Spedify Project Report

- **Project Title**: Spedify
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- **Course Name**: Full Stack Development
- **Course Code**: CET3003
- **Submission Date**: 6th November, 2024

Abstract

This project report details the development of a MERN stack application for price comparison across popular e-commerce websites. The application allows users to search for products in categories such as electronics, cosmetics, groceries, and clothing. It compares prices from various websites to offer the user the best possible deal. Key features include user authentication, product search, price comparison, and history tracking. The project implements a full-stack approach and integrates technologies like Express.js, MongoDB, React, and Node.js for a robust and dynamic user experience.

Introduction

Background and Motivation

With the growing popularity of online shopping, consumers frequently seek ways to compare prices across different websites. The Price Comparison App aims to meet this demand by providing users with an efficient and convenient way to compare prices for products across major e-commerce platforms. This approach saves users time and effort by centralizing the search process and offering a clear comparison.

Problem Statement and Project Objectives

The main objective of this project is to develop a web application where users can search for products and receive a list of options showing prices from different websites, helping them to find the most cost-effective choice. The app also stores user search history to improve the user experience, allowing for repeated searches and user convenience.

Scope and Limitations

This application provides price comparison only for selected e-commerce platforms—currently Amazon and Flipkart—and is limited to a few product categories. Future versions may incorporate additional websites, more product categories, and advanced features like caching frequent searches for faster access.

Literature Review

Overview of Existing Systems

Numerous price comparison tools and applications are available online. Websites like PriceGrabber, Google Shopping, and Trivago have established a benchmark for price comparison by aggregating data from multiple e-commerce sources. These platforms are popular for their ease of use and convenience. However, many of these applications rely on APIs provided by e-commerce websites. In this project, web scraping is employed to extract data, which introduces unique challenges and potential issues around data accuracy and ethical considerations.

State-of-the-Art in Price Comparison

Web scraping for e-commerce data is a common technique for gathering information; however, it requires frequent updates as websites change their structure. Techniques like caching, data cleaning, and the use of cloud databases have made such projects more feasible. Security and user authentication are also increasingly integrated into such applications to personalize user experience while protecting data.

Methodology

Project Design and Implementation

Project Structure

The application follows a MERN architecture with a clear separation between frontend and backend:

- **Frontend**: Built with React, with components for login, search, user history, and home/about pages.
- **Backend**: Developed with Express and Node.js, handling API requests, user authentication, and search logic.
- **Database**: MongoDB stores user information, search history, and authentication tokens.

Technology Choices

- **React**: Chosen for its component-based architecture, facilitating easy UI development.
- **Express & Node.js**: Utilized for building a scalable and RESTful API.
- **MongoDB**: A NoSQL database chosen for its flexibility and ease of integration with Node.js.
- **Axios & Cheerio**: Axios is used to make HTTP requests, and Cheerio is employed for HTML parsing in web scraping.

System Architecture and Components

- **Authentication**: JWT (JSON Web Token) is used for user login and registration.
- **Product Search & Scraping**: Product search queries are handled in the backend by scraping Amazon and Flipkart websites based on user input.
- **Frontend Components**:
    - Home: Displays the welcome message and provides access to the login page.
    - Login: Manages user login and redirects to search upon success.

- Search: Accepts a query from the user, sends it to the backend, and displays the results.
- History: Shows user search history.

Development Process and Methodologies

The development process followed an Agile methodology, iterating between frontend and backend features to ensure alignment and integration. This process allowed incremental development and quick debugging, especially important for the scraping feature.

Results and Discussion

Project Outcomes and Findings

The Price Comparison App successfully implements:

- **User Authentication**: Users can securely register, log in, and maintain search histories.
- **Price Comparison**: Real-time comparison across Amazon and Flipkart by scraping search results.
- **User Interface**: A simple and responsive UI with React components, allowing easy navigation.
- **Error Handling**: Basic error handling in both frontend and backend to improve the app's robustness.

Successes and Challenges

- **Successes**: The app demonstrates that web scraping can be effectively used for price comparison and displays prices and product information from Amazon and Flipkart.
- **Challenges**: Web scraping poses challenges due to varying page structures and legal considerations. The implementation required detailed error handling and testing to ensure reliability.
- **Limitations**: The app is restricted to specific platforms and categories, and the reliance on scraping makes it vulnerable to site changes.

Evaluation of Project Effectiveness

Overall, the project meets its initial objectives. The app provides users with a functional tool for price comparison while tracking their search history for convenience. However, further development could include support for more e-commerce platforms, caching, and API-based data fetching if available.

