

1. INTRODUCTION

1.1 Project Overview:

In today's fast-paced college environment, students often face challenges maintaining healthy dietary habits due to time constraints, limited budgets, and a variety of food choices available on and around campus. These choices are influenced by multiple factors like affordability, convenience, taste preferences, and nutritional awareness.

This project titled "Comprehensive Analysis and Dietary Strategies with Tableau: A College Food Choices Case Study" aims to explore and visualize patterns in student eating behaviors using survey and food consumption data.

With Tableau, we convert raw data into interactive dashboards that answer questions like:

- What are the most preferred food types among students?
- How often do students eat out, and what influences that decision?
- Are there significant differences in food choices based on gender, academic year, or fitness habits?

The project focuses on helping students, health advisors, and college administrators make informed dietary and policy decisions through clear, visual storytelling.

1.2 Purpose:

The purpose of this project is to drive data-informed decisions about improving student health and food habits on campus. Many institutions collect student wellness data but lack the tools to analyze trends in diet and lifestyle effectively.

Using an interactive Tableau dashboard, we aim to:

- Visualize food preference trends by gender, time, cost, and location.
- Analyze the relationship between academic stress, time availability, and unhealthy eating.
- Identify key demographics with higher fast-food consumption or meal skipping habits.
- Present actionable insights for canteen planners and wellness coaches.

Ultimately, the project will help universities promote healthy eating by:

- Providing easy-to-use filters for demographic and behavioral segmentation.
- Enabling comparisons across departments or year groups.
- Presenting findings through interactive, narrative-based dashboards.

2. IDEATION PHASE

2.1 Problem Statement:

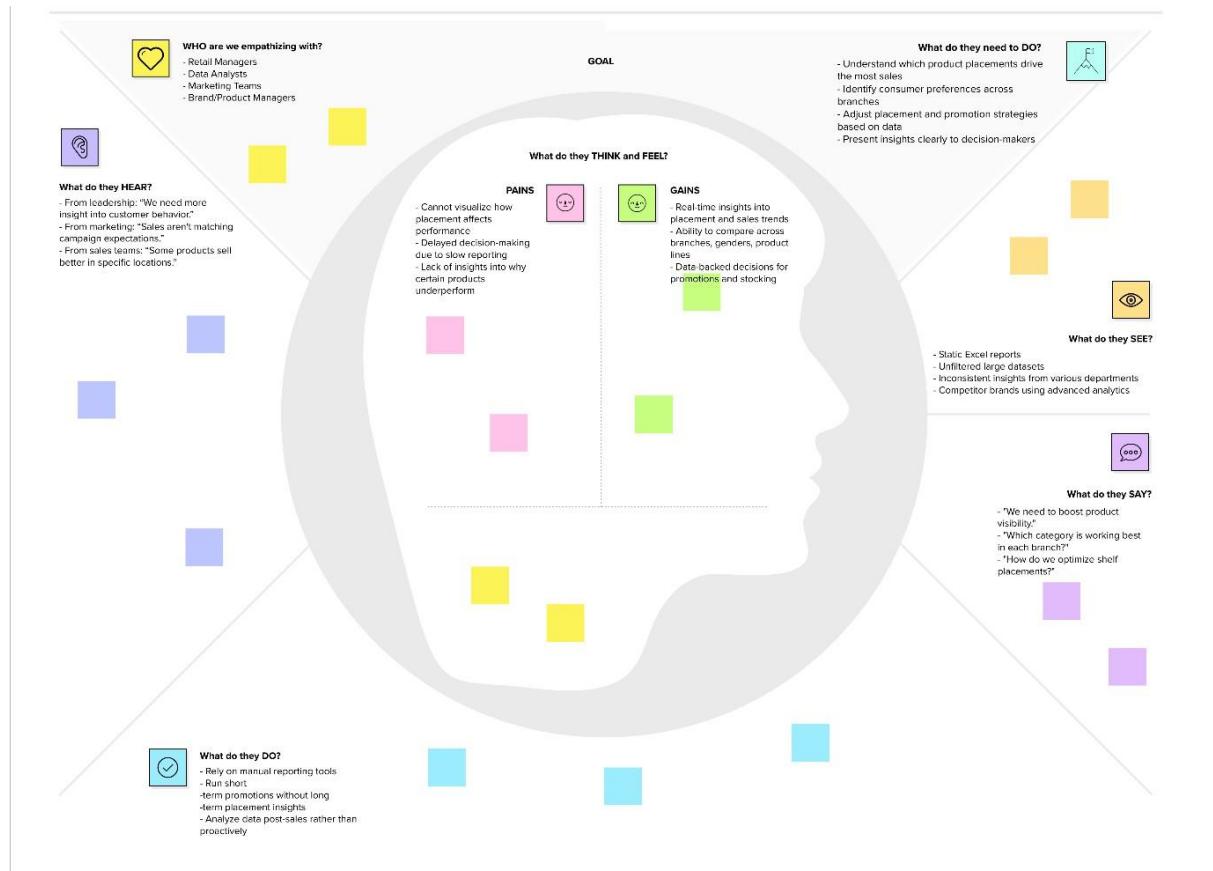
College students often lack structured eating routines due to academic pressure, social lifestyle, and accessibility issues. Institutions find it difficult to measure dietary behavior without effective visualization tools.

