Monthly Expense Management of The Student

Team Members:

NAME	DEPARTMENT	BATCH NO.	REGISTRATION NO.
VARDHAN YADAV	CTECH	Batch 1	RA2211003010481
CHIYA TIWARI	NWC	Batch 1	RA2211031010027
RATISH OBEROI	CINTEL	Batch 1	RA2211026010091
ROHIT SINGH	CINTEL	Batch 2	RA2211026010350

Problem Statement:

Many students in India face challenges managing their finances, especially when it comes to food expenses. This project aims to provide a comprehensive understanding of student spending habits related to food, enabling better financial planning and decision-making for both students and parents.

Specific Objectives:

1. Analyse Monthly and Weekly Spending Patterns: Examine trends in food expenditure over time, identifying peak spending periods and potential areas for cost-saving.

2. Compare Online vs. Takeaway Preferences: Evaluate the popularity of different food delivery methods and their impact on spending habits.

3. Assess Overall Food Expenditure: Determine the average amount students spend on food per month and week, providing insights into affordability and budgeting.

4. Identify Essential Daily Expenses: Explore other costs students incur for daily living, such as transportation, toiletries, and miscellaneous items, to offer a holistic view of their financial needs.

By leveraging Tableau and Power BI, this project will visualize complex data sets to uncover meaningful patterns and insights. This information will empower students to make informed financial decisions, while also providing parents with valuable data to support their children's financial well-being.

Solution Description:

This data visualization project aims to provide insights into student expenditure patterns, specifically focusing on food consumption and related expenses. By collecting and analyzing data from various colleges across India, we will develop visualizations using Tableau and Power BI to:

- Track monthly and weekly food expenditure trends: Identify patterns in spending habits and identify peak and off-peak spending periods.
- Analyse preferred food sourcing methods: Determine whether students prefer online food ordering or takeaway options.
- Assess overall food spending: Evaluate the average amount students spend on food per month and per week.
- Evaluate daily necessity expenses: Gain insights into the additional costs students incur for daily living expenses beyond food.

Data Collection and Preparation

- Identify data sources: Establish partnerships with colleges across India to obtain student expenditure data.
- Data collection: Collect relevant data points
- Monthly and weekly food expenditure
- Preferred food sourcing methods (online ordering, takeaway)
- Daily necessity expenses (e.g., toiletries, transportation)
- Data cleaning and preparation: Ensure data quality by cleaning and standardizing the collected data.

Data Visualization in Tableau and Power BI

1. Tableau visualizations:
   Interactive dashboards: Create visually appealing dashboards to display key trends and insights.
   Time series analysis: Use line charts and bar charts to visualize monthly and weekly expenditure patterns.
   Comparative analysis: Compare expenditure patterns between different student groups (e.g., by age, gender, course).

2. Power BI visualizations:
   Interactive reports: Develop detailed reports to provide in-depth analysis of specific expenditure areas.
   Data exploration: Enable users to explore data interactively and uncover hidden patterns.
   Custom visualizations: Create custom visualizations to tailor the analysis to specific needs.

Key Visualizations

- Monthly and weekly expenditure trends: Line charts showing total food expenditure over time.
- Preferred food sourcing methods: Pie charts or bar charts comparing the popularity of online ordering and takeaway.
- Average food spending: Bar charts showing average expenditure per month and per week.
- Daily necessity expenses: Bar charts or stacked bar charts visualizing the breakdown of daily necessity costs.
- Comparative analysis: Bar charts or scatter plots comparing expenditure between different student groups.

Target Audiences:

1. College Students: The primary audience for your project, college students can use the visualizations to track their own spending habits, identify areas where they can save money, and make informed decisions about their finances.

2. Parents: Parents can use the visualizations to understand their children's spending patterns, set realistic budgets, and provide financial guidance.

3. College Administrators: College administrators can use the visualizations to gain insights into student spending habits, identify areas where resources can be allocated more effectively, and improve campus dining services.

4. Financial Institutions: Financial institutions can use the visualizations to develop targeted financial products and services for college students and their parents.

5. Researchers and Academics: Researchers and academics can use the visualizations to study student spending behavior, analyze trends over time, and identify factors that influence financial decision-making.

6. Government Agencies: Government agencies can use the visualizations to inform policy decisions related to student financial aid, campus dining services, and other relevant areas.