Conclusion

Summary of Key Findings and Contributions

This project demonstrates the effectiveness of a MERN stack in developing a full-stack application with real-world utility. The integration of web scraping, user authentication, and data management in MongoDB created a dynamic, user-friendly application. By implementing a product search with real-time data from two major e-commerce sites, the app provides a convenient solution for users looking to save on purchases.

Recommendations for Future Work

Future improvements could include:

- **Increased Platform Support**: Expanding the scraping to include additional websites and regions.
- **Enhanced Data Caching**: Implementing Redis or a similar caching service to reduce the load and improve search speed.
- **Improved UI/UX**: Refining the user interface for enhanced accessibility and ease of use.
- **Legal Compliance**: Exploring partnerships with e-commerce sites to obtain API access, mitigating ethical concerns associated with web scraping.

References

- https://react.dev
- https://pptr.dev
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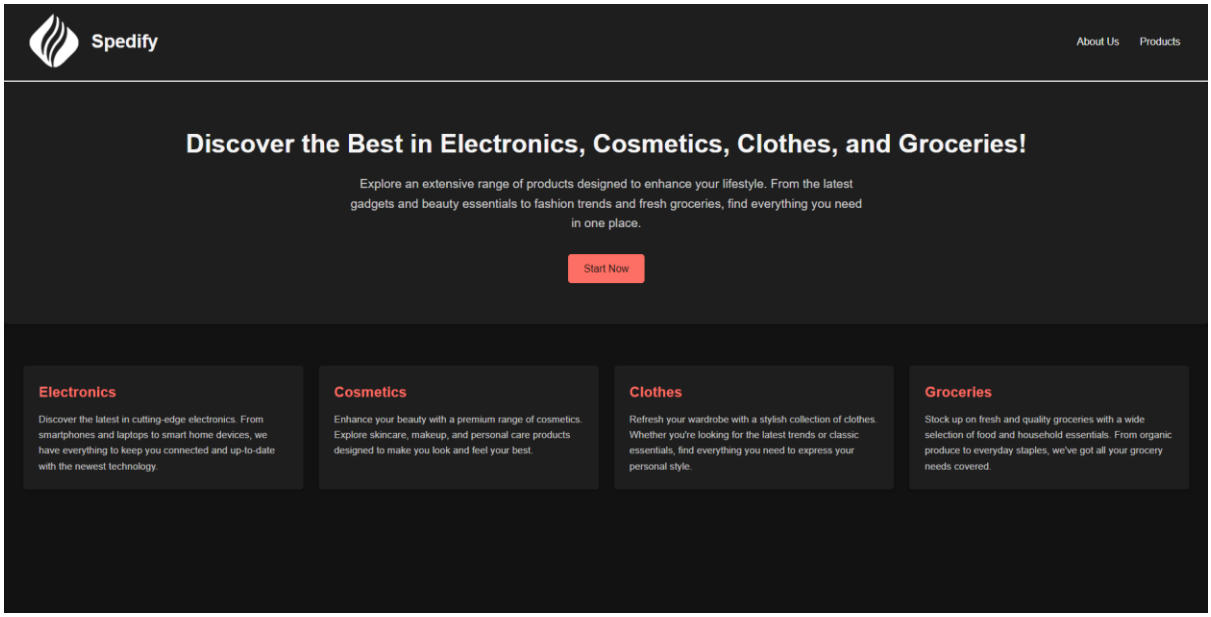
Appendices

Appendix A: Screenshots

Screenshots of key components:



