PROJECT FINAL REPORT

1. INTRODUCTION

1.1 Project Overview

In today's fast-paced academic environment, college students often neglect their dietary habits due to lack of time, awareness, or accessibility to healthy food choices. Poor nutrition can negatively impact concentration, energy levels, and overall well-being. This project, titled **"Comprehensive Analysis and Dietary Strategies – A College Students Food Case Study"**, aims to explore and visualize dietary patterns among college students using **Tableau**, a powerful data visualization tool.

Through the collection and analysis of student food consumption data, the project identifies key trends, behaviours, and nutritional gaps. By converting raw data into interactive visual dashboards, the project helps uncover actionable insights that can guide both students and institutions toward smarter, healthier dietary decisions.

1.2 Purpose

The primary purpose of this project is to apply data analytics techniques using Tableau to analyse the food habits of college students and develop data-driven dietary strategies.

The objective is to:

- Understand the relationship between student lifestyle and eating behaviour.
- Identify unhealthy patterns such as meal skipping or frequent junk food consumption.
- Deliver easy-to-understand visualizations that support informed decision-making.

Recommend potential strategies to improve nutritional awareness and dietary balance. This project supports the goal of promoting long-term health and academic performance through targeted visual insights.

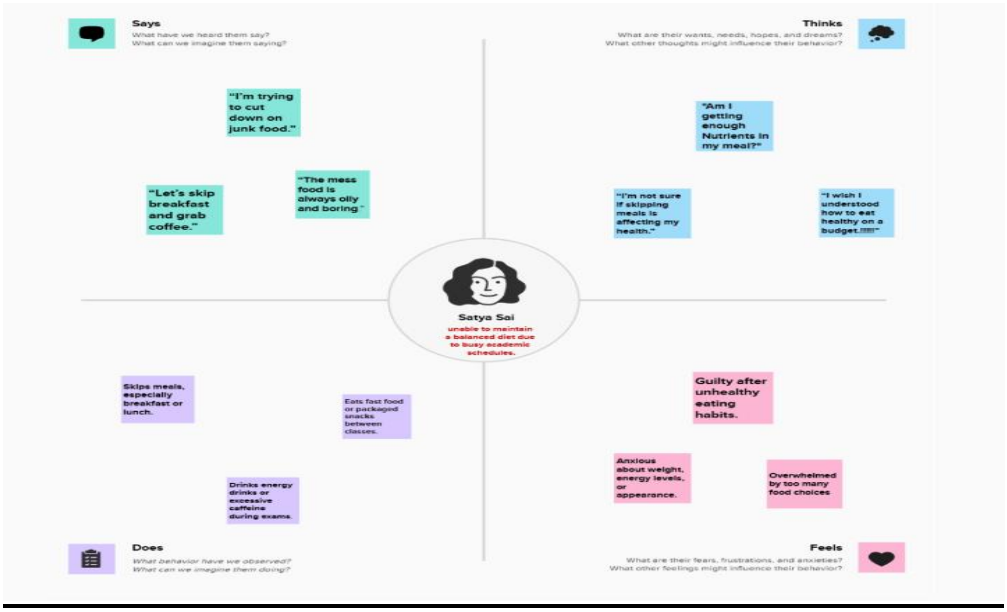
2. IDEATION PHASE

2.1 Problem Statement

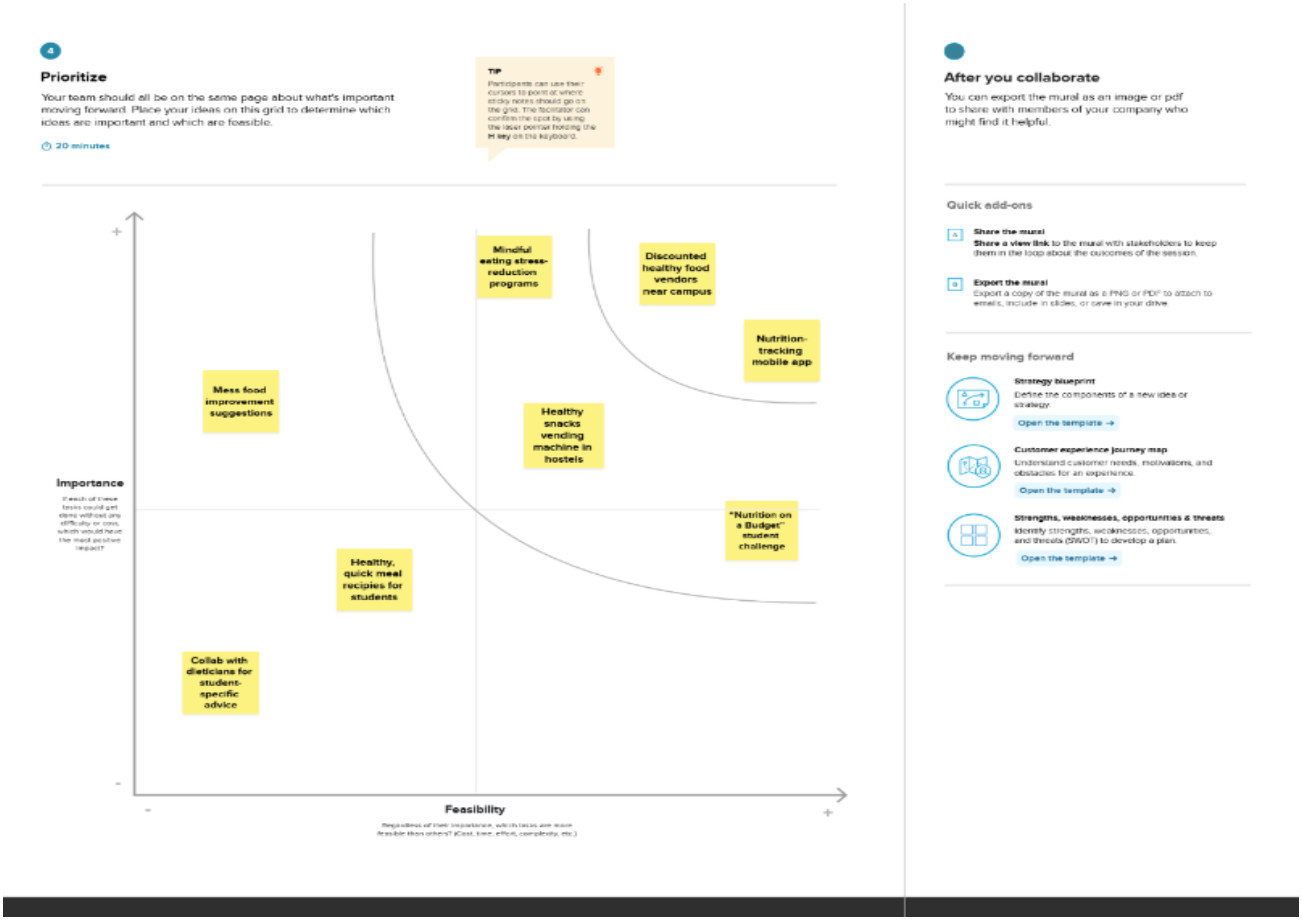
I am a college student with a hectic academic schedule	**trying to** maintain a healthy and balanced diet	**but** I often end up skipping breakfast and lunch,	**because** I lack time and the mess food is unappealing	**which makes me feel** tired, guilty, and worried about my health
I am someone who wants to eat healthy on a student budget	**trying to** make better food choices	**but** I keep falling back into unhealthy patterns during Exams	**because** I depend on caffeine and packaged food	**which makes me feel** overwhelmed and anxious about my eating habits.

Problem Statement (PS)	I am (Customer)	I'm trying to	But	Because	Which makes me feel
PS-1	College Student with strict academic schedule	Maintain healthy diet	Skips breakfast	I lack time	Worried about my health
PS-2	**Student who wish to have healthy food on budget**	Make better food choices	Falling back into unhealthy patterns	I depend on packaged food	Anxious about my eating habits