Application Analysis:

Key Data Points

- Monthly and Weekly Expenditure: Total food spending per month and week
- Ordering Preferences: Comparison of online food ordering and takeaway options
- Daily Necessities: Expenditure on items beyond food (e.g., toiletries, stationery)
- College-Specific Trends: Analysis of expenditure patterns across different colleges

Tool Selection: Tableau vs. Power BI

Both Tableau and Power BI are excellent tools for data visualization. The choice between them often depends on personal preference, specific project requirements, and existing team expertise. Here's a brief comparison:

1. Tableau
   Strengths: User-friendly interface, strong visualization capabilities, and a large community.
   Considerations: Licensing costs can be higher for enterprise-level use.
2. Power BI
   Strengths: Tight integration with Microsoft products (Excel, SQL Server), cost-effective for smaller teams, and extensive customization options.
   Considerations: Steep learning curve for those unfamiliar with Microsoft tools.

Potential Visualizations:

- Interactive Dashboards: Allow users to filter data by college, month, or week to explore specific trends.
- Bar Charts: Compare expenditure on different food categories (e.g., dining out, fast food, grocery).
- Line Graphs: Visualize changes in expenditure over time (monthly, weekly).
- Pie Charts: Show the proportion of expenditure on different categories (e.g., food, necessities).
- Maps: If college locations are available, visualize regional variations in expenditure patterns.

Key Insights to Extract

- Average Spending: Identify the average amount students spend on food per month and week.
- Ordering Habits: Determine the popularity of online ordering vs. takeaway and any associated trends.
- High-Spending Categories: Pinpoint areas where students tend to spend more (e.g., dining out, branded food).
- Seasonal Variations: Analyze if expenditure changes significantly during different seasons (e.g., exam periods, holidays).

Potential Challenges and Solutions

- Data Quality: Ensure data accuracy and completeness. Implement data cleaning and validation processes.
- Privacy Concerns: Address privacy issues by anonymizing student data or obtaining necessary consent.
- Scalability: If the project grows, consider using cloud-based solutions or exploring more powerful hardware.

Sample Output:

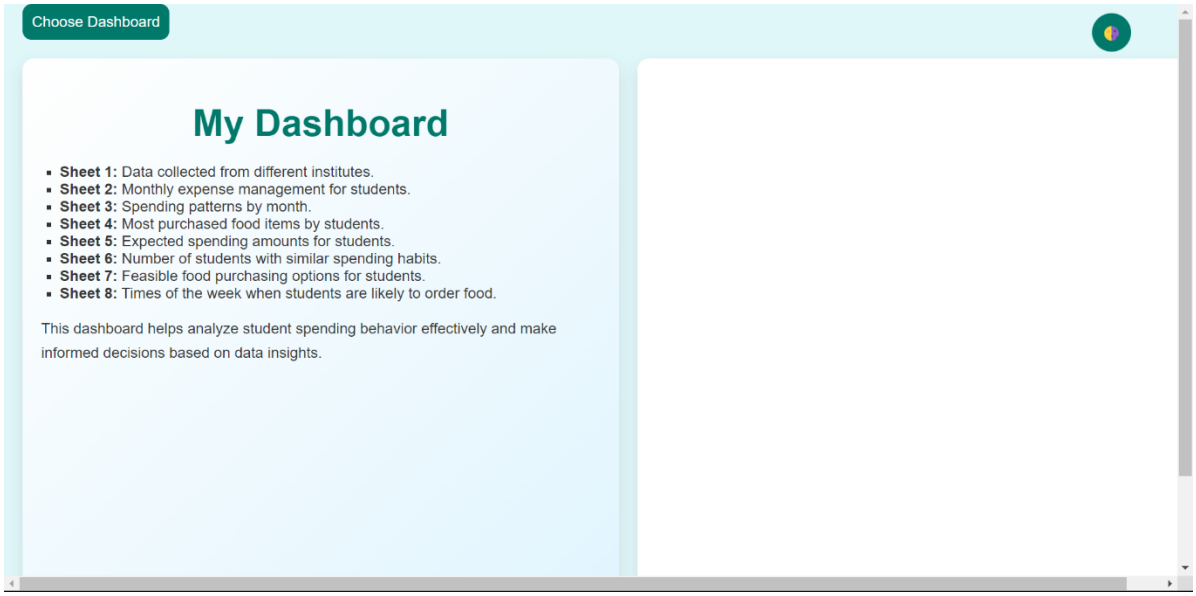

Figure 1: Represents the main user interface to choose to get access for either Tableau or PowerBI interface

