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Project Title: ByteBazaar

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Submitted to: Mr. Prithivi Maharjan

I confirm that I understand my coursework needs to be submitted online via Google Classroom under the relevant module page before the deadline in order for my assignment to be accepted and marked. I am fully aware that late submissions will be treated as non-submission and a mark of zero will be awarded.

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1. Introduction:

This is the introduction report for the group project that our group worked on to create the ByteBazaar e-commerce website. The goal of this team effort is to utilise a combination of MySQL database administration, HTML, CSS, and JavaScript for front-end interface development, and the JEE Framework for back-end development. The project demonstrates the application of complex JSTL, and MySQL along with basic web development technologies like HTML, CSS, and JS. It also shows how these technologies can be integrated and used in a real-world scenario.

ByteBazaar is a company that aims to create a strong online marketplace by combining technological innovation and economic savvy. Our project aims to provide a smooth user experience that is distinguished by functionality, responsiveness, and visual appeal, with an emphasis on the selling of mobile phones. Through the integration of various technologies and approaches, our goal is to create a dynamic, user-focused online marketplace that meets the changing demands of contemporary customers.

We will examine the development processes, technology stack, architectural design, and planned features of ByteBazaar in this paper. By means of methodical planning, intense development, and proficient teamwork, our team strives to actualize the concept of a fully operational and adaptable e-commerce website, ready to leave an imprint on the digital landscape.

Come along on this trip with us as we negotiate the complexities of web development and pave the way for the creation of ByteBazaar, a place where convenience and innovation collide and technology and business meet.

1.1. Aims:

The main aims for the ByteBazaar project are given below:

- i. Create a User-Friendly E-commerce Platform
- ii. Develop a Scalable and Maintainable Architecture
- iii. Ensure High Performance and Responsiveness
- iv. Provide a Secure Online Shopping Experience
- v. Enhance User Interaction and Engagement

1.2. Objectives:

The main objective of the ByteBazaar project is to create, develop, and implement a mobile phone-focused e-commerce website that is fully responsive and operational.

- i. Design a visually appealing and easy-to-use interface using HTML, CSS, and JavaScript
- ii. Develop strong backend features using the Java web building technology, including order processing, user authentication, and product management.
- iii. Implement a MySQL database schema to effectively store and manage product information, user data, and order details.
- iv. Apply responsive web design techniques to ensure a consistent user experience across devices.
- v. Integrate search and filtering features to improve the overall buying experience.

2. User Interface Design:

2.1. Wireframes:

2.1.1. Splash Screen:

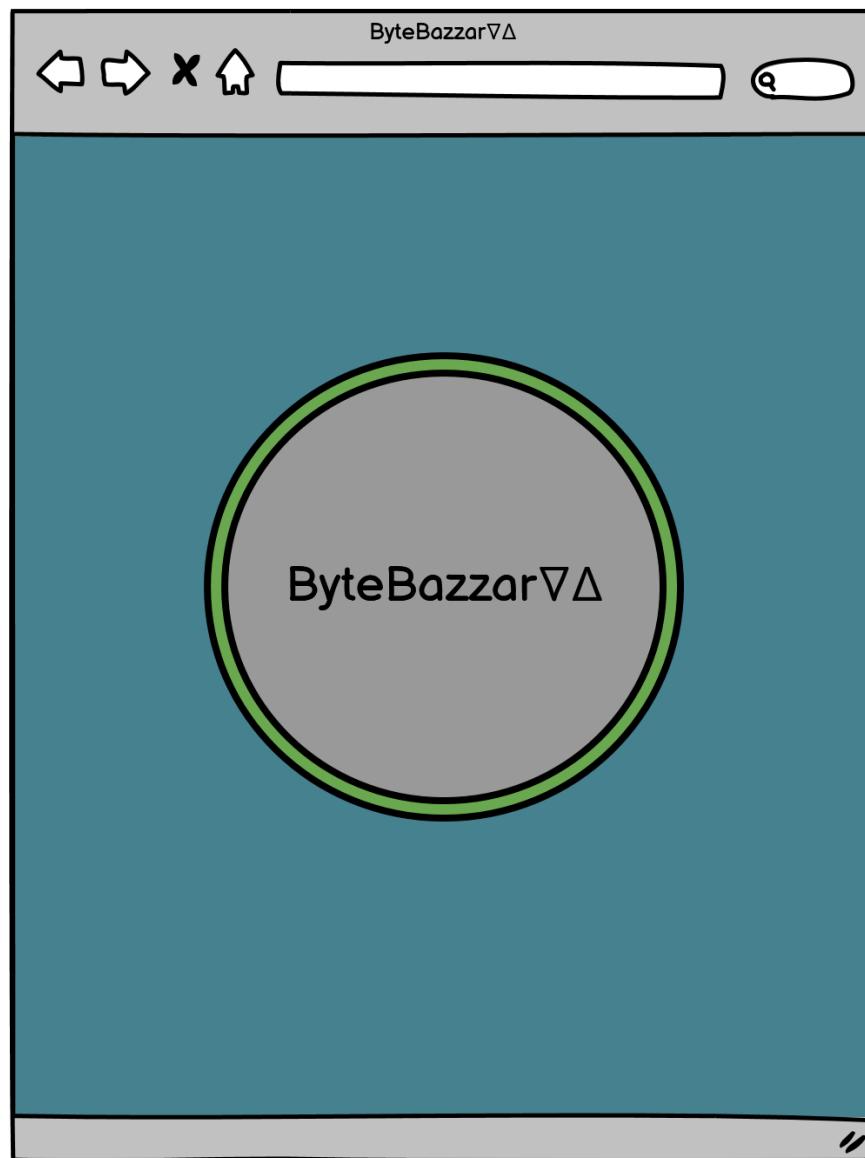


Figure 1: Splash Screen.

2.1.2. Login Page:

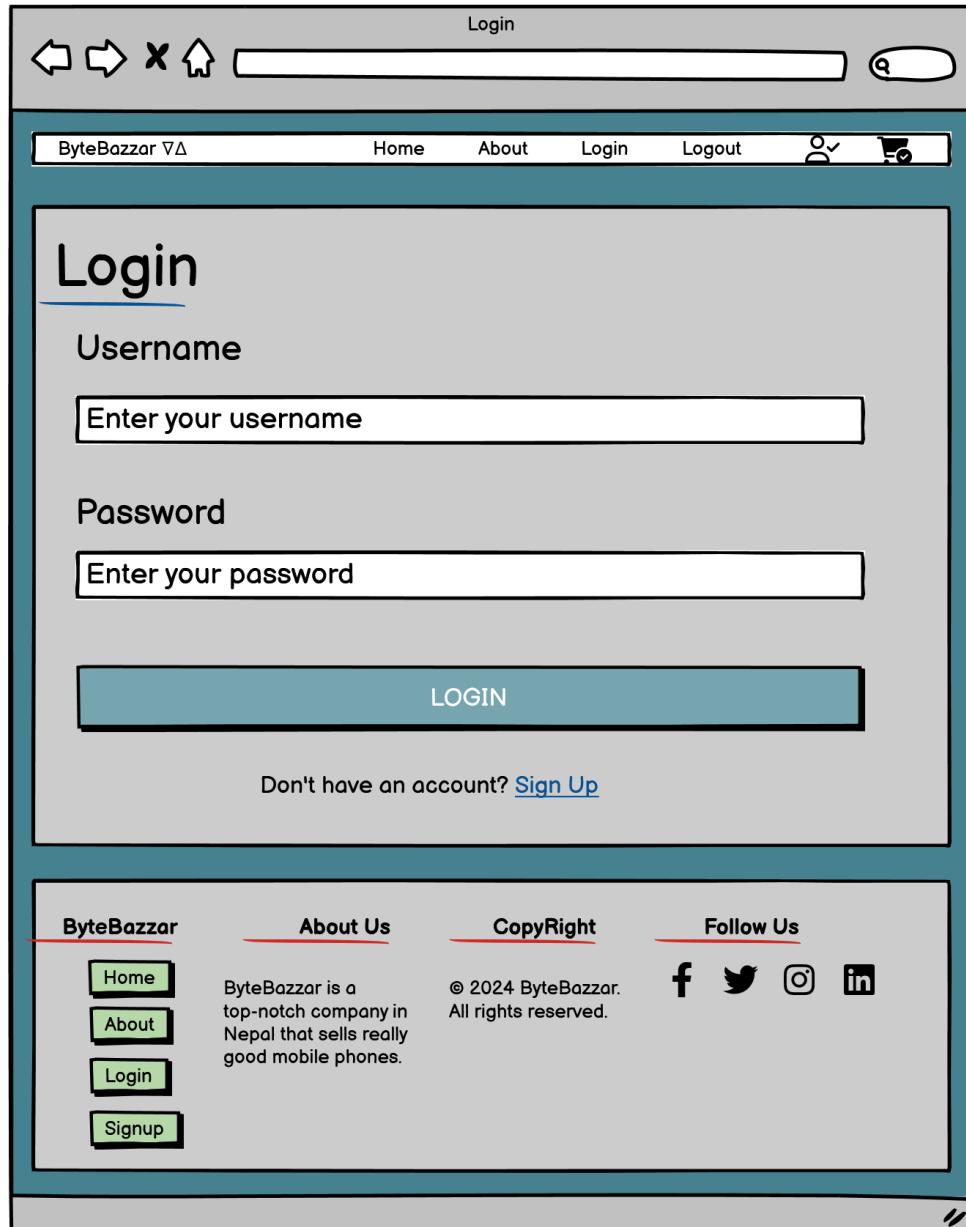


Figure 2: Login Page.

2.1.3. SignUp Page:

The screenshot shows the 'SignUp' page for the ByteBazaar website. The page has a light gray header bar with a back button, forward button, close button, and a search bar. Below the header is a dark blue navigation bar with the 'ByteBazaar' logo, 'Home', 'About', 'Login', 'Logout', and a user icon. The main content area is titled 'Registration'. It contains six input fields arranged in two columns: 'Full name' and 'Username', 'Email' and 'Phone Number', and 'Password' and 'Confirm Password'. Below these fields is a 'Gender:' section with 'Male' and 'Female' radio buttons. A large blue 'REGISTER' button is centered at the bottom of the form. Below the form, a message says 'Already have an account? [Login](#)'. At the very bottom of the page is a footer bar with the 'ByteBazaar' logo, 'About Us', 'CopyRight', and 'Follow Us' sections, along with social media icons for Facebook, Twitter, Instagram, and LinkedIn.

Sign Up

ByteBazaar ▾Δ Home About Login Logout

Registration

Full name

Username

Email

Phone Number

Password

Confirm Password

Gender:

Male Female

REGISTER

Already have an account? [Login](#)

ByteBazaar

[Home](#)
[About](#)
[Login](#)
[Signup](#)

About Us

ByteBazaar is a top-notch company in Nepal that sells really good mobile phones.

CopyRight

© 2024 ByteBazaar. All rights reserved.

Follow Us

Figure 3: SignUp Page.

2.1.4. Home Page:

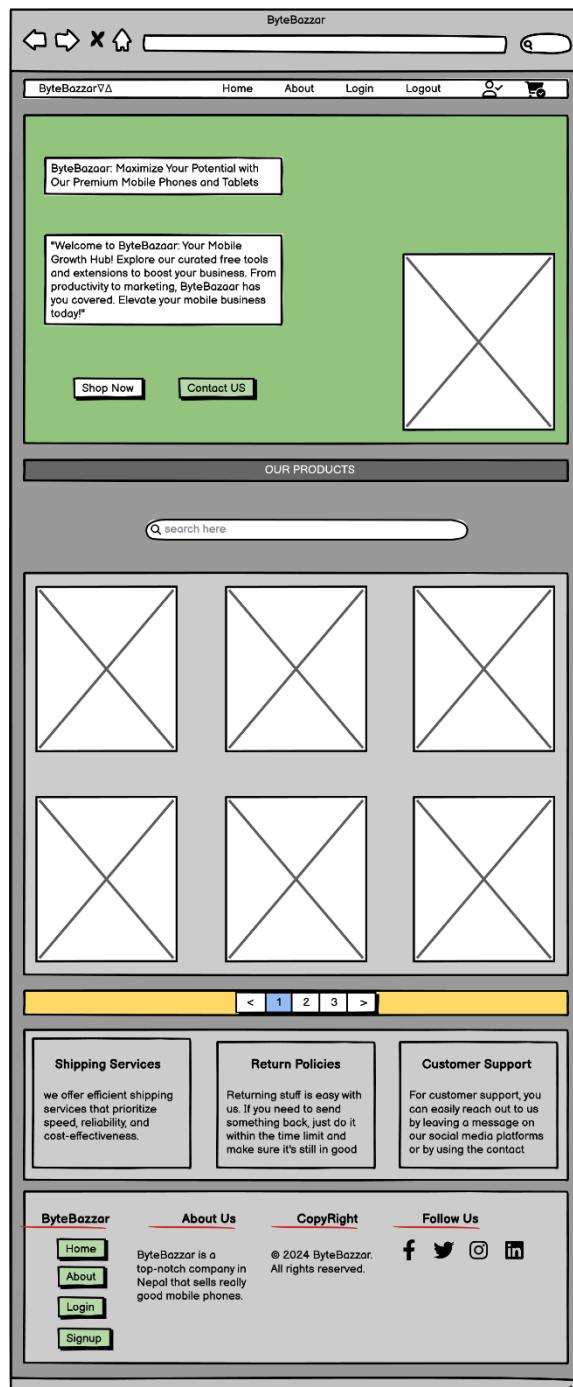


Figure 4: Home Page.

2.1.5. About Us Page:

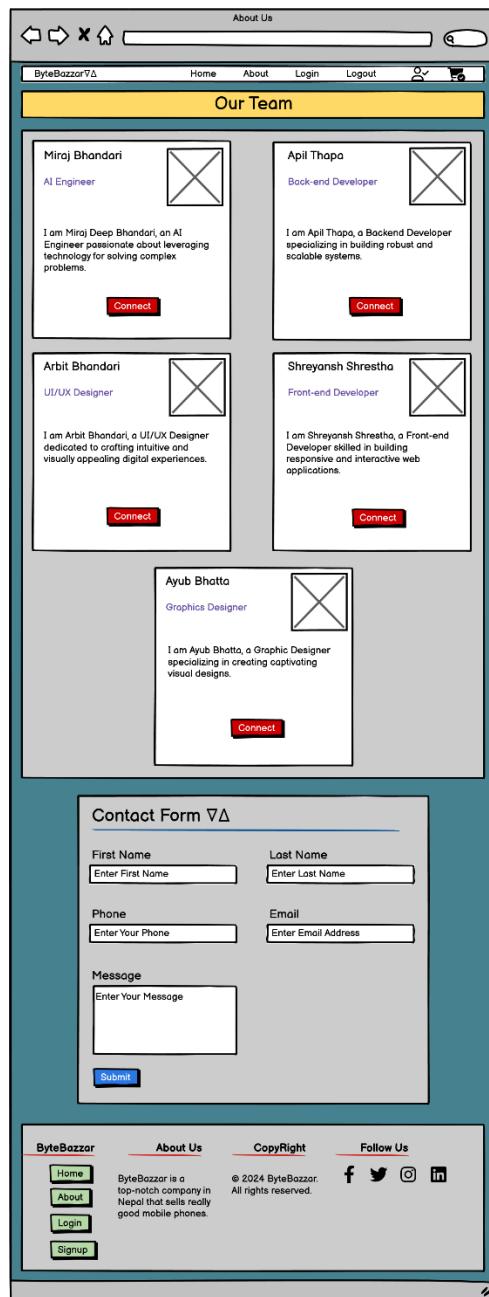


Figure 5: About Us Page.

2.1.6. Profile Page:

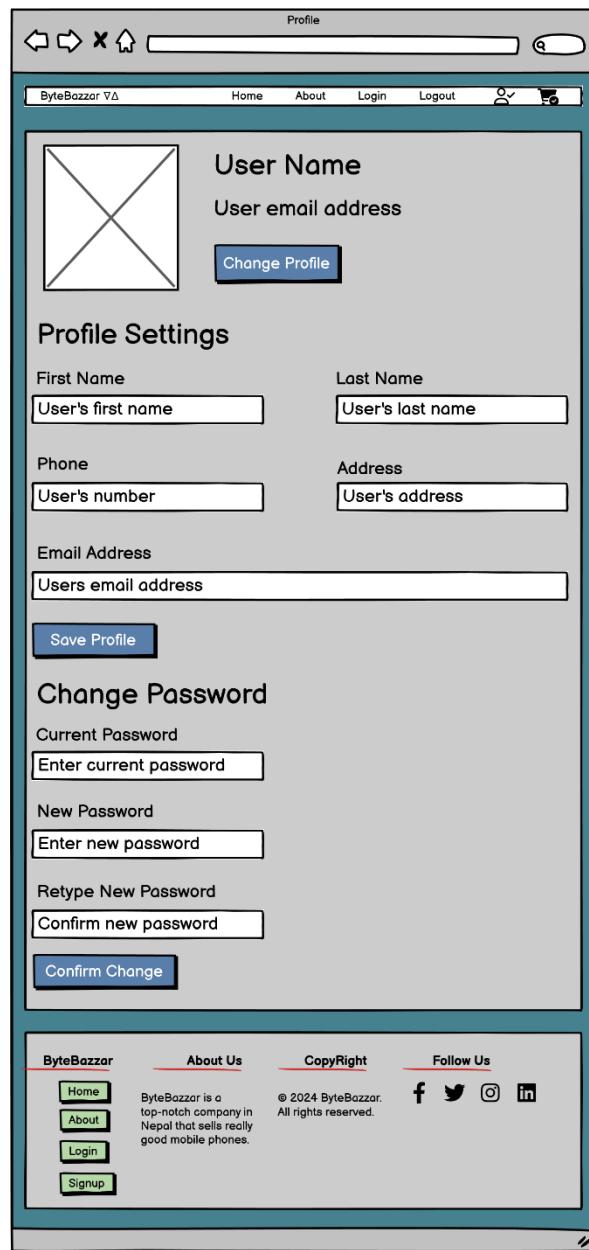


Figure 6: Profile Page.

2.1.7. Admin Panel:

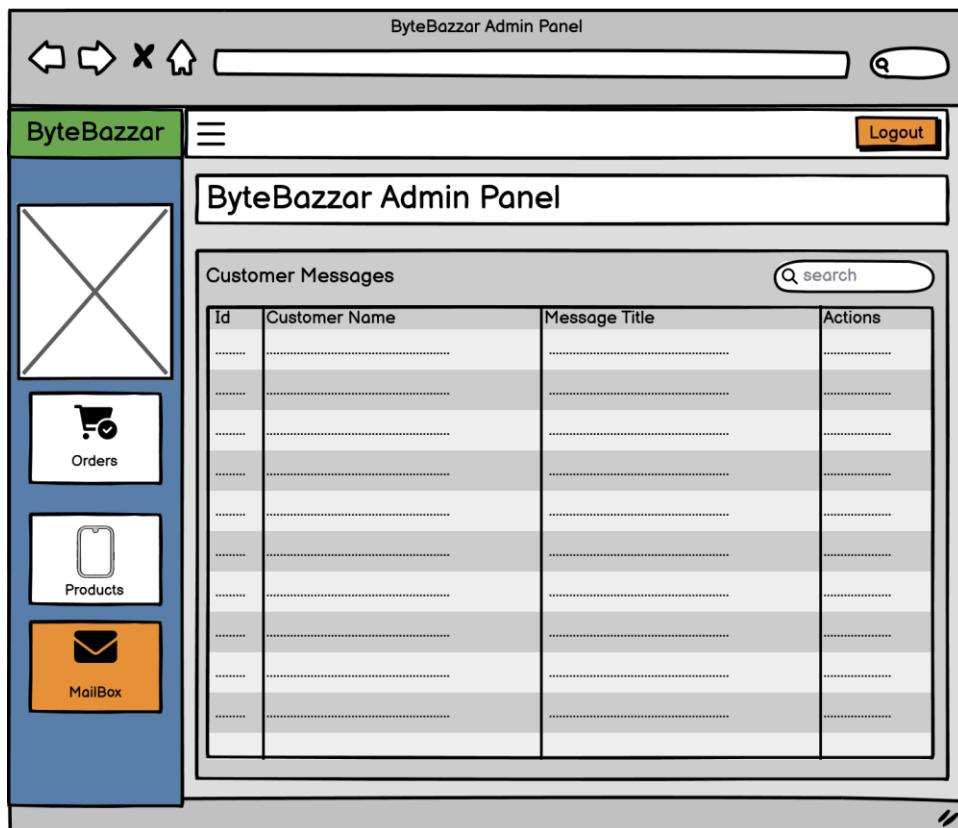


Figure 7: Admin Panel.