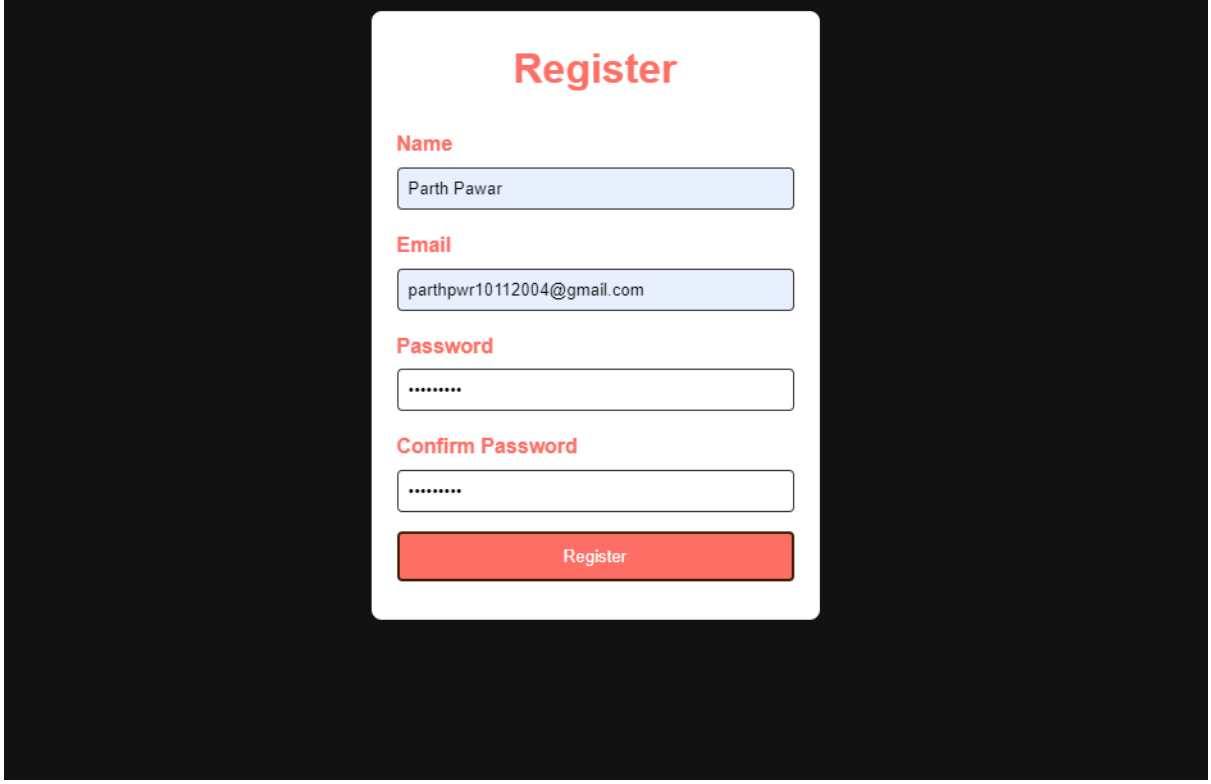
About Us

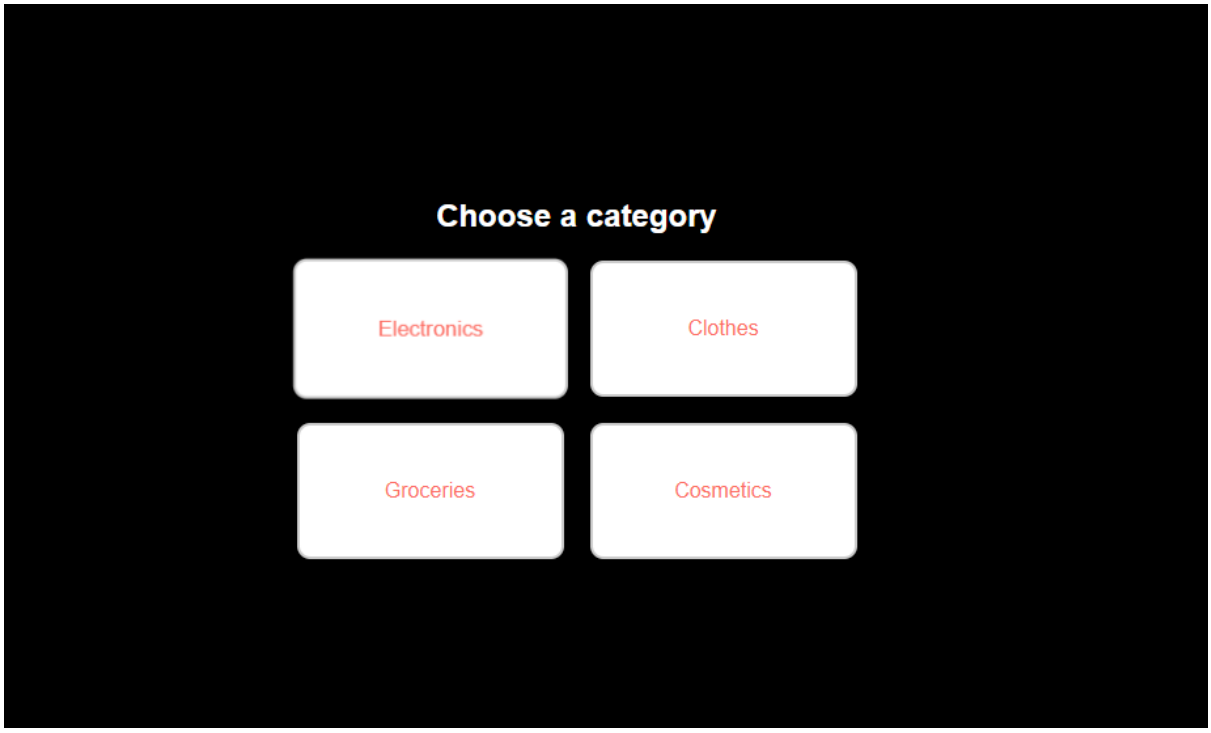
Welcome to Spedify, your trusted partner in finding the best deals online. We understand that with countless e-commerce platforms, locating the best price for your desired product can be overwhelming. That's where we come in.

