



جامعة بيروت العربية
BEIRUT ARAB UNIVERSITY

Verde Rosa: Design and Implementation of a Full-Stack E-Commerce Flower Shop Website

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CMPs264: Web Development

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Gitthub Repository Link:

<https://github.com/Amjad-dev1/verde-rosa.git>

Abstract

Verde Rosa is a family-run flower business with over two decades of expertise in Beirut, Lebanon. The company must have an online presence in order to adjust to shifting e-commerce trends. The objective of this project is to develop a functioning, visually appealing, and responsive website that enables users to browse things, place orders, give to sustainability, and manage their accounts properly. The system's mix of a SQL database, PHP backend, and React frontend enables for flawless integration of the user interface and data administration.

Table of Contents:

Section	Page
Introduction	4
Technology Stack	5
Design Phases	5
➤ Collaboration & Version Control	
➤ Database Setup	
➤ Frontend Project Setup	
➤ Backend Project Setup	
Functionalities Overview	7
Development Workflow and Functional Implementation	9
➤ React Router	
➤ Navbar and Navigation Links	
➤ User Authentication	
➤ Product Browsing, Cart & Checkout	
➤ Donations & Sustainability	
➤ User Dashboard & Profile Management	
➤ Data Flow & Full-Stack Integration	
➤ Error Handling & Validation	
Frontend Architecture & Component Structure	14
➤ State Management	
➤ Component Organization	
➤ Routing & Navigation	
➤ Frontend Validation	
Styling & Design Choices	16
➤ CSS & Layout Structure	
➤ Reusable Components & Glassmorphism	
➤ Animations & Responsiveness	
➤ Visual & UX Choices	
➤ Home Page Highlights	
➤ Location Assistance	
Website Screenshots	24
Conclusion	37
References	38

Introduction

Verde Rosa has been providing consumers for two decades, delivering high-quality bouquets and flower arrangements. The store realized it needed to upgrade its procedures and develop a digital platform as internet shopping grew in popularity.

The website seeks to:

- Introduce the shop to the e-commerce world.

- Simplify internet shopping.
- Improve accessibility and user experience.
- Promote tree planting and other environmentally friendly initiatives.

The idea is to keep the shop's tradition while embracing technology.

Needs and Problem Statement

Despite its long-standing history, Verde Rosa faces several challenges:

- **Restricted Internet Presence:** Sales are limited to in-person customers.
- **Manual Order Processing:** No centralized system to manage inventory or orders.
- **Customer Engagement:** Minimal interaction with loyal clients.
- **Sustainability Integration:** No online platform to support environmental initiatives.

To address these issues, the shop requires a website that:

- Displays products dynamically.
- Allows users to add items to a cart and complete transactions.
- Supports user accounts with order history, donations, and address management.
- Implements sustainability features.
- Offers a modern, visually engaging interface.

Technology Stack

Layer	Technology	Purpose
Frontend	React.js (Vite)	Fast, interactive UI and routing
Styling	CSS + Glassmorphism	Modern, glass-effect aesthetic
Backend	PHP	API endpoints, session management, data handling
Database	SQL Server (SSMS)	Stores products, users, orders, donations
Server	PHP built-in server	Local backend development
Additional Tools	Illustrator	Logo and UI graphics

Design Phases

Collaboration & Version Control

GitHub push and pull were heavily utilized for version control during development. The repository was updated often by both team members, facilitating easy communication, avoiding code conflicts, and effectively monitoring advancement. This approach allows frontend and backend activities to be created in parallel while maintaining a consistent, up-to-date codebase.

Database Setup

1. Database Creation:

- A new database VerdeRosaDB was created in SSMS.

2. Tables and Relationships:

- Core tables include Users, Products, Carts, CartItems, Orders, OrderItems, Donations, Addresses, Subscribers, and SustainabilityFacts.

- Proper primary and foreign keys maintain data integrity (e.g., Users → Carts → CartItems).

Example snippet:

```
CREATE DATABASE VerdeRosaDB;
GO
USE VerdeRosaDB;
GO
CREATE TABLE Users (
    UserID INT IDENTITY(1,1) PRIMARY KEY,
    FullName VARCHAR(100) NOT NULL,
    Email VARCHAR(150) NOT NULL UNIQUE,
    PasswordHash VARCHAR(255) NOT NULL,
    Phone VARCHAR(50),
    Role VARCHAR(20) DEFAULT 'User',
    CreatedAt DATETIME DEFAULT GETDATE()
);
```

This setup ensures a solid foundation for storing users, products, orders, donations, and other essential information.

Frontend Project Setup

1. Vite Server Initialization:

- A new React project folder was generated with Vite, creating the basic application structure.

2. Folder Structure:

- src/: All React components and pages (Home, Products, Cart, Donate, Account, etc.)
- assets/: Images, videos, and media
- styles/: CSS files for components
- App.jsx: Handles routing and integrates global components like Navbar

This setup provides a clean and scalable environment for frontend development.

Backend Project Setup

1. Folder Structure:

- backend/: PHP scripts organized by functionality
 - authentication: login.php, register.php, session_check.php
 - product operations: getProducts.php, getCategories.php, getSingleProduct.php
 - cart operations: getCart.php, addToCart.php, removeFromCart.php
 - order processing: checkout.php, get_orders.php
 - donations/tree counter: donate.php, get_tree_counter.php
- db.php: PDO database connection and error handling

2. Integration with Frontend:

- PHP endpoints are accessed via fetch() from React components.
- JSON is used as the data exchange format.

This separation ensures maintainability and a clean division between UI logic and business logic.

Functionalities Overview

- **User Authentication:** Secure registration, login, session management, logout, and password hashing.
- **Navigation:** Smooth transitions across Home, Products, Cart, Donate, and Account.
- **Product Browsing & Filtering:** View, filter, sort, and access product details.
- **Shopping Cart & Checkout:** Add products/custom bouquets, modify quantities, remove items, and complete orders.
- **Donations & Sustainability Features:** Donate money, track trees planted, and access sustainability facts.
- **User Dashboard & Profile Management:** View/edit personal info, manage addresses, and monitor orders.
- **Full-Stack Integration:** React frontend + PHP backend + SQL Server for dynamic, secure, responsive interactions.

Development Workflow and Functional Implementation

Frontend Routing with React Router

- React Router v6 manages client-side routing between pages without reloading.
- **App.jsx** wraps all pages and global components:

```
import { BrowserRouter as Router, Routes, Route } from "react-router-dom";
import Navbar from "./components/Navbar.jsx";
import Home from "./pages/home.jsx";
import ProductsPage from "./pages/products1.jsx";
import Cart from "./pages/cart.jsx";

function App() {
  return (
    <Router>
      <Navbar />
      <Routes>
        <Route path="/" element={<Home />} />
        <Route path="/products" element={<ProductsPage />} />
        <Route path="/cart" element={<Cart />} />
      </Routes>
    </Router>
  );
}
export default App;
```

- **index.html & main.jsx**: Mounts App.jsx into the root div using ReactDOM.createRoot.

Navbar and Navigation Links

- **<NavLink>** highlights active pages automatically.
- Conditional rendering shows different links for logged-in vs. logged-out users.

Example:

```
import { NavLink } from "react-router-dom";

export default function Navbar() {
```

```

    return (
      <nav>
        <NavLink to="/">Home</NavLink>
        <NavLink to="/products">Products</NavLink>
        <NavLink to="/cart">Cart</NavLink>
        <NavLink to="/donate">Donate</NavLink>
        <NavLink to="/account">Account</NavLink>
      </nav>
    );
}

```

User Authentication

The authentication system uses PHP, PDO, and React to ensure secure login, registration, and session handling.

Database Connection (db.php)

Centralized PDO connection:

```

<?php
$dsn = "sqlsrv:Server=YOUR_SERVER;Database=VerdeRosa";
$conn = new PDO($dsn, "user", "pass", [
    PDO::ATTR_ERRMODE => PDO::ERRMODE_EXCEPTION
]);
?>

```

Registration (register.php)

Uses password_hash() for secure storage:

```

$password = password_hash($_POST['password'], PASSWORD_DEFAULT);
$stmt = $conn->prepare("INSERT INTO Users (name,email,password) VALUES
(?, ?, ?)");
$stmt->execute([$name, $email, $password]);

```

Login (login.php)

Verifies password and creates session:

```

$stmt = $conn->prepare("SELECT * FROM Users WHERE email=?");
$stmt->execute([$email]);
$user = $stmt->fetch();

if ($user && password_verify($password, $user['password'])) {
  session_start();
}

```

```
    $_SESSION['user_id'] = $user['UserID'];
    echo json_encode(["success" => true]);
}
```

Session Check (session_check.php)

Used to protect restricted pages:

```
session_start();

echo json_encode(["loggedIn" => isset($_SESSION['user_id'])));
```

Logout

Destroys session:

```
session_start();
session_destroy();
Frontend (React) Example
useEffect(() => {
  fetch("/backend/session_check.php")
    .then(res => res.json())
    .then(data => setLoggedIn(data.loggedIn));
}, []);
```

Product Browsing, Cart & Checkout

Backend APIs fetch products, categories, and handle cart operations.