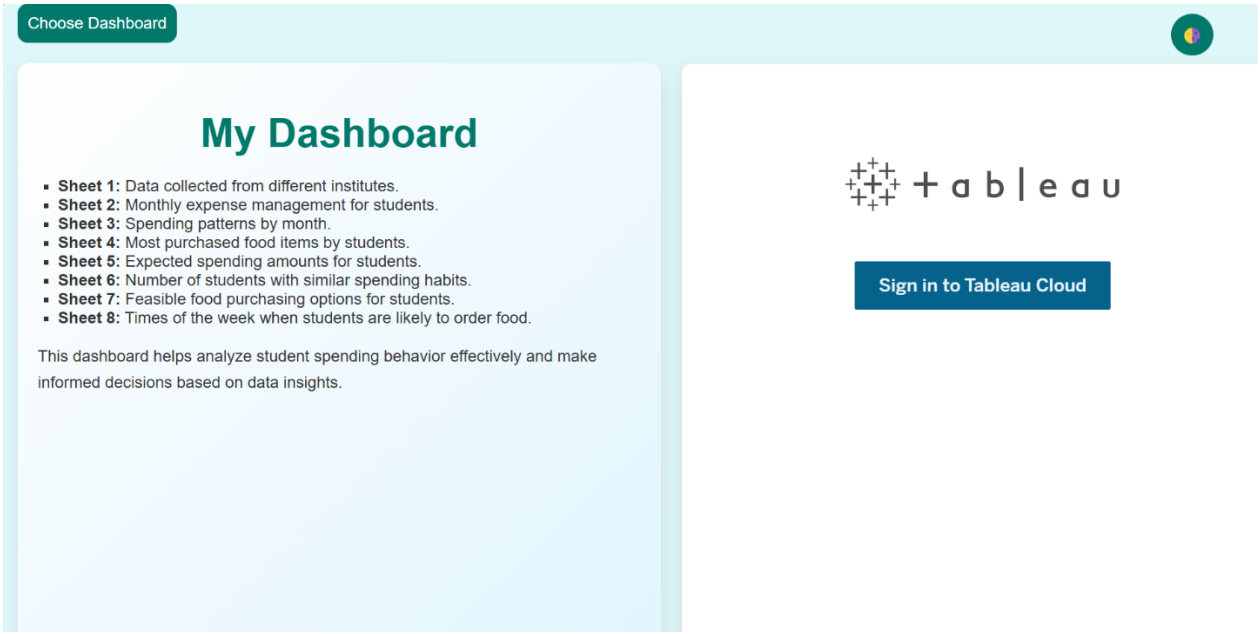

Figure 2: Represents the Tableau interface and login page to access the interface

