Day 4 - Dynamic Frontend Components General E-commerce Website

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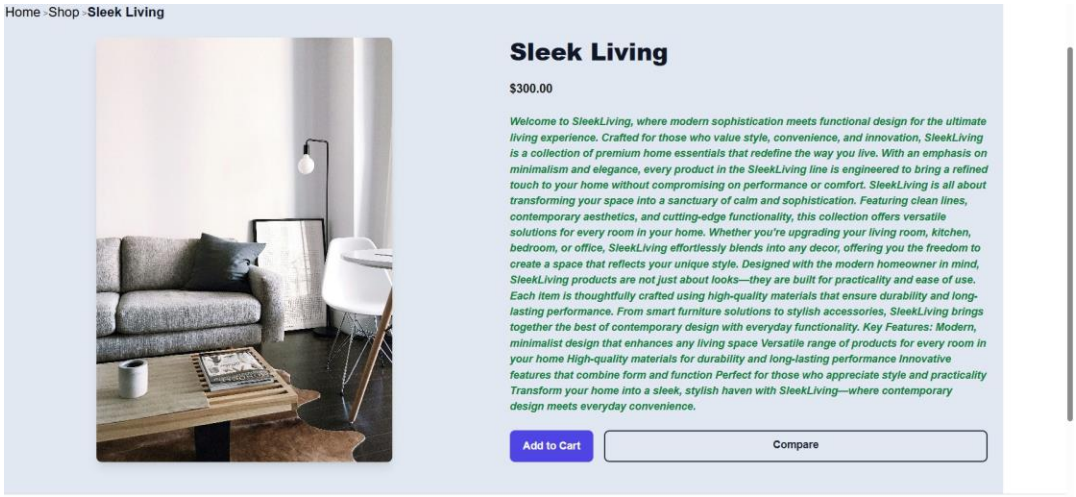
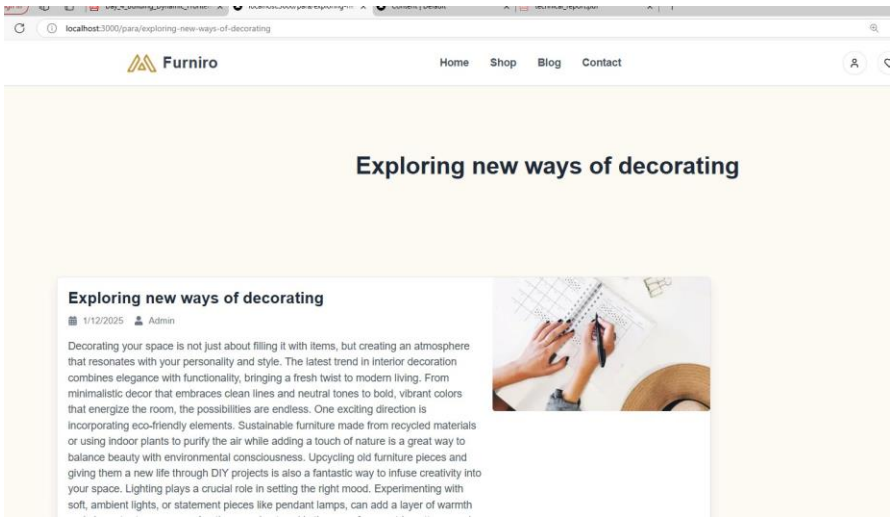
1) FUNCTIONAL DELIVERY