2.2 Empathy Map Canvas



2.3 Brain Storming



3.REQUIREMENT ANALYSIS

3.1 Customer Journey Map

Scenario: [Existing experience through a product or service]	Entice How does someone become aware of this service?	Enter What do people experience as they begin the process?	Engage In the core moments in the process, what happens?	Exit What do people typically experience as the process finishes?	Extend What happens after the experience is over?
Experience steps What does the person (or people) at the center of this scenario typically experience in each step?	Notices APP via Posters Spots a Social Media Post by the College Union	Scans a QR Code on a Cafeteria	Login Daily or Weekly to check plan Receiving Tips Adjust Goals	Returning to Platform	Gets Discount for Consistent Users Upgrading the Features
Interactions What interactions do they have at each step along the way? • **People:** Who do they see or talk to? • **Places:** Where are they? • **Things:** What digital touchpoints or physical objects do they use?	Watching the fitness Content College App Push Notifications	Sample Web Sign-Up form	Getting Snack Recommendations Exploring App Features APP QUIZZES,Pools or Related Challenges	Revisiting dietician advice	FeedBack Surveys Campus tie-ins
Goals & motivations At each step, what is a person's primary goal or motivation? ("Help me..." or "Help me avoid...")	Improve Health & Eating Habits Save Time & Money On Meals	Trust that their data is Secure	UnderStand Eating Habits Sticks to Better Eating Patterns Connect With Peers	Stick to Better Eating Patterns	Stay Consistent Be Recognised for Progress
Positive moments What steps does a typical person find enjoyable, productive, fun, motivating, delightful, or exciting?	Easy To Understand Visuals Showing Benefits Friends Sharing Positive Moments	Sign-up Takes less than 2 minutes	Gets Daily Streak Badge For Consistency Using App Effectively Participates in FUN Campus events	Feels Confident	Wins a healthy cooking contestant on campus Sees their FeedBacl
Negative moments What steps does a typical person find frustrating, confusing, angering, costly, or time-consuming?	Ignores Mess Meal Too Many Apps Already	Too much data at first	Forgets to use app for days Feels Lazy to continue Using the app App crashes,slow loading or bugs	Slides Back to Old diet	Challenges get Boring Rewards feel to Small
Areas of opportunity How might we make each step better? What ideas do we have? What have others suggested?	Offer Trail Pack Peer Engagement	Link to Cafeteria Menus Or Dining Hall	Reminders PartnerShips FeedBack	Offer Mini Challenges	Grow with them isten Actively

3.2 Solution Requirement

Functional Requirements:

Following are the functional requirements of the proposed solution.

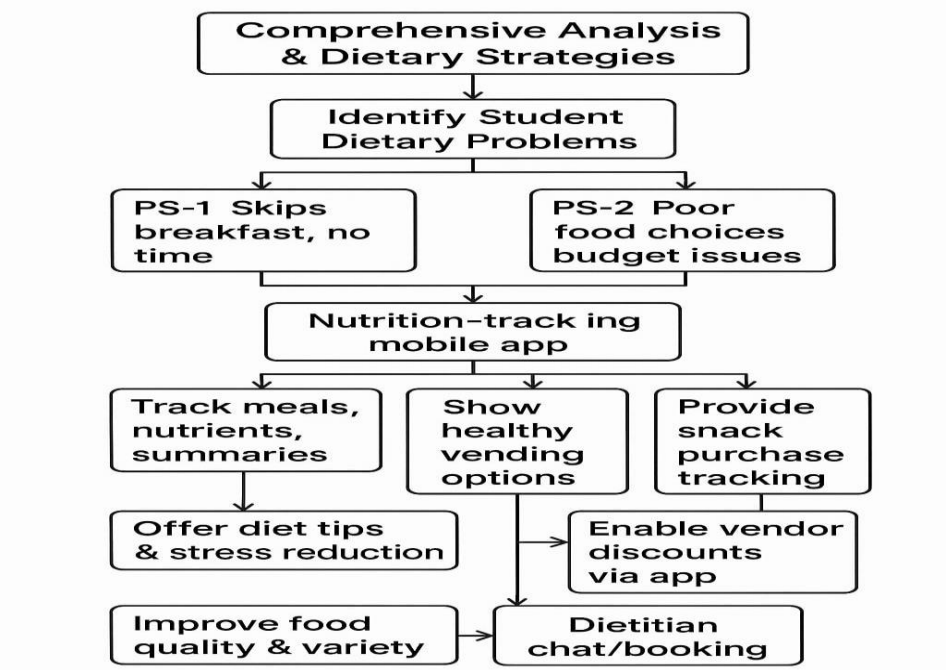
FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	Mindful Eating Programs	Conduct workshops and awareness sessions on mindful eating Provide guided stress-reduction tips in-app
FR-2	Nutrition-Tracking Mobile App	Enable users to log meals Track calories and nutrients Generate daily/weekly summaries
FR-3	Healthy Snacks Vending Machines	Machines Allow students to view availability and locations via app Track snack purchases for nutritional info
FR-4	Mess Food Feedback	Provide feedback form for mess food quality
FR-5	Discounted Healthy Food Access	Partner with local vendors to offer discounts
FR-6	Dietitian Collaboration	Schedule appointments or chat with dietitians

Non-functional Requirements:

Following are the non-functional requirements of the proposed solution.

FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	The interface should be intuitive and designed for mobile-first use by college students.
NFR-2	**Security**	Personal and dietary data must be protected through encryption and secure login/authentication.
NFR-3	**Reliability**	The system should function consistently without failures features even during peak usage.
NFR-4	**Performance**	The app should load under 2 seconds and handle at least 1,000 simultaneous users without lag.
NFR-5	**Availability**	App should support screen readers, large text, and colour- blind-friendly design.
NFR-6	**Scalability**	Should support future features like multi-campus rollouts and add-ons like chatbot assistance.

3.3Data Flow Diagram



User Stories

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer (Mobile user)	Registration	USN-1	As a user, I can register for the application by entering my email, password, and confirming my password.	I can access my account / dashboard	High	Sprint-1
		USN-2	As a user, I will receive confirmation email once I have registered for the application	I can receive confirmation email & click confirm	High	Sprint-1
		USN-3	As a user, I can register for the application through Facebook	I can register & access the dashboard with Facebook Login	Low	Sprint-2
		USN-4	As a user, I can register for the application through Gmail	I can register with Gmail and access dashboard	Medium	Sprint-1
	Login	USN-5	As a user, I can log into the application by entering email & password	I can securely access the platform	High	Sprint-1
	Dashboard	USN-6	As a user, I can view my daily calorie intake and nutrition balance	I can see charts based on my food log	High	Sprint-2
Customer (Web user)	Food Logging	USN-7	As a user, I can log my meals by selecting food items from the menu or scanning a QR code	Logged food appears in dashboard summary	High	Sprint-2
Customer Care Executive	Dietary Recommendations	USN-8	As a user, I get personalized nutrition suggestions based on my logs and BMI	I receive daily/weekly food tips	High	Sprint-3
Administrator	Notifications	USN-9	As a user, I receive reminders to log meals and hydrate	I get timely reminders via push notifications	Medium	Sprint-3
	Feedback Submission	USN-10	As a user, I can give feedback on mess food quality	My feedback is submitted and stored in the system	Medium	Sprint-3
	User Management	USN-11	As an admin, I can view, add, or deactivate student accounts	I can manage users from an admin dashboard	High	Sprint-2
	Report Generation	USN-12	As an admin, I can generate reports on nutrition trends, app usage, and user engagement	I can download or view reports in visual and tabular format	Medium	Sprint-3