2.1.8. Product-View Page:

The screenshot shows the ByteBazaar Admin Panel interface. At the top, there is a header bar with navigation icons (back, forward, search, refresh) and a title "ByteBazaar Admin Panel". On the right side of the header is a "Logout" button. Below the header, the main content area has a title "ByteBazaar Admin Panel" and a "Logout" button. To the left, there is a sidebar with a green header "ByteBazaar" containing a logo and a menu icon. The sidebar also includes four buttons: "Orders" (with a shopping cart icon), "Products" (with a smartphone icon), and "MailBox" (with an envelope icon). The main content area features a "Products List" table with columns: Id, Product Name, RAM, Storage, Discount %, Price, and Actions. A search bar is located at the top right of the table. The table contains 15 rows of placeholder data.

Id	Product Name	RAM	Storage	Discount %	Price	Actions
.....
.....
.....
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.....
.....
.....
.....

Figure 8: Product-List Page.

2.1.9. Product Detail Page:

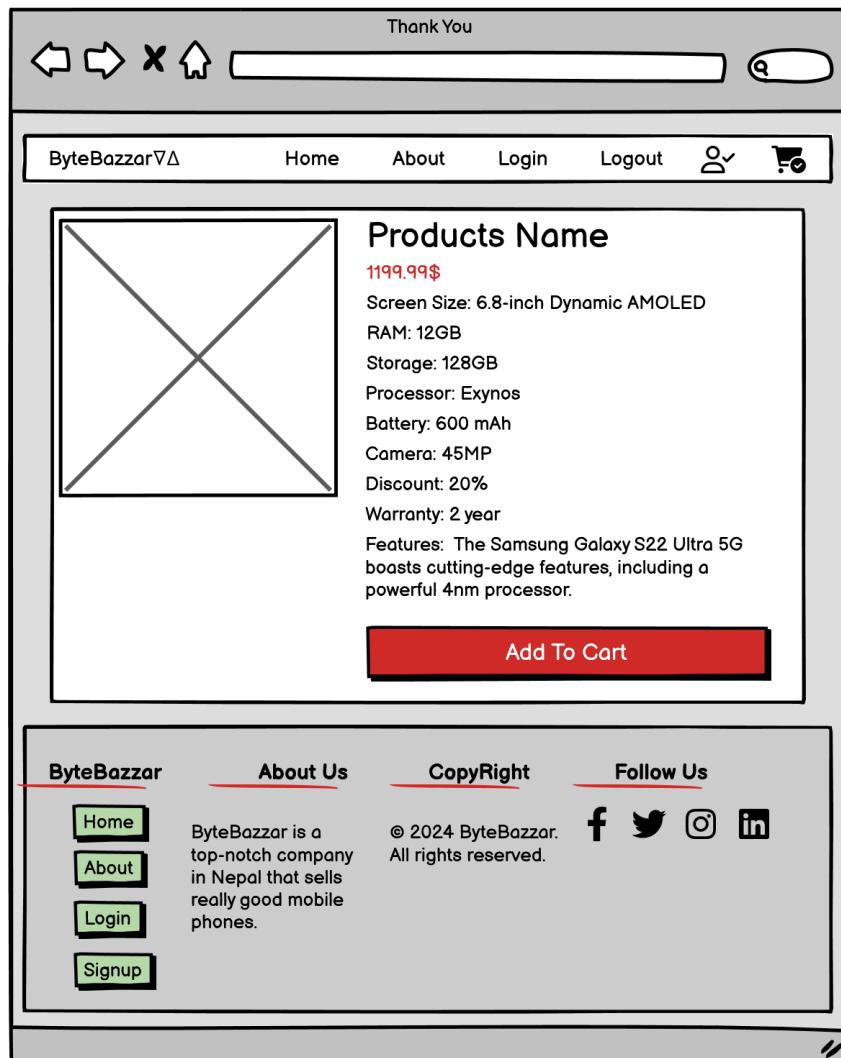


Figure 9: Product Details Page.

2.1.10. Order List:

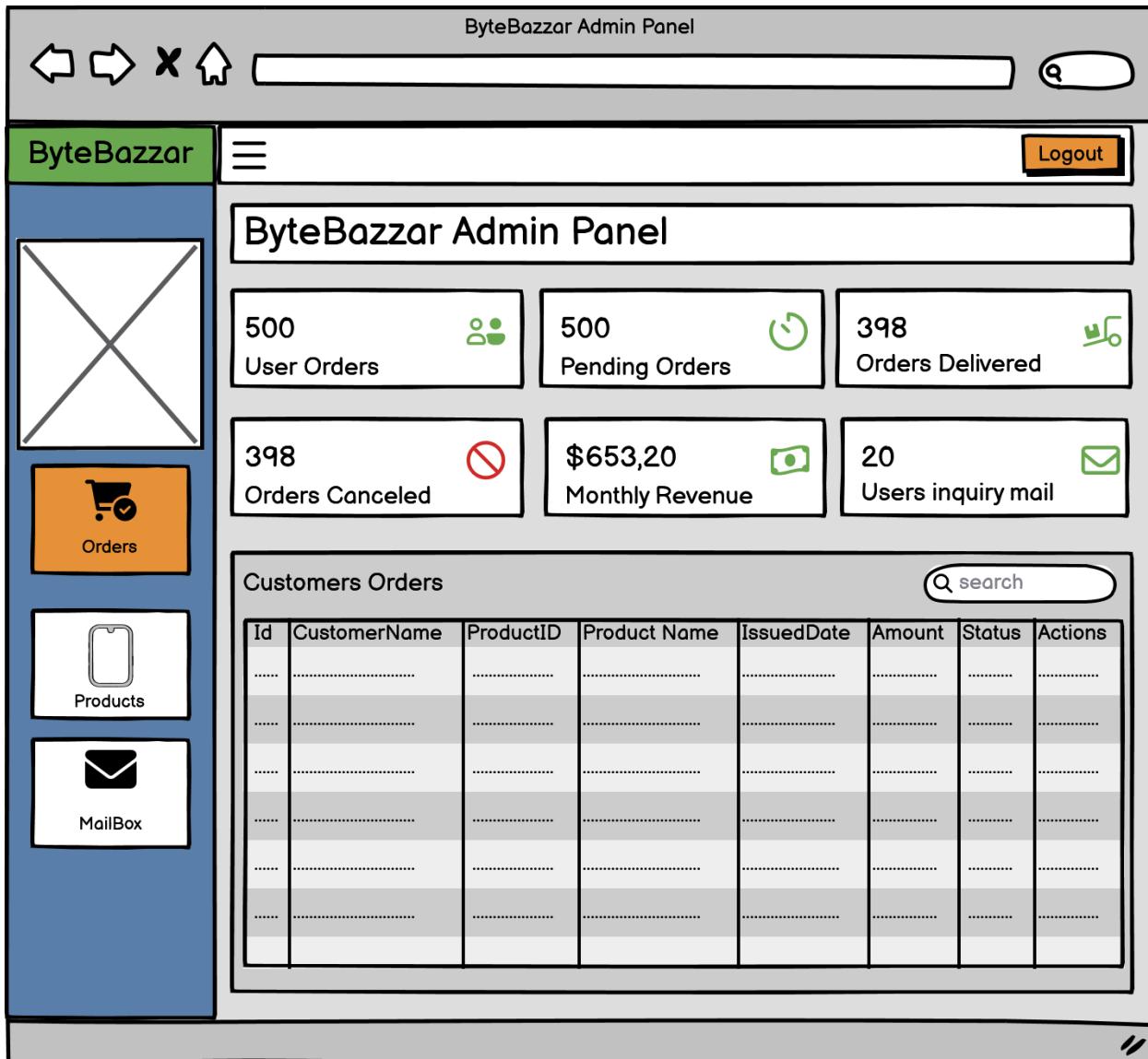


Figure 10: Order Lists.

2.1.11. Shopping-Cart Page:

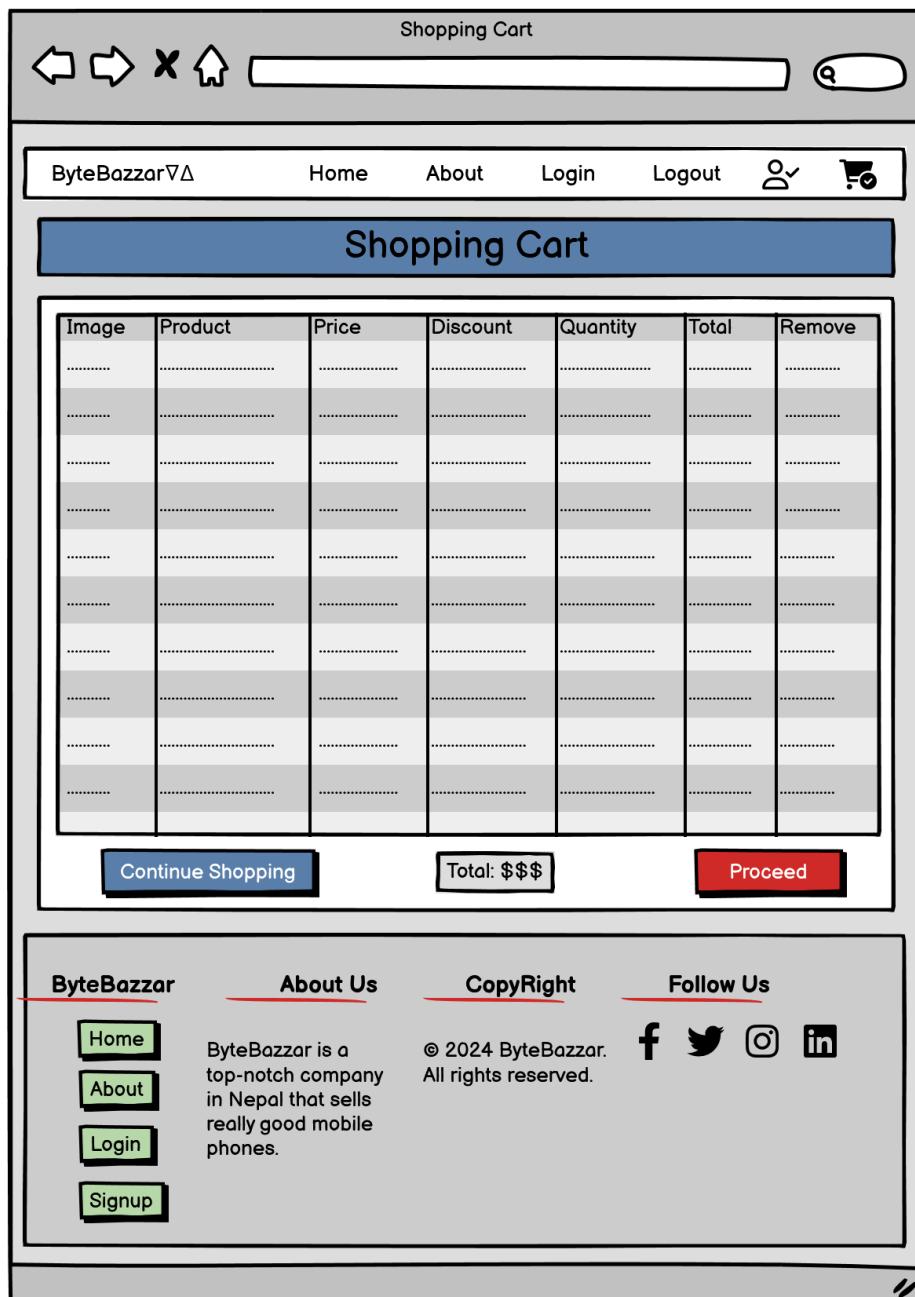


Figure 11: Shopping Cart Page.

2.1.12. Thank-You Page:

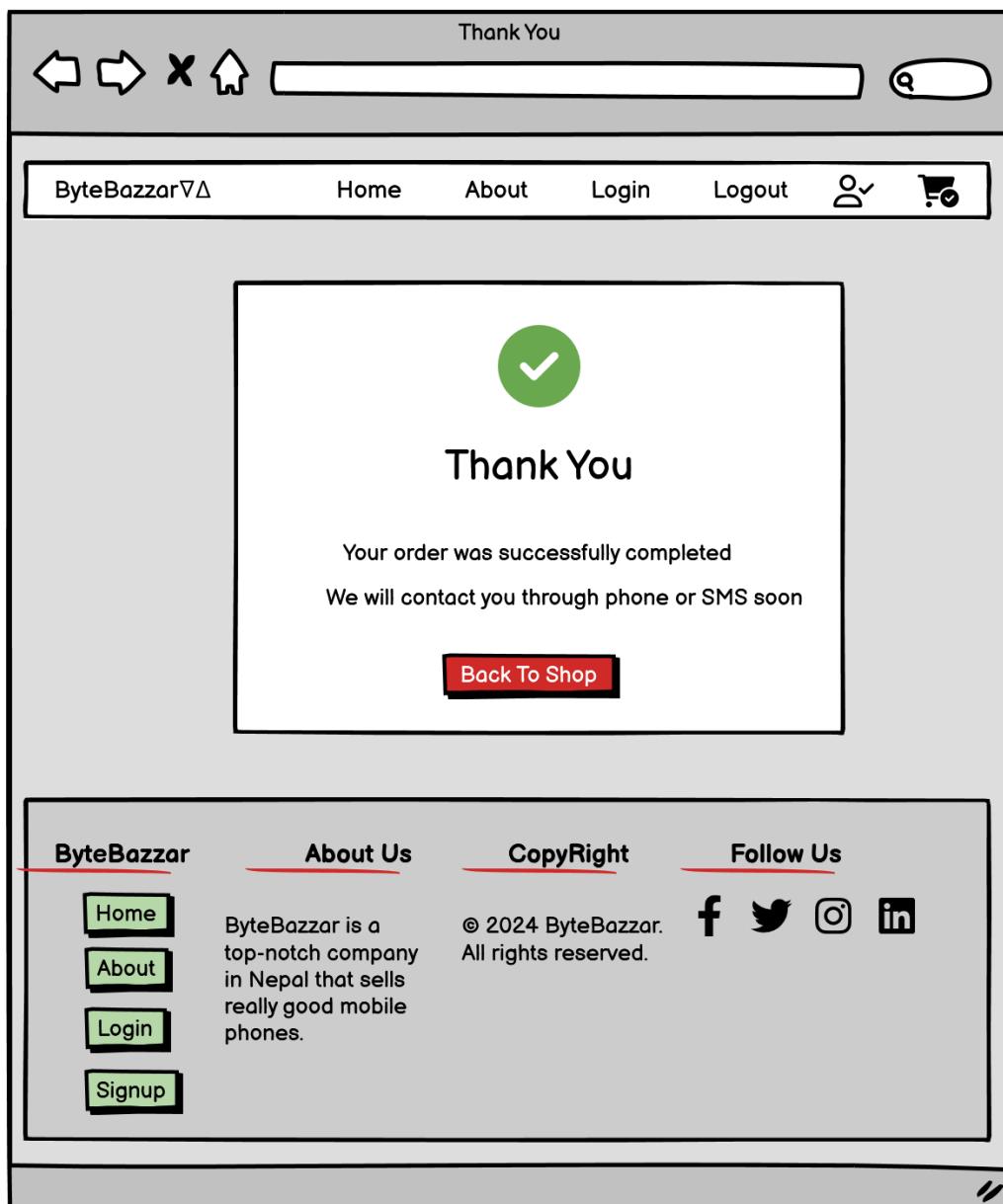


Figure 12: Thankyou Page.

2.2. Actual Design:

2.2.1. Login Page:

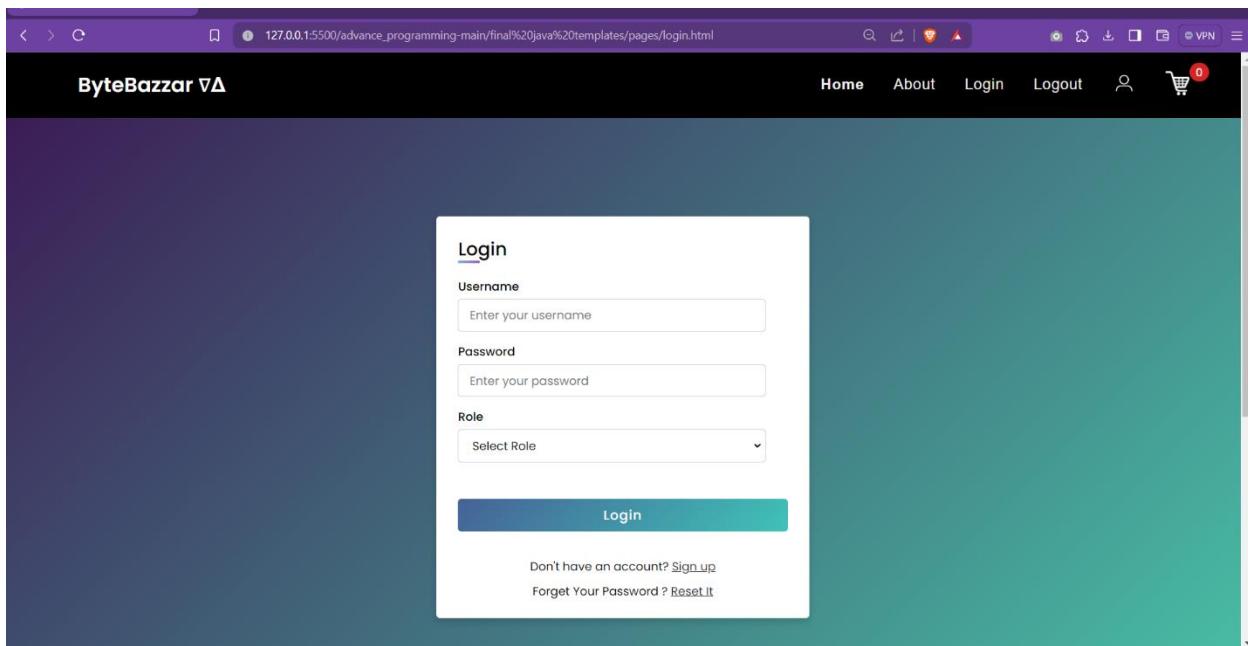


Figure 13: Actual Design-Login Page

2.2.2. Sign Up Page:

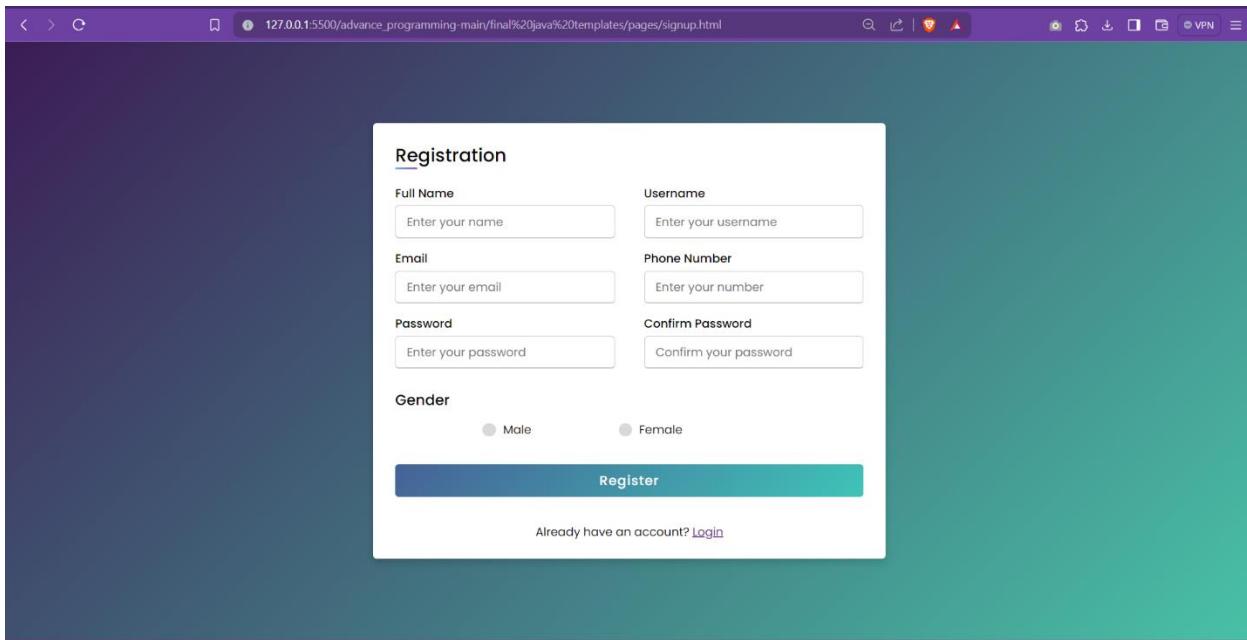


Figure 14: Sign Up Page.