Fetch All Products (products.php)

```
$stmt = $conn->query("SELECT * FROM Products");
echo json_encode($stmt->fetchAll());
Dynamic Product Details
$stmt = $conn->prepare("SELECT * FROM Products WHERE ProductID=?");
$stmt->execute([$_GET['id']]);
echo json_encode($stmt->fetch());
```

Add to Cart (add_to_cart.php)

```
$stmt = $conn->prepare(
  "INSERT INTO CartItems (UserID, ProductID, Quantity)
   VALUES (?, ?, ?)
");
$stmt->execute([$uid, $pid, $qty]);
```

Frontend Example (Add to Cart)

```
fetch(`/backend/add_to_cart.php`, {
  method: "POST",
  body: new FormData(formRef.current)
}).then(() => loadCart());
```

Checkout Backend

```
$stmt = $conn->prepare("INSERT INTO Orders (UserID, Total) VALUES (?,?)");
$stmt->execute([$uid, $total]);
```

Donations & Sustainability Features

Submit Donation (donate.php)

```
$stmt = $conn->prepare("INSERT INTO Donations (UserID, Amount) VALUES
(?,?);
$stmt->execute([$uid, $amount]);
```

Get Total Trees

```
$stmt = $conn->query("SELECT SUM(Amount) AS total FROM Donations");
echo json_encode($stmt->fetch());
```

Frontend Example

```
fetch("/backend/donate.php", {
  method: "POST",
  body: donationFormData
}).then(() => updateTreeCount());
```

User Dashboard & Profile Management

Backend APIs allow users to view and update their profile and manage addresses.

Fetch User Profile

```
$stmt = $conn->prepare("SELECT * FROM Users WHERE UserID=?");
$stmt->execute([$uid]);
echo json_encode($stmt->fetch());
```

Update Profile

```
$stmt = $conn->prepare("UPDATE Users SET name=?, phone=? WHERE UserID=?");
$stmt->execute([$name, $phone, $uid]);
```

Frontend (React)

```
useEffect(() => {
  fetch("/backend/get_profile.php")
    .then(res => res.json())
```

```
    .then(setProfile);
}, []);
```

Data Flow & Full-Stack Integration

The full-stack workflow is consistent across all features:

React UI → fetch() → PHP API → PDO query → JSON → React state update

Example:

Add to Cart → Stored in DB → Cart Page Reloads Using API

```
useEffect(() => {
  fetch("/backend/get_cart.php")
    .then(res => res.json())
    .then(setCartItems);
}, []);
```

Error Handling & Validation

Backend Validation

```
if (!filter_var($email, FILTER_VALIDATE_EMAIL)) {
  echo json_encode(["success" => false, "msg" => "Invalid email"]);
  exit;
}
```

Using prepared statements:

```
$stmt = $conn->prepare("SELECT * FROM Users WHERE email=?");
```

Frontend Validation Example

```
if (!email.includes("@")) {
  setError("Please enter a valid email");
  return;
}
```

UI Error Messages

```
{error && <p className="error">{error}</p>}
```

Frontend Architecture & Component Structure

The frontend of the Verde Rosa website is built using **React (Vite)** with a modular component-based structure. Each part of the interface is composed of reusable components, ensuring consistency, maintainability, and scalability throughout the project.

1. State Management (useState & useEffect)

State across the application is managed with React's built-in hooks:

- **useState()** stores dynamic data such as products, categories, cart items, user session state, form inputs, and backend responses.
- **useEffect()** triggers API calls on component mount or when certain states change.

Example: Fetching Products

```
const [products, setProducts] = useState([]);
```

```
useEffect(() => {
  fetch("/backend/get_products.php")
    .then(res => res.json())
    .then(data => setProducts(data));
}, []);
```

This structure ensures the UI updates instantly after each backend request.

2. Component Organization & Reusability

The frontend is split into:

- **Pages:** Home, Products, ProductDetails, Cart, Checkout, Dashboard, Login, Register, Donate.

- **Shared Components:** Navbar, Footer, Filters, VideoBackground, Vase3D, CategoryBar.
- **Utility Components:** ProtectedRoute, session handlers, loaders, error displays.

Reusable components provide a consistent user experience. For example:

VideoBackground Component

```
export default function VideoBackground({ src }) {
  return (
    <div className="video-container">
      <video autoPlay muted loop playsInline className="background-video">
        <source src={src} type="video/mp4" />
      </video>
    </div>
  );
}
```

This component is used across multiple pages to maintain emotional engagement and visual atmosphere.

3. Routing & Navigation

Routing is handled using **React Router v6**, enabling smooth navigation between pages.

- **Protected Routes:** Session-based route guarding for dashboard, cart, checkout, donations.
- **Dynamic Routes:** Product pages use URLs like /product/:id and useParams() to fetch the correct product from the backend.

Dynamic Product Page Example

```
const { id } = useParams();
useEffect(() => {
  fetch('/backend/product.php?id=${id}`)
```

```
.then(res => res.json())
.then(setProduct);
}, [id]);
```

4. Frontend Validation

- Form inputs are checked before sending requests.
- Incorrect email formats, empty fields, and invalid donation amounts trigger UI warnings.

```
if (!email.includes("@")) {
  setError("Please enter a valid email");
  return;
}
```

Friendly UI error messages ensure a smooth user experience.

Styling & Design Choices



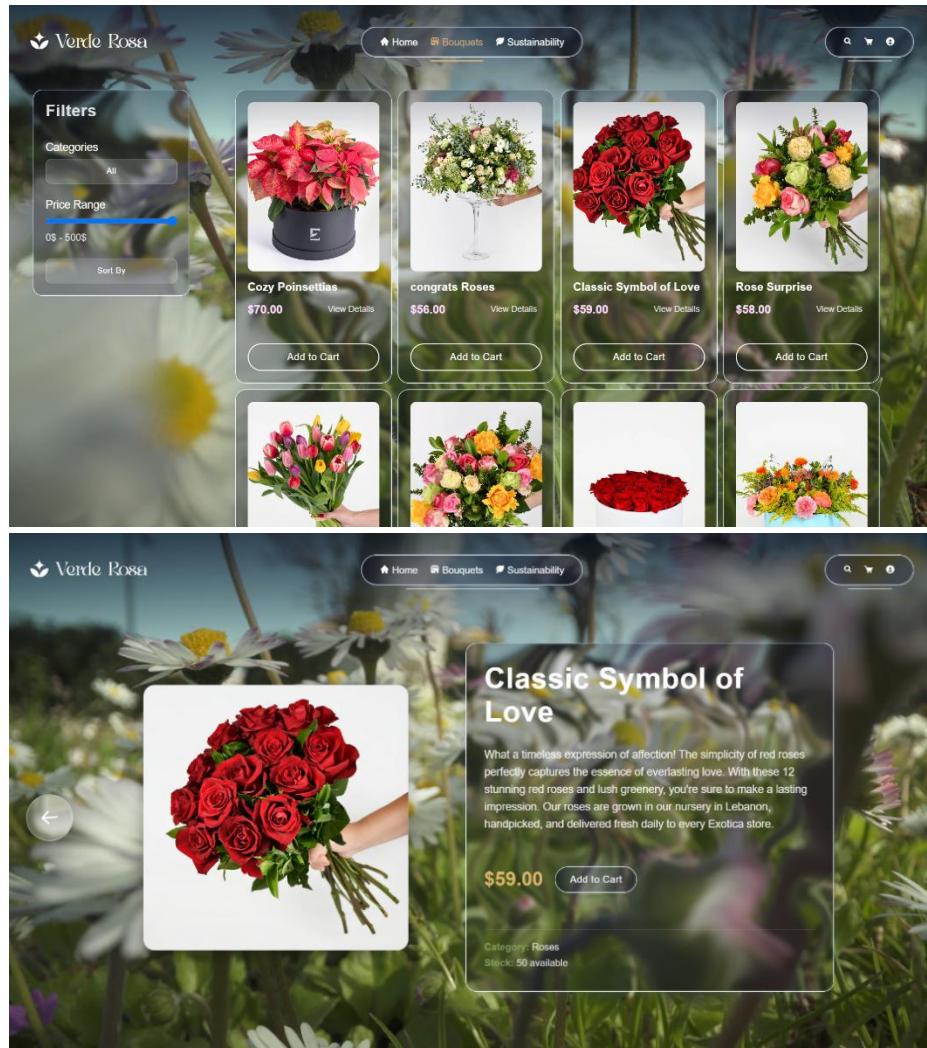
The website's visual theme blends **glassmorphism**, gradient-enhanced sections, and immersive 3D/visual elements to reinforce the brand's floral identity.

1. CSS & Layout Structure

Key Layout Choices:

- **Home page:** Full-screen, stacked sections using Flexbox.

- **Product grid:** Responsive CSS Grid adapting across all device sizes.
- **Global design:** Unified colors, typographic consistency, global reset.css.



2. Reusable Components & Glassmorphism

A universal .glass class creates the soft, frosted-glass aesthetic used across:

- Navbar
- Buttons
- Panels
- Product cards
- Form inputs

Glassmorphism is achieved with:

- Blur filters
- Transparency
- Bright highlights
- Light borders

Example Glass Class (conceptual)

```
.glass {  
    background: rgba(255,255,255,0.15);  
    backdrop-filter: blur(10px);  
    border-radius: 16px;  
    border: 1px solid rgba(255,255,255,0.3);  
}  
  
<filter  
    id="glass-morphism"  
    x="0%"  
    y="0%"  
    width="100%"  
    height="100%"  
    filterUnits="objectBoundingBox"  
>>  
    <feTurbulence  
        type="fractalNoise"  
        baseFrequency="0.01 0.01"  
        numOctaves="1"  
        seed="5"  
        result="turbulence"  
    />  
    <feGaussianBlur in="turbulence" stdDeviation="0" result="softMap"  
/>  
    <feDisplacementMap  
        in="SourceGraphic"  
        in2="fadedEdges"  
        scale="150"  
        xChannelSelector="R"  
        yChannelSelector="G"  
    />  
</filter>
```

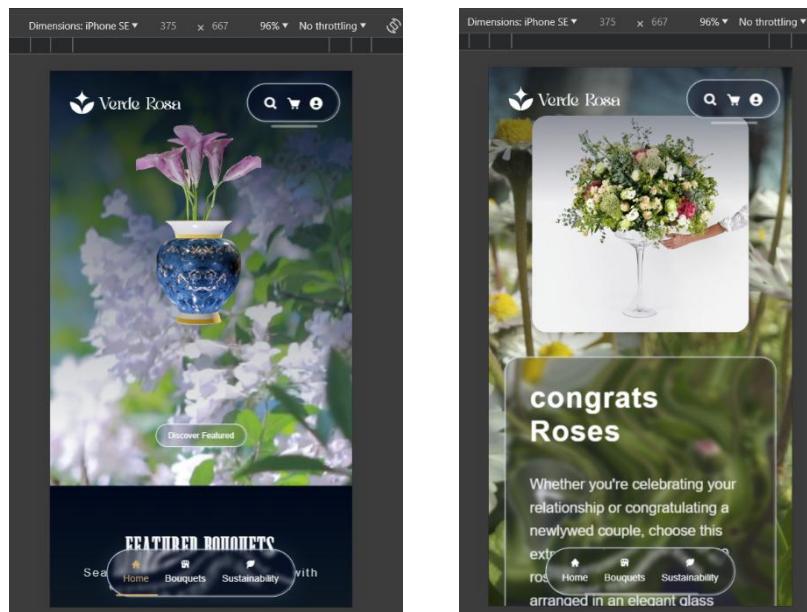
This ensures the website maintains a cohesive visual identity.