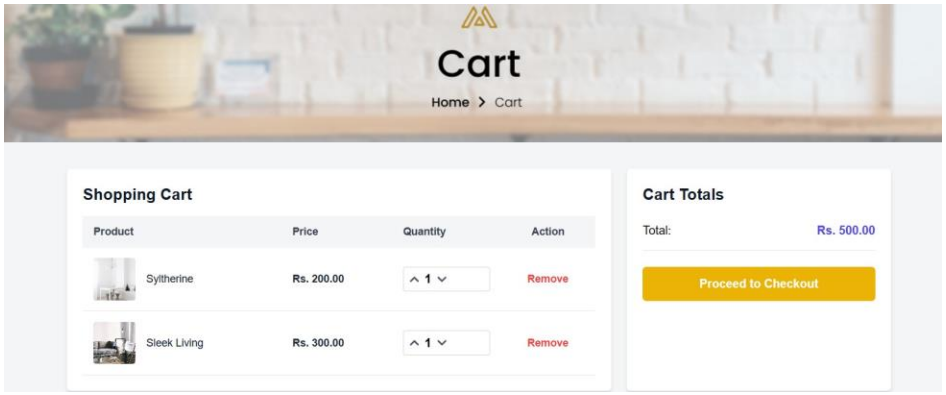
a) Dynamic Product page



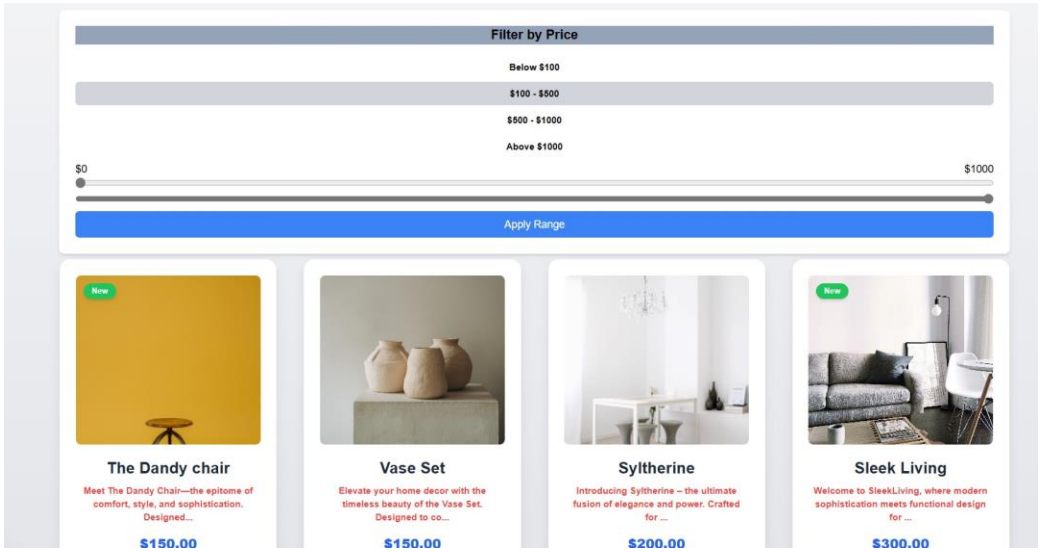
b) Dynamic Blog Page



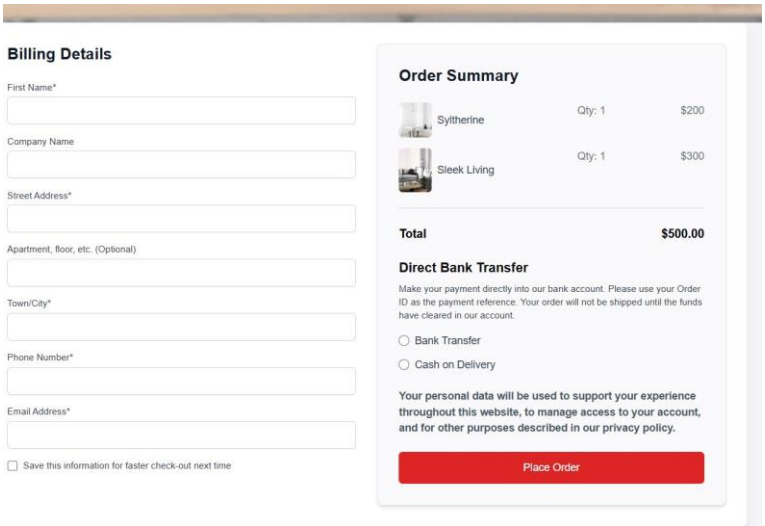
c) Cart Page With Functionality



d) Price Filter And pagination



e) Checkout Page With Functionality

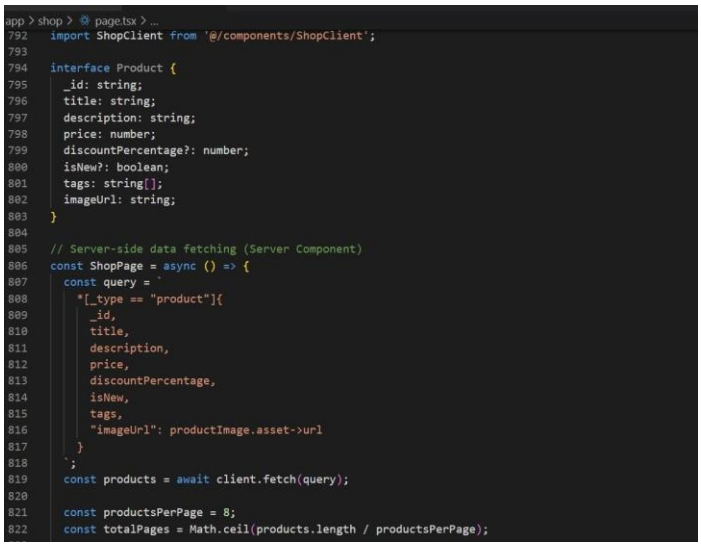


2) Code Deliverables

- Code snippet for components

    a) Shop page

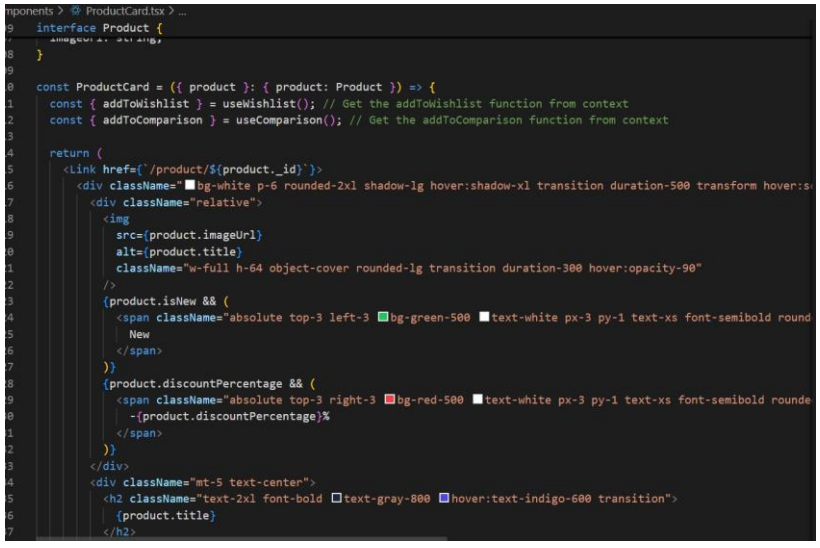
This pages show frontend display with the help of query .



```
app > shop > page.tsx > ...
import ShopClient from '@/components/ShopClient';

interface Product {
  _id: string;
  title: string;
  description: string;
  price: number;
  discountPercentage?: number;
  isNew?: boolean;
  tags: string[];
  imageUrl: string;
}

// Server-side data fetching (Server Component)
const ShopPage = async () => {
  const query = `
    *[_type == "product"]{
      _id,
      title,
      description,
      price,
      discountPercentage,
      isNew,
      tags,
      "imageUrl": productImage.asset->url
    }
  `;
  const products = await client.fetch(query);

  const productsPerPage = 8;
  const totalPages = Math.ceil(products.length / productsPerPage);
```