2.2.3. Home Page:

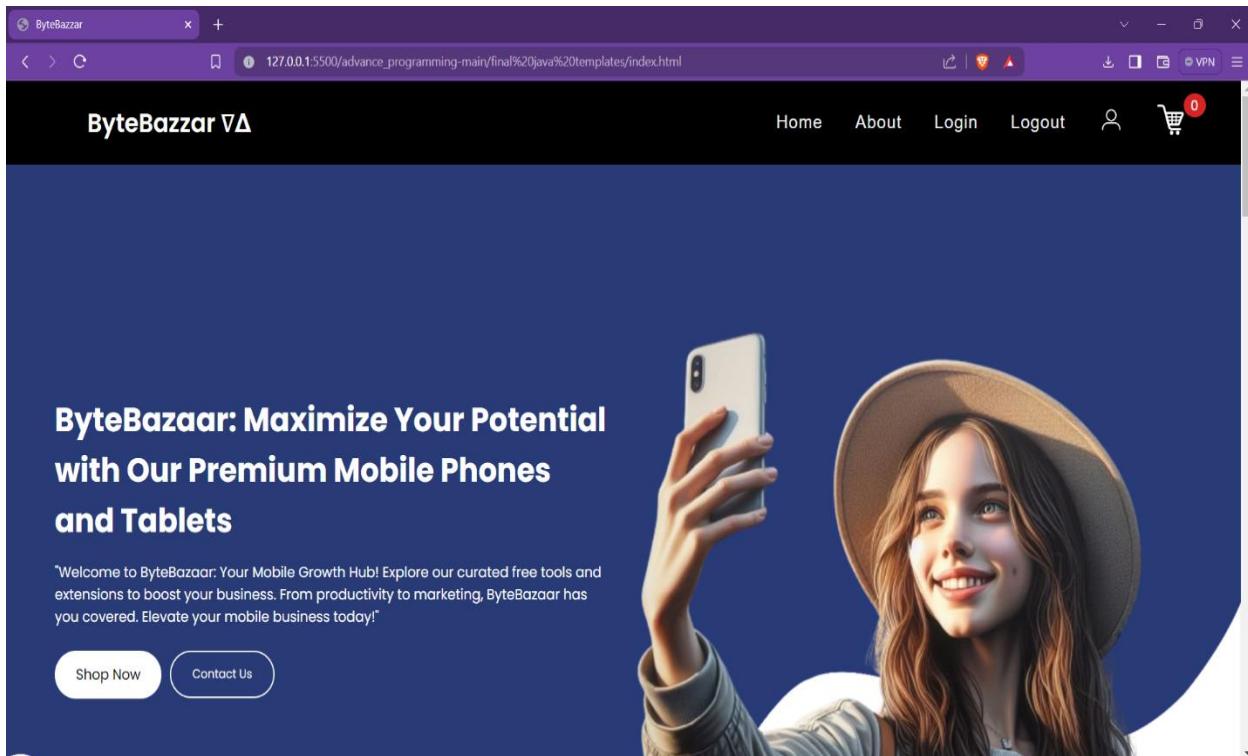


Figure 15: Home Page-1.

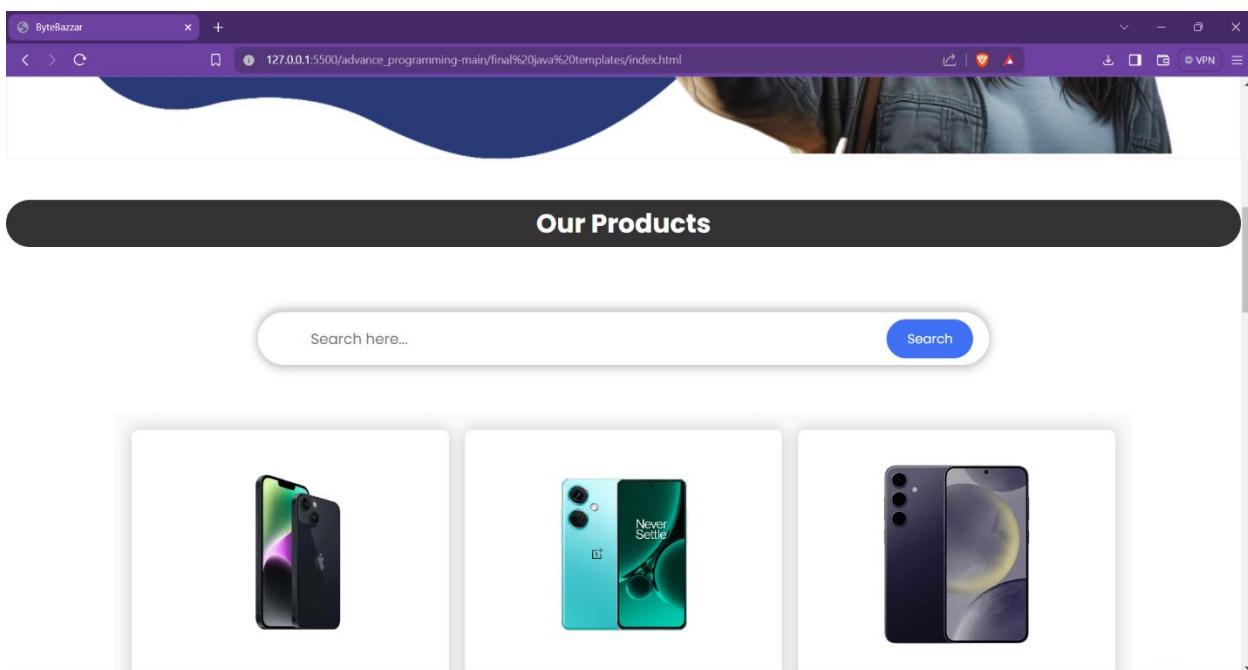


Figure 16: Home Page-2.

Our Products

Search


50% OFF
Apple iPhone 15
 Price: \$2500


30% OFF
OnePlus C3E
 Price: \$1700


20% OFF
Samsung S24
 Price: \$2200


10% OFF
Samsung Galaxy Z Flip 5
 Price: \$1200


20% OFF
Realme 11 pro
 Price: \$999


20% OFF
Samsung Galaxy Z Flip 5
 Price: \$2000


20% OFF
Samsung Galaxy Z Flip 5
 Price: \$2000


20% OFF
Samsung Galaxy Z Flip 5
 Price: \$2000


20% OFF
Samsung Galaxy Z Flip 5
 Price: \$2000

< 1 2 3 >

Figure 17: Home Page-3-Displaying products,

2.2.4. About Us Page:

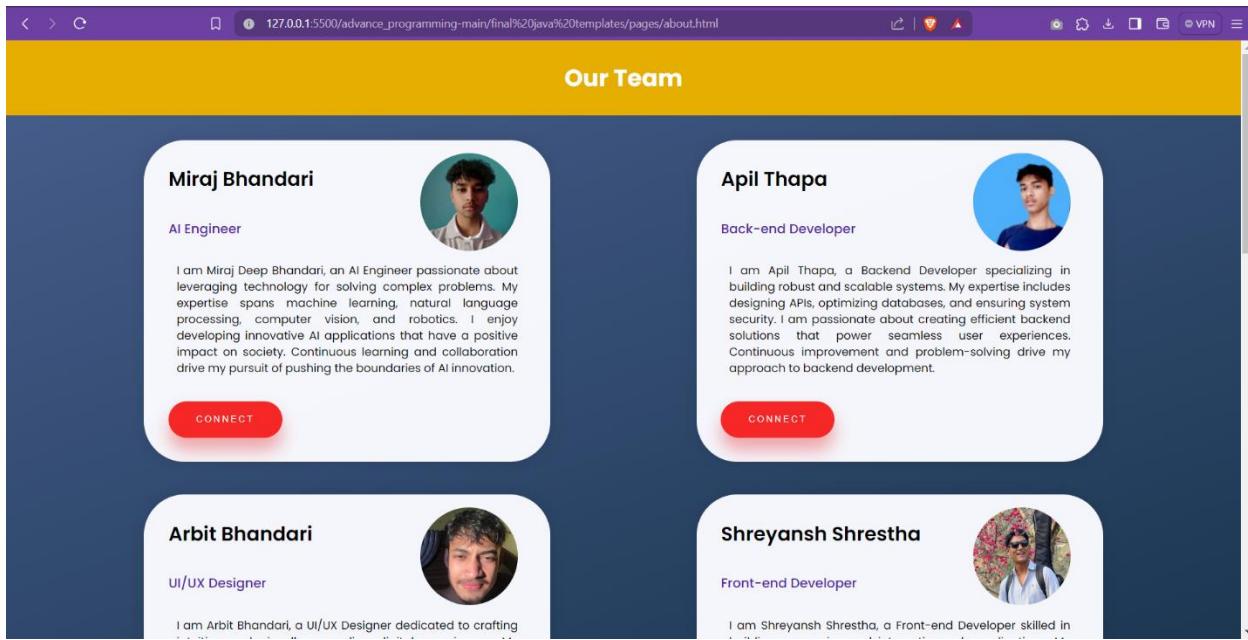


Figure 18: About Us Page-1.

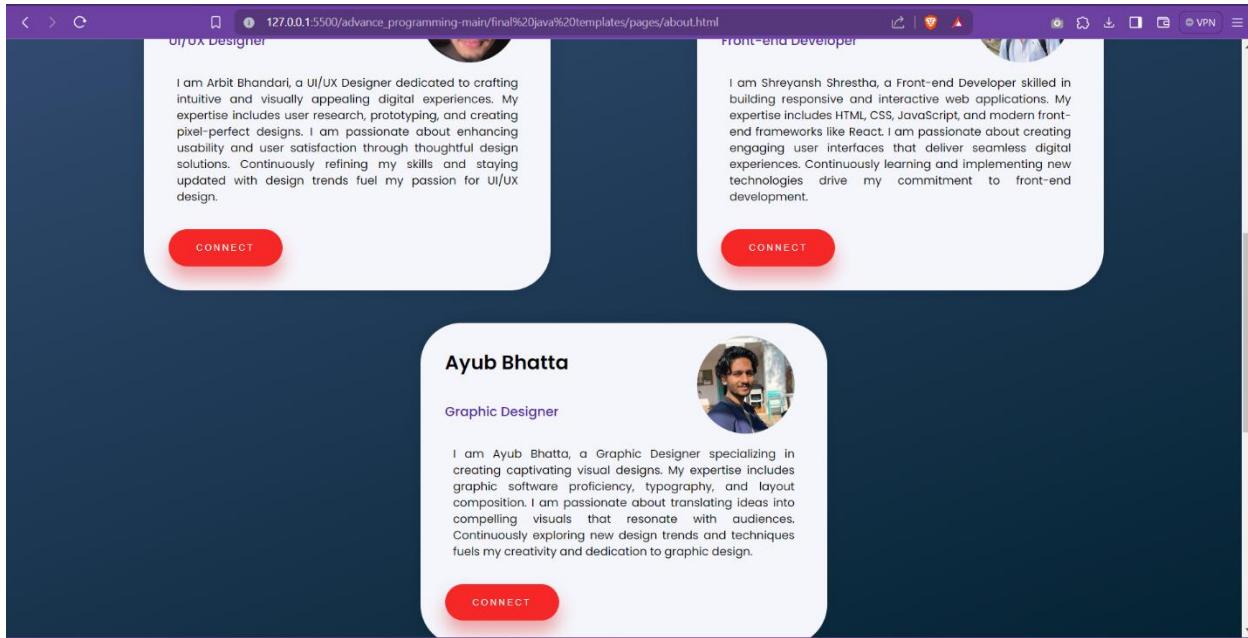


Figure 19: About Us Page-2.

A screenshot of a web browser displaying a contact form. The form is titled 'Contact Form'. It contains several input fields: 'Full Name' (split into 'Enter First Name' and 'Enter Last Name'), 'Phone' (with placeholder 'Enter your Phone'), 'Email' (with placeholder 'Enter email address'), 'Subject' (with placeholder 'Enter Message Subject'), and a large 'Message' area (with placeholder 'Enter your message'). At the bottom of the form is a blue 'Submit' button.

Figure 20: About Us-Contact Form.

2.2.5. Profile Page:

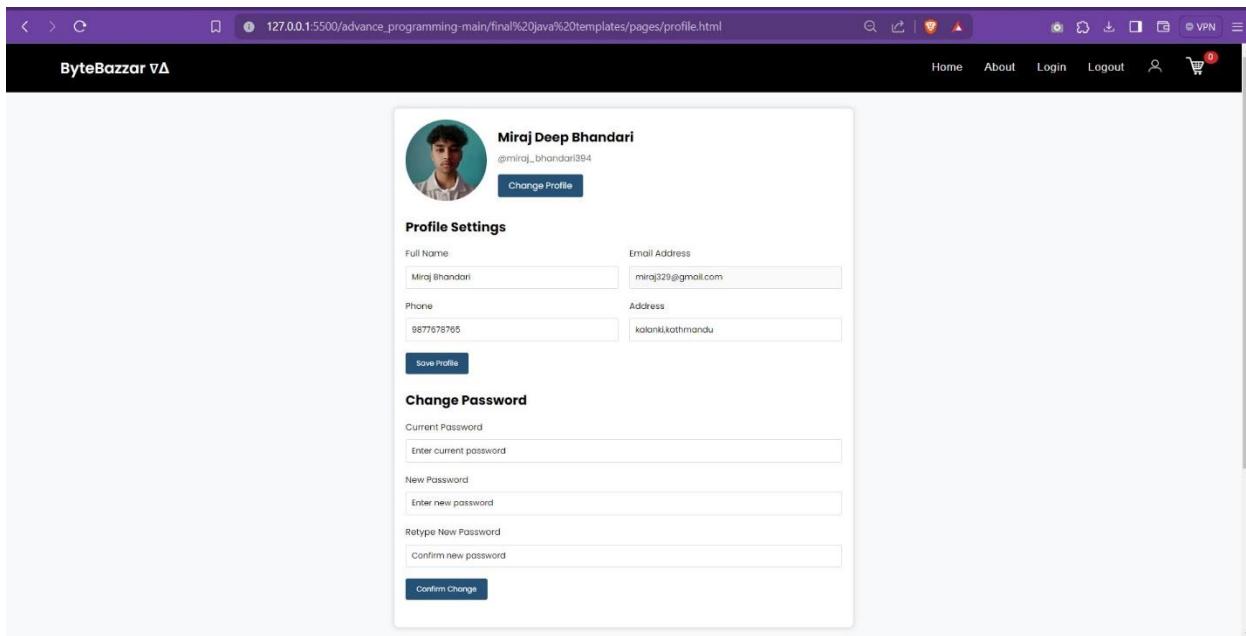


Figure 21: Profile Page.

2.2.6. Admin Panel:

The screenshot shows the ByteBazaar Admin Panel interface. On the left, there is a sidebar with a user profile picture of Miraj Deep Bhandari and three menu items: Orders, Products, and Mailbox. The main content area has a title "ByteBazaar Admin Panel". It displays several key metrics in cards: 500 User Orders (with a person icon), 102 Pending Orders (with a circular arrow icon), 398 Order Delivered (with a document icon), 398 Order Canceled (with a crossed-out circle icon), \$653,20 Monthly revenue growth (with a money bag icon), and 20 User Inquiry E-mails (with an envelope icon). Below these is a section titled "Customer Orders" with a table. The table has columns: Id, Customer Name, Product Id, Product Name, Issued Date, Amount, Status, and ACTIONS. Two rows of data are shown for customer #5033, both purchased One Plus 7 Pro for \$900. The first row is marked as "Delivered" and the second as "Pending". Each row includes icons for edit, view, and delete.

Id	Customer Name	Product Id	Product Name	Issued Date	Amount	Status	ACTIONS
#5033	Apil Thapa Apil@gmail.com	#p_3392	One Plus 7 Pro	19 April, 2022	\$900	Delivered	
#5033	Apil Thapa Apil@gmail.com	#p_3392	One Plus 7 Pro	19 April, 2022	\$900	Pending	

Figure 22: Admin Panel.

2.2.7. Admin-Products Page:

The screenshot shows the ByteBazaar Admin Panel interface. On the left, there is a sidebar with navigation links: 'ByteBazzar' (highlighted in green), 'Orders', 'Products' (selected), and 'Mailbox'. The main area has a header 'ByteBazaar Admin Panel' and a sub-header 'Products List'. A search bar with placeholder 'Search...' and a magnifying glass icon is located at the top right of the list table. Below the table, there is a horizontal scroll bar. The table has columns: Id, Product Name, RAM, Storage, Discount %, Price, and ACTIONS. There are five rows, each representing an 'Iphone 15 Pro Max' with the same specifications: 8 GB RAM, 256 GB Storage, 25% Discount, and \$2200 Price. Each row has three icons in the ACTIONS column: a pencil, an eye, and a trash can.

Id	Product Name	RAM	Storage	Discount %	Price	ACTIONS
		8 GB	256 GB	25%	\$2200	
#1_pun	Iphone 15 Pro Max	8 GB	256 GB	25%	\$2200	
#1_pun	Iphone 15 Pro Max	8 GB	256 GB	25%	\$2200	
#1_pun	Iphone 15 Pro Max	8 GB	256 GB	25%	\$2200	
#1_pun	Iphone 15 Pro Max	8 GB	256 GB	25%	\$2200	
#1_pun	Iphone 15 Pro Max	8 GB	256 GB	25%	\$2200	

Figure 23: Admin-Products Page.