3. Animations & Responsiveness

- Smooth hover transitions using transition: 0.3s.
- Scroll-based animations (e.g., 3D vase rotates with scroll).
- Components react gracefully to screen size changes via media queries.
- On mobile, the **navbar becomes a bottom dock**, improving accessibility.

Responsiveness:



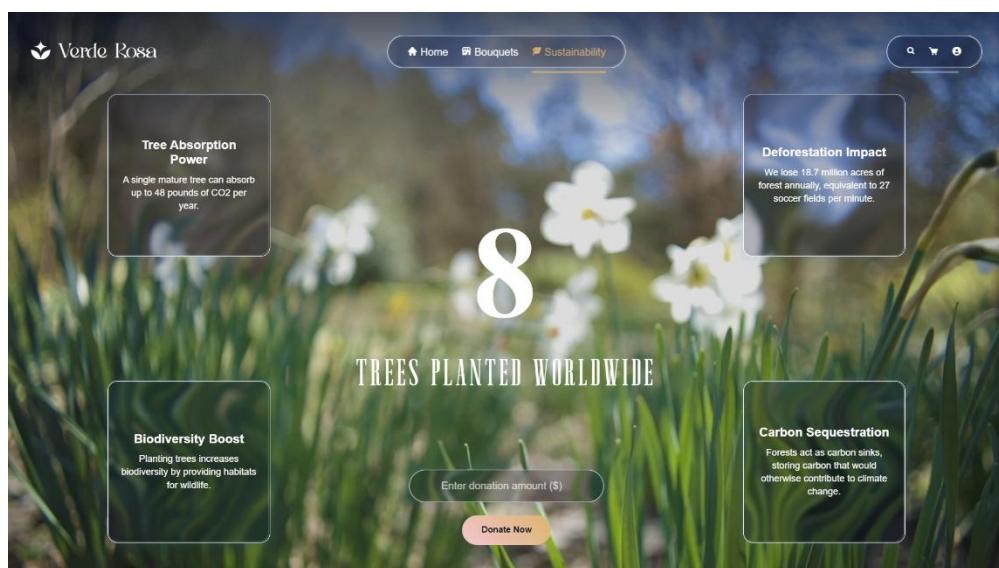
4. Visual & UX Choices

Video Background Sections

Certain pages feature looping video backgrounds to evoke the atmosphere of flowers and nature.

(Component shown earlier.)

These videos add emotion without overwhelming readability due to the blurred glass overlays.



5. Home Page Highlights

(1) 3D Vase Model – React Three Fiber

The landing page features a rotating 3D vase model (vase.glb) rendered using **React Three Fiber**.

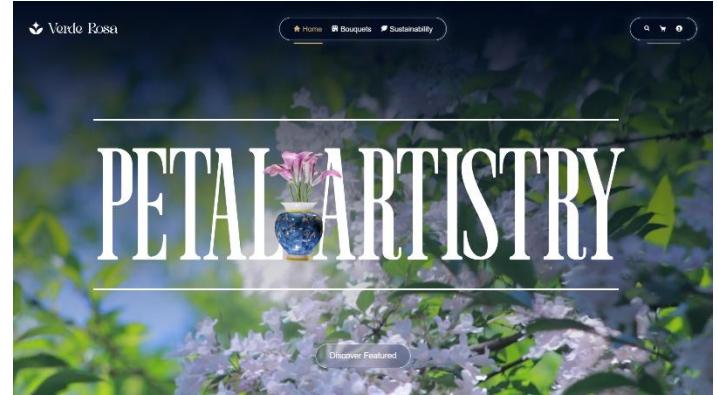
It slowly rotates based on scroll position, with fading material opacity:

```

useFrame(() => {
  const scroll = window.scrollY * 0.005;
  targetRotation.current = scroll * amplitude;

  ref.current.rotation.y = THREE.MathUtils.lerp(
    ref.current.rotation.y,
    targetRotation.current,
    damping
  );
});

```



This creates a dynamic and premium look for the brand.

(2) Smooth Scroll CTA

The landing page includes a “Discover Featured” button that scrolls smoothly to the featured section:

```

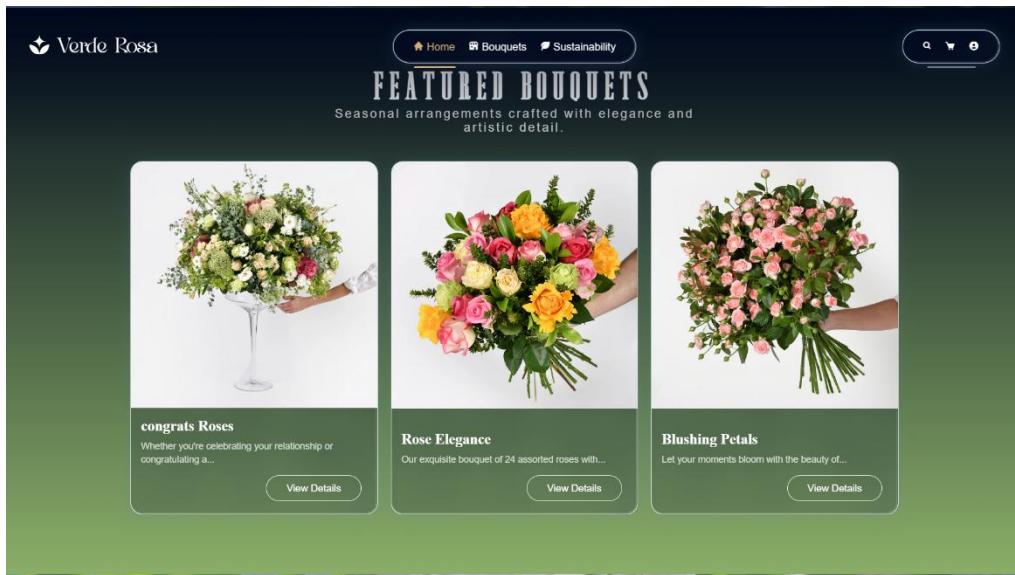
html {
  scroll-behavior: smooth;
}

```

(3) Featured Bouquets Section

- Gradient backgrounds reflecting brand colors
- Floral emblems to reinforce identity
- Product cards styled with glassmorphism

This section visually introduces top products without overwhelming the user.

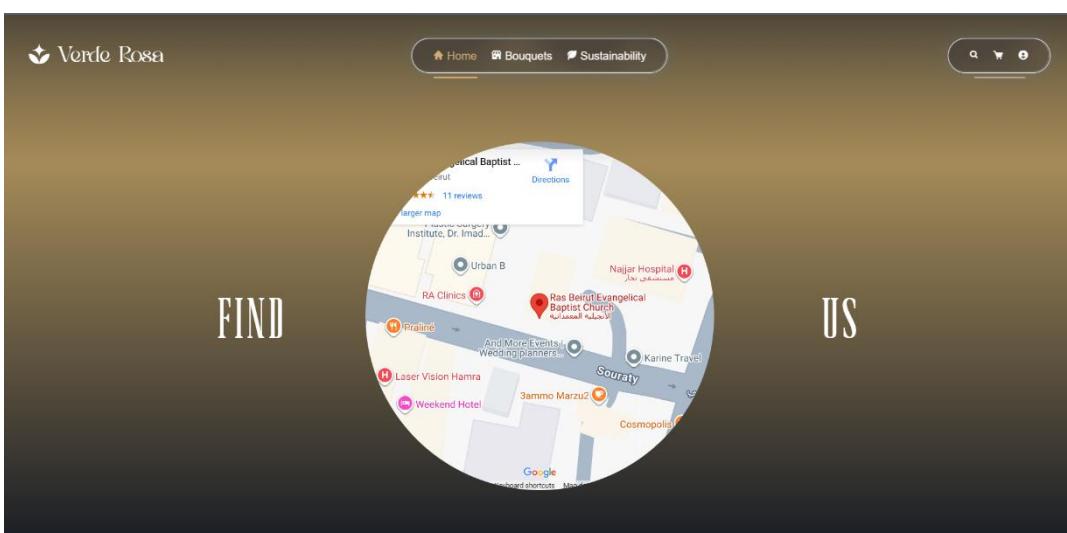


6. Location Assistance (Google Maps)

The “Visit Us” section embeds a live Google Maps iframe to help customers quickly locate the shop:

```
<iframe  
src="https://www.google.com/maps/embed?...(full link)"  
width="500"  
height="500"  
style={{ border: 0 }}  
allowFullScreen  
loading="lazy"  
referrerPolicy="no-referrer-when-downgrade"  
/>
```

