North South University

Project:	*Budget Bazaar – Your Gateway to Savings*
Course Code:	*CSE299*
Section:	*07*
Course Name:	*Junior Design Course*
Prepared By:	*Group 05*

ID:	Group Members:
2122272642	Ahsan Rizvi
2014321042	Mohammad Irtiza Hossain Mahmud

Submitted to: *Intisar Tahmid Naheen [ITN],*
Senior Lecturer, Department of ECE

Date of Submission: *10-06-2024*

ABSTRACT

This project aims to mitigate the impact of rising inflation in Bangladesh by developing a user-friendly platform for comparing grocery prices across various online stores. The web application aggregates data from multiple grocery platforms, allowing users to search for products and identify the cheapest options available in real-time. Built using Django, Python, HTML, and CSS, the application employs web scraping and data aggregation techniques to provide accurate and up-to-date price comparisons across different categories. Additionally, a secure user authentication system ensures personalized experiences. By promoting informed purchasing decisions, this initiative seeks to ease the financial strain on consumers during economic hardships.

INTRODUCTION

Problem Statement:

Bangladesh is currently experiencing inflation, making it increasingly difficult for people to afford essential goods. Despite the presence of numerous online grocery stores in the country, it is impractical for individuals to manually compare prices across each platform to find the best deals. The fluctuation and disparity in grocery prices further complicate the situation, making it challenging for consumers to consistently find affordable products. The absence of a centralized source for price information exacerbates this issue, forcing consumers to rely on time-consuming manual comparisons. This project addresses the need for a centralized platform that streamlines the process of comparing grocery prices, ultimately helping consumers save money amidst economic challenges.

Our Solution:

To tackle this problem, we developed a user-friendly website that aggregates product data from multiple online grocery stores in Bangladesh. By leveraging web scraping techniques, the platform collects information on product prices, quantities, and categories from various retailers. Users can easily search for specific products and view the cheapest options available across different websites, empowering them to make cost-effective purchasing decisions. This project addresses the issue by:

- **Centralized price comparison**: Users can search for grocery items and instantly see the lowest prices available from various retailers.
- **Real-time updates:** Automated web scraping ensures that price data is current, providing users with accurate information for their shopping decisions.
- **Cost-effective decisions**: By displaying the cheapest options, the platform helps users save money on their grocery purchases.

Existing Solutions:

Several price comparison websites and applications exist that aim to help consumers find the best deals. Examples include Google Shopping and PriceGrabber, which provide some level of price comparison across a variety of products, including groceries. Additionally, price trackers for platforms like Amazon and eBay are available, although these are primarily used for a broader range of products and are not specifically tailored to grocery shopping.

Their Limitations:

While existing price comparison platforms offer some benefits, they have notable limitations, especially for consumers in Bangladesh:

- **Limited to specific regions or stores**: Many platforms do not offer comprehensive coverage across Bangladesh, restricting users to a limited selection of retailers.
- **Infrequent data updates**: Some platforms fail to update their price data regularly, leading to outdated and potentially inaccurate information.
- **Not tailored to groceries:** General price comparison sites like Google Shopping and PriceGrabber are not specifically designed to meet the needs of grocery shoppers.

Moreover, the use of price trackers for platforms like Amazon and eBay is impractical for the general public in Bangladesh, as these sites are not commonly used for purchasing groceries. They will most likely use Chaldal or Daraz, platforms that are not covered by the existing price-tracking websites.

How We Solve the Limitations

Our project addresses these limitations by developing a dedicated platform specifically designed to meet the needs of consumers in Bangladesh:

- **Centralized platform for price comparison**: Our website aggregates data from multiple online grocery stores across Bangladesh, providing a comprehensive view of grocery prices.
- **Real-time updates through automated web scraping**: We use automated web scraping techniques to ensure that price data is frequently updated, providing users with the most current and accurate information.
- **Focus on grocery products:** By concentrating exclusively on groceries, our platform provides a more relevant and user-friendly experience for shoppers.