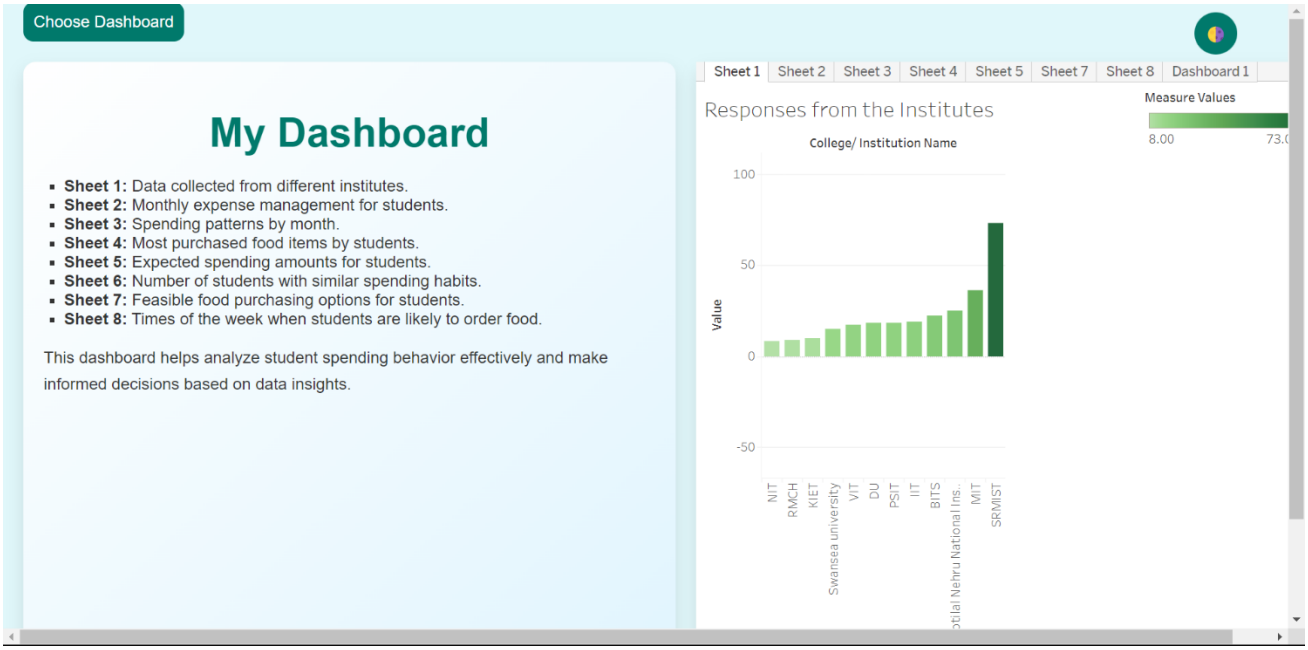

Figure 3: Represents the different functionalities provided in the Tableau application, the description is given on the left side of the webpage