2.2.8. Admin-Products-View Page.

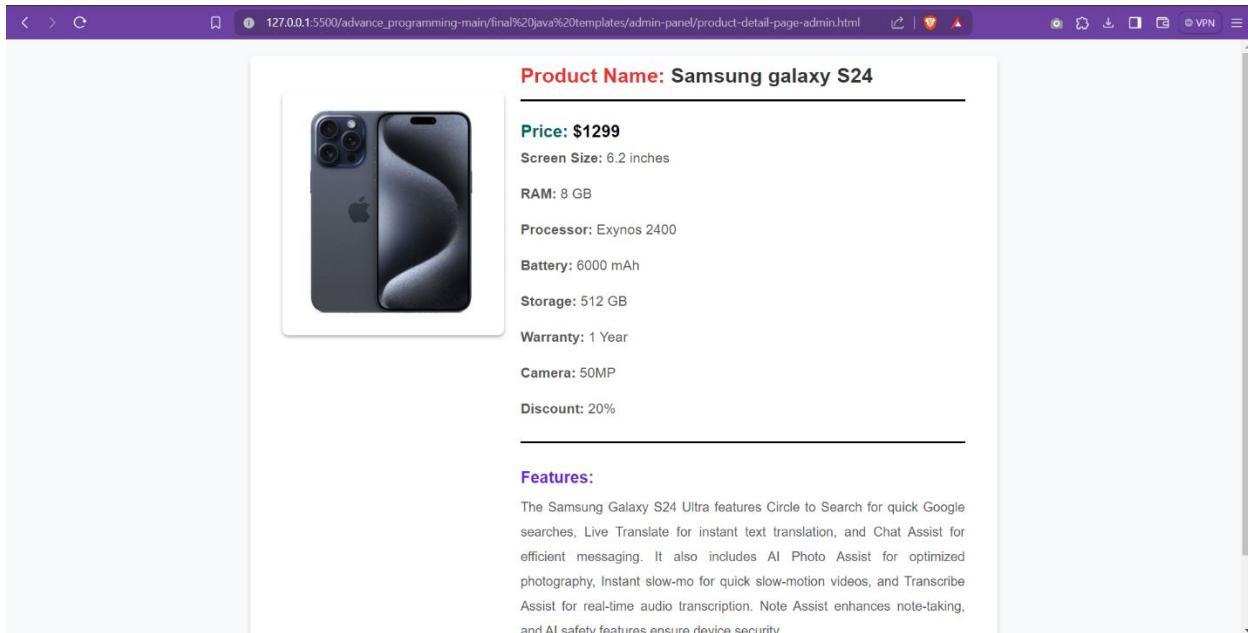
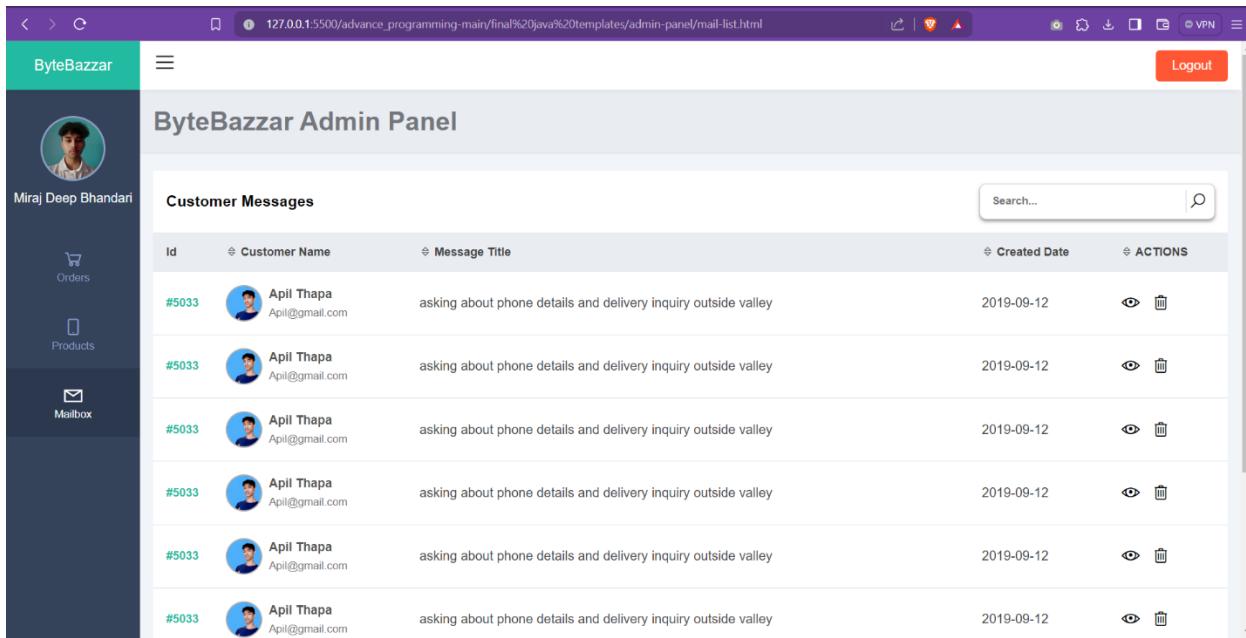


Figure 24: Admin-Products-View Page.

2.2.9. Admin-Mail Page:



The screenshot shows the ByteBazaar Admin Panel interface. On the left, there is a sidebar with a user profile picture of Miraj Deep Bhandari and three menu items: Orders, Products, and Mailbox. The main content area is titled "ByteBazaar Admin Panel" and contains a table titled "Customer Messages". The table has columns for Id, Customer Name, Message Title, Created Date, and Actions. There are six rows in the table, all from customer #5033 named Apil Thapa, asking about phone details and delivery inquiry outside valley, created on 2019-09-12. Each row has an eye icon and a trash bin icon in the Actions column. A search bar is located at the top right of the table.

Id	Customer Name	Message Title	Created Date	ACTIONS
#5033	Apil Thapa Apil@gmail.com	asking about phone details and delivery inquiry outside valley	2019-09-12	
#5033	Apil Thapa Apil@gmail.com	asking about phone details and delivery inquiry outside valley	2019-09-12	
#5033	Apil Thapa Apil@gmail.com	asking about phone details and delivery inquiry outside valley	2019-09-12	
#5033	Apil Thapa Apil@gmail.com	asking about phone details and delivery inquiry outside valley	2019-09-12	
#5033	Apil Thapa Apil@gmail.com	asking about phone details and delivery inquiry outside valley	2019-09-12	

Figure 25: Admin-Mail Page.

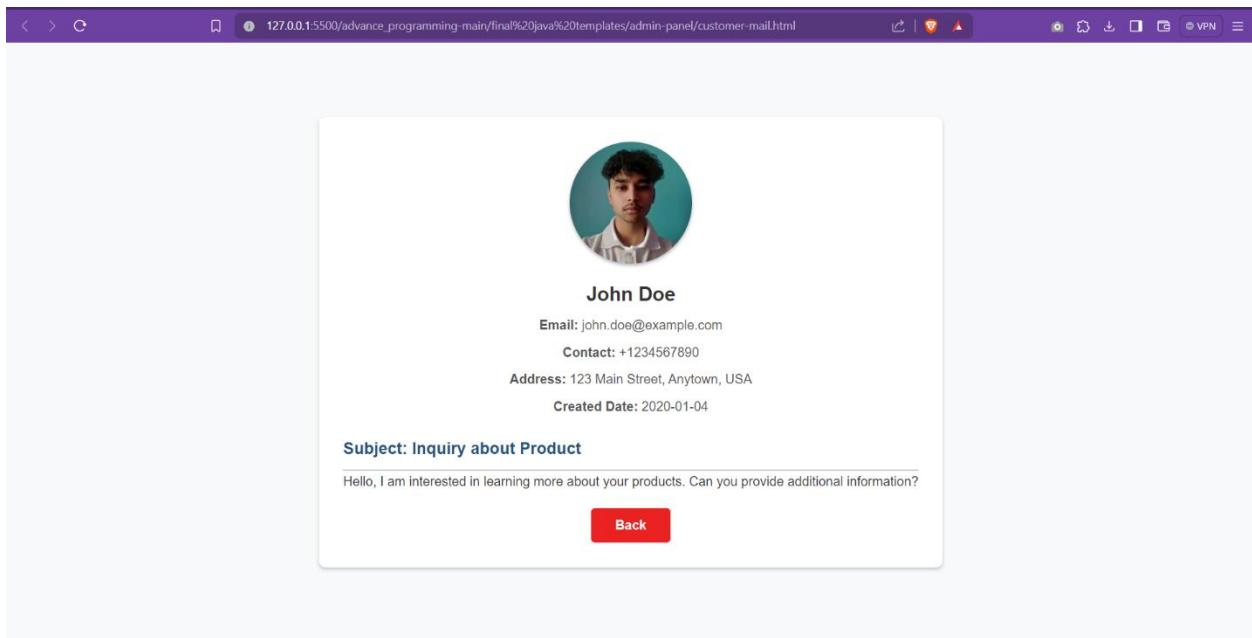
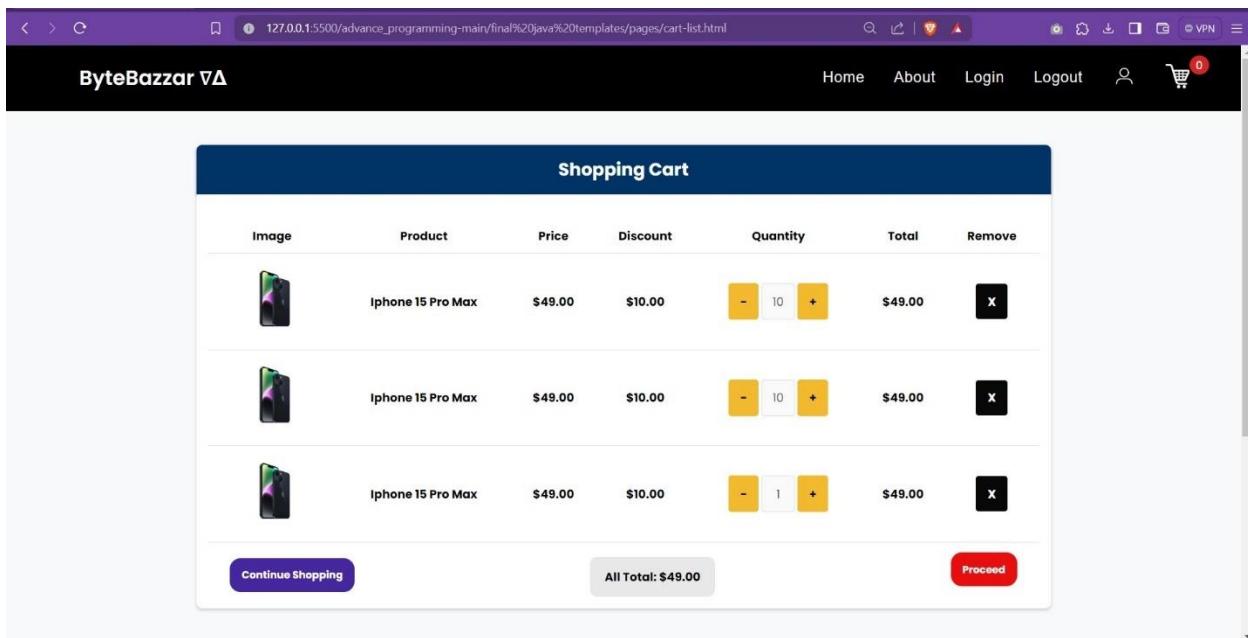
2.2.10. Admin-Mail View Page:

Figure 26: Admin-Mail-View Page.

2.2.11. Cart Page:



The screenshot shows a web browser displaying the ByteBazaar shopping cart page. The URL in the address bar is 127.0.0.1:5500/advance_programming-mair/final%20java%20templates/pages/cart-list.html. The page title is "ByteBazaar ▾". The navigation menu includes Home, About, Login, Logout, and a shopping cart icon with a red notification bubble showing '0'.

The main content is a "Shopping Cart" table with the following data:

Image	Product	Price	Discount	Quantity	Total	Remove
	Iphone 15 Pro Max	\$49.00	\$10.00	<button>-</button> 10 <button>+</button>	\$49.00	<button>X</button>
	Iphone 15 Pro Max	\$49.00	\$10.00	<button>-</button> 10 <button>+</button>	\$49.00	<button>X</button>
	Iphone 15 Pro Max	\$49.00	\$10.00	<button>-</button> 1 <button>+</button>	\$49.00	<button>X</button>

At the bottom of the table, there are three buttons: "Continue Shopping" (purple), "All Total: \$49.00" (gray), and "Proceed" (red).

Figure 27: Shopping Cart Page.

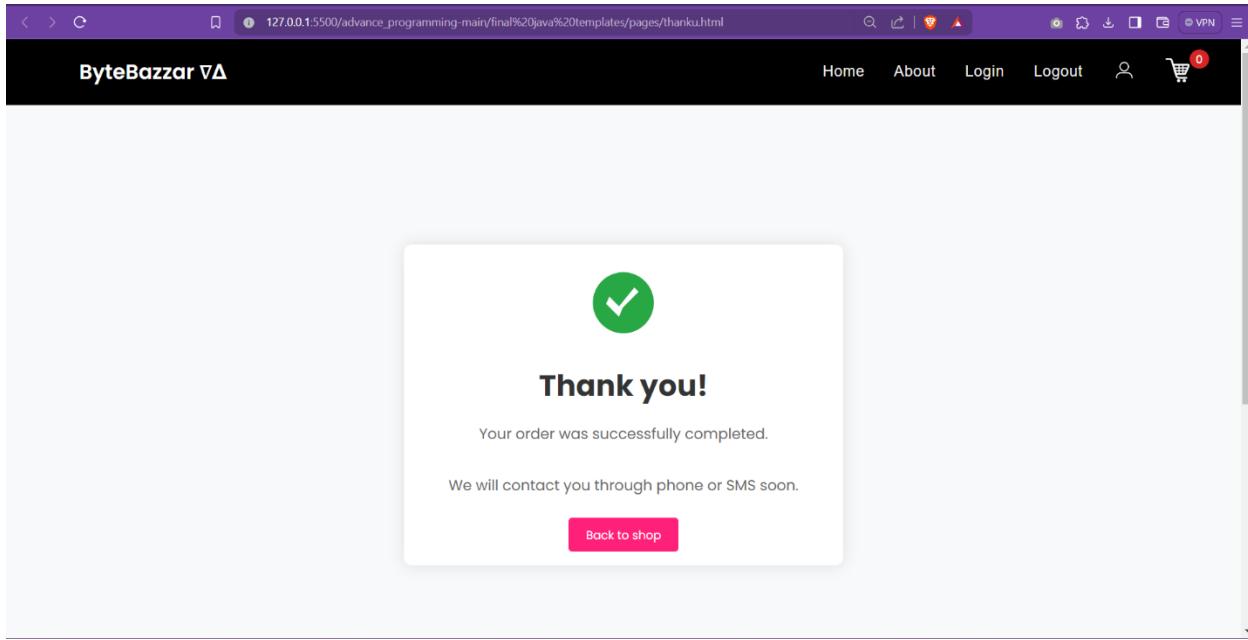
2.2.12. Thank-You Page:

Figure 28: Thank-You Page.

3. Class Diagram:

3.1. Overall Class Diagram:

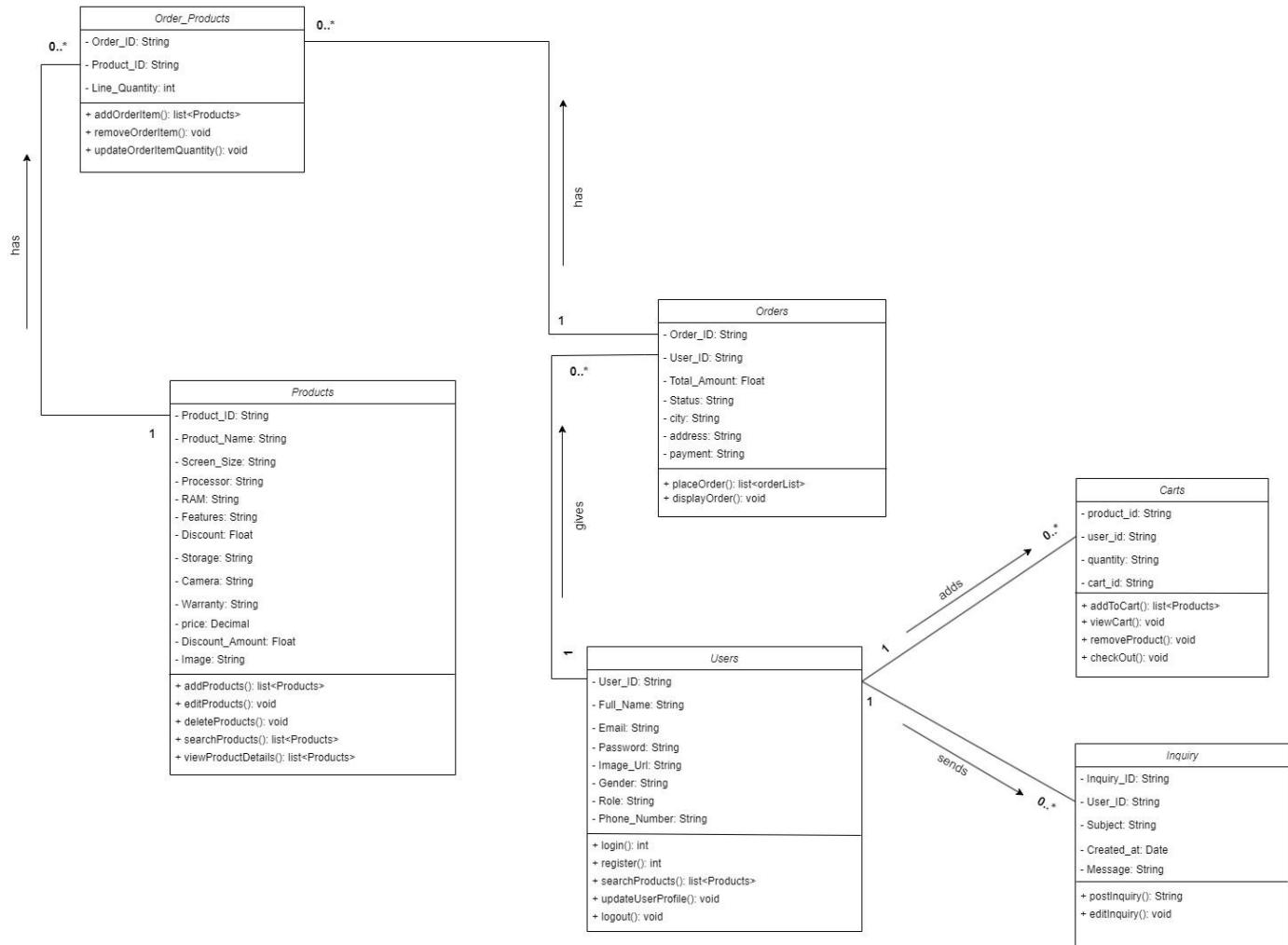


Figure 29: Overall Class Diagram.

