Price Comparison Website Using Python

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ABSTRACT

A price comparison website is an online platform that allows users to compare prices of products or services across multiple retailers. By aggregating data from various e-commerce stores, the website provides real-time price comparisons, helping consumers make informed purchasing decisions. The platform typically includes features such as product filtering, user reviews, discount alerts, and historical price tracking. Advanced algorithms and web scraping techniques ensure accurate and up-to-date pricing information. By offering a convenient and efficient way to find the best deals, the price comparison website enhances shopping experiences and promotes competitive pricing among retailers.

***Key Words*:** Comparison, Web Scrapping, Discount alert.

1.INTRODUCTION

Ecommerce has become a significant market for online purchases, with the increasing use of smart devices and other mediums enabling users to buy products from anywhere. However, the large number of ecommerce websites can make it difficult for users to find the best deal for their products. A proposed solution helps users find the best deals on multiple ecommerce websites on a single web interface, saving time, money, and effort.

The system uses web scraping techniques to extract data from ecommerce web pages and link products to the web crawler. It also includes a price alert feature that users can set to be notified when the appropriate price is found. The system uses technologies such as a web crawler to gather large amounts of data from different e-commerce websites, a web scrapper to extract HTML data from URLs, Python libraries like Django Web Framework to facilitate fast development and seamless planning.

Python is a widely used, intelligent, object-oriented programming language that emphasizes code legibility and simplifies computer-related tasks. Django is free and open source, designed to facilitate complex, database-driven websites, focusing on reusability and "pluggability" of parts. Python is used throughout the system for setting documents and information models.

2. LITERATURE SURVEY

Price comparison sites are designed to compare the price of goods and services from a range of providers, which will help consumers in making decision to choose products that will save their money through online. Considering the customers' busy lifestyle especially those who are living in the city area, most of the consumers prefer to buy their needs through the internet because it saves their time. Besides, consumers always go for the cheaper price in purchasing products therefore by using price comparison website, customers do not have to travel from shop to shop only to survey the price offered by different shops for the same product. They can just check it from the price comparison website itself and decide where they should buy the products they need. This project, named as Price comparison website using web scrapping is the place where shoppers could find the great deals on the products. The best deals will be clearly highlighted. To obtain best deals from Price comparison websites web scrapping techniques are used to fetch detailed information. This way, paper aims to provide solution for online customers to buy products at good deal and save their valuable time, effort, and money**. [1]**

Lots of online shopping systems (OSS) are proposed and used practically due to the rich opportunities provided by the Internet. The traditional OSS, however, essentially provides basic browsing via category and

"advanced" keyword without any analysis. The paper presents a price comparison system of online products to show all the possible prices of products for customers. In particular, the proposed system develops a multithreaded crawler to implement web information crawling, and uses Lucene, a very popular full-text search library, to implement the data indexing and retrieval. The experimental results demonstrate that the proposed system improves shopping efficiencies for the consumers in a flexible and advanced way**[2]**

Every online user wants a detailed review about the product they buy or the product they are interested in. Buyers research various websites on the internet to get the best offers on their desired products.Purpose:We need a model which can give us the details of the products from different websites.Method:In this paper, we are trying to utilize PHP, XAMPP, and MongoDB to build a website to get the prices of any desired product from Amazon and Flipkart.Result:Experimental evaluations showed that this proposed website shows the prices of the desired product from Amazon and Flipkart with an accuracy of 96%**[3]**

3.TECHNOLOGY USED IN PRICE COMPARISON AND PRICE ALERT WEBSITE

- VSCODE: Microsoft's Visual Studio Code is a source-code editor for Windows, Linux, and macOS devices. It offers debugging, syntax highlighting, intelligent code completion, snippets, code refactoring, and embedded Git. It supports various programming languages like Java, JavaScript, Go, Node.js, Python, C++, C, Rust, and Fortran. It also includes IntelliSense for JavaScript, TypeScript, JSON, CSS, and HTML.

- PYTHON: Python, a high-level, interpreted programming language, is known for its readability, simplicity, and versatility. Created by Guido van Rossum in 1991, it supports multiple programming paradigms and is widely used in fields like web development, data science, artificial intelligence, automation, and scientific computing. Its clean, intuitive syntax makes it suitable for beginners and professionals.

- HTML: HTML is the standard language for creating web pages, utilizing elements and tags to structure content. It serves as the foundation for all web pages and is often paired with CSS for styling and JavaScript for interactivity. HTML is crucial for web development as it enables effective content rendering.