    b) ProductCard

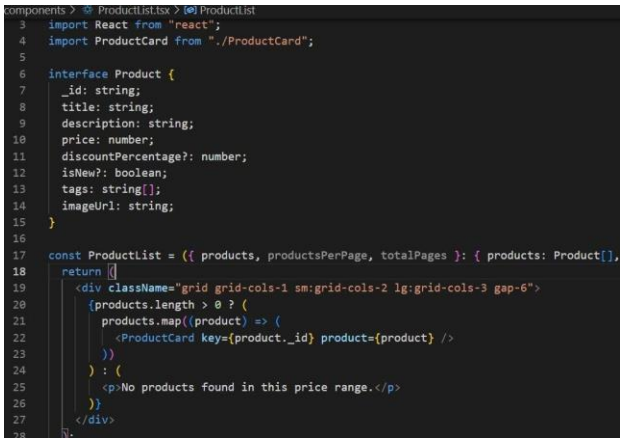
This component displays individual product details and includes the "Add to Cart" button.



```
nponents > ProductCard.tsx > ...
  interface Product {
}

const ProductCard = ({ product }: { product: Product }) => {
  const { addToWishlist } = useWishlist(); // Get the addToWishlist function from context
  const { addToComparison } = useComparison(); // Get the addToComparison function from context

  return (
    <Link href={`/product/${product._id}`}>
      <div className="bg-white p-6 rounded-2xl shadow-lg hover:shadow-xl transition duration-500 transform hover:s
        <div className="relative">
          <img
            src={product.imageUrl}
            alt={product.title}
            className="w-full h-64 object-cover rounded-lg transition duration-300 hover:opacity-90"
          />
          {product.isNew && (
            <span className="absolute top-3 left-3 bg-green-500 text-white px-3 py-1 text-xs font-semibold round
              New
            </span>
          )}
          {product.discountPercentage && (
            <span className="absolute top-3 right-3 bg-red-500 text-white px-3 py-1 text-xs font-semibold rounde
              -{product.discountPercentage}%
            </span>
          )}
        </div>
        <div className="mt-5 text-center">
          <h2 className="text-2xl font-bold text-gray-800 hover:text-indigo-600 transition">
            {product.title}
          </h2>
```

    c) Product List

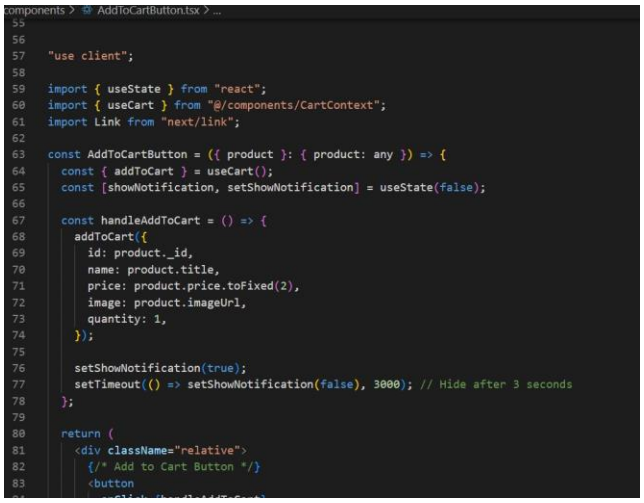
Fetches and Display a list of products



```
components > ProductList.tsx > ProductList
3   import React from "react";
4   import ProductCard from "./ProductCard";
5
6   interface Product {
7     _id: string;
8     title: string;
9     description: string;
10    price: number;
11    discountPercentage?: number;
12    isNew?: boolean;
13    tags: string[];
14    imageUrl: string;
15  }
16
17  const ProductList = ({ products, productsPerPage, totalPages }: { products: Product[],
18    return (
19      <div className="grid grid-cols-1 sm:grid-cols-2 lg:grid-cols-3 gap-6">
20        {products.length > 0 ? (
21          products.map((product) => (
22            <ProductCard key={product._id} product={product} />
23          ))
24        ) : (
25          <p>No products found in this price range.</p>
26        )}
27      </div>
```

d) Add to Cart

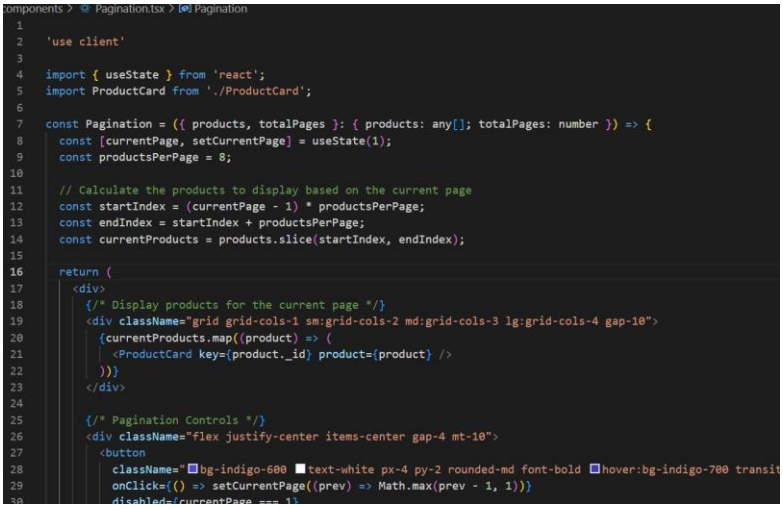
This components allows user to add products to the cart from the shop page