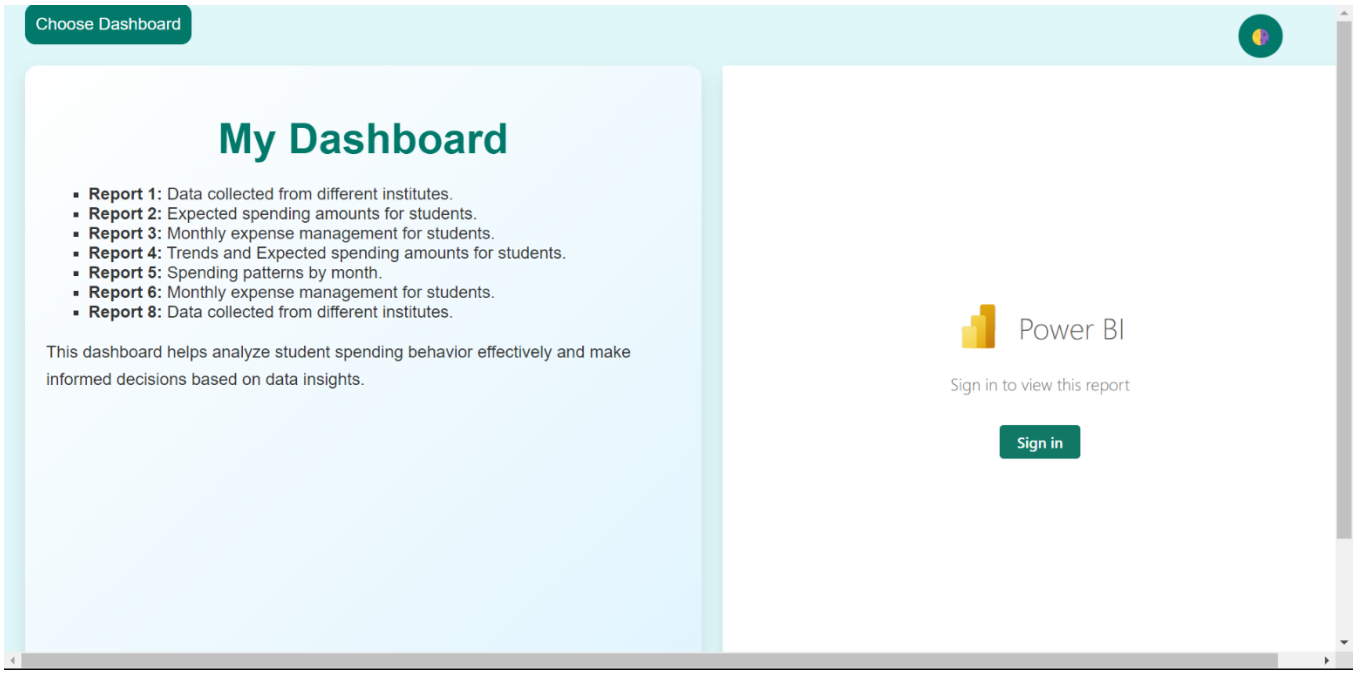

Figure 4: Represents the PowerBI login interface for the user to access

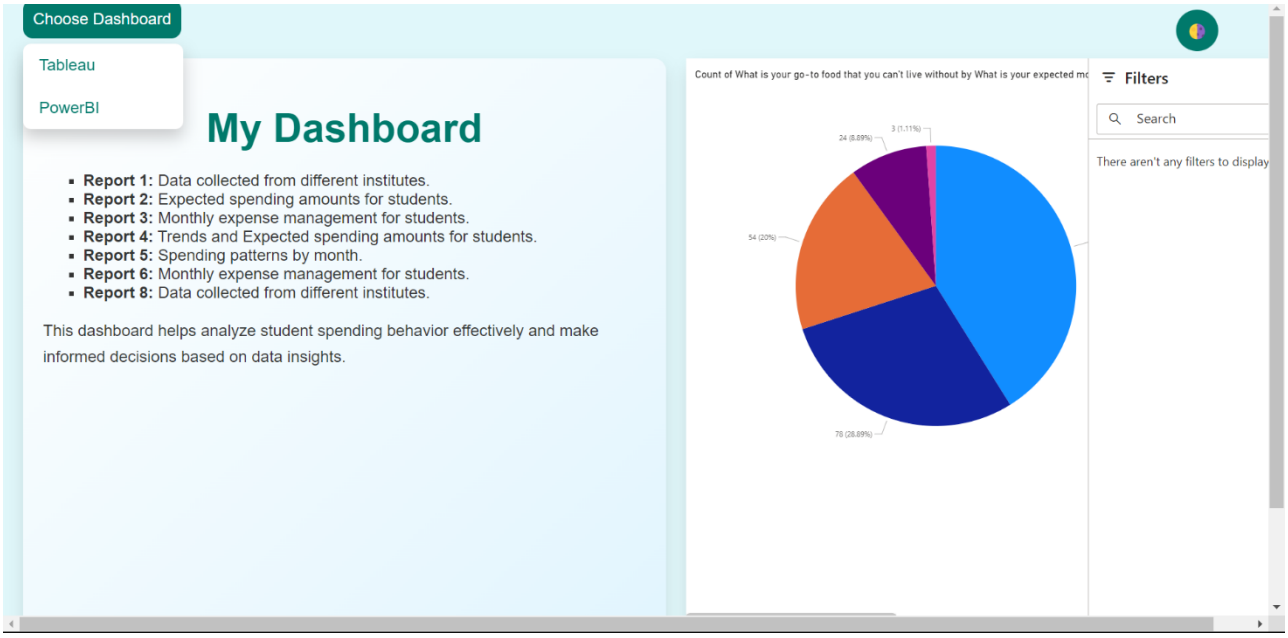

Figure 5: Represents the PowerBI interface and its functionalities provided for the user to access it.

Conclusion:

This project using Tableau and Power BI has provided valuable insights into the spending habits of students from various institutes. The analysis revealed that a significant portion of the students' monthly budget is allocated towards basic necessities, followed by food expenses. The visualization also identified the preferred food types among students and highlighted a tendency to spend more during weekends compared to weekdays. Furthermore, the analysis revealed that students tend to spend a larger portion of their income towards the beginning and middle of the month.

These findings offer valuable information for institutes and businesses alike. Institutes can use this data to understand the financial challenges faced by students and implement support measures accordingly. Businesses can leverage these insights to tailor their offerings and marketing strategies to meet the specific needs and preferences of the student population.

Contributions:

1. Data Collection - Vardhan Yadav

   (A google form was circulated to the students, where they were asked to fill as per the questions asked.)
2. Tableau Implementations – Vardhan Yadav, Ratish Oberoi
3. PowerBI – Chiya Tiwari, Rohit Singh
4. Frontend Interface – Ratish Oberoi, Rohit Singh
5. Documentations – Vardhan Yadav, Chiya Tiwari