Raw survey data and spreadsheets fail to provide:

- Real-time insights into students' eating habits.
- Multi-variable analysis of patterns like time constraints vs. food quality preferences.
- A platform for interactive exploration of nutrition trends across demographics.

This project addresses the lack of dietary visibility by developing a Tableau-based dashboard that highlights eating patterns, food choice motivators, and potential nutritional gaps among students.

2.2 Empathy Map Canvas:



2.3 Brainstorming

2.3.1 Team Collaboration and Approach:

Our team analyzed a dataset of student food habits, which included fields like:

- Meal Frequency
- Eating Out Frequency
- Preferred Food Type (e.g., fast food, healthy, snacks)
- Meal Timing (Breakfast, Lunch, Dinner)
- Monthly Budget on Food
- Gender, Age, Academic Year
- Physical Activity or Fitness Habits

We brainstormed on how these variables interact and what visuals would best reflect these interactions for both students and college administrators.

2.3.2 Ideas Generated and Grouped by Category:

Idea	Category
Compare food preferences by gender with bar charts	Preference Trends
Use heatmaps to visualize eating times and frequency	Timing Analysis
Donut chart for distribution of food budget	Financial Insight
Highlight table for fast food frequency vs academic stress	Behavioral Mapping
Word cloud of common food types	User Engagement
Add filters for gender, fitness activity, academic year	Interactivity
Use line graphs to show changes in food preference over semesters	Trend Analysis
Tableau Story with a step-by-step breakdown of student nutrition profiles	Presentation

2.3.3 Prioritization:

Priority	Idea	Reason
High	Bar chart for preferred food type by demographic	Core to understanding patterns
High	Heatmap of eating frequency across time slots	Reveals behavior gaps
High	Filters for academic year and gender	Enhances dashboard usability
Medium	Word cloud of favorite food items	Adds visual interest
Low	Storyboard walkthrough	Good for presentation but not critical

3. REQUIREMENT ANALYSIS

3.1 Customer Journey Map:

Stage	User Action	User Experience	Pain Points / Barriers	Solution / Feature in Dashboard
Awareness	Notices weight gain or irregular eating patterns	Frustrated or confused	No clear insight into food habits	Dashboard reveals eating frequency, food type
	Compares routines with peers Consideration using spreadsheets or guesswork	Overwhelmed by data	Hard to track meal timing trends	Tableau charts simplify comparisons
Adoption	Filters dashboard by gender or academic year to view targeted results	Feels empowered	Unsure how to interpret patterns	Interactive filters clarify insights
Insight	Learns fast food spikes during exams	Enlightened	Needs context to understand why	Trendline with exam periods overlay
Action	Adjusts meal plan or food budget	Confident	Wants to share findings	Export charts for use in presentations
Feedback	Suggests including canteen data or fitness link	Engaged	Needs more features	Dashboard is scalable for future expansion