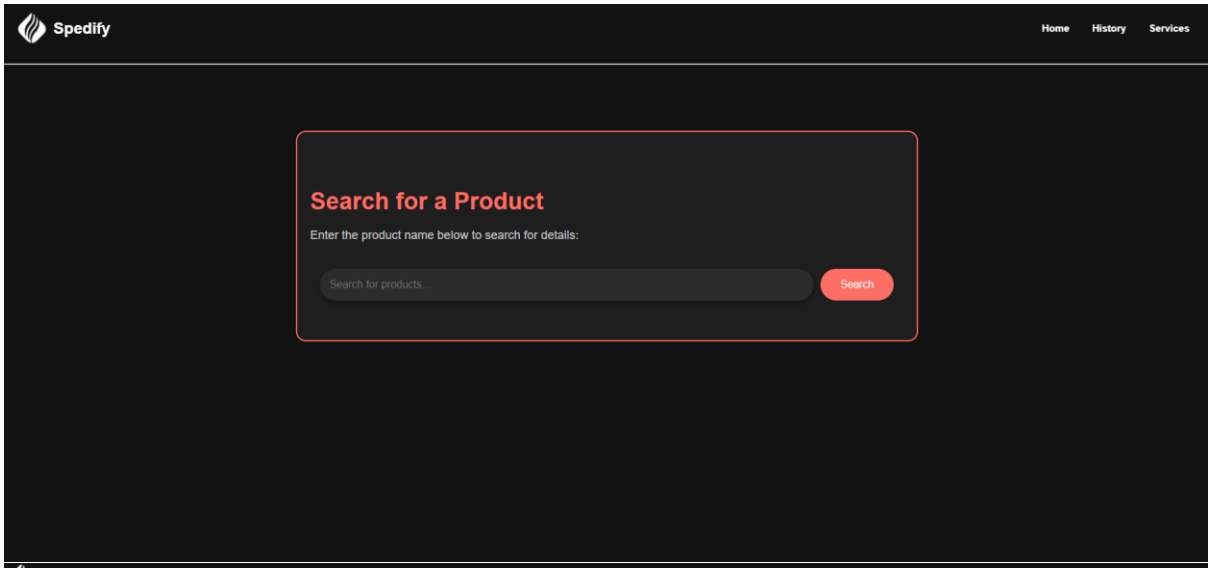
Our intelligent platform simplifies your shopping experience by instantly comparing prices across multiple platforms. Whether you're searching for the latest smartphone or everyday essentials, we do the legwork to present you with the most affordable options. Just enter the product you're looking for, and our model will find the platform offering the lowest price.