3.2. Individual Class Diagram:

3.2.1. User Class Diagram:

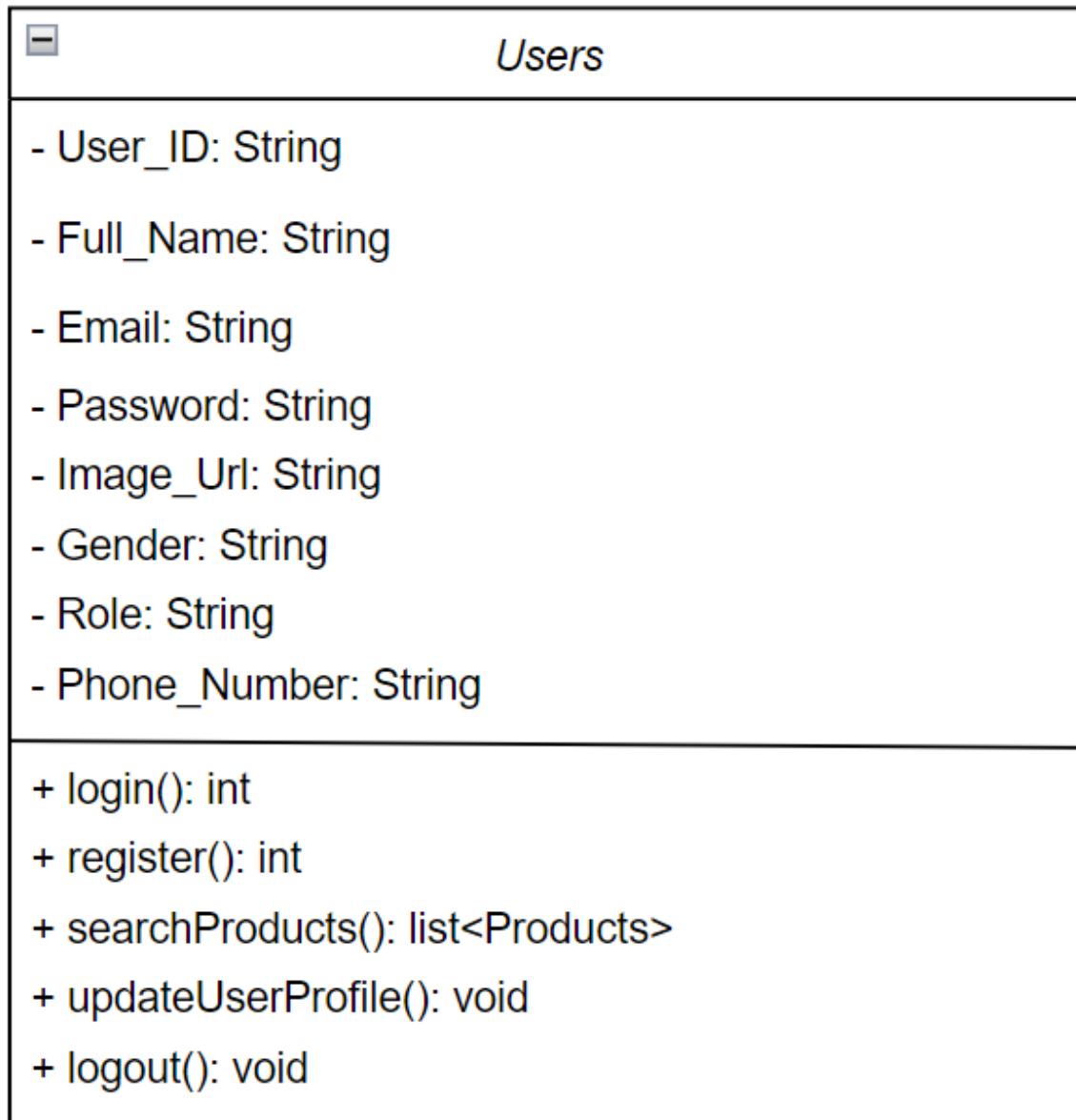
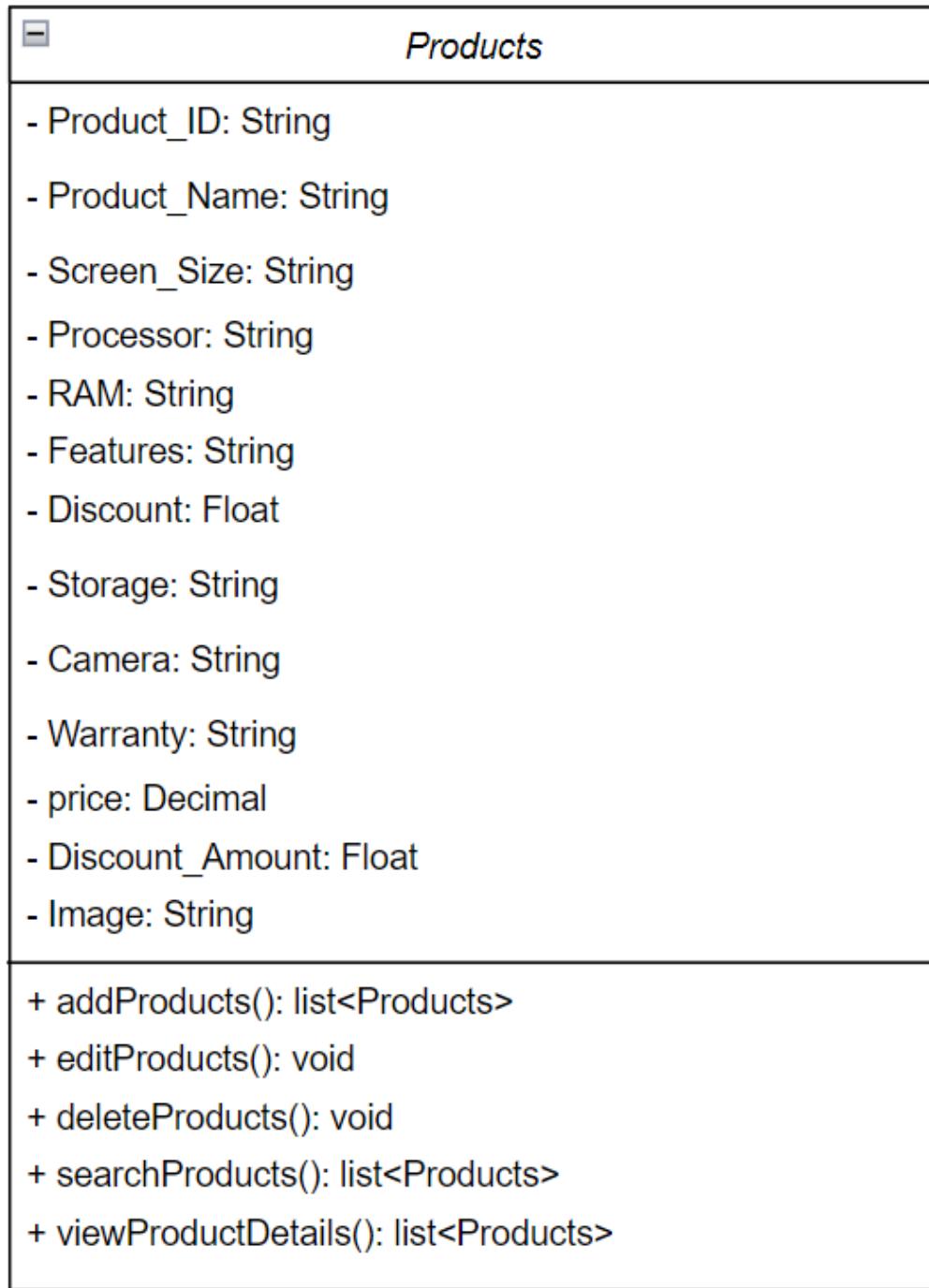


Figure 30: User Class Diagram.

3.2.2. Products Class Diagram:*Figure 31: Products Class Diagram.*

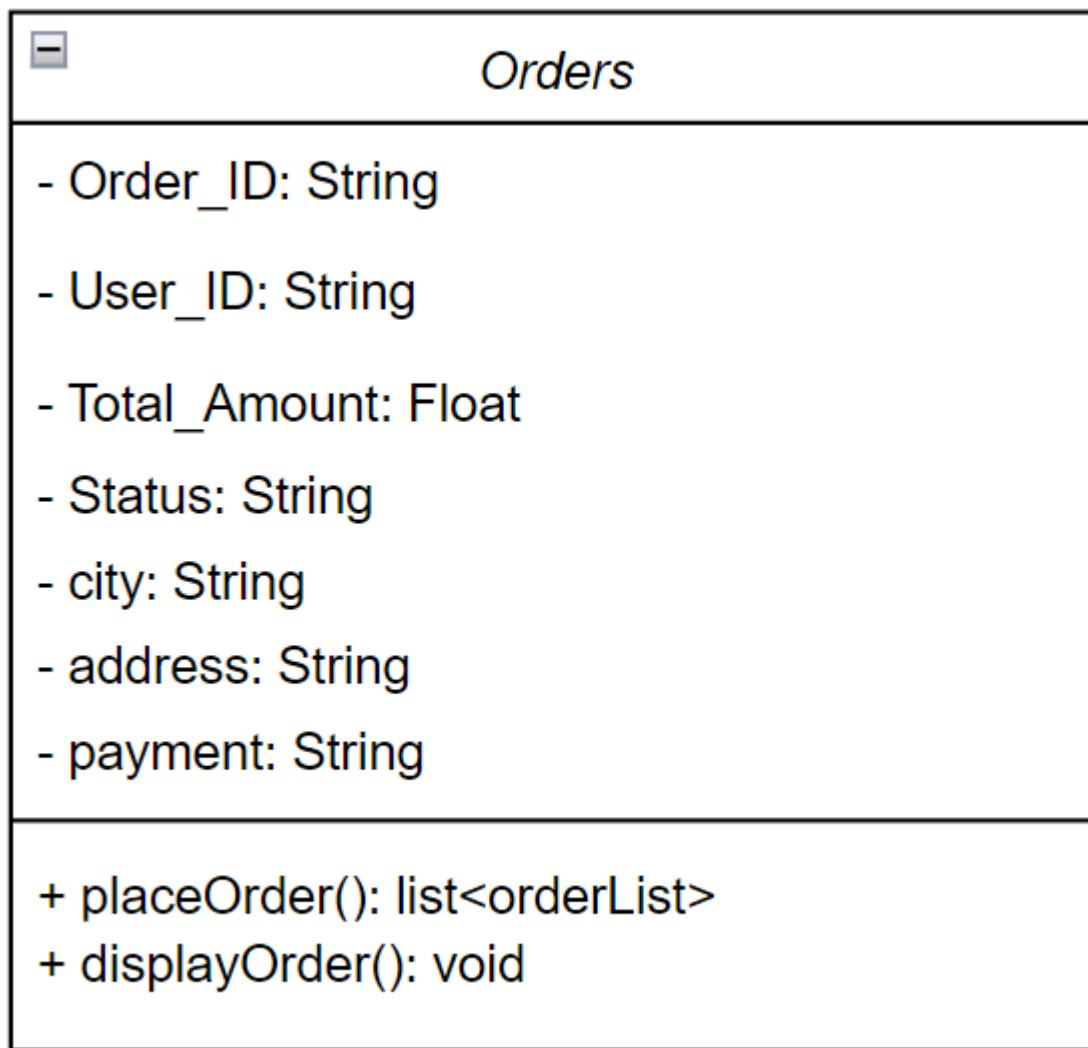
3.2.3. Orders Class Diagram:

Figure 32: Orders Class Diagram.

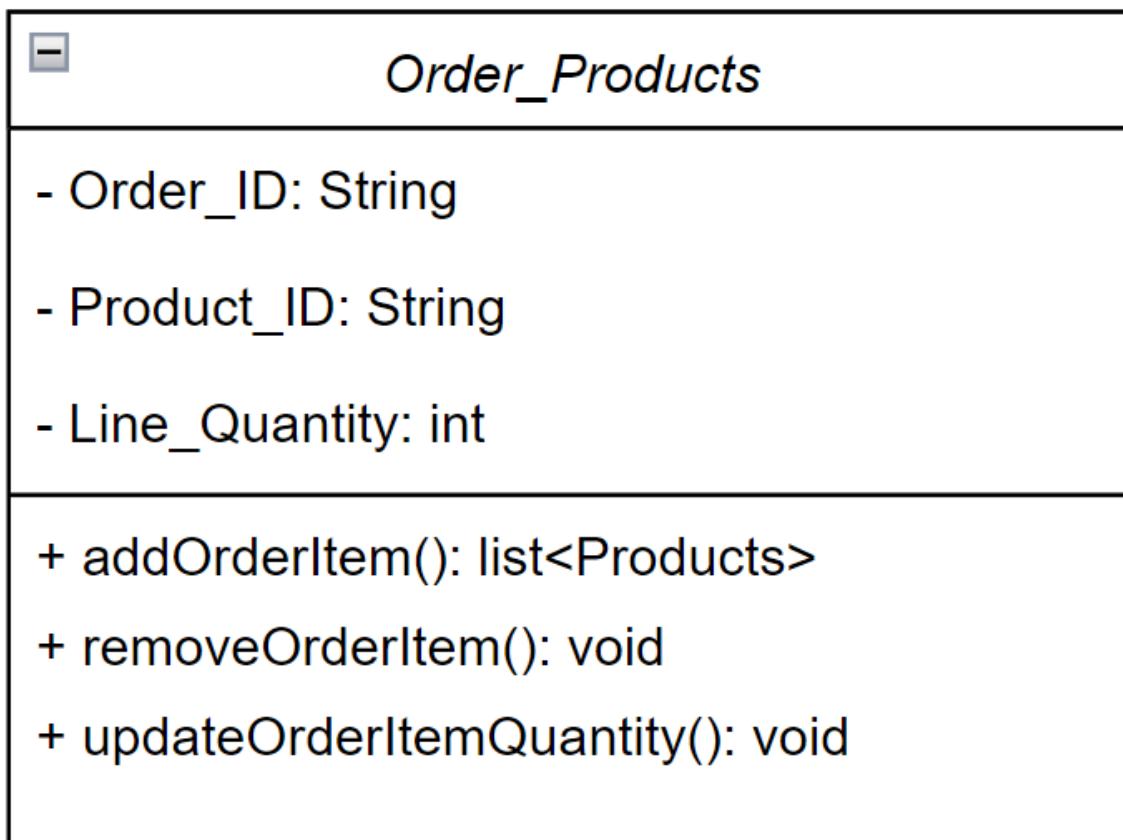
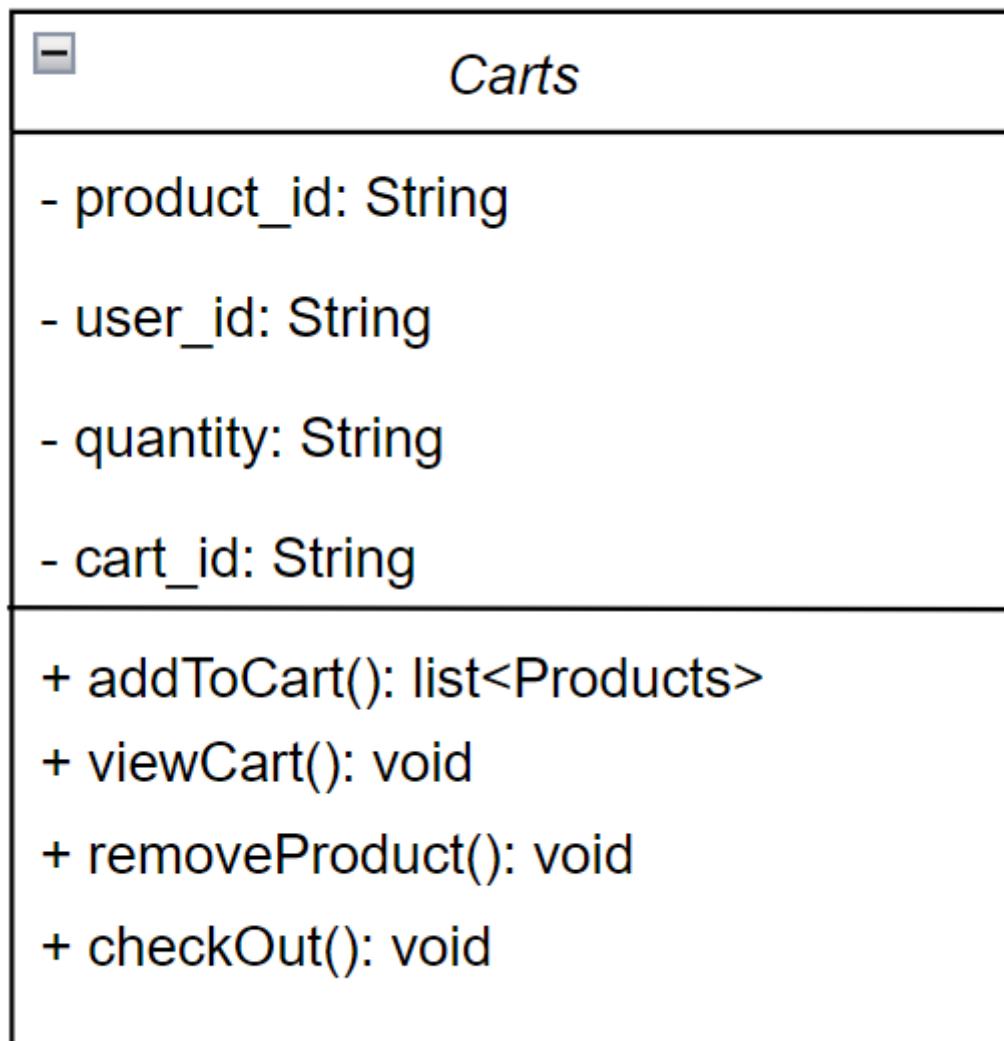
3.2.4. Order_Products Class Diagram:

Figure 33: Order_Products Class Diagram.

3.2.5. Carts Class Diagram:*Figure 34: Carts Class Diagram.*

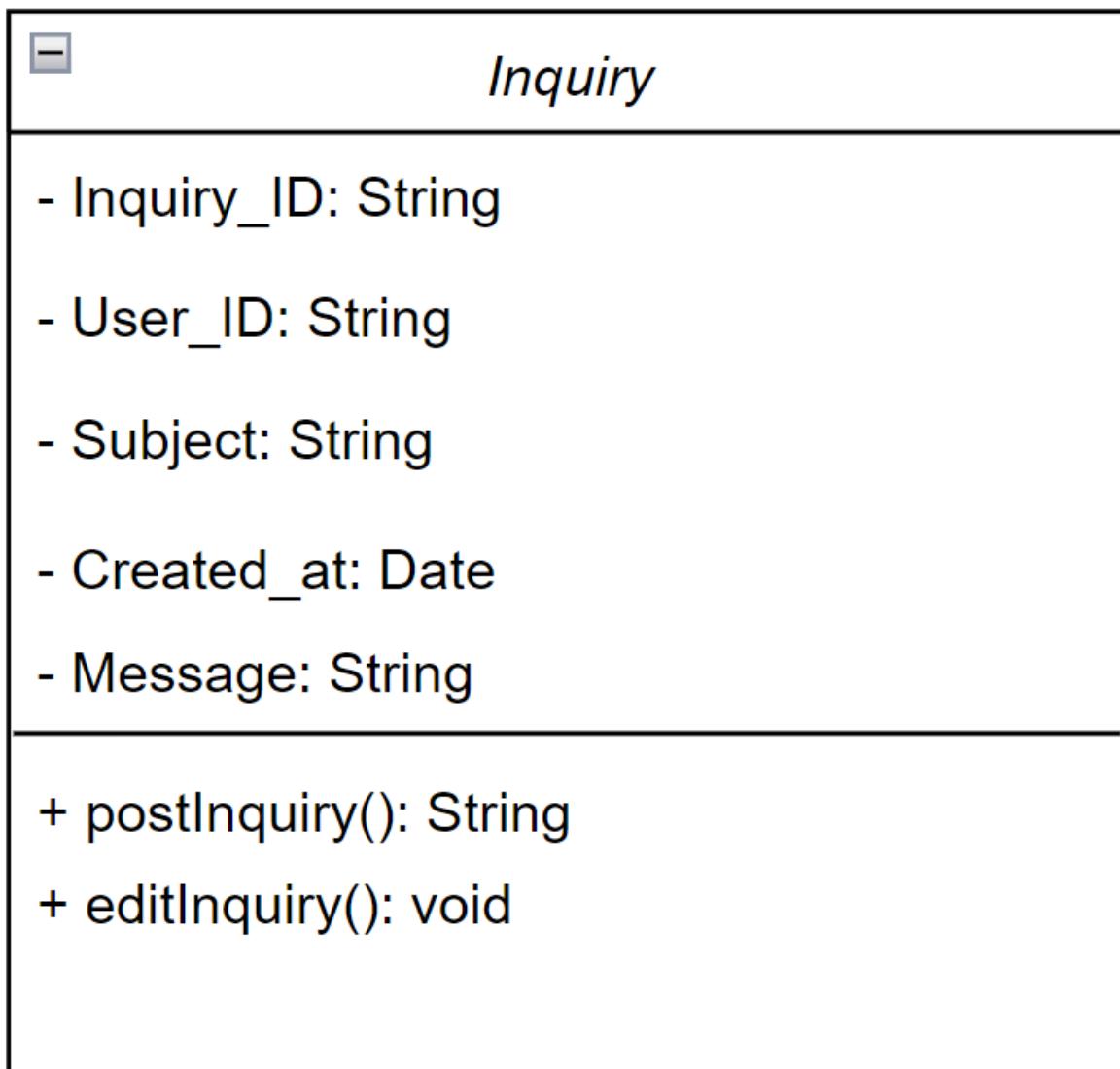
3.2.6. Inquiry Class Diagram:

Figure 35: Inquiry Class Diagram.

4. Method Description:

METHOD	DESCRIPTION
login()	Through a comparison of the user's login credentials with previously stored user data, the Login() method authorises users granting them access to their accounts on the online store.
register()	By providing their personal information, users can use the Register() method to create a new account on the e-commerce website. Since the website saves and verifies the information users input, they can register and use its features.
searchProducts()	Customers can use keywords or other criteria to search for specific items on the online store using the searchProducts() method, which delivers relevant search results to make it easier for customers to locate what they're looking for.
updateUserProfile()	The "updateUserProfile()" method typically refers to a function within a software system or application that allows users to modify their profile information.
logout()	The logout() function is one of the User class's public functions. The user can cease accessing prohibited content and preserve their security and privacy by being able to safely log out of their account and end their current session.
addProducts()	The administrator can increase the options for customers and website visitors to browse and buy by adding a new product to the online store using addProducts().

editProducts()	The editProducts() method allows the admin to make changes to an existing product's name, price, stock, or image, guaranteeing that users receive up-to-date and accurate information.
deleteProducts()	The admin can delete a product from the e-commerce website, eliminating user interactions with it and removing it from the product listing, by utilising the deleteProducts() function.
searchProducts()	The "searchProducts()" method is a functionality commonly found in e-commerce platforms, online marketplaces, and various other systems where users need to find specific products among a large inventory.
viewProductDetails()	The "viewProductDetails()" method is a fundamental functionality in many e-commerce systems and online marketplaces. It allows users to retrieve detailed information about a specific product.
placeOrder()	The "placeOrder()" method is a core functionality in e-commerce systems and online shopping platforms. It enables users to complete a purchase transaction by placing an order for one or more products.
displayOrder()	The "displayOrder()" method is a functionality commonly found in e-commerce systems and order management systems. It allows users to view details and status information about their orders.
addOrderItem()	The "addOrderItem()" method is a functionality commonly found in e-commerce systems and order management systems. It allows users to add items to their existing orders before the order is finalized and processed.

removeOrderItem()	The "removeOrderItem()" method is a crucial functionality in e-commerce and order management systems, allowing users to remove specific items from their existing orders before finalizing the purchase.
updateOrderItemQuantity()	The "updateOrderItemQuantity()" method is an essential functionality in e-commerce and order management systems, allowing users to adjust the quantity of specific items within their existing orders.
addToCart()	The "addToCart()" method is a fundamental functionality in e-commerce systems, enabling users to add items to their shopping cart as they browse products on the platform.
viewCart()	The "viewCart()" method is a crucial functionality in e-commerce systems, allowing users to view the contents of their shopping cart before proceeding to checkout.
removeProduct()	The "removeProduct()" method is a functionality commonly found in e-commerce systems and shopping cart management systems. It allows users to remove a specific product from their shopping cart before proceeding to checkout.
checkout()	The "checkout()" method is a crucial functionality in e-commerce systems, allowing users to complete their purchases and proceed with the payment process.
searchInquiry()	The "searchInquiry()" method is a functionality commonly found in systems where users can submit inquiries or requests for information.
postInquiry()	The "postInquiry()" method is a functionality often present in systems where users can submit inquiries, questions, or requests for information.