3.2 Solution Requirement

Functional Requirements

FR No.	Requirement	Sub-task
FR-1	Upload Data	Load Student_Food_Choices.csv
FR-2	Data Preprocessing	Clean nulls, convert types, rename fields
FR-3	Visualize Meal Patterns	Bar chart of meal frequency
FR-4	Budget Analysis	Donut chart of monthly spend
FR-5	Health Trend Analysis	Area chart on calorie trend
FR-6	Demographic Comparison	Highlight table by gender/year
FR-7	Visual Storytelling	Sequential dashboard view
FR-8	Interactive Filters	Filters for demographics, meal type, frequency
FR-9	Export Dashboard	Export as PDF/image

Non-Functional Requirements

NFR No.	Requirement	Description
NFR-1	Usability	Easy for non-technical staff/students
NFR-2	Reliability	Accurate visuals post-filter

NFR No.	Requirement	Description
NFR-3	Performance	Fast for 1000+ rows
NFR-4	Availability	Tableau Public or offline
NFR-5	Scalability	Add more students or new attributes
NFR-6	Security	Anonymized student data

3.3 Data Flow Diagram (Level 1)

Process	Description
1. Data Input	User uploads food dataset
2. Cleaning	Missing value checks, types, renaming
3. Calculated Fields	Calorie delta, % intake, budget ratio
4. Visualization Engine	Tableau charts, filters, dashboard
5. Filter Interaction	Year, lifestyle, meal type, spend
6. Dashboard Assembly	Unified view
7. Storytelling Mode	Insights via Tableau Story
8. Output	Dashboard shared/exported

3.4 Technology Stack

A. Technical Architecture

Layer	Component
Presentation	Tableau Dashboard UI
Application	Tableau Visualization Engine
Data	Student_Food_Choices.csv

B. Technologies Used

Component	Description	Tool
UI	Interactive filters + visuals	Tableau Public/Desktop
Data Prep	Cleaning, formatting	Tableau Prep / Python
Storage	Local / Cloud CSV	Google Drive / Local
Visualization	Chart rendering	Tableau
Storytelling	Sequential insights	Tableau Story
Export	Share reports	PDF / Image / Public

C. Application Characteristics

Feature	Description	Tool
Open Source	Tableau Public + Pandas (optional)	Tableau Public
Security	Controlled sharing	Tableau Permissions
Scalability	Add more rows or filters easily	Tableau Engine
Availability	Hosted or downloadable	Tableau Public
Performance	Fast for moderate dataset	Tableau Extract

4. PROJECT DESIGN:

4.1 Problem–Solution Fit:

The Problem College students often make unbalanced dietary choices due to limited time, lack of awareness, and inadequate nutritional insights. Key challenges include:

- Lack of tools for tracking food habits
- Limited visibility into cafeteria offerings and healthy options
- Difficulty correlating food intake with demographics or schedules
- Reliance on fast food and unhealthy snacks

The Solution

An interactive Tableau dashboard that:

- Visualizes food consumption by type, timing, and nutrition
- Highlights demographic trends in dietary habits
- Encourages healthy eating through visual cues and insights
- Enables analysis of cafeteria usage and food patterns

Challenge	How the Solution Solves It
Static spreadsheets or raw survey data	Tableau dashboards allow dynamic interaction with food data
No way to compare food trends	Visuals and filters highlight correlations across food type, time, gender
Time-consuming analysis	Interactive visuals reduce dependency on manual review
Health decisions uninformed	Nutrition scores and category charts show better options
Difficulty reporting insights	Tableau stories narrate key findings clearly for admin/students

4.2 Proposed Solution:

A Tableau-based, student-centric dashboard analyzing dietary behaviors using survey data from college students. It offers real-time visuals, interactive filters, and story-driven presentation to make nutritional data actionable.