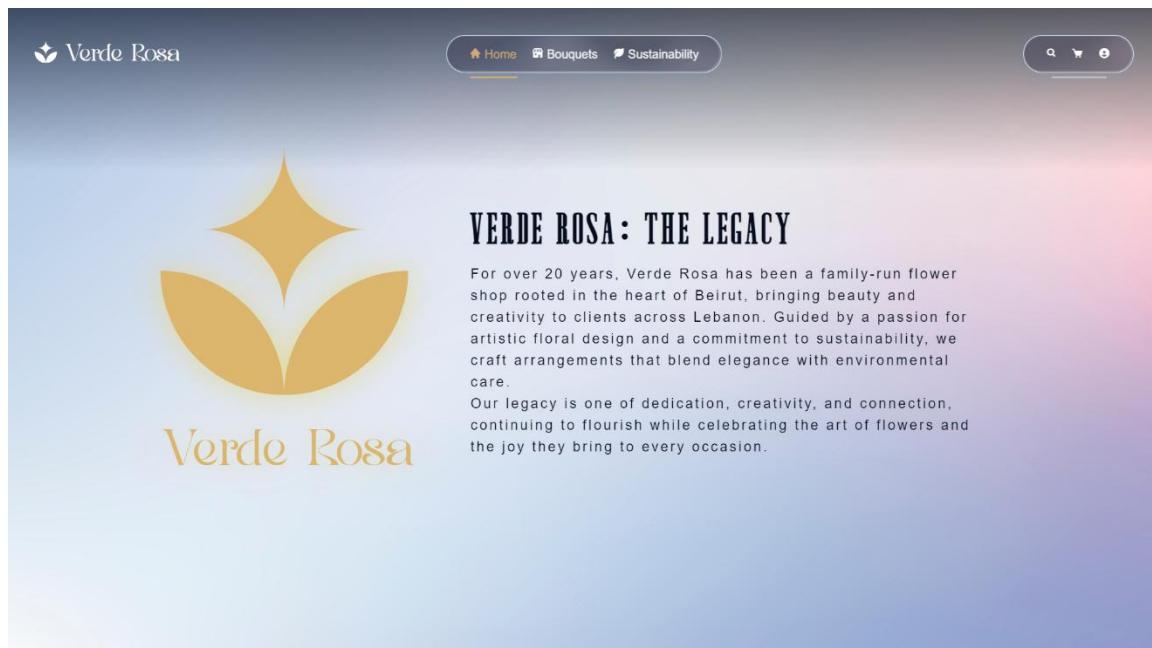
This improves real-world usability and accessibility.



7. Cohesive Styling & Interaction

- Hover animations on buttons and product cards
- Floating and fading sections for a modern aesthetic
- Scroll-triggered 3D and visual effects
- Consistent color palette reflecting Verde Rosa branding

All these contribute to an engaging yet easy-to-navigate experience.

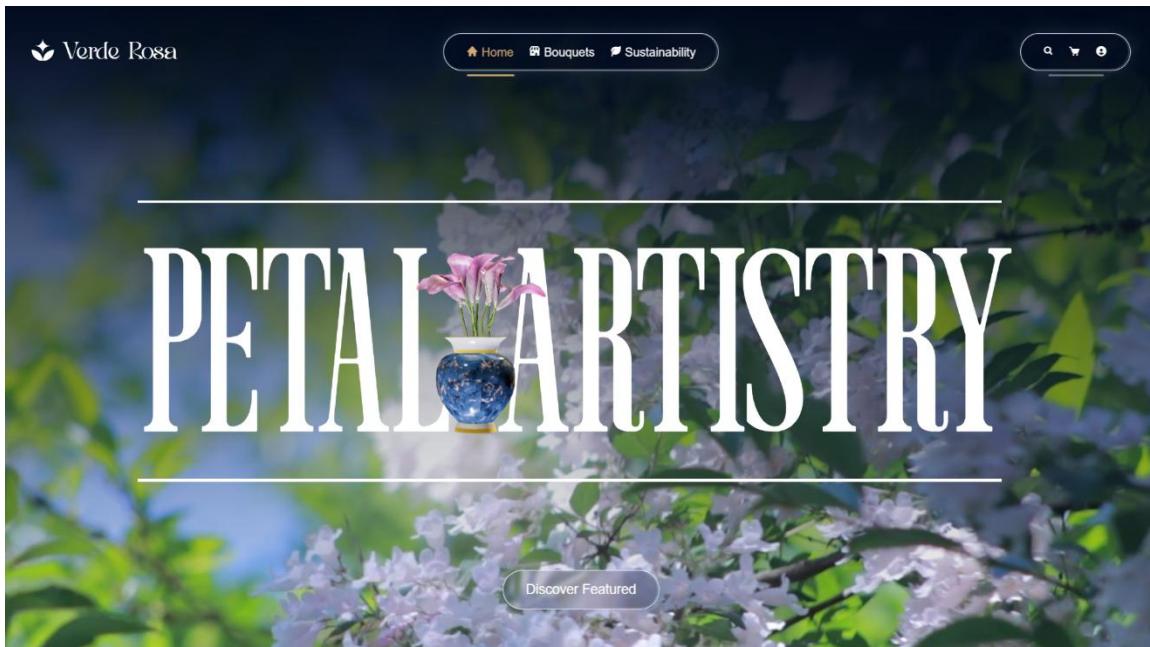


Visual Overview & Website Screenshots

This section will contain **screenshots of the website**, illustrating:

- Home page (With a 3d section)
- Featured sections
- Bouquets Page
- Single Product Details page
- Sustainability page (Donation)
- Cart and checkout
- Search pop up
- Account login and register
- User dashboard
- Maps section

These images highlight the functional components, styling layers, and user interactions that form the complete Verde Rosa experience.



Home page

 Verde Rosa

[Home](#) [Bouquets](#) [Sustainability](#)

FEATURED BOUQUETS

Seasonal arrangements crafted with elegance and artistic detail.



congrats Roses
Whether you're celebrating your relationship or congratulating a...

[View Details](#)



Rose Elegance
Our exquisite bouquet of 24 assorted roses with...

[View Details](#)



Blushing Petals
Let your moments bloom with the beauty of...

[View Details](#)

 Verde Rosa

[Home](#) [Bouquets](#) [Sustainability](#)



VERDE ROSA: THE LEGACY

For over 20 years, Verde Rosa has been a family-run flower shop rooted in the heart of Beirut, bringing beauty and creativity to clients across Lebanon. Guided by a passion for artistic floral design and a commitment to sustainability, we craft arrangements that blend elegance with environmental care. Our legacy is one of dedication, creativity, and connection, continuing to flourish while celebrating the art of flowers and the joy they bring to every occasion.

Verde Rosa

[Home](#) [Bouquets](#) [Sustainability](#)

VERDE ROSA: THE LEGACY

For over 20 years, Verde Rosa has been a family-run flower shop rooted in the heart of Beirut, bringing beauty and creativity to clients across Lebanon. Guided by a passion for artistic floral design and a commitment to sustainability, we craft arrangements that blend elegance with environmental care.

Our legacy is one of dedication, creativity, and connection, continuing to flourish while celebrating the art of flowers and the joy they bring to every occasion.

Shop now — New arrivals — Discounts —Shop now — New arriv

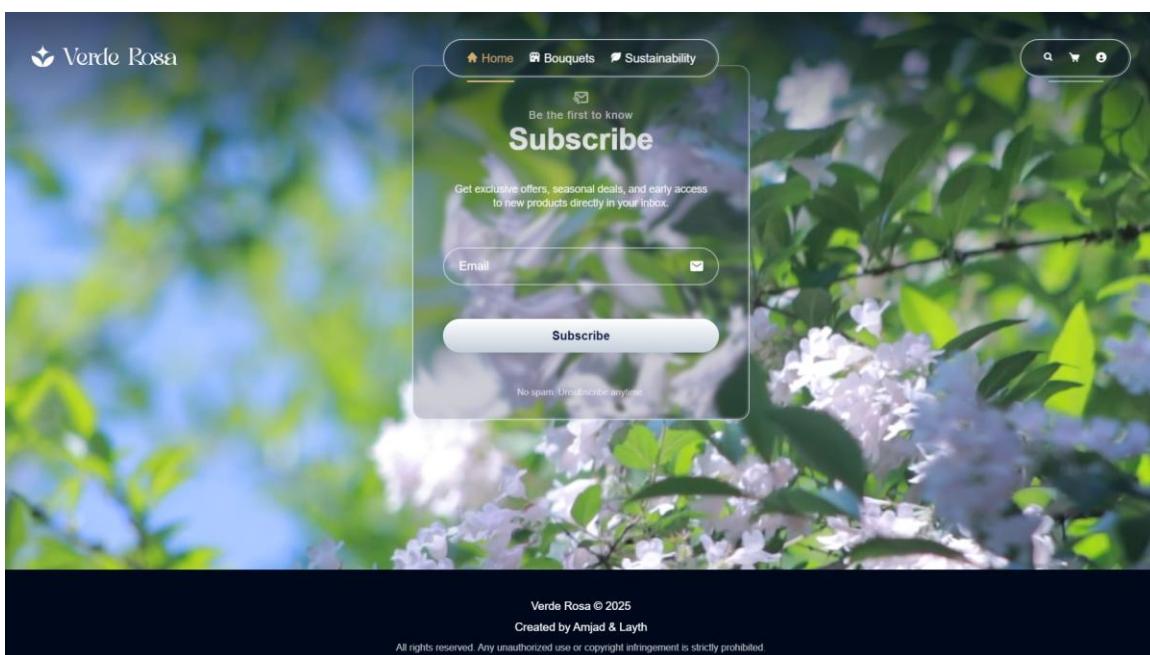
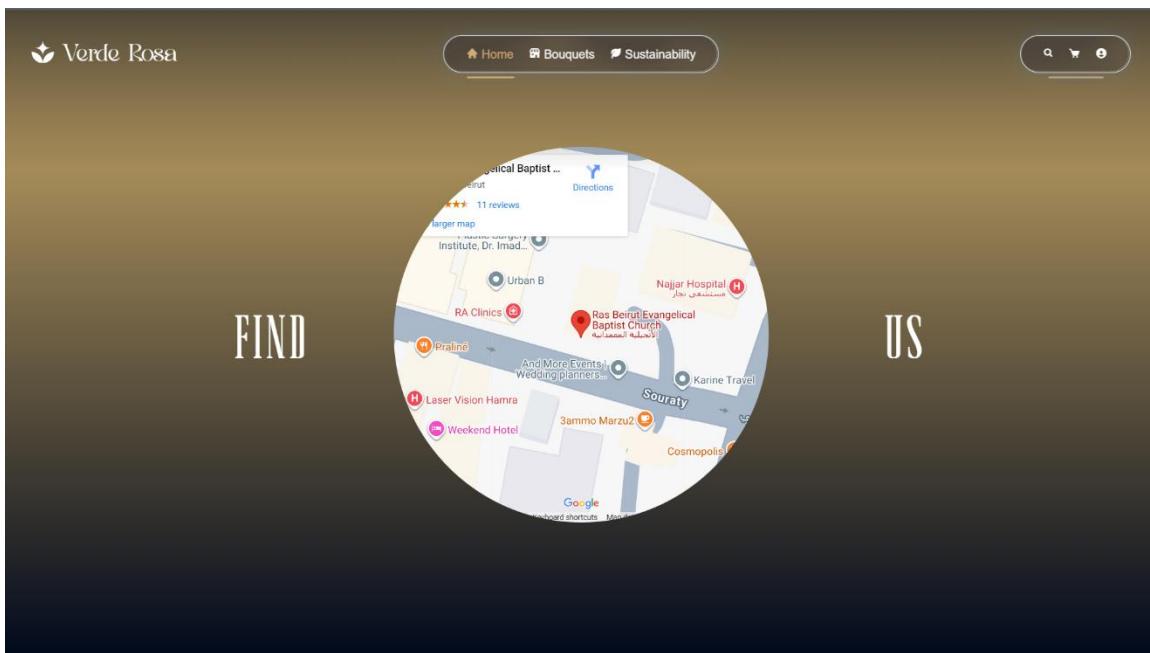
Professional Service
Business in domain since 2005