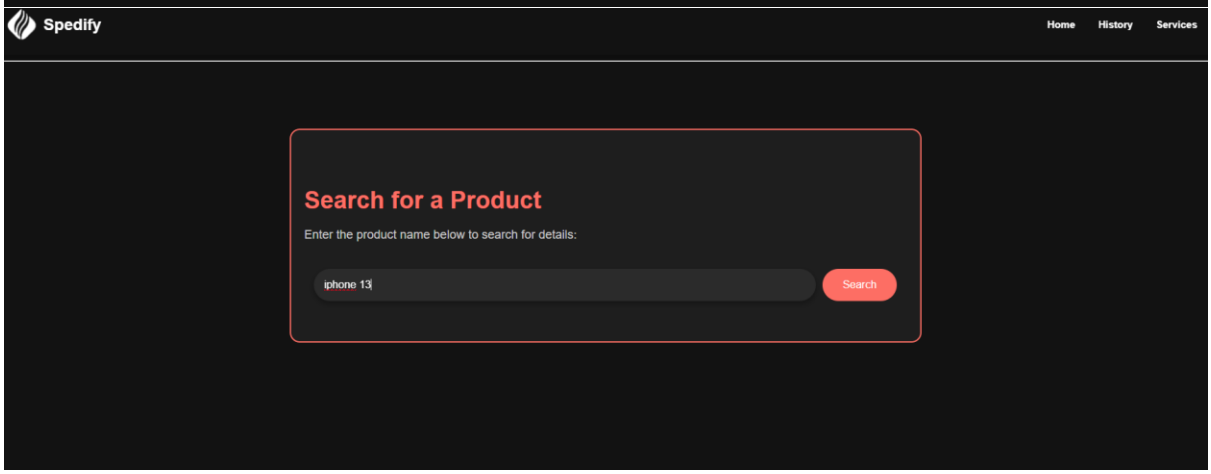
At Spedify, our mission is to save you time and money, ensuring you never miss out on the best deal. Start your smarter shopping journey with us and make every purchase count.

Back to Home




Choose a category
Electronics
Clothes
Groceries
Cosmetics


Spedify
Home
History
Services
Search for a Product
Enter the product name below to search for details:
Search for products...
Search


Spedify
Home
History
Services
Search for a Product
Enter the product name below to search for details:
iphone 13
Search

Search Results

Apple iPhone 13 (128GB) - Midnight

45,499

Apple iPhone 13 (128GB) - Blue

45,499

Apple iPhone 13 (128GB) - Starlight

45,499

Apple iPhone 13 (128GB) - Green

Apple iPhone 13 (128GB) - Pink

45,499

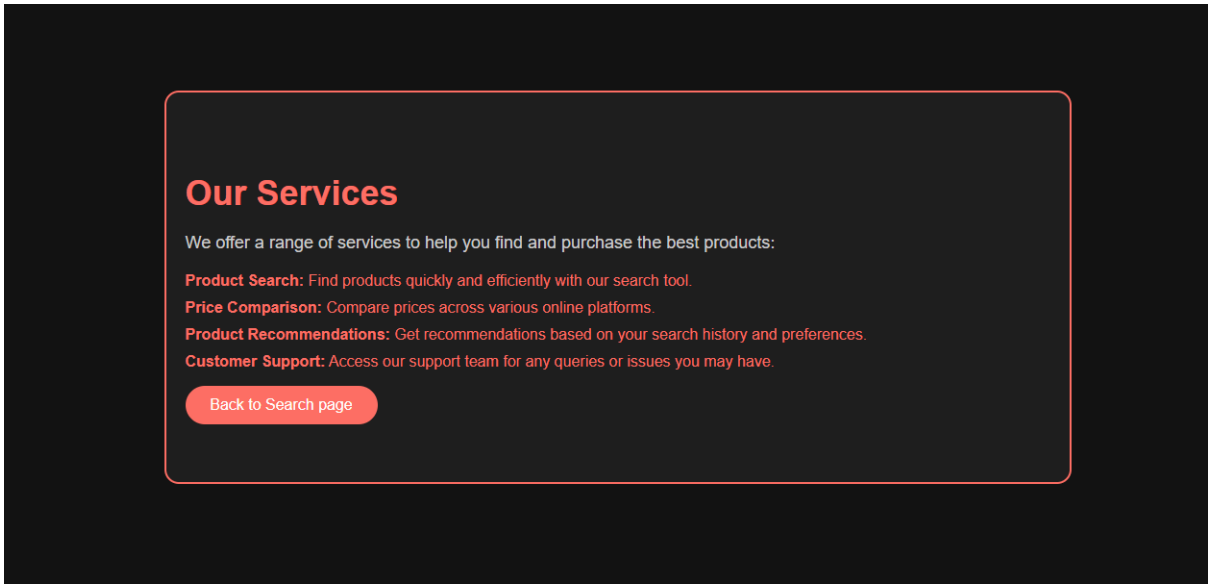
Apple iPhone 13 (128GB) - (Product) RED

HISTORY

Back to Search page

Delete History

iphone 13


Our Services
We offer a range of services to help you find and purchase the best products:
Product Search: Find products quickly and efficiently with our search tool.
Price Comparison: Compare prices across various online platforms.
Product Recommendations: Get recommendations based on your search history and preferences.
Customer Support: Access our support team for any queries or issues you may have.
Back to Search page