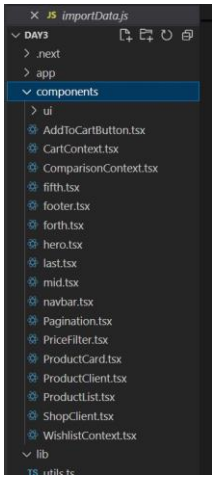
```
components > AddToCartButton.tsx > ...
55
56
57  "use client";
58
59  import { useState } from "react";
60  import { useCart } from "@/components/CartContext";
61  import Link from "next/link";
62
63  const AddToCartButton = ({ product }: { product: any }) => {
64    const { addToCart } = useCart();
65    const [showNotification, setShowNotification] = useState(false);
66
67    const handleAddToCart = () => {
68      addToCart({
69        id: product._id,
70        name: product.title,
71        price: product.price.toFixed(2),
72        image: product.imageUrl,
73        quantity: 1,
74      });
75
76      setShowNotification(true);
77      setTimeout(() => setShowNotification(false), 3000); // Hide after 3 seconds
78    };
79
80    return (
81      <div className="relative">
82        {/* Add to Cart Button */}
83        <button
```

e) Pagination

The Pagination component is responsible for displaying paginated products on the shop page. It ensures that only a limited number of products are shown per page while providing navigation controls to switch between pages.



f) Other components



AddToCartButton.tsx – Handles adding products to the cart using CartContext.

CartContext.tsx – Manages global cart state, including add/remove functions
.
ComparisonContext.tsx – Stores and manages product comparison data.

fifth.tsx – Likely a section or UI component used in the layout.

footer.tsx – Displays the website footer with relevant links and information
. forth.tsx – Another layout or section component used in the
UI.

hero.tsx – The main banner or hero section for the homepage.

last.tsx – Possibly the final section of a webpage layout.

mid.tsx – Likely represents a middle section in a webpage
. navbar.tsx – The navigation bar containing links and the cart icon.

Pagination.tsx – Implements pagination for product listings.

PriceFilter.tsx – Allows users to filter products based on price.

ProductCard.tsx – Displays individual product details in a card format.

ProductClient.tsx – Manages product-related API calls or client-side logic.

ProductList.tsx – Fetches and displays a list of products dynamically.

ShopClient.tsx – Handles the shop page functionality and client-side logic.

WishlistContext.tsx – Manages the wishlist state for storing favorite products.

- Scripts and Logic for API Integration and Dynamic Routing

- API Integration

The project integrates APIs to fetch and manage product data dynamically. The API endpoint used for product data retrieval is:

 https://template6-six.vercel.app/api/products

Key steps for API integration:

Fetching Data – Products are fetched using fetch or axios inside ProductList.tsx or ShopClient.tsx.

State Management – The data is stored in state using useState and updated using useEffect.

Error Handling – Try-catch blocks ensure smooth error handling during API requests
.
Filtering & Searching – Filters like PriceFilter.tsx refine the displayed products.

```
importData.js > ...
35  async function uploadProduct(product) {
57      const createdProduct = await client.create(document);
58      console.log(`✅ Product ${product.title} uploaded successfully:`, createdProduct);
59    } else {
60      console.log(`❌ Product ${product.title} skipped due to image upload failure.`);
61    }
62  } catch (error) {
63    console.error('Error uploading product:', error);
64  }
65  }
66
67  async function importProducts() {
68    try {
69      const response = await fetch('https://template6-six.vercel.app/api/products');
70
71      if (!response.ok) {
72        throw new Error(`HTTP error! Status: ${response.status}`);
73      }
74
75      const products = await response.json();
76      console.log('Fetched Products:', products); // Debugging
77
78      for (const product of products) {
79        await uploadProduct(product);
80      }
81    } catch (error) {
82      console.error('Error fetching products:', error);
83    }
84  }
```