Table 1: Method Description

5. Test Cases:

- i. Displaying error while registration:

The image shows a registration form with the following fields and values:

- Full Name:** Enter your name
- User Name:** mirajbhandari1
- Email:** Enter your email
- Phone Number:** +977
- Password:** (redacted)
- Confirm Password:** Confirm your password
- Gender:** Male (radio button selected)

A red error message at the top of the form reads: "Invalid email address. Please enter a valid email."

At the bottom of the form, there is a link: "Already have an account? [Login](#)".

Figure 36: Displaying error.

- ii. Redirecting to login page after successfully Registering.

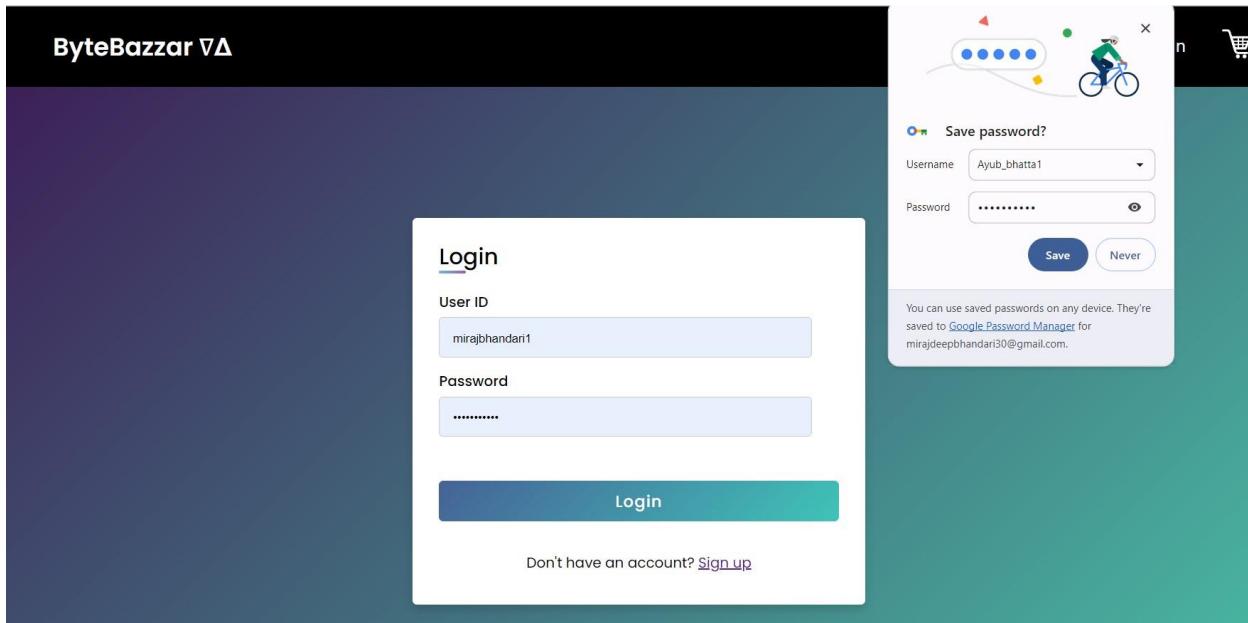


Figure 37: redirecting the user.

- iii. Displaying error if the product is already added to the cart.

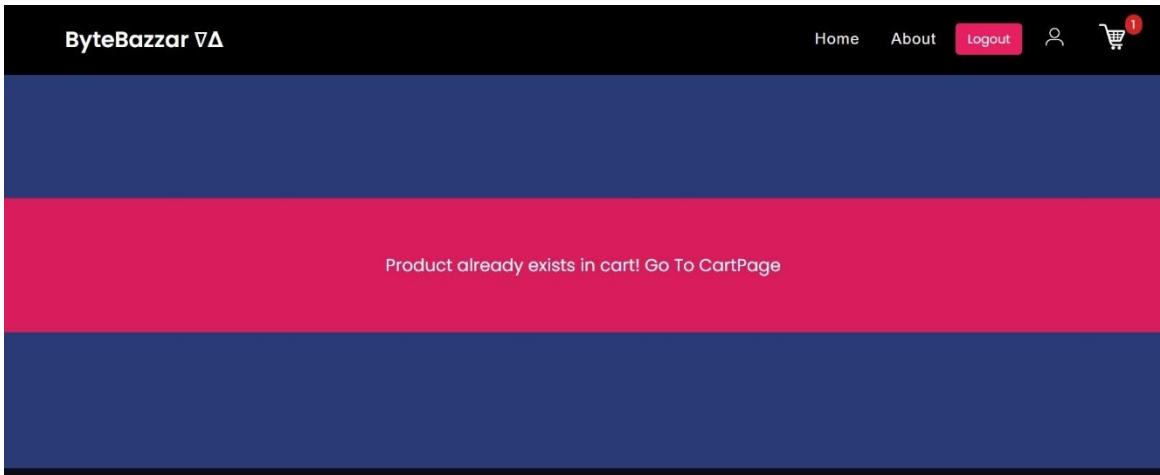


Figure 38: Displaying error if the product is already added to the cart.

iv. Displaying product description.

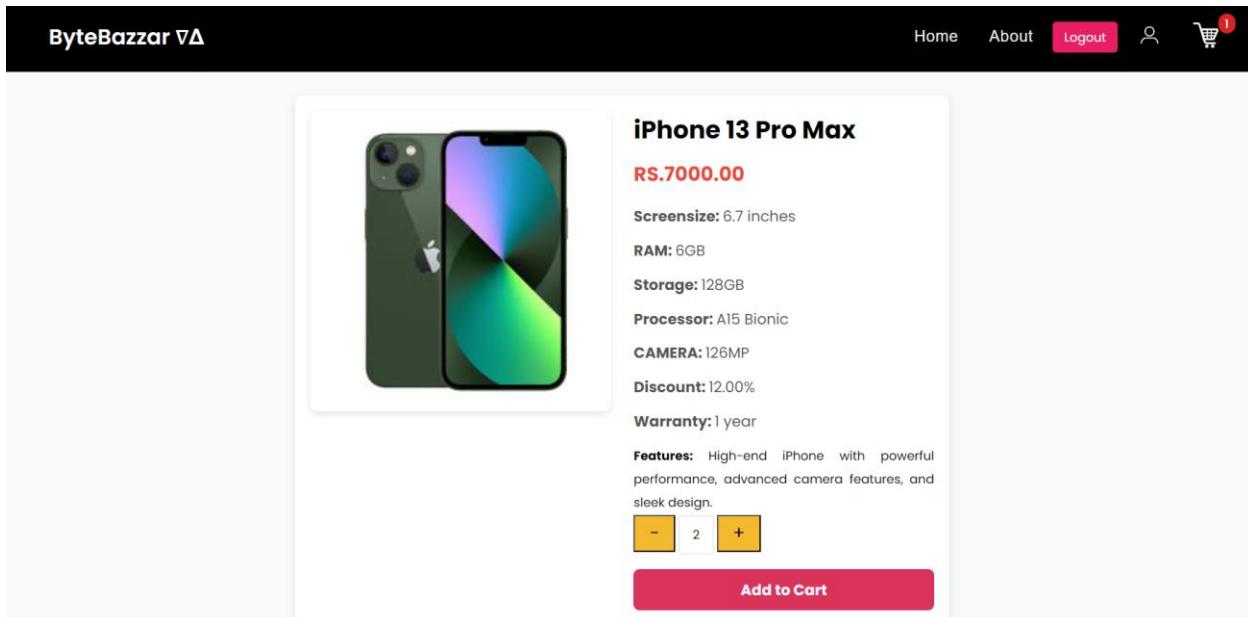
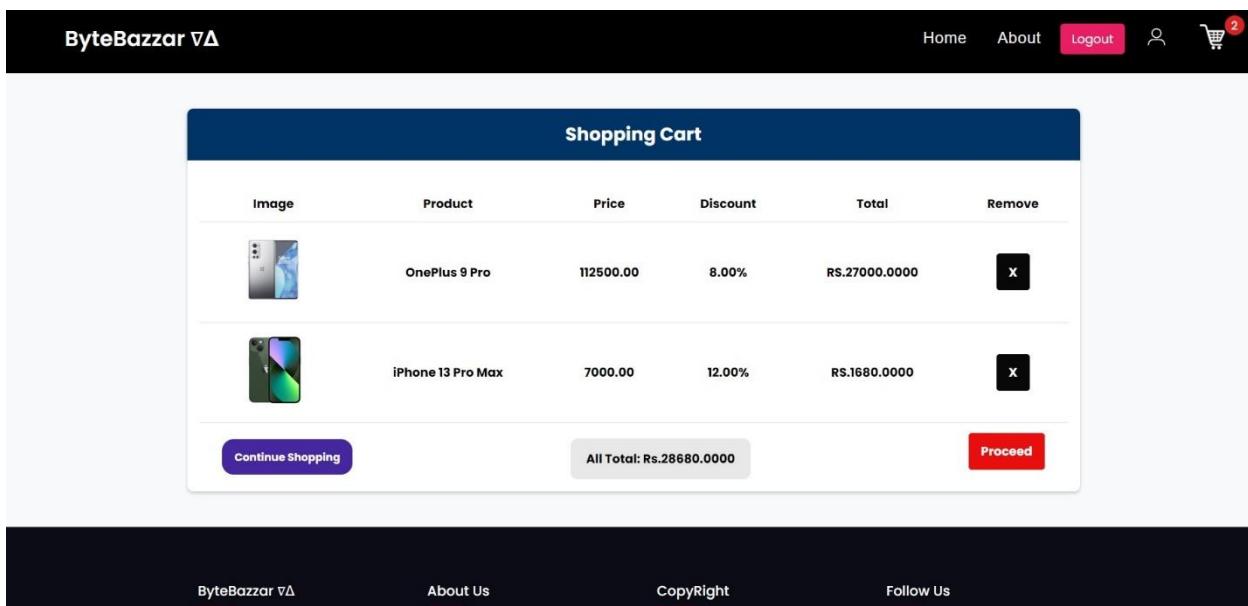


Figure 39: Displaying product Description.

v. Displaying cart items.



After adding items into cart, we can see all our shopping cart and also the increased quantity in real time at the top right corner of the site.

vi. Displaying cart items after removing a product.

The screenshot shows the ByteBazaar vΔ website's shopping cart interface. At the top, there is a navigation bar with links for Home, About, Logout, and a user icon. To the right of the navigation bar is a shopping cart icon with a red notification badge showing the number '1'. Below the navigation bar is the 'Shopping Cart' section, which has a dark blue header bar with the title 'Shopping Cart' in white. The main content area is a table with the following columns: Image, Product, Price, Discount, Total, and Remove. There is one row in the table representing an iPhone 13 Pro Max. The 'Image' column shows a thumbnail of the phone. The 'Product' column shows 'iPhone 13 Pro Max'. The 'Price' column shows '7000.00'. The 'Discount' column shows '12.00%'. The 'Total' column shows 'Rs.1680.0000'. The 'Remove' column contains a black button with a white 'X' icon. At the bottom of the table, there are three buttons: 'Continue Shopping' (purple), 'All Total: Rs.1680.0000' (grey), and 'Proceed' (red). The footer of the page includes links for 'ByteBazaar vΔ', 'About Us', 'CopyRight', and 'Follow Us'.

Figure 40: Displaying cart items after removing a item.

After clicking the remove button, we can see that the other product is removed, and then the counter is also being updated at real time.

vii. Displaying product before ordering.

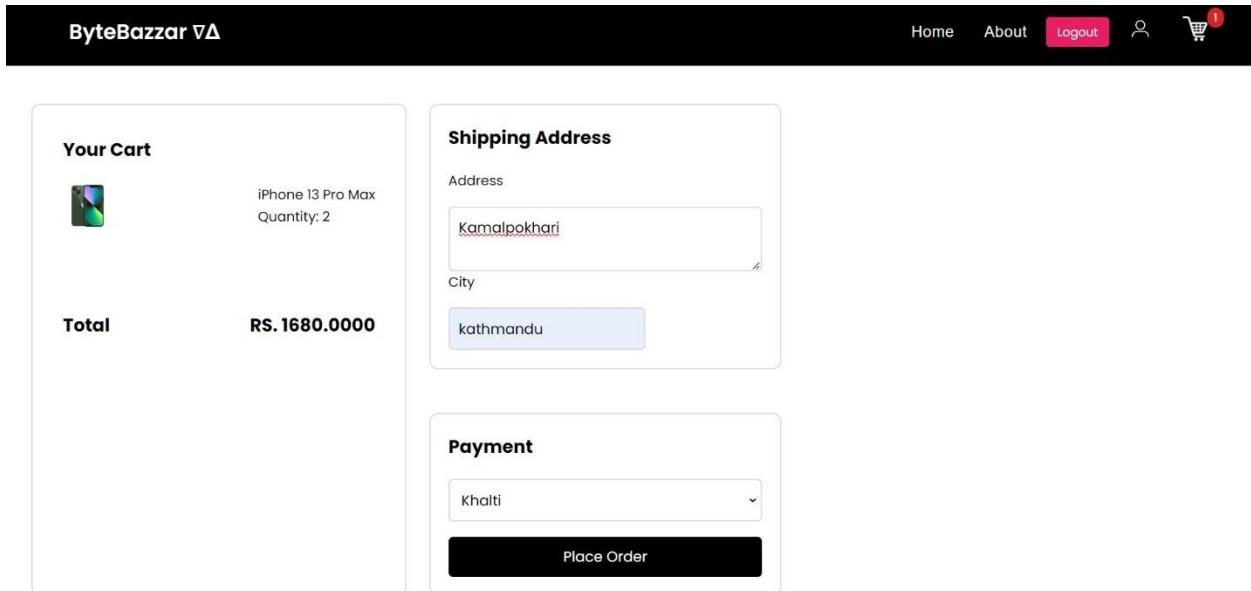


Figure 41: Displaying product before ordering.

viii. Displaying Thank-You message after completing order.

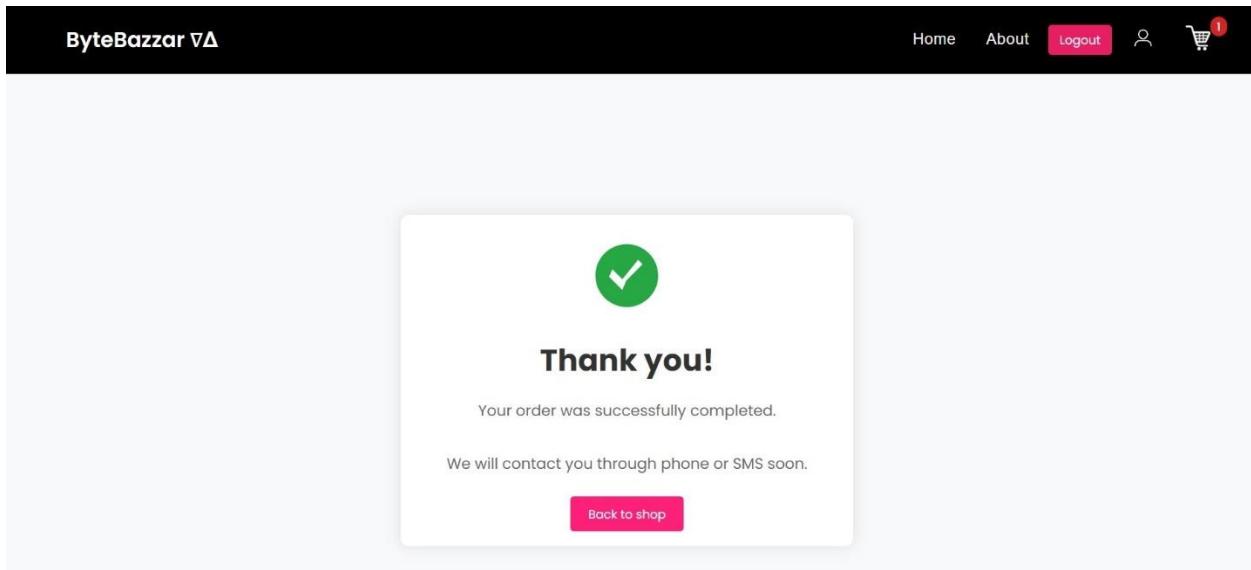


Figure 42: Displaying Thank-You message.

After the order is completed, then Thank You! Message is displayed to the user.

ix. Displaying products after searching in the search box.

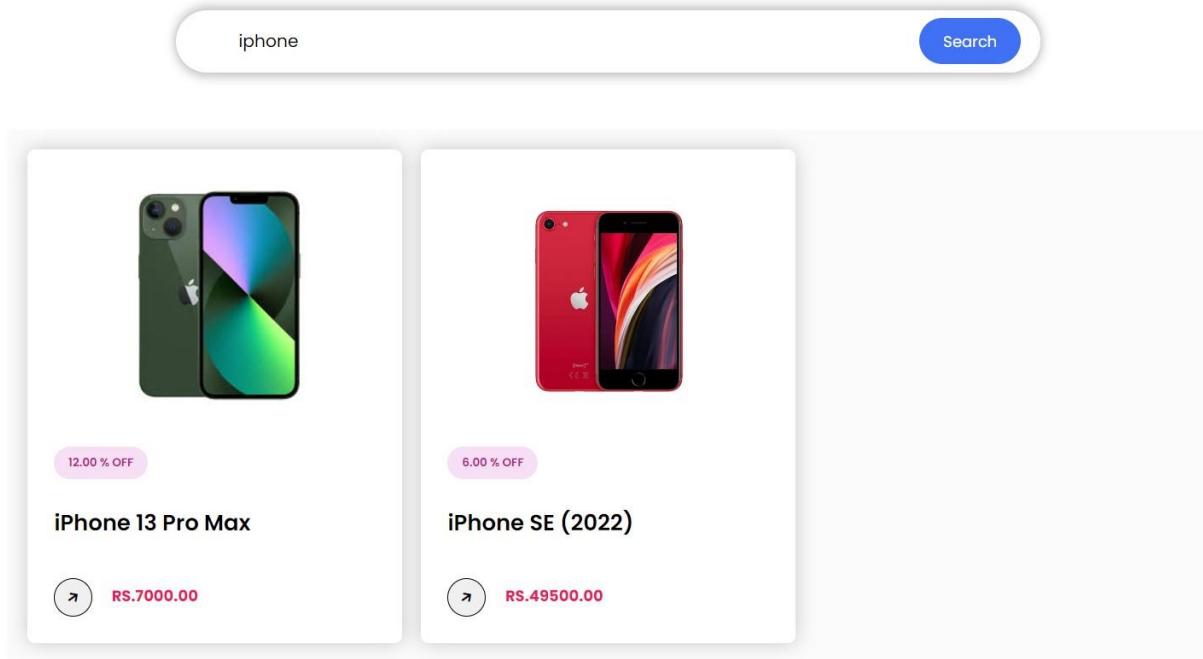


Figure 43: Displaying searched Items.

x. Displaying Admin Panel.

The screenshot shows the ByteBazaar Admin Panel interface. On the left, there is a sidebar with the user's name 'Miraj Deep Bhandari' and two navigation options: 'Products' and 'Orders'. The main content area has a title 'ByteBazaar Admin Panel' and a sub-section 'Products List'. It displays a table with three rows of product data:

ID	Product Name	RAM	Storage	Discount %	Price	ACTIONS
1	iPhone 13 Pro Max	6GB	128GB	12.00	RS 7000.00	
2	OnePlus 9 Pro	12GB	64GB	8.00	RS 112500.00	
3	Google Pixel 6 Pro	12GB	126GB	9.00	RS 99500.00	

Figure 44: Displaying Admin Panel.

xi. Getting all updated data from database.