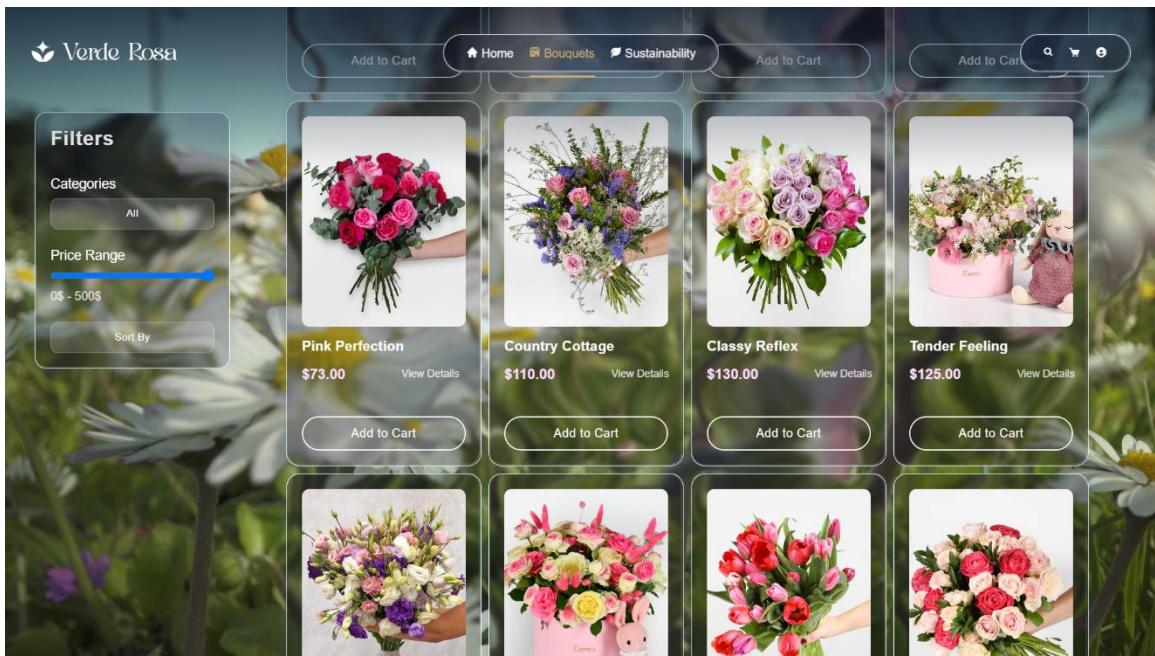
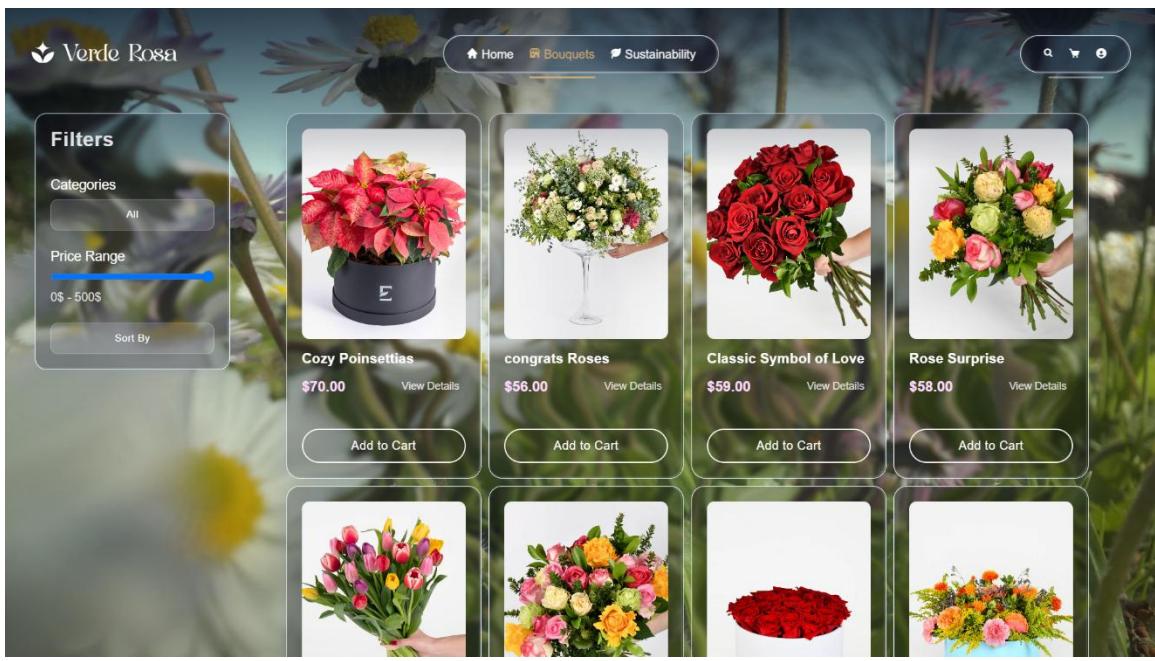
Luxurious presentation
of Flowers, Plants & More

