish list
- The users could subscribe for price alerts which would enable them to receive messages when price for products fall below a particular level
- Users can have multiple shipping information's saved. During the checkout they can easily select address from there address lists
- Users can add and save different types of payment options
- After ordering or after confirmation of payment email or SMS with invoice details can be sent to customer
- An email notification about out-of-stock products which is now available

9.REFERENCES

Following is the list of websites we referred during the course of our project:

1. www.w3schools.com
2. https://start.spring.io/
3. https://www.digitalocean.com/community/tutorials/spring-validation-example-mvc-validator
4. https://spring.io/projects/spring-data-rest
5. https://spring.io/guides/gs/rest-service/
6. https://spring.io/guides/tutorials/react-and-spring-data-rest/
7. https://getbootstrap.com/docs/5.0/getting-started/introduction/