Our Unique Contributions:

We are the first in Bangladesh to come up with a website like this. Our project offers several unique contributions that set it apart from existing solutions:

- **Expansive Coverage Across Bangladesh:** Unlike many existing platforms, our project provides comprehensive price information of groceries from multiple websites across Bangladesh.
- **Frequent updates**: The use of automated web scraping tools ensures that price data is regularly updated, offering users the most current information.
- **User authentication:** The platform includes a user authentication system, allowing for personalized experiences and the ability to save user preferences for future searches.
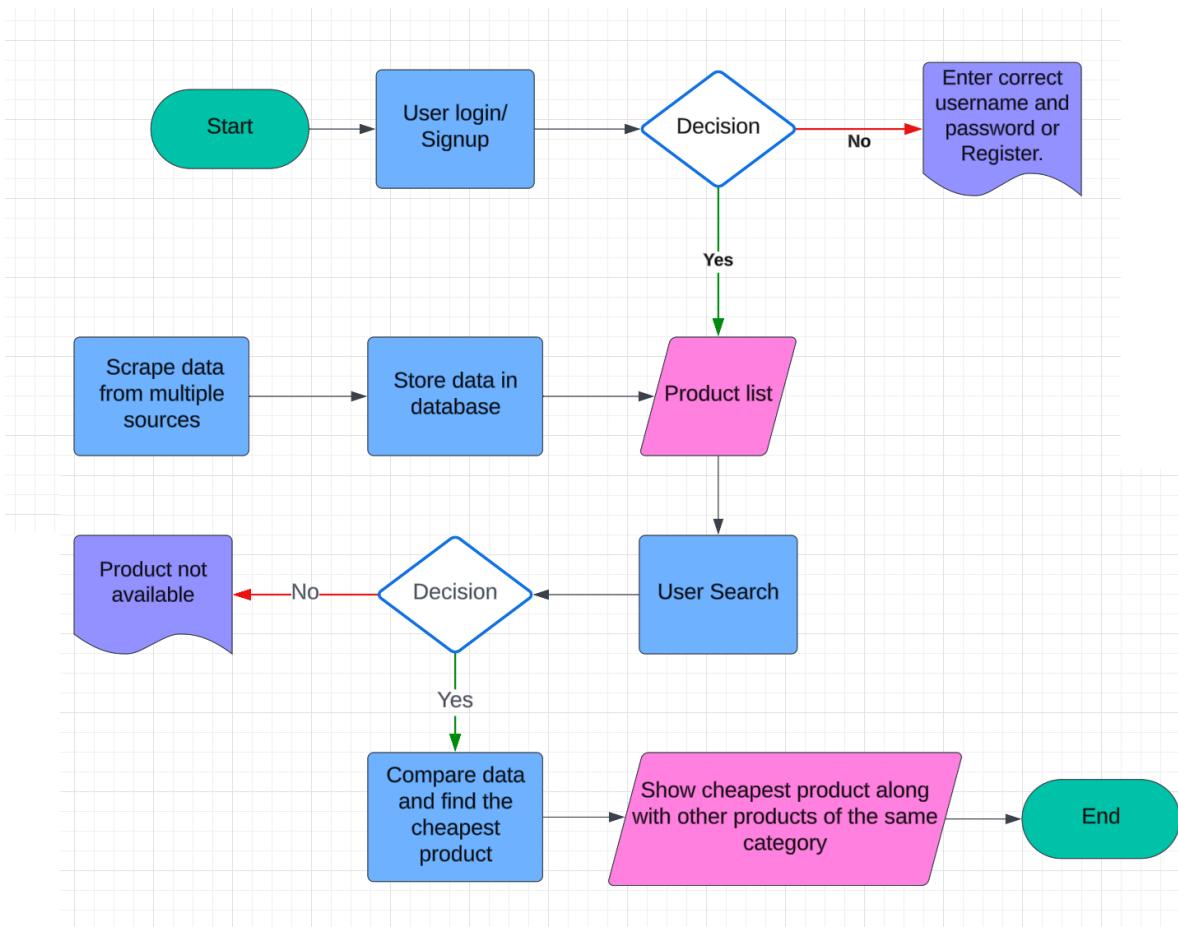
LITERATURE STUDY