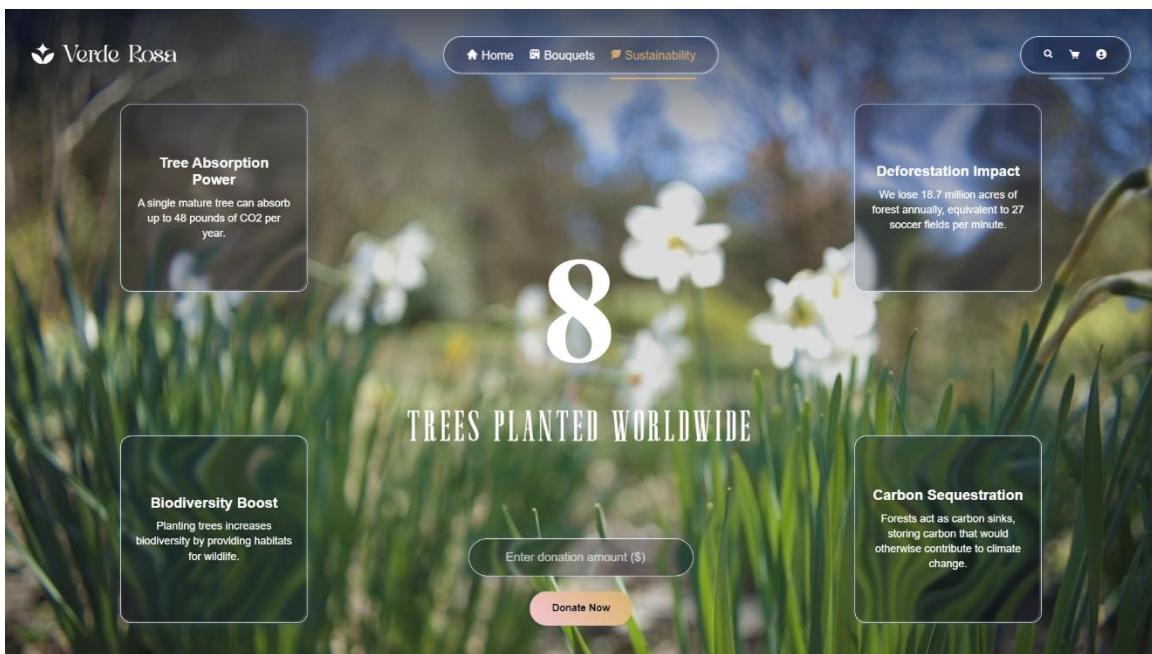
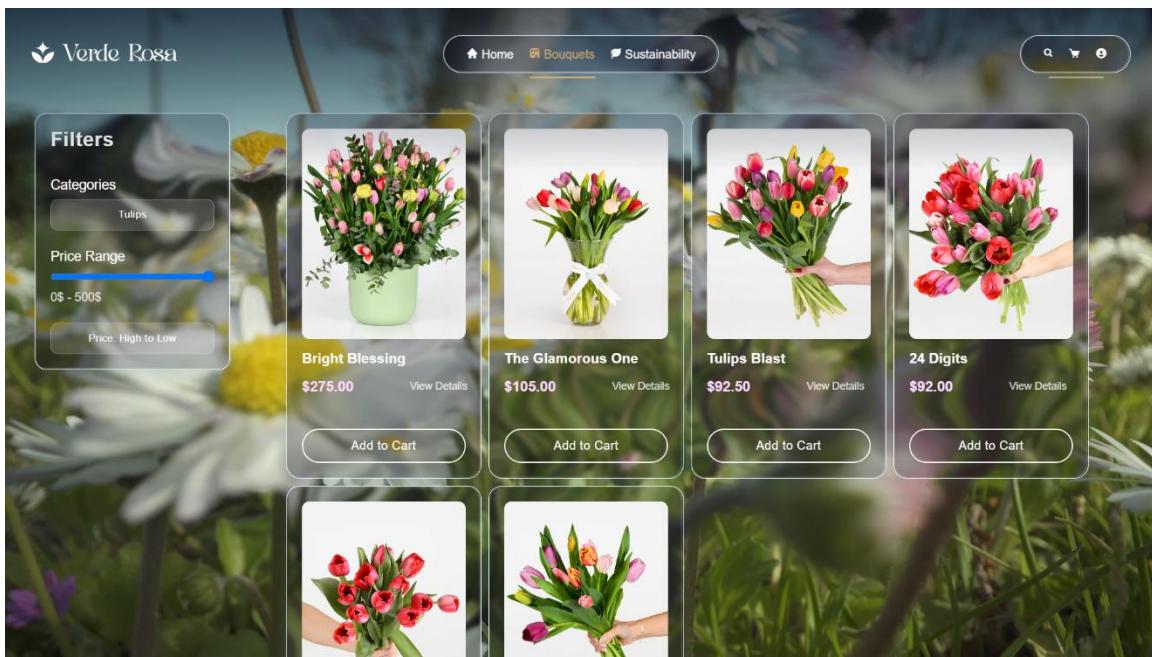
Delivery Across Lebanon
Express Delivery Available*

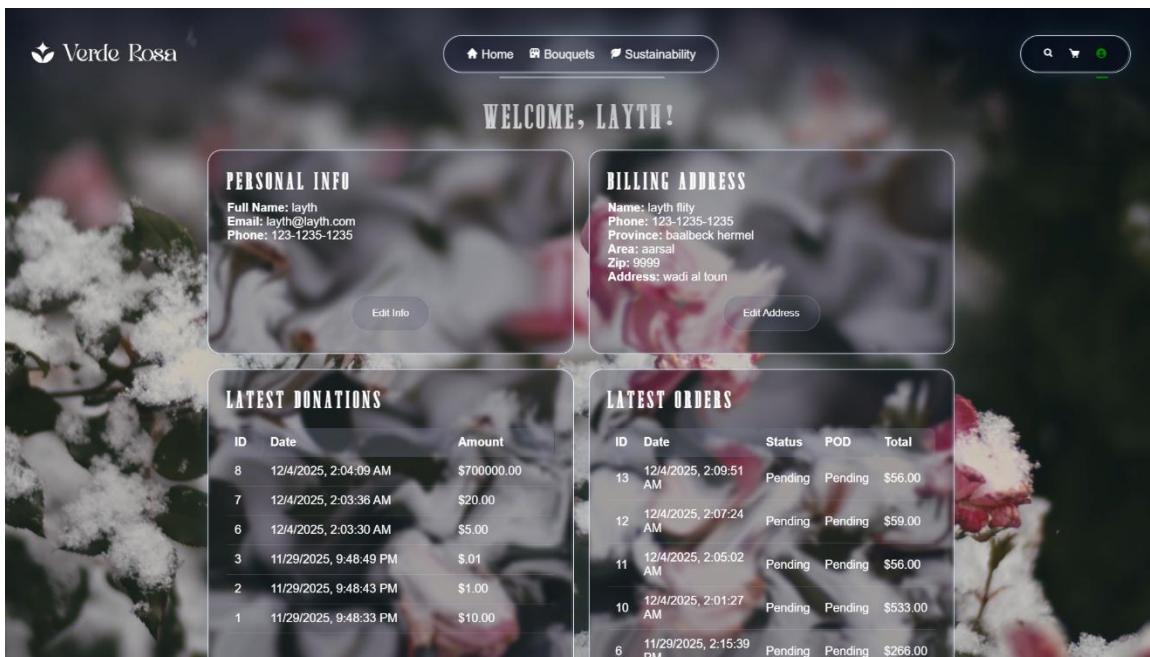
Live Chat
Get in touch with our Team

[Directions](#)









Verde Rosa

Home Bouquets Sustainability

WELCOME, LAYTH!

PERSONAL INFO

Full Name: layth
Email: layth@layth.com
Phone: 123-1235-1235

Edit Info

BILLING ADDRESS

Name: layth fifty
Phone: 123-1235-1235
Province: baalbeck hermel
Area: aarsal
Zip: 9999
Address: wadi al toun

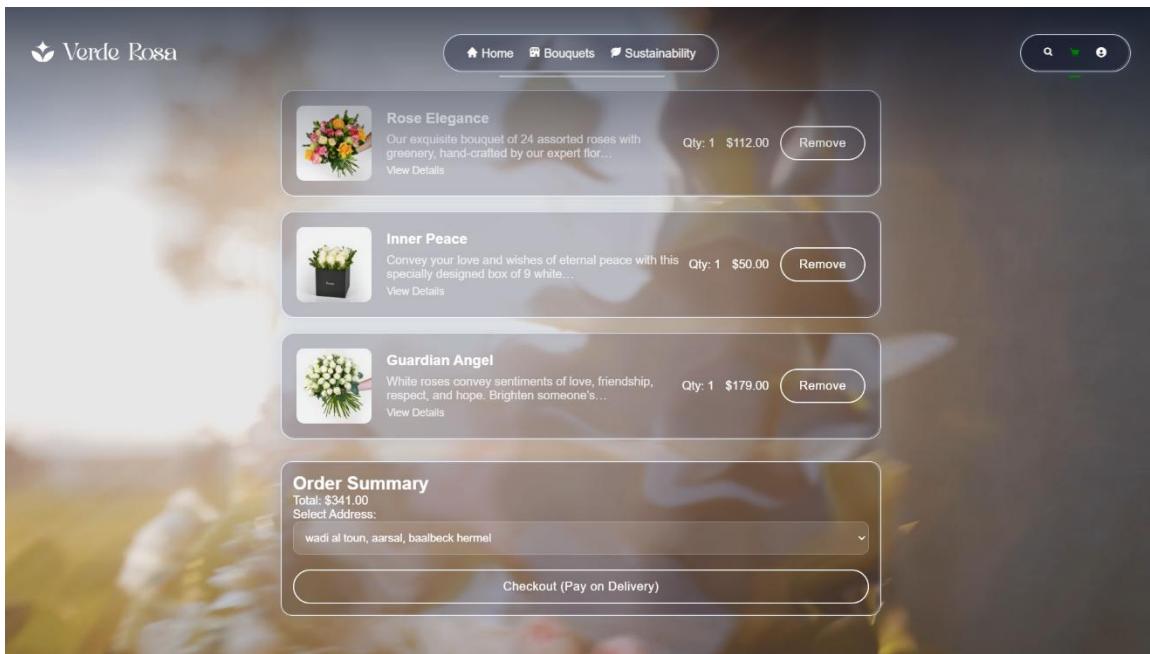
Edit Address

LATEST DONATIONS

ID	Date	Amount
8	12/4/2025, 2:04:09 AM	\$700000.00
7	12/4/2025, 2:03:36 AM	\$20.00
6	12/4/2025, 2:03:30 AM	\$5.00
3	11/29/2025, 9:48:49 PM	\$0.01
2	11/29/2025, 9:48:43 PM	\$1.00
1	11/29/2025, 9:48:33 PM	\$10.00

LATEST ORDERS

ID	Date	Status	POD	Total
13	12/4/2025, 2:09:51 AM	Pending	Pending	\$56.00
12	12/4/2025, 2:07:24 AM	Pending	Pending	\$59.00
11	12/4/2025, 2:05:02 AM	Pending	Pending	\$56.00
10	12/4/2025, 2:01:27 AM	Pending	Pending	\$533.00
6	11/29/2025, 2:15:39 PM	Pending	Pending	\$266.00



Verde Rosa

Home Bouquets Sustainability

Rose Elegance
Our exquisite bouquet of 24 assorted roses with greenery, hand-crafted by our expert flor...
Qty: 1 \$112.00 [Remove](#)

Inner Peace
Convey your love and wishes of eternal peace with this specially designed box of 9 white...
Qty: 1 \$50.00 [Remove](#)

Guardian Angel
White roses convey sentiments of love, friendship, respect, and hope. Brighten someone's...
Qty: 1 \$179.00 [Remove](#)

Order Summary
Total: \$341.00
Select Address:
wadi al toun, aarsal, baalbeck hermel

[Checkout \(Pay on Delivery\)](#)

The screenshot shows a flower shop website with a background image of various flowers. At the top, there's a navigation bar with a logo, Home, Bouquets, Sustainability, and a search icon.