Product ID:	Product Name:
PRD002	iPhone 13 Pro Max
Price:	Ram:
7000.00	6GB
Screen Size:	Processor:
6.7 inches	A15 Bionic
New Product Image:	
 Choose File No file chosen	
Previous Product Image:	
Storage:	Warranty:
128GB	1 year
Camera:	Discount %
126MP	12.00
Features:	
High-end iPhone with powerful performance, advanced camera features, and sleek design.	
UPDATE	

Figure 45: Displaying updated data from database.

xii. Displaying product being deleted.

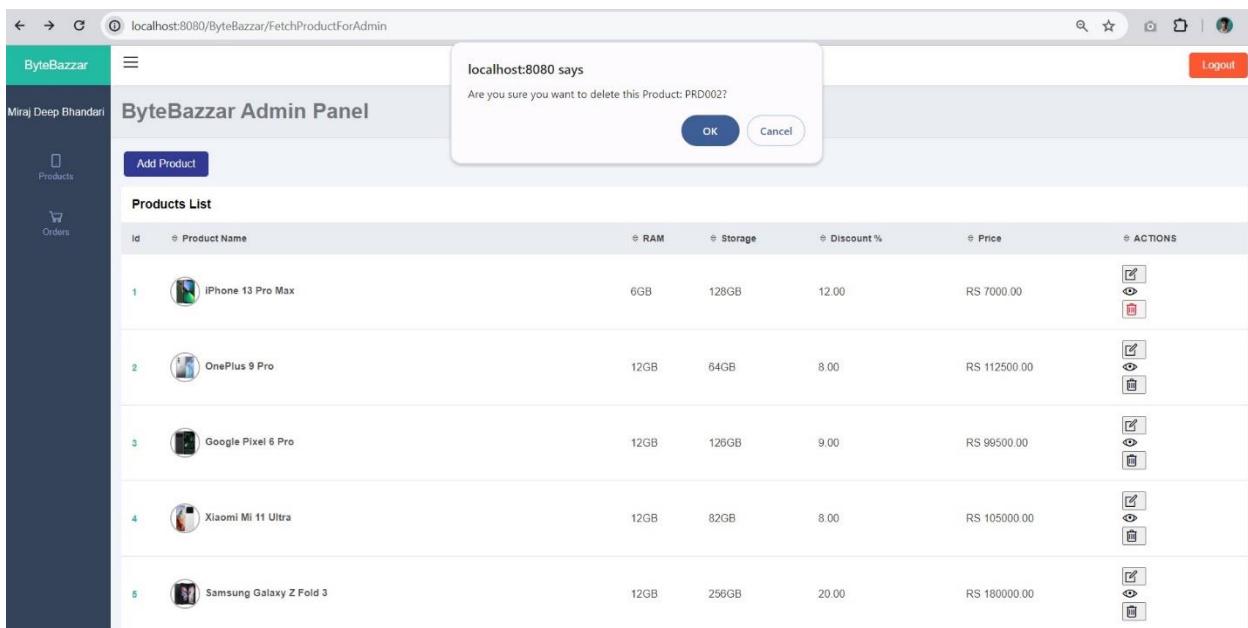


Figure 46: Displaying product being deleted.

xiii. Displaying order details.

The screenshot shows the ByteBazaar Admin Panel interface. At the top, there's a header bar with the title "ByteBazaar Admin Panel". On the far right of the header is a red "Logout" button. To the left of the header, the user's name "Miraj Deep Bhandari" is displayed. Below the header, there's a sidebar on the left with two main menu items: "Products" and "Orders". The "Orders" item is currently selected, indicated by a blue background and white text. The main content area is titled "Customer Orders". It displays three categories of orders: "User Orders" (1), "Pending Orders" (1), and "Order Delivered" (0). Below these categories, there's a table titled "Customer Orders" with columns: "Customer Name", "Product Id", "Product Name", "Amount", and "Status". The table contains three rows of data, each corresponding to an order placed by a customer named "AYUB BHATTA" with the handle "@Ayub_bhatta1". The first row shows an iPhone 13 Pro Max with Product ID PRD002, Amount 1680.00, and Status Pending. The second row shows a Xiaomi Redmi Note 11 Pro with Product ID PRD009, Amount 1680.00, and Status Pending. The third row shows a Realme GT 2 Pro with Product ID PRD010, Amount 1680.00, and Status Pending.

Customer Name	Product Id	Product Name	Amount	Status
AYUB BHATTA @Ayub_bhatta1	PRD002	iPhone 13 Pro Max	1680.00	Pending
AYUB BHATTA @Ayub_bhatta1	PRD009	Xiaomi Redmi Note 11 Pro	1680.00	Pending
AYUB BHATTA @Ayub_bhatta1	PRD010	Realme GT 2 Pro	1680.00	Pending

Figure 47: Displaying order details.

xiv. Displaying updated profile page.



Ayub Bhattarai
@mirajbhandari1

[Change Profile](#) [Save Profile](#)

Profile Successfully Updated X

Profile Settings

Full Name	Email Address
Ayub Bhattarai	mirajdeepbhandari@gmail.com
Phone	
+9779888998822	
Address	
dillibazar	

[Save Profile](#)

Change Password

Current Password
Enter current password
New Password
Enter new password
Retype New Password
Confirm new password

[Confirm Change](#)

Figure 48: Displaying updated profile page.

6. Tools and Libraries used:

6.1. JEE Framework:

The Java EE stands for Java Enterprise Edition, which was earlier known as J2EE and is currently known as Jakarta EE. It is a set of specifications wrapping around Java SE (Standard Edition). Examples of some contexts where Java EE is used are e-commerce, accounting, banking information systems (javatpoint, 2021).

6.2. Eclipse:

In the context of computing, Eclipse is an integrated development environment (IDE) for developing applications using the Java programming language and other programming languages such as C/C++, Python, PERL, Ruby etc.

The Java Development Tools (JDT) project provides a plug-in that allows Eclipse to be used as a Java IDE, PyDev is a plugin that allows Eclipse to be used as a Python IDE, the Eclipse Scala plug-in allows Eclipse to be used as an IDE to develop Scala applications and PHPEclipse is a plug-in to eclipse that provides complete development tool for PHP (2024, 2024).

6.3. Xampp:

XAMPP, which stands for Cross-Platform, Apache, MySQL, PHP, and Perl, is a free platform that allows developers to test their code locally on their own computers. It is a safe space to experiment and perfect code before it goes live. (edx, 2024).

6.4. Balsamiq:

Balsamiq Wireframes is a user interface design tool for creating wireframes (sometimes called mockups or low-fidelity prototypes).

You can use it to generate digital sketches of your idea or concept for an application or website, to facilitate discussion and understanding before any code is written. The completed wireframes can be used for user testing, clarifying your vision, getting feedback from stakeholders, or getting approval to start development (Balsamiq, 2024).

6.5. JSTL Core Library:

The JavaServer Pages Standard Tag Library (JSTL) is a collection of useful JSP tags which encapsulates the core functionality common to many JSP applications.

JSTL has support for common, structural tasks such as iteration and conditionals, tags for manipulating XML documents, internationalization tags, and SQL tags. It also provides a framework for integrating the existing custom tags with the JSTL tags (tutorialspoint, 2024).

7. Development Process:

The e-commerce system's development followed a systematic approach, involving various stages with specific tasks and deliverables. The development process is outlined below:

- i. **Requirements Gathering and Analysis:** The initial stage involved gathering and analysing the requirements for the e-commerce system. This included defining the project scope, identifying functional and non-functional requirements, understanding business needs, and establishing system objectives.
- ii. **Design:** In the design stage, we developed the architecture, layout, and functionality of the e-commerce system. We followed the Model-View-Controller (MVC) design pattern, which separates the application into three packages:
 - **Model package:** Contained classes and methods for database operations and data models.
 - **Controller package:** Comprised Servlets that handled user requests and coordinated application flow.
 - **View package:** Included JSP and HTML files for rendering the user interface.
- iii. **Implementation:** We proceeded with the implementation stage after completing the design. The system was developed using the Java programming language and the Eclipse IDE for Enterprise Java and Web Developers. We employed the Servlets, JSP, and JDBC frameworks, and JSTL

core library to efficiently manage data, process user requests, and generate dynamic web pages.

- iv. **Testing:** After implementation, we entered the testing stage. We conducted various tests, including performance, usability, and functionality tests, to ensure the system adhered to the specified requirements and functioned as intended. Testing involved both manual and automated approaches.
- v. **Deployment:** Once the e-commerce system passed the testing phase, we deployed it to a web server. The Tomcat server was used for deployment, making the system accessible to users over the internet.
- vi. **Maintenance:** In the maintenance stage, we continuously monitored and maintained the system. This involved ensuring the system's security, keeping it up-to-date, and addressing any errors or issues that arose. Based on user feedback and evolving business requirements, we implemented system updates and enhancements.

The development of the e-commerce website followed a structured methodology, leveraging tools and libraries such as the Eclipse IDE, Servlets, JSP, JDBC, and XAMPP for MySQL as the database. HTML and CSS were used for the front-end development.

7.1. Development References:

7.1.1. Login Page:

This is our login page;

The image shows a clean, modern login interface. At the top left is the word "Login". Below it is a "Username" field with a placeholder "Enter your username". Below that is a "Password" field with a placeholder "Enter your password". Underneath is a "Role" dropdown menu with the option "Select Role". At the bottom center is a large blue gradient "Login" button. Below the button, there are two links: "Don't have an account? [Sign up](#)" and "Forgot Your Password? [Reset It](#)".

Figure 49: Login Page.

And here is the reference login page;

Sign in to Dribbble

 Sign in with Google

or sign in with email

Username or Email

Password [Forgot?](#)

Sign In

Don't have an account? [Sign up](#)

Figure 50: Reference Login Page.

Reference Link : [Click Here](#)

7.1.2. Sign Up Page:

This is our sign up page;

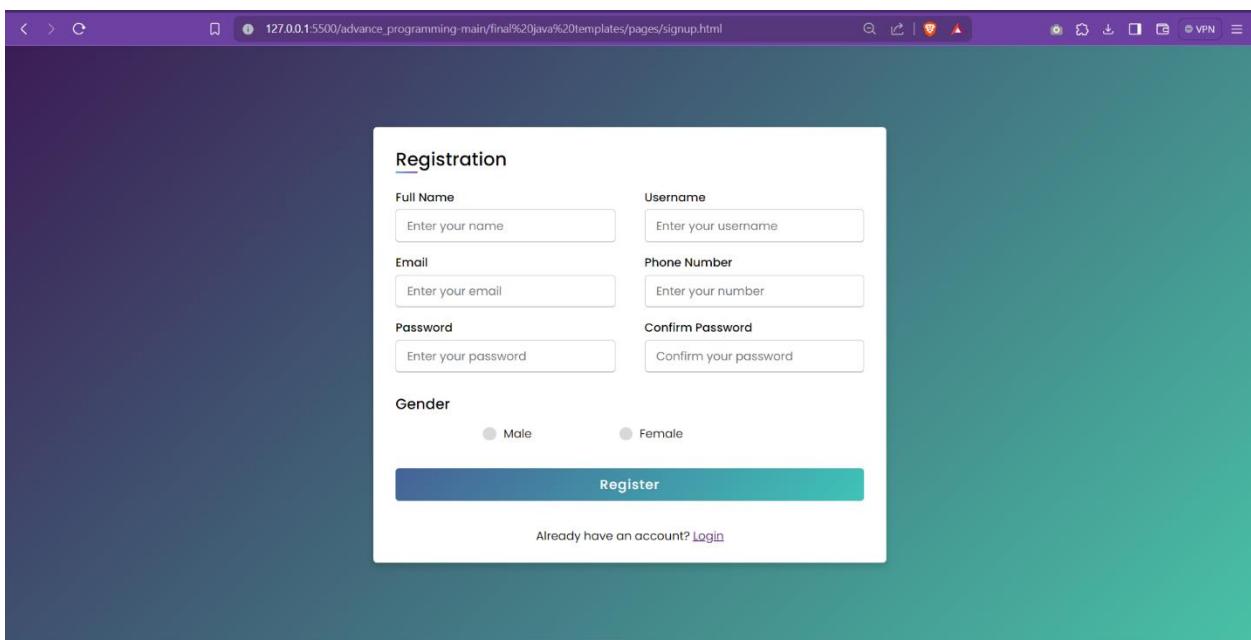


Figure 51: Sign Up Page.

And here is the reference sign up page;

The screenshot shows a sign-up form for 'promovere'. At the top, there's a logo consisting of a stylized blue 'P' followed by the word 'promovere'. Below the logo, the heading 'Welcome aboard!' is displayed in a large, bold, black font. A sub-instruction 'To kick things off, we need a bit of info.' is present, followed by a descriptive sentence: 'Fill in your details below, and let's get you set up in no time.' The form itself consists of several input fields arranged in a grid-like structure:

First Name	Last Name
<input type="text" value="Name"/>	<input type="text" value="Name"/>
Password	Confirm Password
<input type="text" value="Type your password here"/>	<input type="text" value="Type your password here"/>
Email Address	
<input type="text" value="email@companymail.com"/>	
Company name	
<input type="text" value="Funky Clothes"/>	
VAT	
<input type="text" value="4232900772"/>	
<input type="button" value="Create account"/>	

At the bottom of the form, a small note states: 'By clicking Register, you agree to our [Terms of Service](#) and [Privacy Policy](#)'.

Figure 52: Reference Sign Up Page.

Reference Link: [Click Here](#)

7.1.3. Nav Bar:

Here is our nav bar;



Figure 53: Nav Bar.

Here is the reference nav bar;



Figure 54: Reference Nav Bar.

Reference Link: [Click Here](#)

7.1.4. Home Page:

Here is our home page;

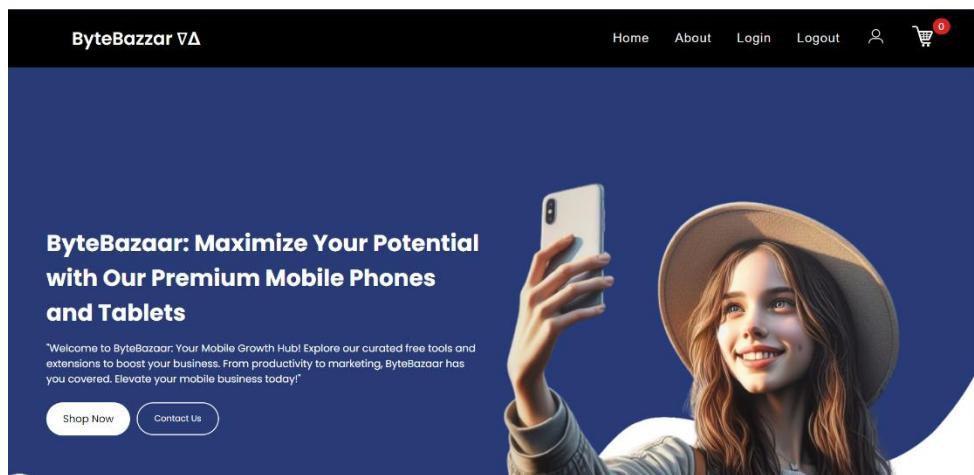


Figure 55: Home Page-1

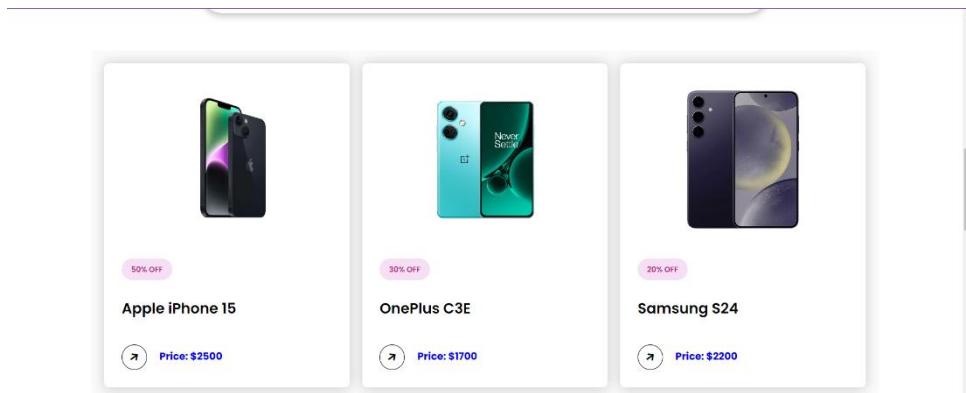


Figure 56: Home Page-2.

Here is the reference home page;

The screenshot shows the Cashify homepage. At the top, there is a navigation bar with links for 'All', 'Sell Phone', 'Sell Gadgets', 'Buy Phone', 'Find New Gadget', 'Buy Laptop', 'Cashify Store', and 'More'. The main header features the Cashify logo and a search bar. Below the header, a large teal-colored section titled 'Sell Old Phone' with the subtext 'From Your Doorstep or At Any of our 200 Stores Pan India' is displayed. It includes an image of a man holding cash and a smartphone, with a delivery person on a scooter in the background. A 'Sell Now' button is visible. Below this, a section titled 'Our Services' lists various services with corresponding icons: Sell Phone, Buy Phone, Buy Laptops, Repair Phone, Find New Phone, Nearby Stores, Recycle, and Buy Smartwatches.

Figure 57: Reference Home Page.

This screenshot shows the 'Buy Refurbished Phones' section of the Cashify homepage. It features a grid of five refurbished phone models with their respective prices and discount information. Each item includes a small image, the model name, a price reduction (e.g., ₹18,500 OFF), a star rating, and the number of reviews. A 'View All' link is located at the top right of the grid. Below the grid, there is a row of icons for other categories: Sell Phone, Sell Laptop, Sell TV, Sell Tablet, Sell Earbuds, Sell Smartwatch, Sell Smart Speakers, and a 'Sell More' option.

Phone Model	Offer	Rating	Reviews
Apple iPhone 11 - Refurbished	₹18,500 OFF	★★★★★	(360)
Apple iPhone XR - Refurbished	₹15,700 OFF	★★★★★	(152)
Apple iPhone 13 - Refurbished	₹31,000 OFF	★★★★★	(140)
Apple iPhone 12 - Refurbished	₹25,800 OFF	★★★★★	(196)
Apple MacBook Air Mid 2017 (13" Intel Core i5) - Refurbished	₹22,000 OFF	★★★★★	(35)

Figure 58: Reference Home Page-2.

Reference link: [Click Here](#)

7.1.5. About Us:

This is our about us page;

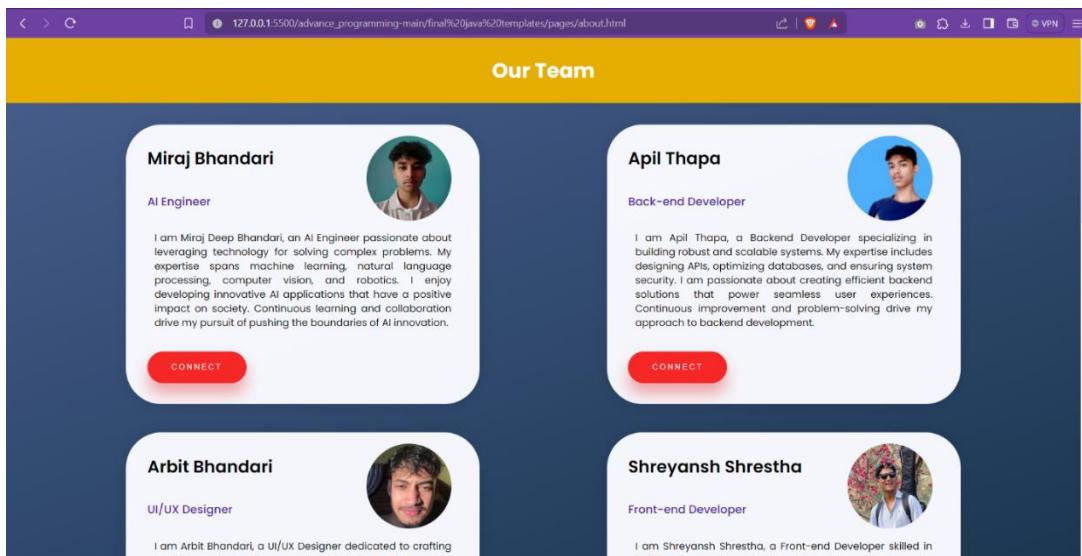


Figure 59: About Us Page.