Relevant research papers and articles that informed the development of this project include:

1. http://ir.kdu.ac.lk/bitstream/handle/345/1051/com-059.pdf: This paper provides a comprehensive overview of various web scraping methods and their applications in different fields, including price comparison. It highlights the technical aspects of web scraping and best practices for ensuring data accuracy and integrity.

2. https://link.springer.com/chapter/10.1007/978-3-030-44999-5_18: This research discusses how price comparison tools influence consumer behavior and spending habits. It provides insights into the economic benefits of such tools for consumers, particularly in terms of cost savings.

3. https://aisel.aisnet.org/bled2018/23/: This article explores the integration of digital technologies in retail and how they enhance consumer decision-making processes. It underscores the importance of digital tools in providing consumers with easy access to information and improving their shopping

4. https://www.scirp.org/journal/paperinformation?paperid=104341: This study aims to evaluate the consumer's buying behaviors in online shopping sites in Bangladesh. This study follows a mixed-method approach where the researchers collected primary data from the questionnaire survey and in-depth interview of the customers who buy services from the e-commerce site.

5. https://www.researchgate.net/publication/281430530_Price_Comparison_Price_Competition_And_The_Effects_Of_ShopBots: The aim of this report is to analyze the use and impact of ShopBots on price dispersion for consumer durables, assess American online shoppers' reliance on these tools and their online shopping behaviors, and explore strategies online merchants can use to avoid direct price competition, as well as the influence of m-commerce, tablets, and apps on price comparison behaviors.

6. https://dl.acm.org/doi/abs/10.1145/3154417: The aim of this report is to develop and validate an online algorithm that helps e-commerce sellers determine the optimal discount rate to offer buyers, balancing short-term profit and the time needed to build a high reputation.