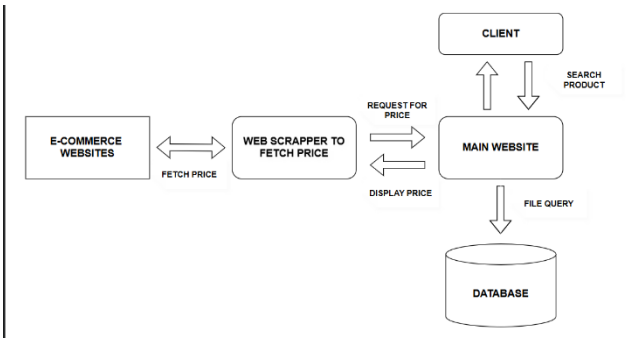
- CSS: CSS is a stylesheet language that controls web page presentation and layout, defining visual elements like colors, fonts, spacing, and positioning. It enhances content by selecting HTML elements and applying specific styles, promoting cleaner, more maintainable code and consistent styling across multiple pages of a website.

4.PROPOSED SYSTEM

In this Web scraping with Python project, the script searches for a specified product via URL and find out the price at that moment. This is particularly useful when you want to monitor the price of the specific item from multiple eCommerce platforms. Here, in this program, we have targeted two major eCommerce website Flipkart and Amazon to find the price of a product. On each execution, all three websites are crawled and the product is located, and the price is obtained and displayed on the website.
The price of the same product from all the sources are displayed on the main website, so that buyer can see the prices and make the decision to buy from the platform which offers the lowest price. Also our python project alerts the users in app about the price drops and other deals

5.CHALLENGES FACED DURING IMPLEMENTATION

6.ARCHITECTURE OF THE SYSYTEM



7.SYSTEM DESIGN

Webscrapping:

Web scraping is the process of extracting data from websites. It involves sending requests to a website, receiving its content (usually HTML), and parsing the content to retrieve useful information. This is often done automatically using specialized software or code, which can collect large amounts of data quickly and efficiently.

Data Storage and Database:

When building a price comparison website, you need to efficiently store and manage the data scraped from various e-commerce platforms. The data might include product details like names, prices, descriptions, ratings, and images. To store this data, you typically use a database.

Comparison Engine:

Comparison Engine in a Price Comparison Website using Python involves several key components. The engine allows users to compare products from multiple vendors based on different attributes like price, ratings, and availability. Below is a step-by-step approach to developing this engine, which includes collecting data, storing it in a database, and building a comparison system to retrieve and display the data.

Frontend:

The Python code itself doesn't directly create the frontend. Instead, Python is typically used for the **backend** logic (e.g., data scraping, database management, and serving APIs), while **HTML, CSS, and JavaScript** are used to build the **frontend** (user interface) of the website. However, Python can play an essential role in serving data to the frontend, especially using web frameworks like **Flask** or **Django**. These frameworks allow Python to interact with the frontend by serving dynamic content through templates, handling form submissions, and managing interactions between the frontend and the backend.

Price Alert:

A price alert system in a price comparison website allows users to monitor product prices and get notified when the price drops below a specified target. This feature is particularly useful for users looking to make informed purchase decisions and save money by waiting for the best price. Implementing a price alert system in a price comparison website using python is a valuable feature that enhances user experience. By combining backend logic, periodic monitoring and notification, users are informed about the best deals, which can drive more traffic and increase user retention.

8.IMPLEMENTATION AND RESULT

8.1 System Development

Web scraping is the process of extracting data from websites by sending HTTP requests, parsing HTML content, extracting relevant information, and storing the extracted data in structured formats. Tools and libraries for web scraping include Beautiful Soup, Requests, Selenium, and Scratch.

To build a price comparison website using Python, data storage and database management are essential. A comparison engine is used to compare products from multiple vendors based on attributes like price, ratings, and availability. Key components include data collection, database storage, comparison logic, user interface, and backend API. Python can play a crucial role in serving data to the frontend, especially using web frameworks like Flask or Django.

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8.2 System Testing

Functional Testing Overview

- Test product search and price comparison.
- Verify user ability to set and trigger price alerts.

Integration Testing

• Test interaction between web scrapers, database, backend API, frontend, notification system, and external services.
• Simulate multiple components working together.

Data Accuracy Testing
• Validate accuracy of scrapped prices, data normalization, and product information matching.

Load and Performance Testing
• Simulate multiple users setting alerts and querying products.

Security Testing
• Test for common vulnerabilities like SQL injection, XSS, and CSRF.
• Ensure authentication, authorization, and data privacy.

Usability Testing
• Evaluate user interface and experience.
• Test responsiveness, alert clarity, and navigation flow.

Regression Testing
• Ensure new changes don't break existing features.
• Regularly run automated test suites.