Rose Elegance
Our exquisite bouquet of 24 assorted roses with greenery, hand-crafted by our expert flor...
Qty: 1 \$112.00 [Remove](#)

Inner Peace
Convey your love and wishes of eternal peace with this specially designed box of 9 white...
Qty: 1 \$50.00 [Remove](#)

Guardian Angel
White roses convey sentiments of love, friendship, respect, and hope. Brighten someone's...
Qty: 1 \$179.00 [Remove](#)

Order Summary
Total: \$341.00
Select Address:
wadi al toun, aarsal, baalbeck hermel
[Checkout \(Pay on Delivery\)](#)

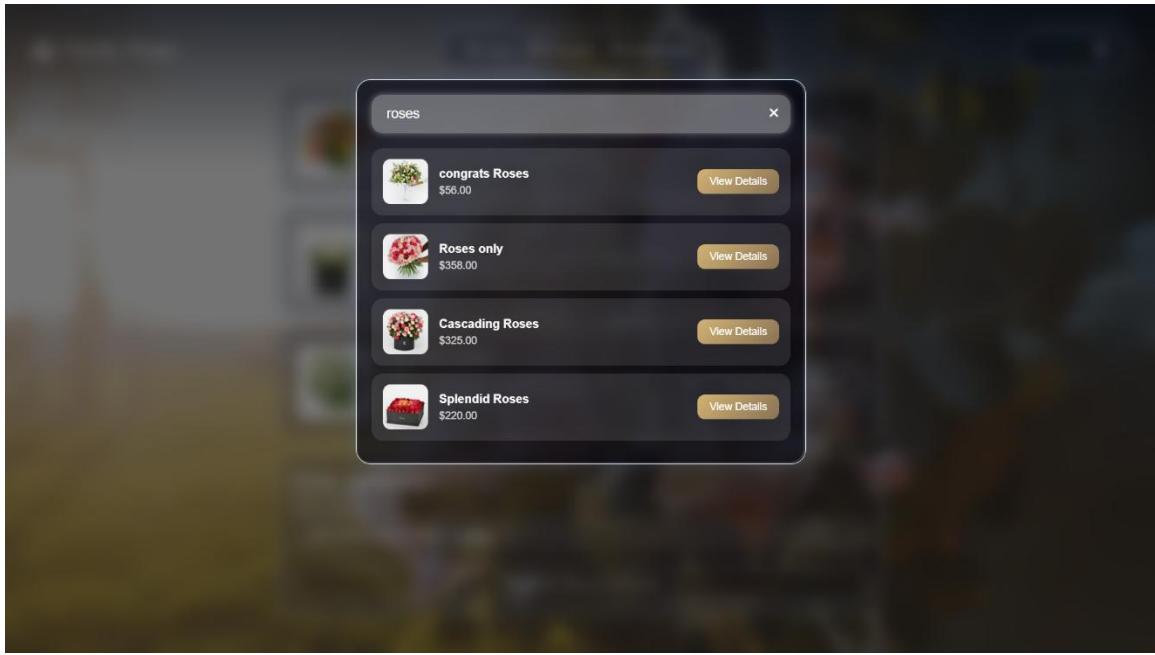
A search overlay is displayed over a blurred background of flowers. It features a search bar with placeholder text "Search for bouquets..." and a close button (X).

Cozy Poinsettias
\$70.00 [View Details](#)

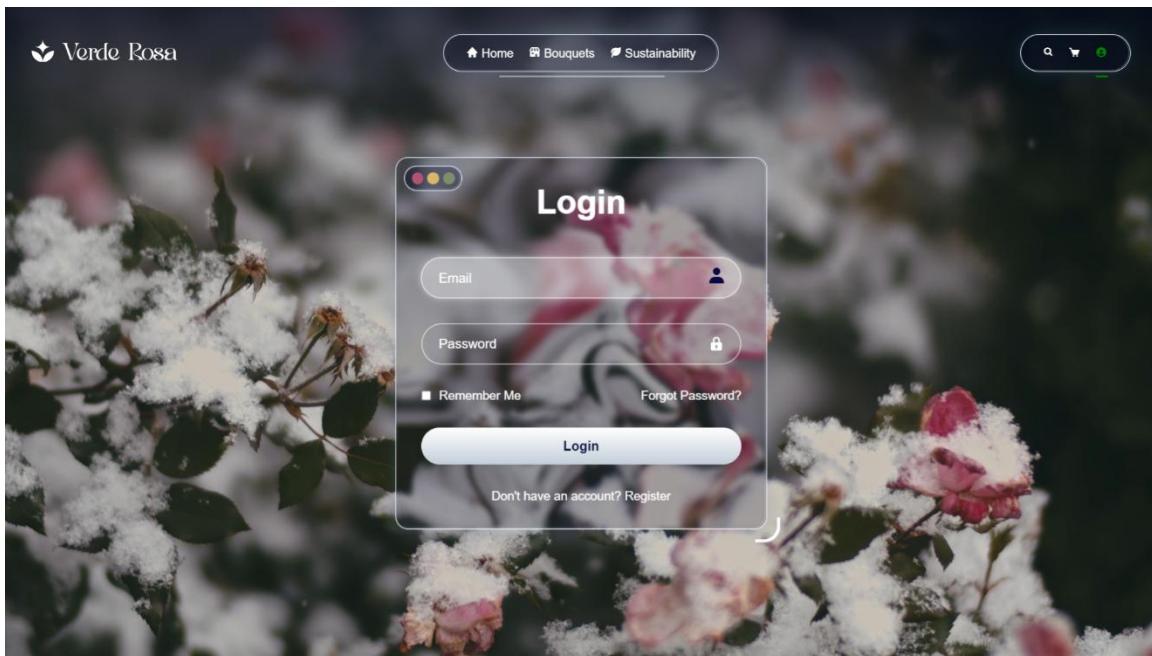
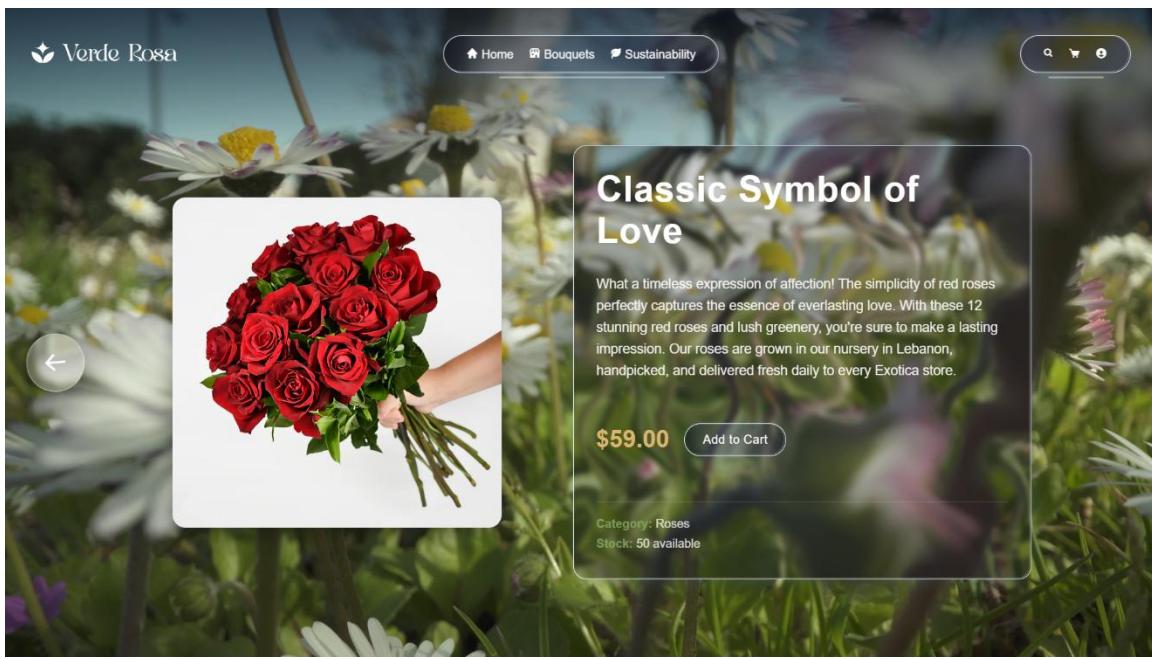
congrats Roses
\$56.00 [View Details](#)

Classic Symbol of Love
\$59.00 [View Details](#)

Rose Surprise
\$58.00 [View Details](#)



A screenshot of a website for "Verde Rosa". The header includes the logo "Verde Rosa", navigation links for "Home", "Bouquets", and "Sustainability", and a search bar. The main content features a large image of a flower field in the background. In the foreground, there is a product card for a bouquet named "congrats Roses". The card includes a thumbnail image of the bouquet, the name "congrats Roses", a description stating "Whether you're celebrating your relationship or congratulating a newlywed couple, choose this extravagant arrangement of 40 roses and other mixed flowers arranged in an elegant glass vase. Vase Size: D=30cm x H=55cm", the price "\$56.00", an "Add to Cart" button, and category information "Category: Mixed Bouquets" and "Stock: 25 available".