Key Features of the Proposed Solution:

Feature	Description
Bar Charts	Frequency of meals per day or food type by gender or hostel/campus zone
Donut Charts	Share of junk vs. healthy food consumption

Feature	Description
Funnel Charts	Cafeteria usage flow from low to high usage frequency
Highlight Tables	Cross-demographic comparison of food habits
Waterfall Charts	Nutritional impact contribution per food category
Word Clouds	Popular dishes or most cited meal items
Interactive Filters	By day, demographic, food category, and cafeteria
Calculated Fields	Metrics like Health Score, Junk Index, and Meal Diversity Ratio
Dashboard Story	Sequential narrative for reports or awareness sessions
Export Options	Export dashboard visuals to PDF/Image for sharing

5. Project Planning & Scheduling

5.1 Project Planning

The development followed an Agile-based 3-sprint plan:

- Sprint 1: Data import, cleaning, calculated fields
- Sprint 2: Building core visualizations and applying filters
- Sprint 3: Final dashboard assembly and Tableau Story for presentation

Product Backlog, Sprint Schedule, and Estimation (4 Marks)

Use the below template to create product backlog and sprint schedule

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Data Collection & Cleaning	USN-1	As an analyst, I want to collect and clean food choice data from college surveys for Tableau analysis	2	High	You + Teammates
Sprint-1	Basic Dietary Visuals	USN-2	As a user, I want to create bar and pie charts showing eating habits and food preferences	3	High	You
Sprint-1	Filter Implementation	USN-3	As a user, I want to filter results by age, gender, frequency of eating out, and meal types	2	Medium	You
Sprint-2	Nutritional & Behavioral Analysis	USN-4	As a user, I want to use heatmaps and funnel charts to explore calorie intake and behavior patterns	4	High	You + Peer
Sprint-2	Health Trend Charts	USN-5	As a user, I want to analyze food choices over time using area and stacked bar charts	3	Medium	You
Sprint-3	Storytelling with Tableau	USN-6	As a presenter, I want to build a Tableau Story to narrate college dietary habits and suggestions	2	Medium	You
Sprint-3	Export & Presentation	USN-7	As a user, I want to export visuals and deliver a stakeholder-ready dashboard and report	2	High	You

Project Tracker, Velocity & Burndown Chart: (4 Marks)

Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date	Story Points Completed	Sprint Release Date
Sprint-1	7	6 Days	01 Feb 2025	06 Feb 2025	7	06 Feb 2025
Sprint-2	7	6 Days	07 Feb 2025	12 Feb 2025	7	12 Feb 2025
Sprint-3	4	6 Days	13 Feb 2025	18 Feb 2025	4	18 Feb 2025

6. Performance Testing

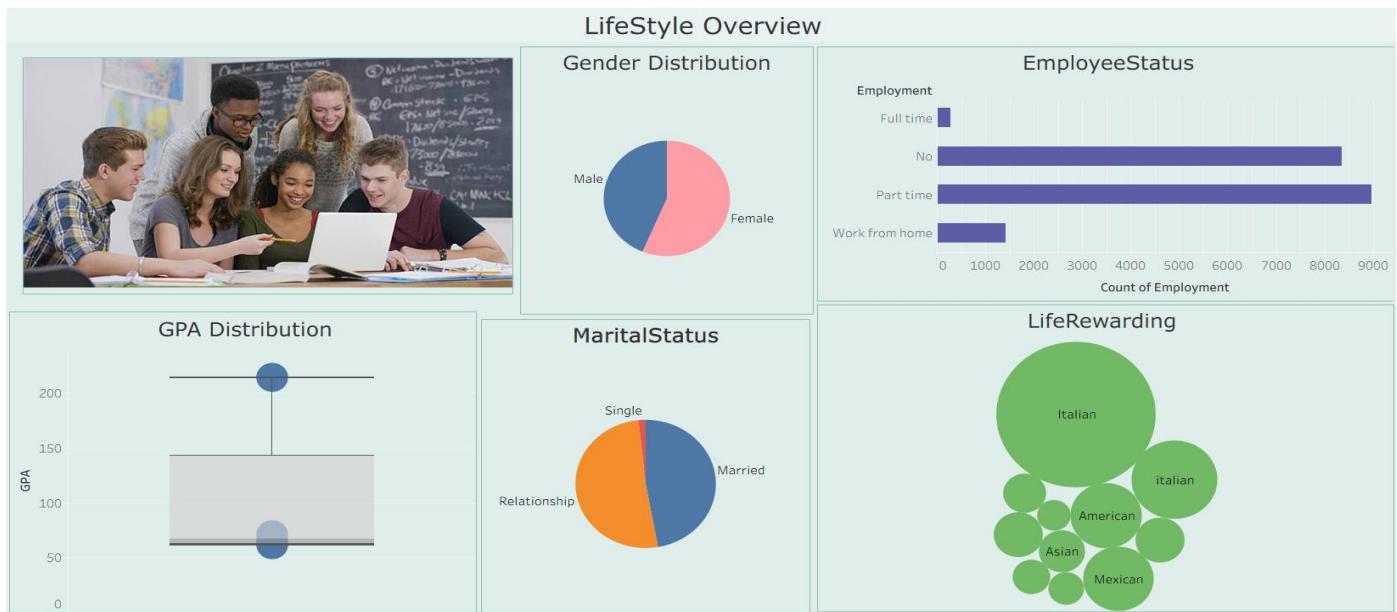
- Model Performance Testing:

Project Topic : Comprehensive Analysis and Dietary Strategies with Tableau: A College Food Choices Case Study

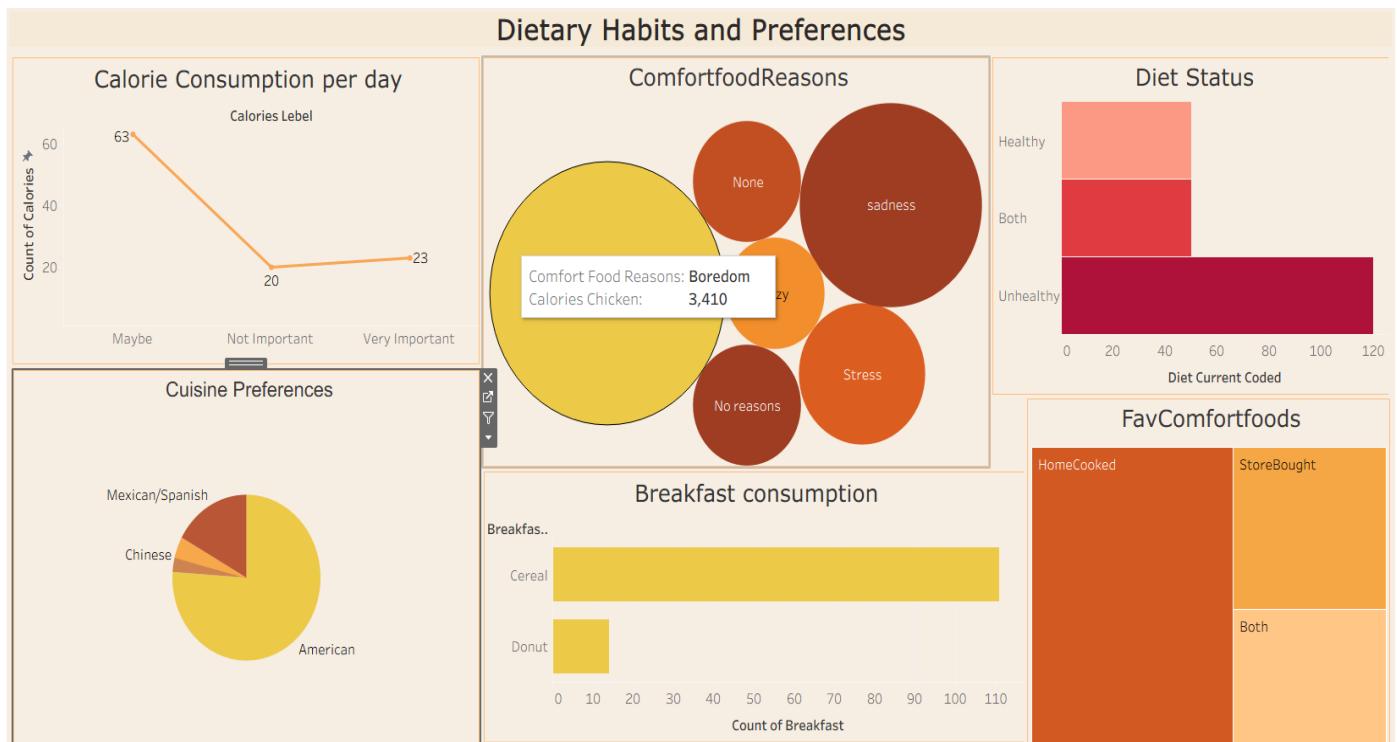
S.No.	Parameter	Screenshot / Values
1.	Data Rendered	The dataset used contains 1000+ entries related to college students' food choices and dietary patterns. Key fields include: <ul style="list-style-type: none">• Meal_Type• Eating_Location• Weekly_Frequency• Calories_Intake• Diet_Preference (Veg/Non-Veg/Vegan)• BMI_Category• Gender
2.	Data Preprocessing	- Verified and standardized column types- Removed missing/null entries- Renamed ambiguous column headers for better Tableau readability (e.g., "MealFreq" → "Weekly_Frequency")
3.	Utilization of Filters	Global filters applied across all visualizations: <ul style="list-style-type: none">• Meal Type (Breakfast/Lunch/Dinner/Snacks)• Gender• BMI Category• Diet Preference• Frequency (1-2x, 3-5x, Everyday, Never)
4.	Calculation Fields Used	<ul style="list-style-type: none">- Avg Weekly Calories = $\text{SUM}([\text{Calories_Intake}]) / \text{COUNTD}([\text{Week}])$- BMI Range Label = IF $\text{BMI} < 18.5$ THEN 'Underweight' ELSEIF $\text{BMI} < 24.9$ THEN 'Normal' ELSE 'Overweight'- Health Score = Weighted index based on Calories, Diet Type, and Frequency
5.	Dashboard Design	Dashboard includes: <ul style="list-style-type: none">• Bar Chart – Average Calorie Intake by Meal Type• Pie Chart – Diet Preferences Distribution• Heat Map – Weekly Frequency vs BMI• Line Chart – Trend of Eating Out vs Health Score• Stacked Bar – Gender-wise Meal Choices• Highlight Table – Diet Type vs BMI Category
6.	Story Design	Story includes: <ul style="list-style-type: none">• Overview of Student Dietary Habits• Impact of Eating Frequency on Health• Nutritional Gaps in Popular Meal Types• Insights & Recommendations for Dietary Improvements