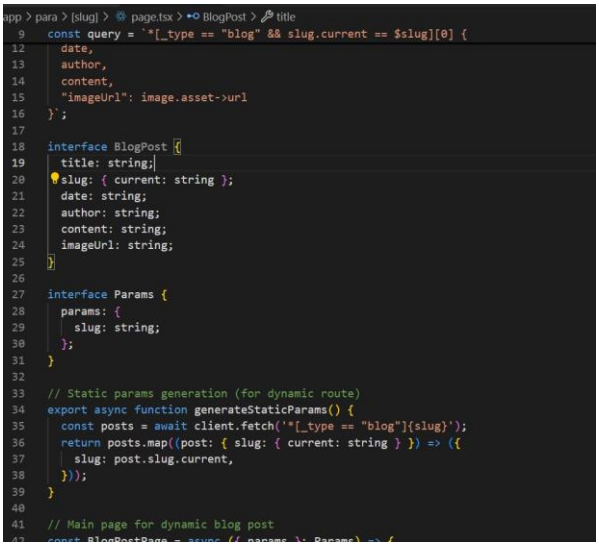
- Dynamic Routing

The project utilizes Next.js dynamic routes to handle product and blog pages:

Product Page: [id]/page.tsx dynamically fetches and displays a product based on its ID.

```
app > product > [id] > page.tsx > ...
762  interface Product {
771    imageUrl: string;
772    colors?: string[];
773    sizes?: string[];
774  }
775
776  const fetchProduct = async (id: string): Promise<Product | null> => {
777    const query = `*[_type == "product" && _id == $id][0]{
778      _id,
779      title,
780      description,
781      price,
782      discountPercentage,
783      isNew,
784      tags,
785      "imageUrl": productImage.asset->url,
786      colors,
787      sizes
788    }`;
789    const product = await client.fetch(query, { id });
790    return product || null;
791  };
792
793  const ProductPage = async ({ params }: { params: { id: string } }) => {
794    const product = await fetchProduct(params.id);
795
796    if (!product) {
797      notFound();
798    }
799
800    return (
```

Blog Page: [slug]/page.tsx dynamically loads blog content based on the slug.



- Technical Report

•Steps Taken to Build and Integrate Components
Project Setup – Initialized the Next.js project and configured the necessary dependencies.
Component Structure – Created reusable components such as ProductCard.tsx, Pagination.tsx, Navbar.tsx, and Footer.tsx
.
State Management – Used useState and useContext (e.g., CartContext.tsx,

WishlistContext.tsx) for cart and wishlist functionality.

API Integration – Fetched product data from https://template6-six.vercel.app/api/products and displayed it dynamically.

Dynamic Routing – Implemented Next.js dynamic routes for product ([id]/page.tsx) and blog ([slug]/page.tsx) pages.

Filtering & Pagination – Integrated PriceFilter.tsx for filtering products and Pagination.tsx for browsing through multiple pages.

UI Enhancements – Improved the UI with Tailwind CSS and ensured responsiveness across devices.

Testing & Optimization – Debugged API calls, optimized rendering, and handled errors for a smoother user experience.

- Challenges Faced and Solutions Implemented

Issue1): API data was not displaying properly on the Product List page.

Solution: Implemented useEffect to fetch data on mount and added error handling.

Issue2): Cart and Wishlist functionality needed to persist across components.

Solution: Used React Context API (CartContext.tsx and WishlistContext.tsx) for global state management.

Issue3): Pagination logic wasn't updating correctly.

Solution: Fixed state updates using useState and ensured currentPage updates were handled properly.

Issue4): Dynamic routes weren't working as expected.

Solution: Used Next.js useRouter to extract parameters and fetch data accordingly.

- Best Practices Followed During Development

✅Component Reusability – Developed modular components (ProductCard.tsx, Navbar.tsx, Footer.tsx) to maintain clean code.

✅State Management – Used Context API for cart and wishlist to avoid prop drilling. ✅ Optimized API Calls – Implemented efficient data fetching with error handling to improve performance.

✅Code Maintainability – Followed proper file structure (components/ui/, lib/, etc.) to keep the codebase organized.

✅Performance Optimization – Used lazy loading and memoization techniques to improve load times.