METHODOLOGY

Flowchart:
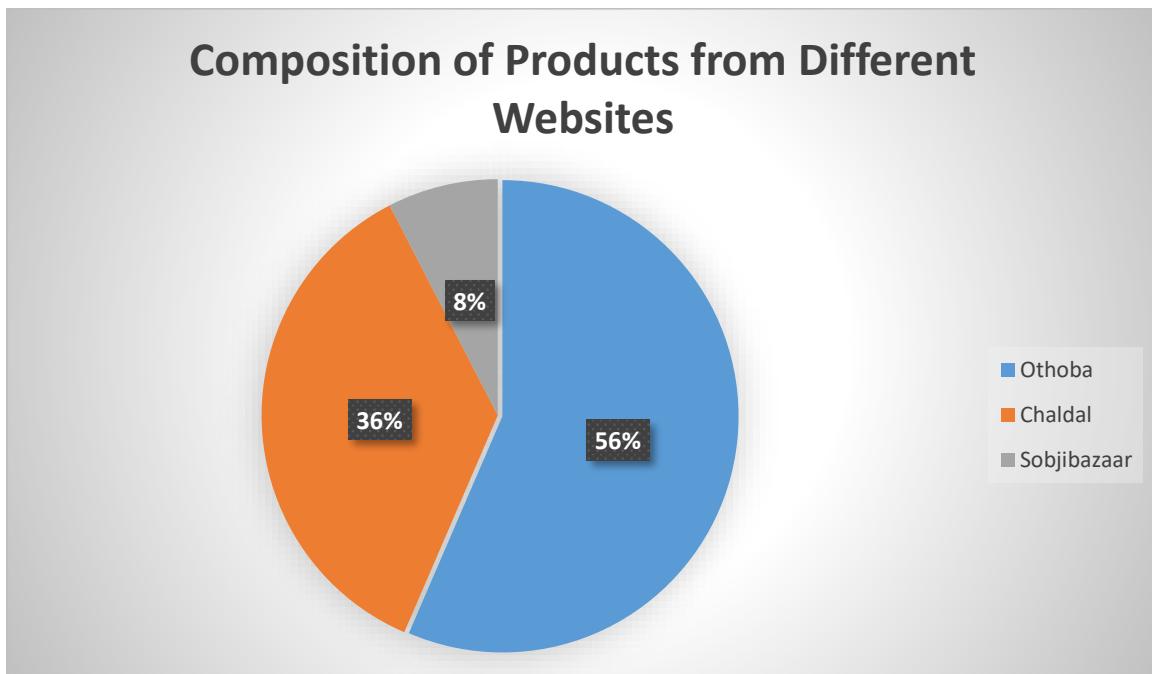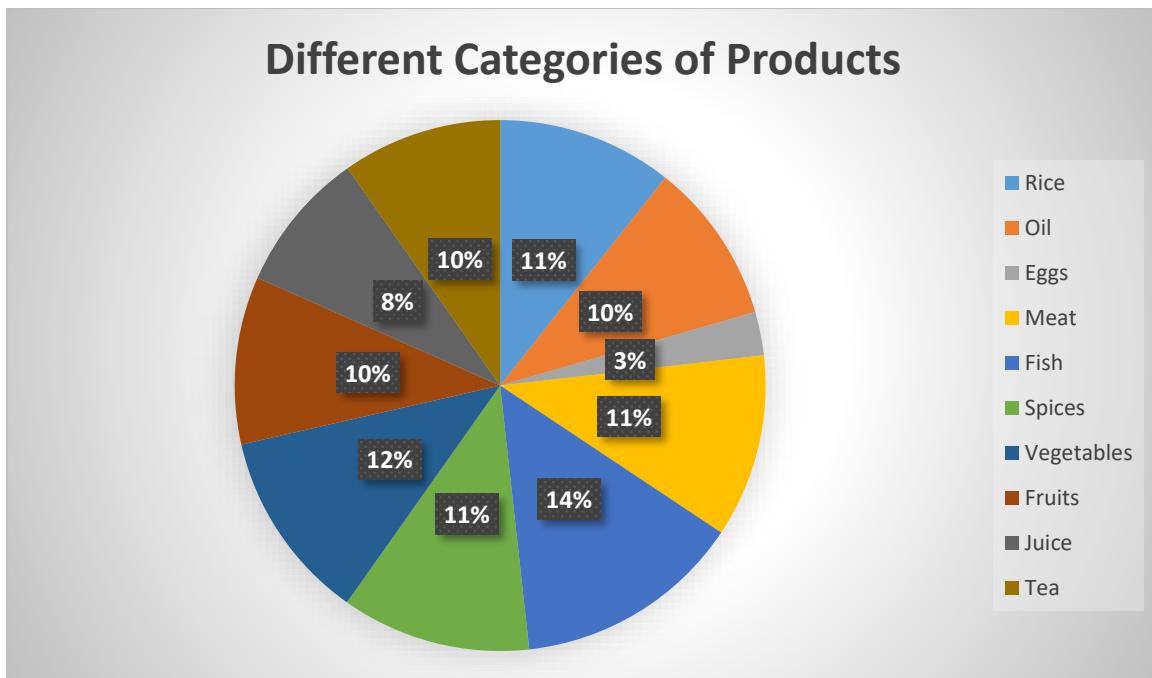
Dataset Details:

Our dataset comprises data collected from various grocery websites in Bangladesh, including Chaldal, Othoba, and Sobjibazar. In total, 1057 products were scraped from these sources.