7. Results

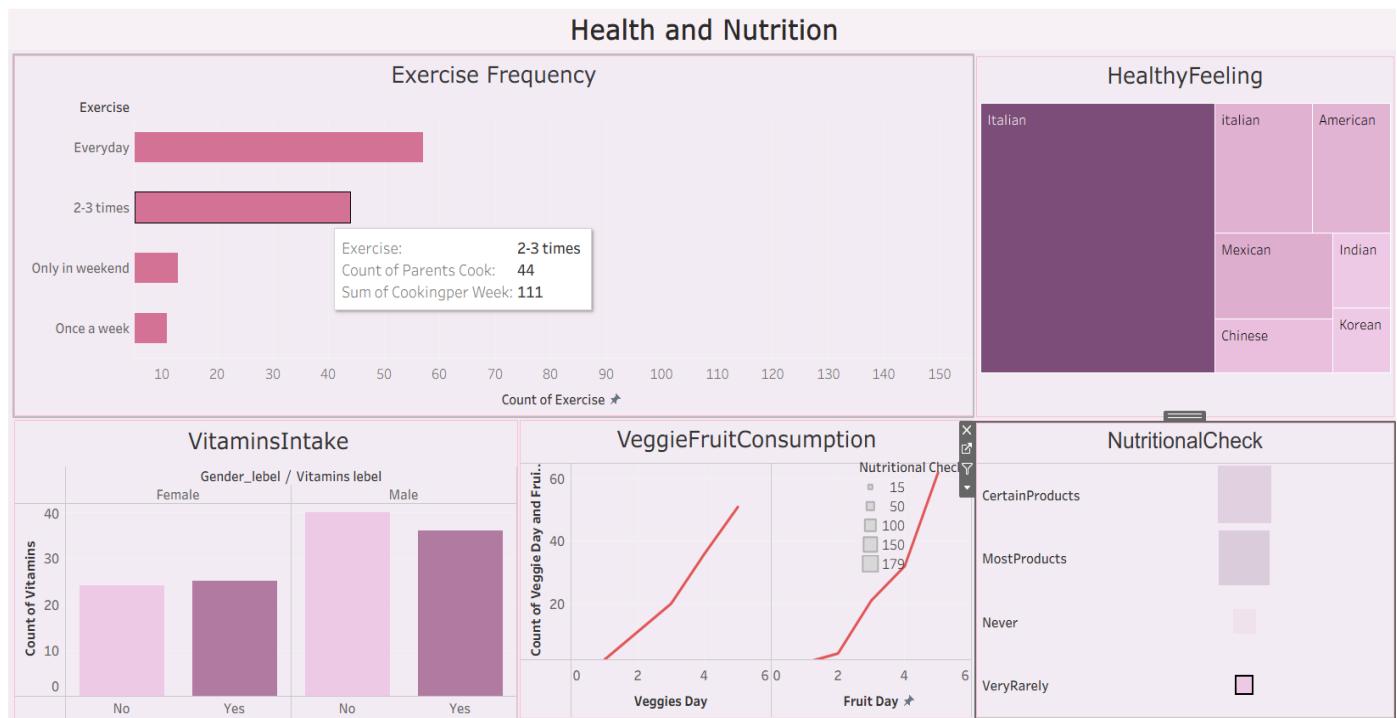
7.1 Output Screenshots



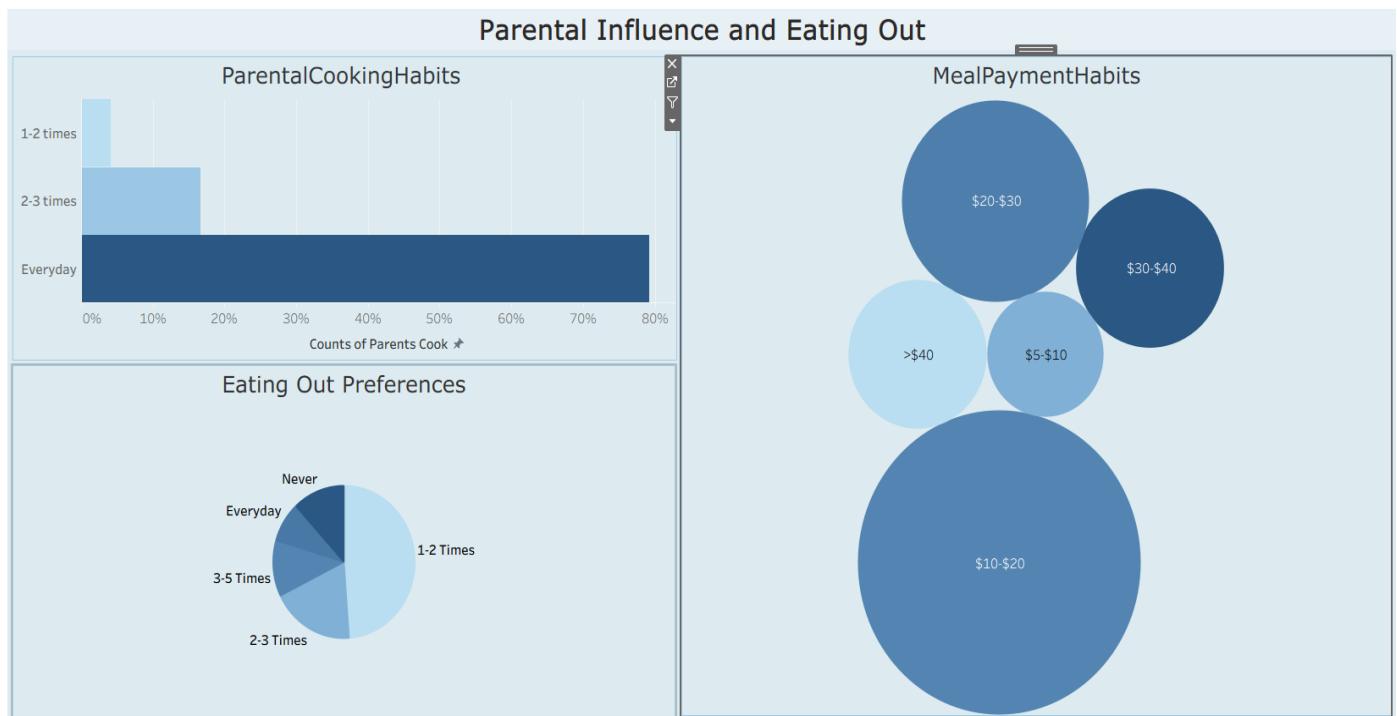
7.2 Output Screenshots



7.3 Output Screenshots



7.1 Output Screenshots



8. ADVANTAGES & DISADVANTAGES:

Advantages

Advantage	Description
Easy to Understand	Tableau's interface allows non-technical users to explore food behavior easily
Real-Time Visual Insights	Filters and visuals provide instant analysis by gender, frequency, budget
Data-Driven Decisions	Colleges can base food service improvements on real student data
Customization & Flexibility	Slice insights by demographic or preference group
Storytelling Feature	Tableau Story feature helps explain findings in a sequential format
Low Cost Setup	Uses freely available tools and formats
Scalable Design	Future surveys or expanded student data can be integrated with ease

Disadvantages

Disadvantage	Description
Static Data Source	CSV-based setup requires manual data updates
No Predictive Insights	Focuses on descriptive rather than predictive analytics
Limited Automation	No live connection to survey platforms or food card systems