Results:

The Python-based price comparison and alert system monitors prices and notifies users when they drop below a threshold, accurately handling user flows **and** scraping, and proving effective in a controlled environment.

8.3 Results:

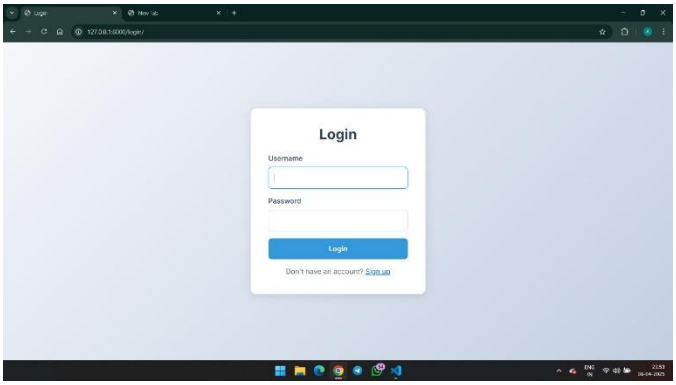

Fig 1. Login Page

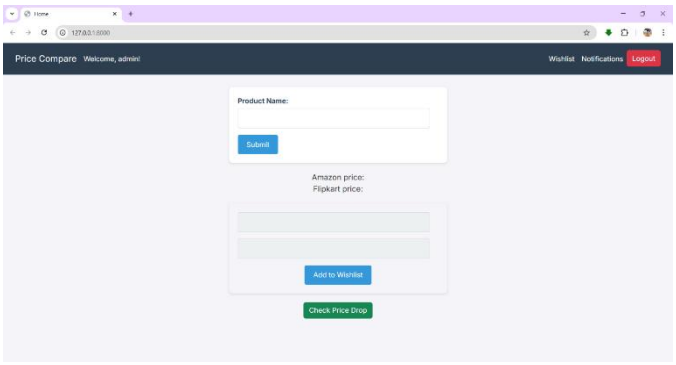

Fig 2. Home Page

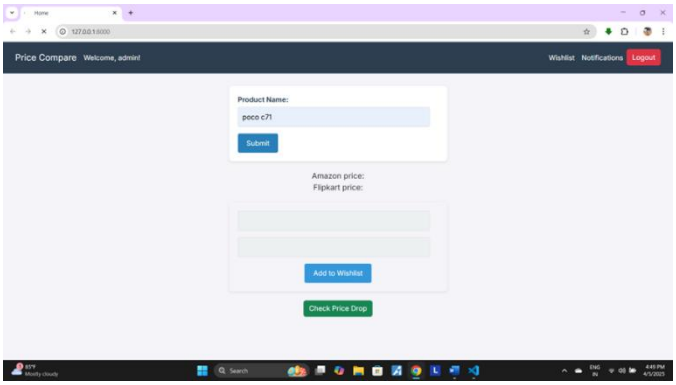

Fig 3. Product added for Comparison

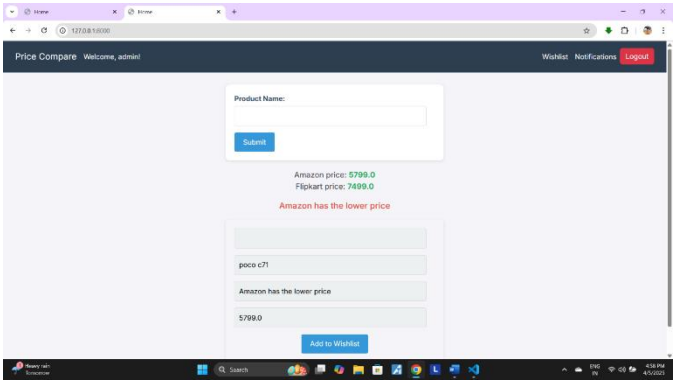

Fig 4. Price Compared

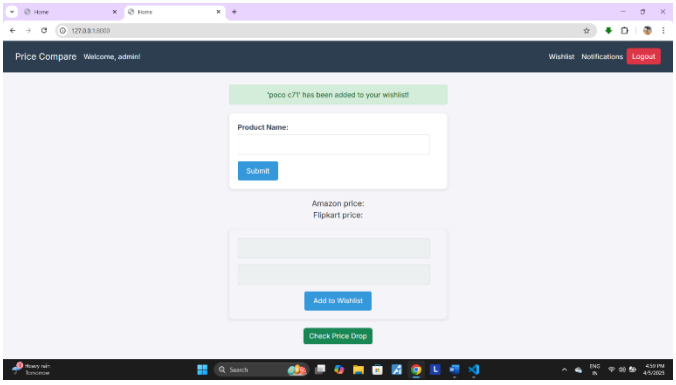

Fig 5. Product added to Wishlist

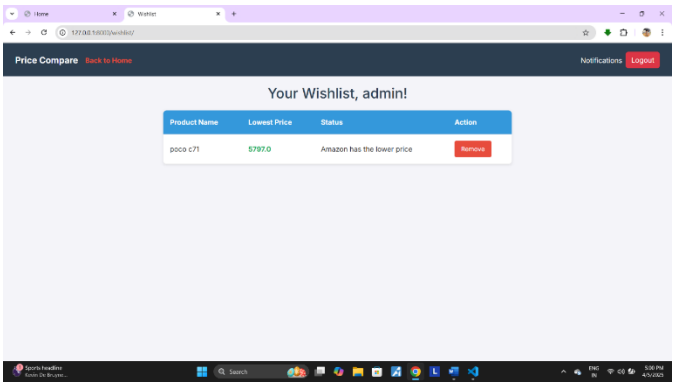

Fig 6. Wishlist

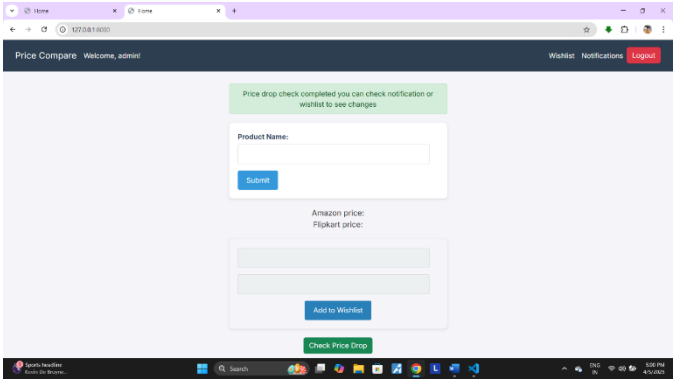

Fig 7. Price Drop

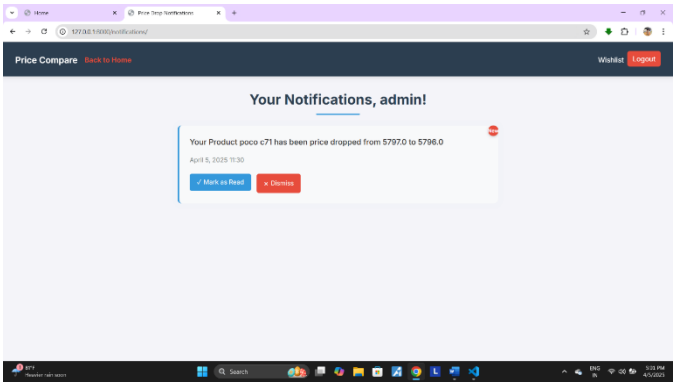

Fig 8. Price Drop Alert

9.DISCUSS AND ANALYSIS

9.1 Advantages of price comparison website:

Data Collection Challenges:

• Expansion to international markets for price comparison

• Web Scraping Limitations: Anti-scraping measures, frequent layout changes, and API access can hinder scraping.

• Data Normalization and Comparison: Different units and formats, product matching, and variations add complexity.

• Scalability and Performance: Concurrency issues and server load can slow down scraping and price checks.

• Price Alert System: Efficient tracking, reliable email or SMS alerts, and proper rate-limiting can be challenging.

• Legal and Ethical Considerations: Violation of terms of service and IP-related issues can occur from scraping websites.

• Frontend and User Experience: Optimizing caching and update frequency, building a robust product search, filter, and sorting system for comparison.

• Database Design: Efficient schema for handling multiple price points per product, tracking changes, and user alerts.

9.2 Future Work

Mobile App Integration and Enhanced Personalization

• Develop mobile apps for convenient access.

• Provide personalized recommendations.

• Ensure real-time price updates.

• Integrate with social media for price sharing.

• Alert users about price drops and exclusive deals.

• Gather market trends insights.

• Expansion to offline retailers.

• Integration with virtual assistants for price information.

• Collaborate with cashback and reward programs.

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11.CONCLUSION

A Python-based price comparison website and alert system offers users a convenient way to track product prices across multiple online stores and receive notifications when prices drop. The system uses web scraping or APIs from e-commerce websites to gather real-time price data. A user-friendly interface is built using Flask or Django web frameworks, while a database stores price history for trend analysis. Price alerts can be implemented via email, SMS, or push notifications. This project benefits consumers and businesses by saving money and analyzing market trends. Challenges include website anti-scraping measures and API limitations. Future improvements could include AI-driven price predictions and browser extensions for seamless integration.

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