This is reference about us page;

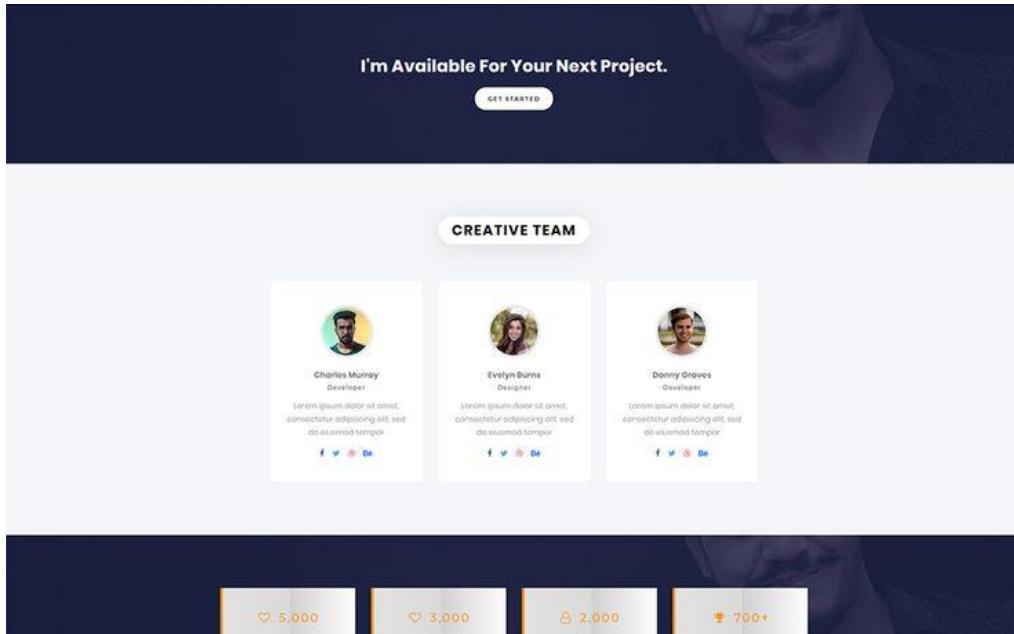


Figure 60: Reference About Us Page.

7.1.6. Profile Page:

This is our profile page;

A screenshot of a website's profile page for 'Miraj Deep Bhandari'. The page is titled 'ByteBazaar' and shows a purple header with navigation links for Home, About, Login, Logout, and a shopping cart icon. The main content area displays a user profile with a circular profile picture, the name 'Miraj Deep Bhandari', the handle '@miraj_bhandari084', and a 'Change Profile' button. Below this, there are two sections: 'Profile Settings' and 'Change Password'. The 'Profile Settings' section contains fields for Full Name (Miraj Bhandari), Email Address (miraj22@gmail.com), Phone (8877978765), and Address (kotanikothmandu), with a 'Save Profile' button. The 'Change Password' section contains fields for Current Password, New Password, Retype New Password, and Confirm new password, with a 'Confirm Change' button.

Figure 61: Profile Page.

This is the reference profile page;

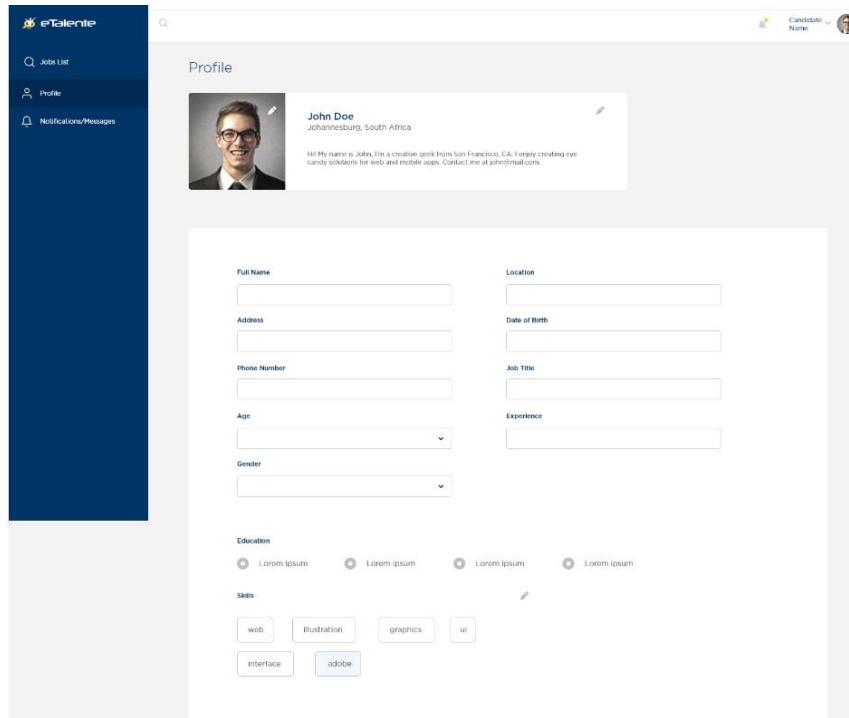


Figure 62: Reference Profile Page.

Reference Link: [Click Here.](#)

7.1.7. Cart Page:

This is our cart page;

Shopping Cart						
Image	Product	Price	Discount	Quantity	Total	Remove
	Iphone 15 Pro Max	\$49.00	\$10.00	<button>-</button> 10 <button>+</button>	\$49.00	<button>X</button>
	Iphone 15 Pro Max	\$49.00	\$10.00	<button>-</button> 10 <button>+</button>	\$49.00	<button>X</button>
	Iphone 15 Pro Max	\$49.00	\$10.00	<button>-</button> 1 <button>+</button>	\$49.00	<button>X</button>

Figure 63: Cart Page.

This is the reference cart page;

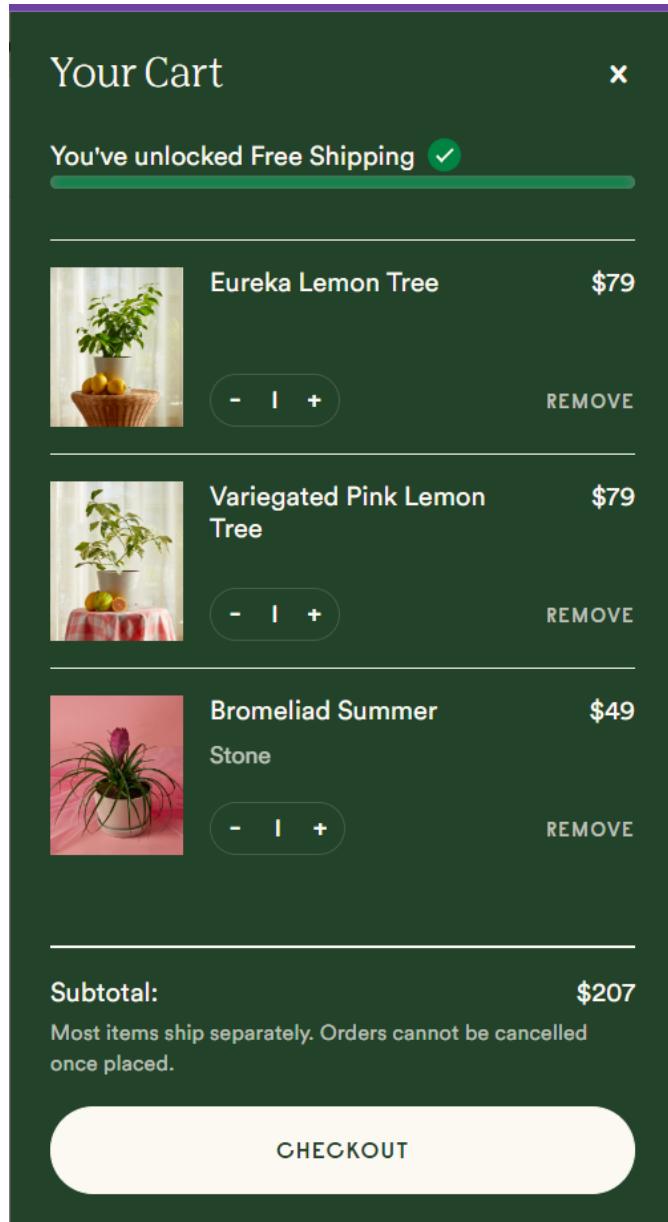


Figure 64: Reference Cart Page.

Reference link: [Click Here](#)

7.1.8. Thank You Page:

This is our thank you page;

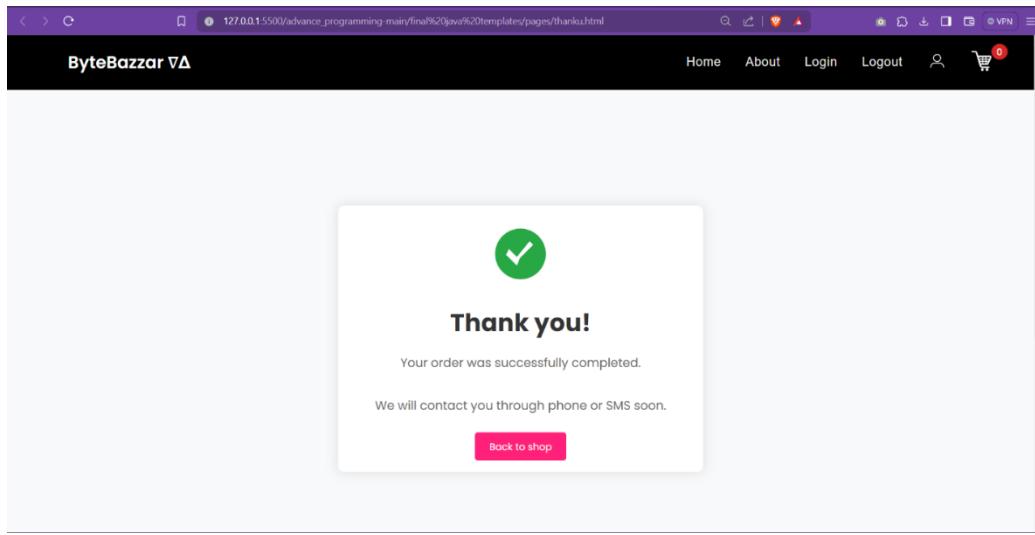


Figure 65: Thank You Page.

This is the reference thank you page;

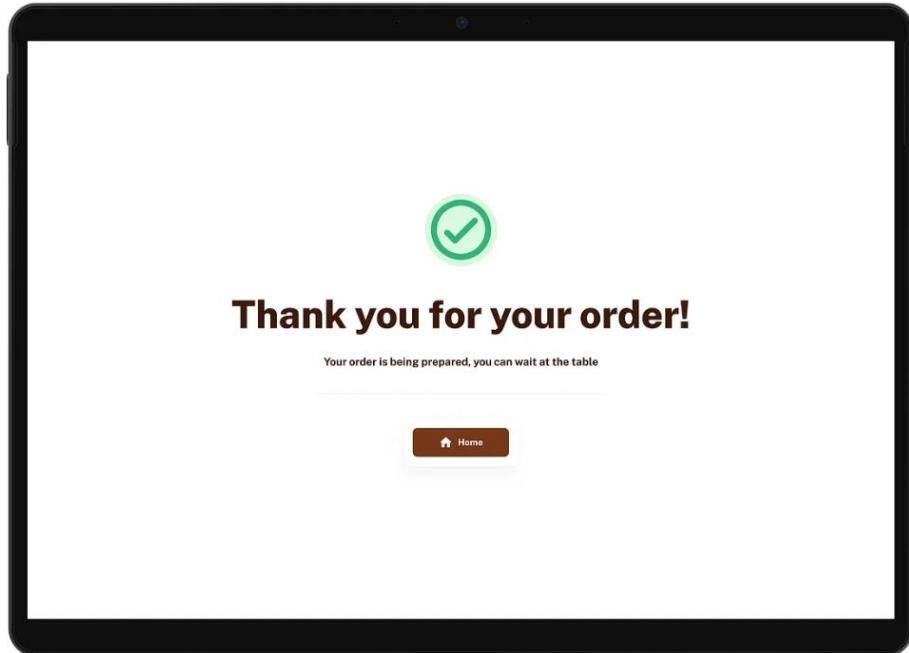


Figure 66: Reference Thank You Page.

Reference link: [Click Here](#)

7.1.9. Admin Page:

This is our admin page;

The screenshot shows the ByteBazaar Admin Panel interface. On the left, there's a sidebar with a user profile picture of Miraj Deep Bhandari and three main menu items: Orders, Products, and Mailbox. The main content area is titled "ByteBazaar Admin Panel". It displays several key metrics in cards: 500 User Orders (with a magnifying glass icon), 102 Pending Orders (with a circular arrow icon), 398 Order Delivered (with a delivery truck icon), 398 Order Canceled (with a crossed-out circle icon), \$653,20 Monthly revenue growth (with a money bag icon), and 20 User Inquiry E-mails (with an envelope icon). Below these, there's a section titled "Customer Orders" with a table. The table has columns for Id, Customer Name, Product Id, Product Name, Issued Date, Amount, Status, and Actions. Two rows of data are shown, both for an order from Apil Thapa (apil@gmail.com) for a One Plus 7 Pro at \$900.

ID	Customer Name	Product ID	Product Name	Issued Date	Amount	Status	ACTIONS
#5033	Apil Thapa Apil@gmail.com	#p_3392	One Plus 7 Pro	19 April, 2022	\$900	Delivered	
#5033	Apil Thapa Apil@gmail.com	#p_3392	One Plus 7 Pro	19 April, 2022	\$900	Pending	

Figure 67: Admin Page.

This is reference Admin page;

The screenshot shows the Pluto Admin Dashboard. On the left, there's a sidebar with a user profile picture of John David and a list of menu items under "General": Dashboard, Widgets, Elements, Tables, Apps, Pricing Tables, Contact, Additional Pages, Map, Charts, and Settings. The main content area is titled "Dashboard". It features several cards with metrics: Welcome (2500), Average time (123.50), Collections (1,805), Comments (54), Friends (35k), Feeds (128), Followers (584k), Tweets (978), Contacts (758+), Feeds (365), Followers (450), and Circles (57). Below these cards is a section titled "Extra Area Chart" containing a bar chart with three datasets and a line graph.

Figure 68: Reference Admin Page.

8. Critical Analysis:

Login

User ID

Password

Don't have an account? [Sign up](#)

Forget Your Password ? [Reset It](#)

Figure 69: entering user credentials.

The screenshot shows the ByteBazaar Admin Panel interface. On the left is a sidebar with a user profile (Mira Deep Bhandari), navigation links for Orders, Products, and Mailbox, and a Logout button. The main content area displays several summary cards:

- User Orders: 102 (Pending Orders)
- Order Delivered: 398
- Order Canceled: 398 (Red icon)
- Monthly revenue growth: \$653,20
- User Inquiry E-mails: 20

Below these cards is a section titled "Customer Orders" with a table:

ID	Customer Name	Product ID	Product Name	Issued Date	Amount	Status	ACTIONS
#5033	Apil Thapa Apil@gmail.com	#p_3392	One Plus 7 Pro	19 April, 2022	\$900	Delivered	

Figure 70: redirecting to admin panel after entering user credentials.

The screenshot shows a database management interface with a sidebar containing tables: New, bytебazaar, address, carts, inquiry, orders, order_products, products, and users. The main area displays the "users" table with the following data:

User_ID	Full_Name	Email	Password	Phone_Number	Gender	Role
apil12	APIL THAPA	apil@gmail.com	501hzdSAKlwBsnUzGSTtzIPiE2SxLB0rt/9UQ/DDQp42qMW...	+9779867004146	Male	admin
mira123	MIRAJDEEP	api1df@gmail.com	juY+HyKxWzIPfgOAdeS6WqCKBRNoDQsPovkZNy28flhw2qkxZ...	+9779841214461	Male	user

Figure 71: displaying database.

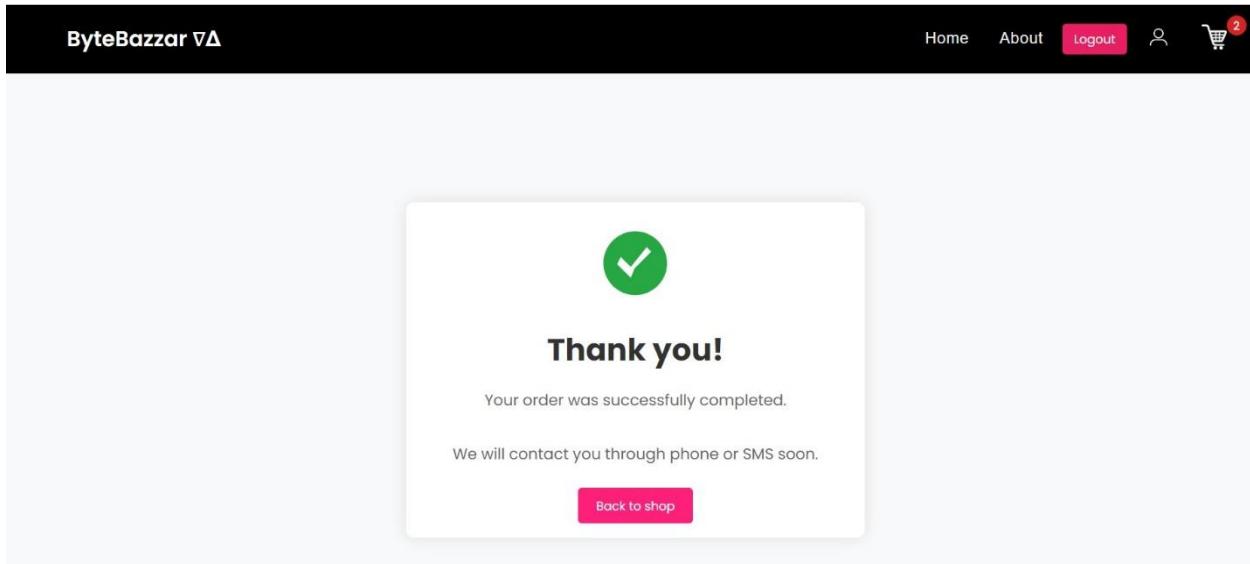


Figure 72: redirecting to thankyou page.

```

System.out.println("cardId is" + cardId);
System.out.println("total is" + total);

String status = "pending";
OrdersModel orders = new OrdersModel(orderid, userId, total, status, city, address, pay);
int orderResult = dbController.addOrder(orders);

// Introducing logical error: Ignoring the orderResult and proceeding with order processing
List<CartsModel> cartDetails = dbController.getCartDetail(cardId);

boolean success = true;

for (CartsModel cartItem : cartDetails) {
    String productId = cartItem.getProductId();
    String Linequantity = cartItem.getQuantity();

    Order_products ordersprod = new Order_products(orderid, productId, Linequantity);

    int lineItemResult = dbController.addOrderLineItem(ordersprod);

    if (lineItemResult != 1) {
        // Set success to false if any line item insertion fails
        success = false;
        // Optionally, handle error for individual line item
    }
}

// Intentionally not checking success and always redirecting
response.sendRedirect(request.getContextPath() + "/pages/thanku.jsp");
}

```

Figure 73: displaying code for redirection into thankyou page without saving into database.

So, we can see that from the above screen shots of the web pages and our code, a logical error was found. With proper research and debugging of code, we came to solve this problem with the help of stack overflow and other sites.

9. Conclusion:

The ByteBazaar project aimed to develop a fully functional and responsive e-commerce website focused on selling mobile phones. Throughout the development process, our team utilized a combination of technologies, including Java EE framework, MySQL database, HTML, CSS, JavaScript, and various tools such as Eclipse IDE, Balsamiq for wireframing, and XAMPP for local testing.

The project followed a structured methodology, involving stages like requirements gathering, design, implementation, testing, deployment, and maintenance. We employed the Model-View-Controller (MVC) architectural pattern to separate concerns and ensure a modular codebase.

The final product features a visually appealing and user-friendly interface, with functionalities like user authentication, product browsing and searching, shopping cart management, order placement, and administrative capabilities. Extensive testing was conducted to ensure the system's performance, usability, and adherence to the specified requirements.

Throughout the development journey, our team faced challenges and learned valuable lessons in teamwork, time management, and problem-solving. We successfully integrated various technologies and libraries, such as Servlets, JSP, JDBC, and JSTL, to create a robust and feature-rich e-commerce platform.

The ByteBazaar project has demonstrated our team's ability to conceptualize, design, and implement a complex web application while adhering to industry best practices. The experience gained from this project has equipped us with practical skills and knowledge that will be invaluable in our future endeavors in the field of web development and e-commerce solutions.

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