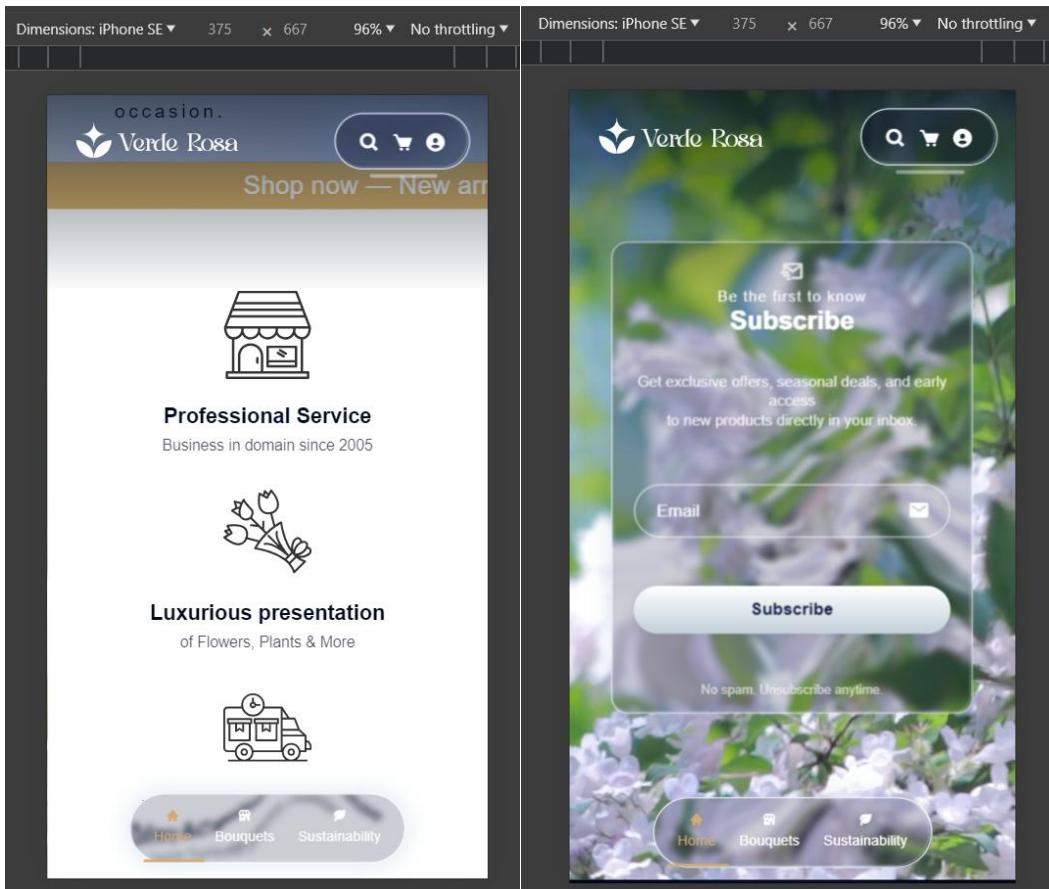
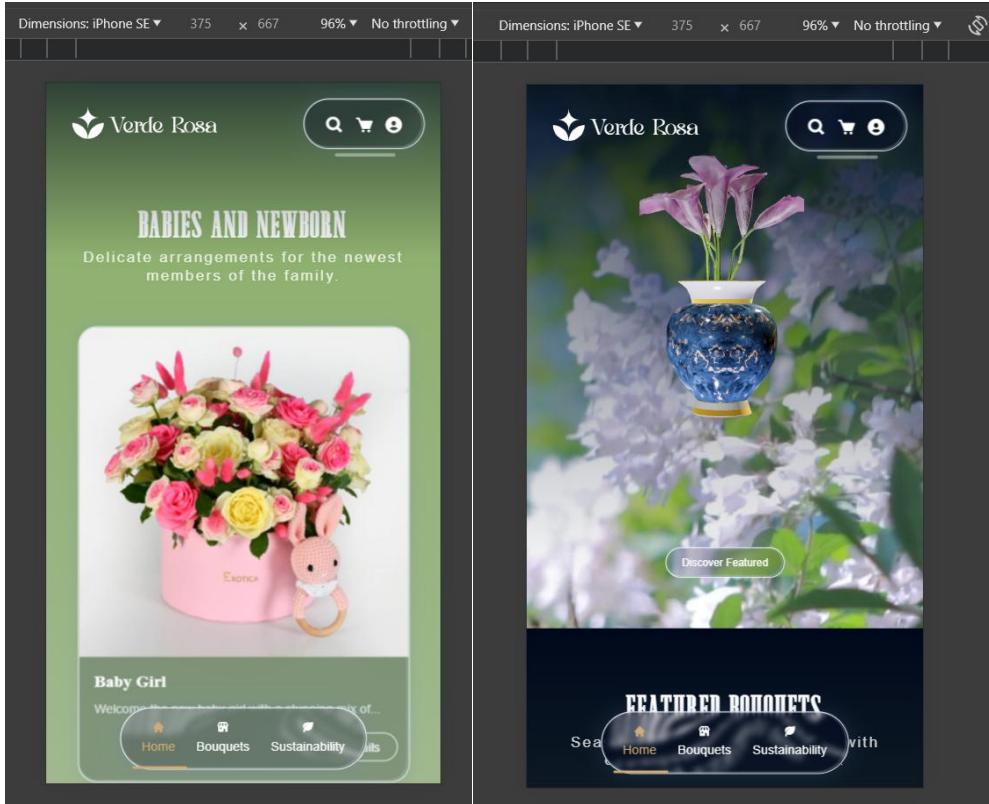


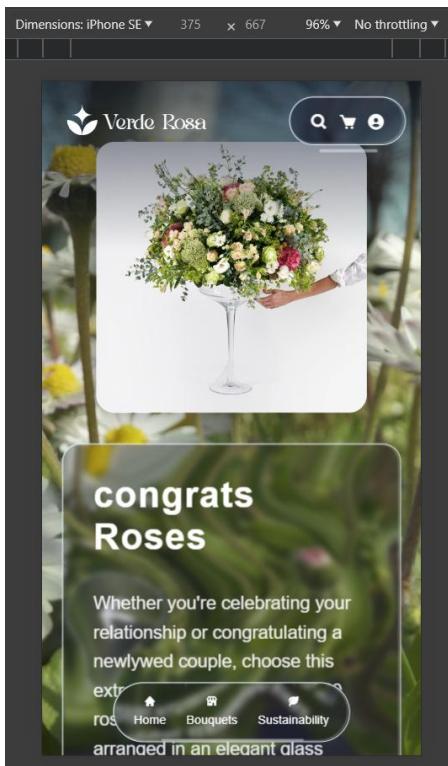
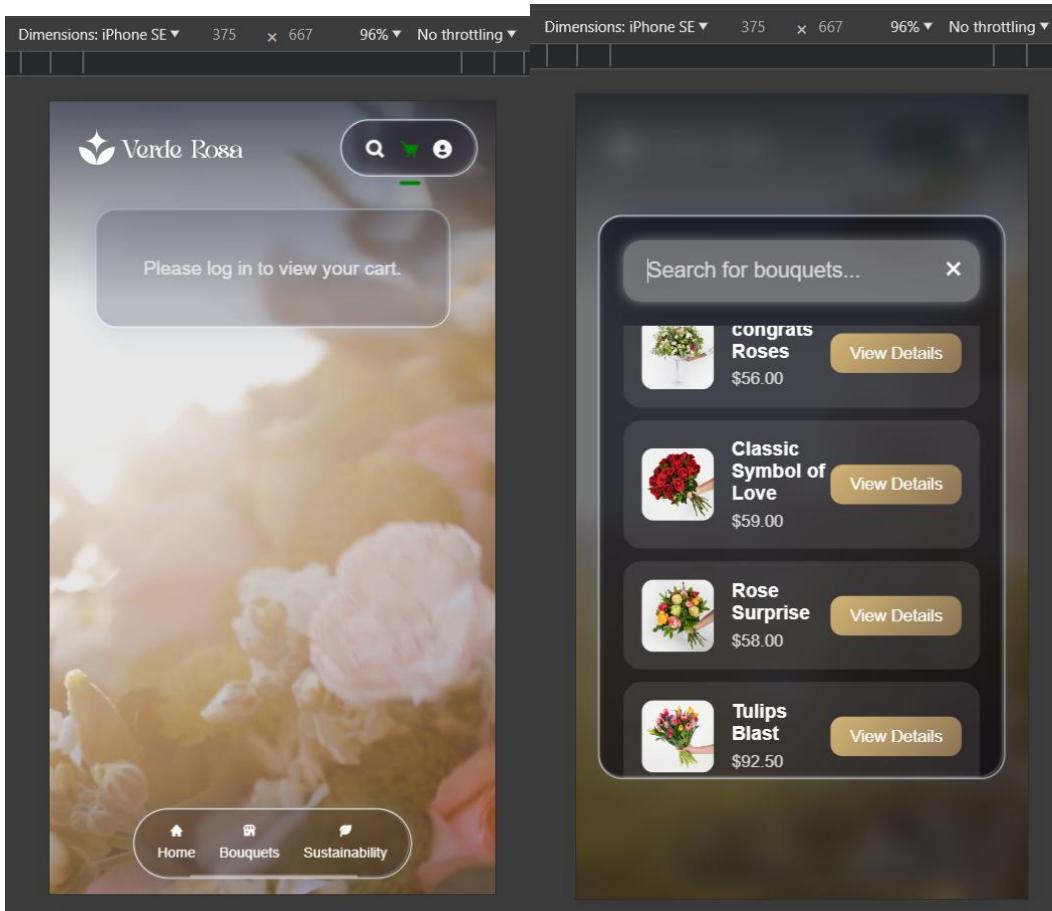
Register

Username	
Email	
Password	
Confirm Password	

Create Account

Already have an account? [Login](#)





Conclusion

Ultimately, Verde Rosa creates a unified website by combining dynamic frontend interactions, safe backend logic, and a polished visual style. Every feature—from product browsing and login to donations and user dashboards—works seamlessly to produce a useful and interesting experience. The project illustrates solid full-stack development concepts while retaining a clear focus on usability, performance, and visual consistency.

References:

<https://react.dev/>

<https://reactrouter.com/en/main>

<https://react.dev/reference/react>

<https://docs.pmnd.rs/react-three-fiber/getting-started/introduction>

<https://developer.mozilla.org/en-US/docs/Web/JavaScript>

<https://vitejs.dev/guide/>