Number of Products from Each Source:	Number of Products by Category:
Othoba: 597 products (56.48%)	Fish: 147 products (13.91%)
Chaldal: 380 products (35.95%)	Vegetables: 123 products (11.64%)
Sobjibazar: 80 products (7.57%)	Spices: 122 products (11.54%)
	Meat: 118 products (11.16%)
	Rice: 113 products (10.69%)
	Fruits: 108 products (10.22%)
	Oil: 104 products (9.84%)
	Tea: 103 products (9.74%)
	Juice: 91 products (8.61%)
	Eggs: 28 products (2.65%)

Dataset Visualization:

Composition of Products from Different Websites

Different Categories of Products

Legend:
- Rice
- Oil
- Eggs
- Meat
- Fish
- Spices
- Vegetables
- Fruits
- Juice
- Tea

Pie chart values: 11%, 10%, 3%, 11%, 14%, 11%, 12%, 10%, 8%, 10%
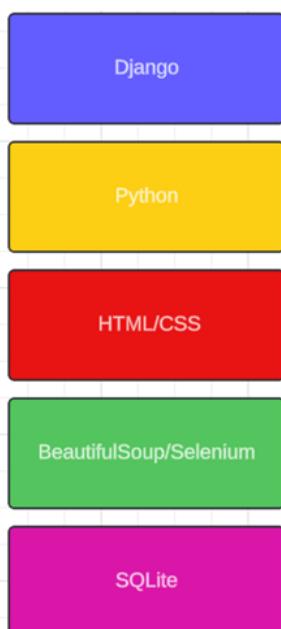
Software Stack
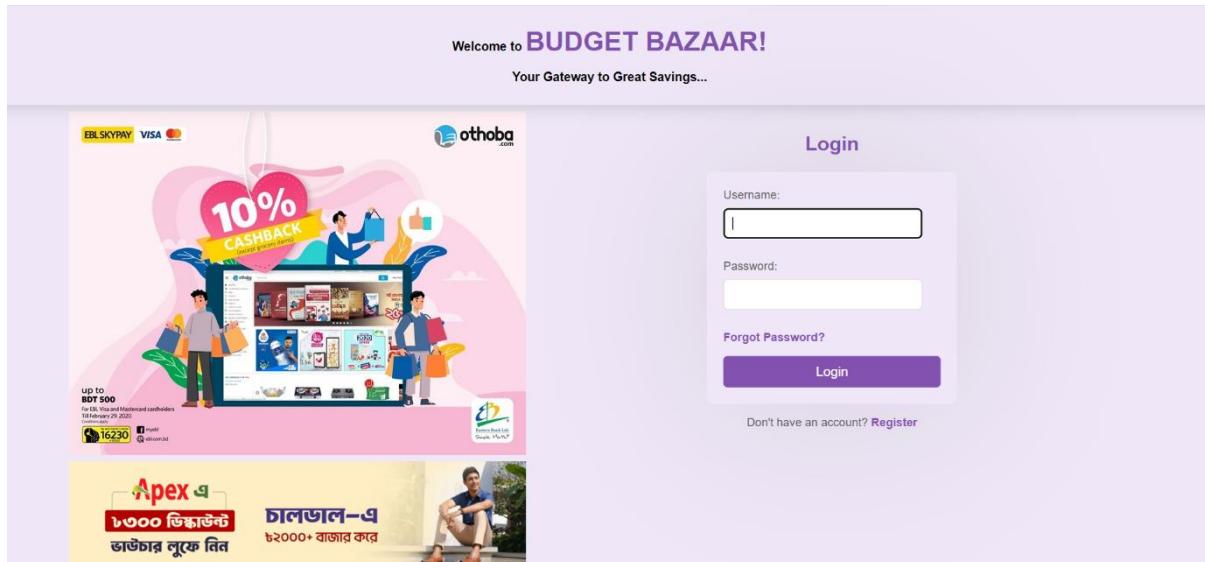
To collect these data, we had to use a range of software.
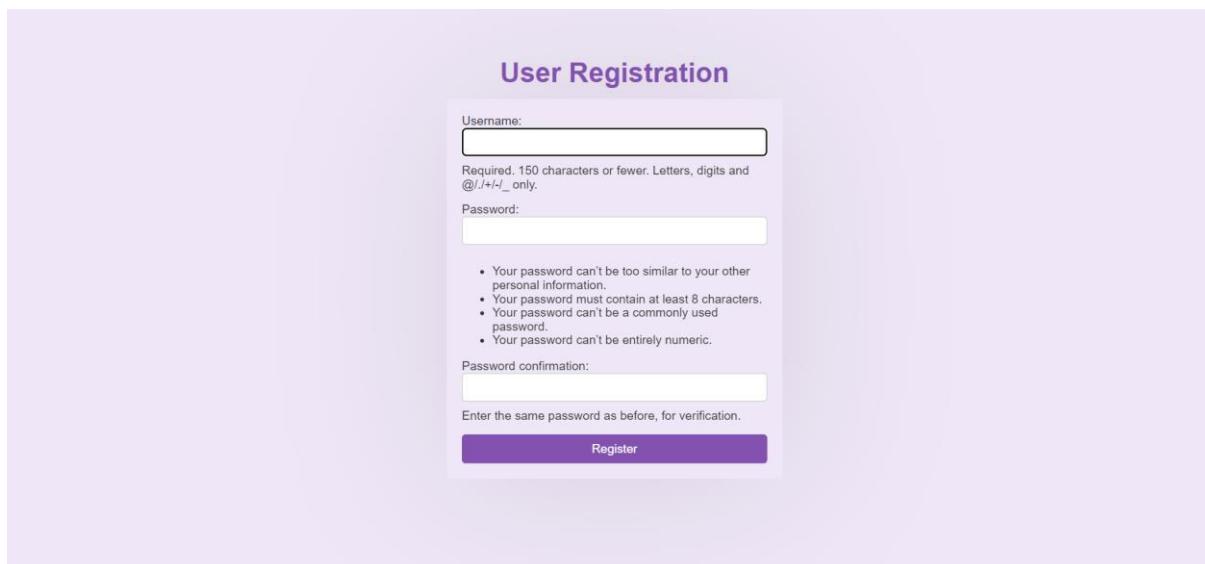
- **Django**: Backend framework to handle web requests, user authentication, and data management. Django provides a robust and scalable foundation for the application.
- **Python**: Core programming language used for web scraping and data processing. Python's versatility and extensive library support make it an ideal choice for this project.
- **HTML/CSS**: Frontend technologies to create a user-friendly interface. These technologies ensure that the website is both functional and visually appealing.
- **BeautifulSoup/Selenium**: BeautifulSoup is used to parse HTML and extract relevant data from grocery websites. Selenium is used for supporting browser automation.
- **SQLite**: Database to store scraped data. The choice of database depends on the scale of the project, with SQLite being suitable for smaller applications and MySQL for larger, more complex implementations.

Website Screenshots:

Screenshot 1: The login page

Screenshot 2: The registration page

Screenshot 3: The products list page

Screenshot 4: The search results page

Results:

- We have helped consumers make informed purchasing decisions
- We got positive feedback from initial users
- We have shown cost-effective options on our website

Conclusion:

In conclusion, our project "Budget Bazaar – Your Gateway to Savings" addresses the pressing issue of rising inflation in Bangladesh by providing consumers with a user-friendly platform for comparing grocery prices across various online stores. The platform offers centralized price comparison, real-time updates through automated web scraping, and personalized experiences through a secure user authentication system. By promoting informed purchasing decisions, our initiative aims to alleviate the financial strain on consumers during economic hardships.

Moving forward, we envision further enhancements and expansions to our platform, including additional features, broader coverage of products and retailers, and continued efforts to improve user experience and satisfaction. Ultimately, "Budget Bazaar" serves as a valuable resource for consumers navigating the complexities of the modern grocery market, helping them make informed decisions and achieve savings in their daily lives.