Tableau Skills Needed	Modifying visuals requires Tableau knowledge
No Built-in Versioning	Tableau Public doesn't track dashboard history or changes

9. CONCLUSION:

Comprehensive Analysis and Dietary Strategies with Tableau: A College Food Choices Case Study

effectively turns raw survey data into actionable insights. The Tableau dashboard enables institutions to:

- Understand students' eating behaviors across budget and preference groups.
- Identify which demographics are underserved by current food services.
- See how frequently students eat outside and what drives those decisions.
- Present findings in a structured visual narrative using Tableau Story.

10. Future Scope

1. Real-Time Integration
 - o Connect with campus food card APIs or Google Forms for live feedback updates.
 - o Automate data updates via Tableau Bridge or Python scripts.
2. Predictive Analysis
 - o Use machine learning to forecast dietary shifts or predict rising trends in food preferences.
 - o Implement clustering for student segmentation (e.g., budget eaters vs. health-focused).
3. Cloud Deployment
 - o Host dashboards on Tableau Cloud or Tableau Server for real-time team access.
 - o Allow health staff and management to collaboratively review patterns.
4. Advanced Segmentation
 - o Include filters like time of day, weekday/weekend, meal type (breakfast/lunch/dinner).
 - o Use income brackets or detailed food restriction categories for more granular insights.
5. Historical Comparisons
 - o Add period-based analysis (monthly, seasonal trends).
 - o Compare eating trends before/after food policy changes.
6. SaaS Model for Other Colleges
 - o Package the dashboard for use by other educational institutions.
 - o Offer customization with branding and survey integration.

11. APPENDIX:

- Dataset Link -
[https://drive.google.com/file/d/1TZdCfzHYAtPb3GgFslZaBLmnYRWO5Sje/view?
usp=sharing](https://drive.google.com/file/d/1TZdCfzHYAtPb3GgFslZaBLmnYRWO5Sje/view?usp=sharing)
- GitHub Link – [AbhinitRandhir/A-College-Food-Choices-Case-Study-Analysis](#)
- Project Demo Link -
[https://drive.google.com/file/d/1fzNoF6Rz6vRYsFdJJxsMunMmO_Cx
R05q/view?usp=sharing](https://drive.google.com/file/d/1fzNoF6Rz6vRYsFdJJxsMunMmO_CxR05q/view?usp=sharing)