3.4 Technology Stack

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+-----------------------------------------------------+
|                  User Interface Layer               |
|   (React.js, HTML/CSS, Flutter – Mobile/Web Frontend)  |
+-----------------------------------------------------+
|            Application Logic / API Layer            |
|  (Node.js / Flask APIs | Nutrition logic | QR Scanner) |
+-----------------------------------------------------+
|                Machine Learning Layer               |
|   (Python Model – Nutrition Suggestions, Trend Alerts) |
+-----------------------------------------------------+
|               Data Storage Layer                    |
|   (Firebase, MySQL, Cloudant – Logs, Feedback, Users)  |
+-----------------------------------------------------+
|            Infrastructure / Cloud Hosting           |
|   (GCP, IBM Cloud, Docker, Kubernetes, Load Balancer)  |
+-----------------------------------------------------+
```

4.PROJECT DESIGN

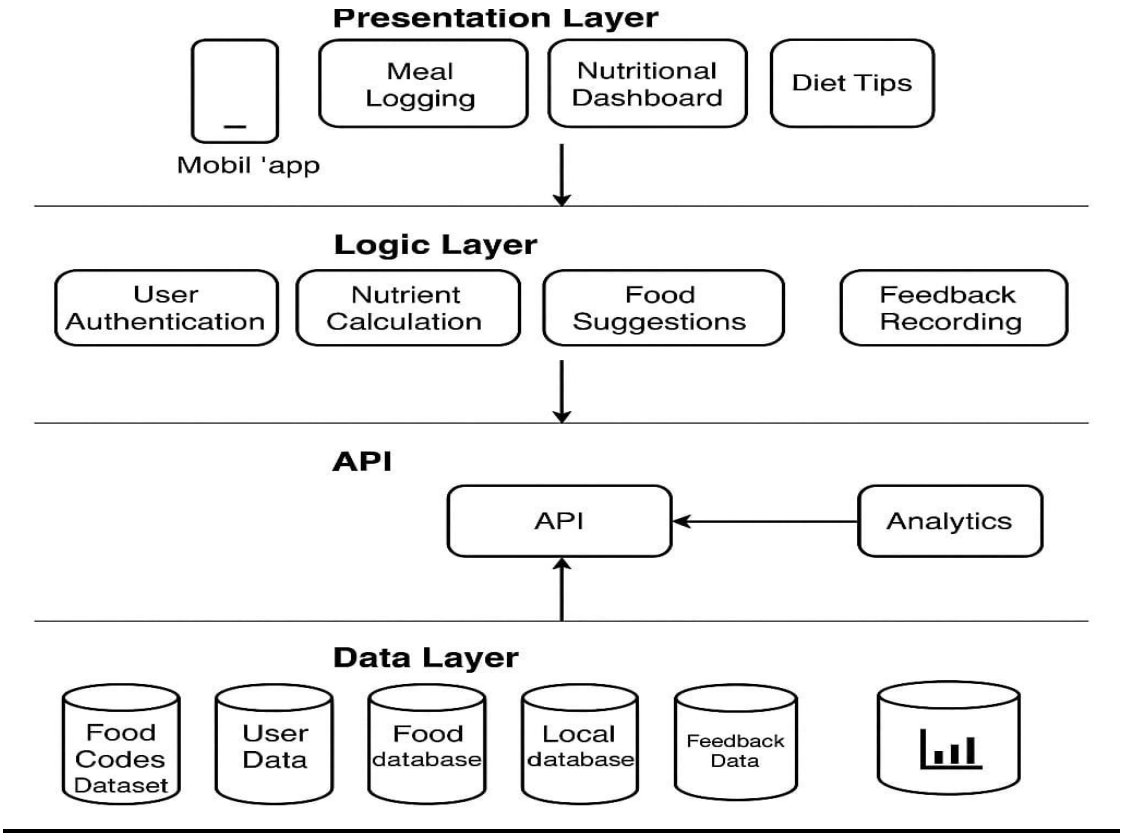
4.1 Problem Solution Fit

4.2 Proposed Solution

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	College students struggle to maintain a healthy diet due to busy schedules and limited budgets leading to poor eating habits and health issues. There is a need for a simple, visual, and data driven method to help students understand and improve their food choices.
2.	Idea / Solution description	The solution is an interactive Tableau dashboard that visualizes college Students dietary data through charts like donut, funnel, and word cloud. It highlights meal patterns and calorie intake enabling students to filter insights and make informed dietary choices.
3.	Novelty / Uniqueness	This solution uniquely focuses on college students, using data visualization through Tableau to deliver real-time, interactive insights. It combines group trends with personalized analysis and offers evidence based dietary strategies.

4.	Social Impact / Customer Satisfaction	Helps students become more aware of their diet, improving health and academic performance. -Assists colleges in enhancing menu planning and food services. -Promotes a healthier campus environment and reduces nutrition-related issues.
5.	Business Model (Revenue Model)	Colleges/Institutes pay for a license to use the dashboard across their student population. Add-on services: Personalized reports, dietician consultations, or mobile app integration can be monetized separately. Collaborations with health tech or wellness companies for sponsored features or insights.
6.	Scalability of the Solution	-Easily scalable to multiple colleges with minimal adjustments. Can be integrated with mobile apps or extended to fitness platforms. Has potential for AI-based recommendations.

4.3 Solution Architecture



5. PROJECT PLANNING & SCHEDULING

5.1 Project Planning

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task
Sprint-1	Data Collection	USN-1	As a user, I can submit my dietary data vi a Google Form for analysis.
Sprint-1	Data Cleaning	USN-2	As a data analyst, I can clean and organiz the raw food intake data.
Sprint-2	Visualization	USN-3	As a user, I can view a donut chart showing meal type distribution.

Sprint-2	Visualization	USN-4	As a user, I can view a word cloud of the most consumed food items.

Sprint	Total Story Points	Duration	Sprint Start Date
Sprint-1	20	4 Days	15 June 2025
Sprint-2	20	4 Days	19 June 2025
Sprint-3	20	4 Days	23 June 2025
Sprint-4	20	4 Days	27 June 2025

6. FUNCTIONAL AND PERFORMANCE TESTING

6.1 Performance Testing

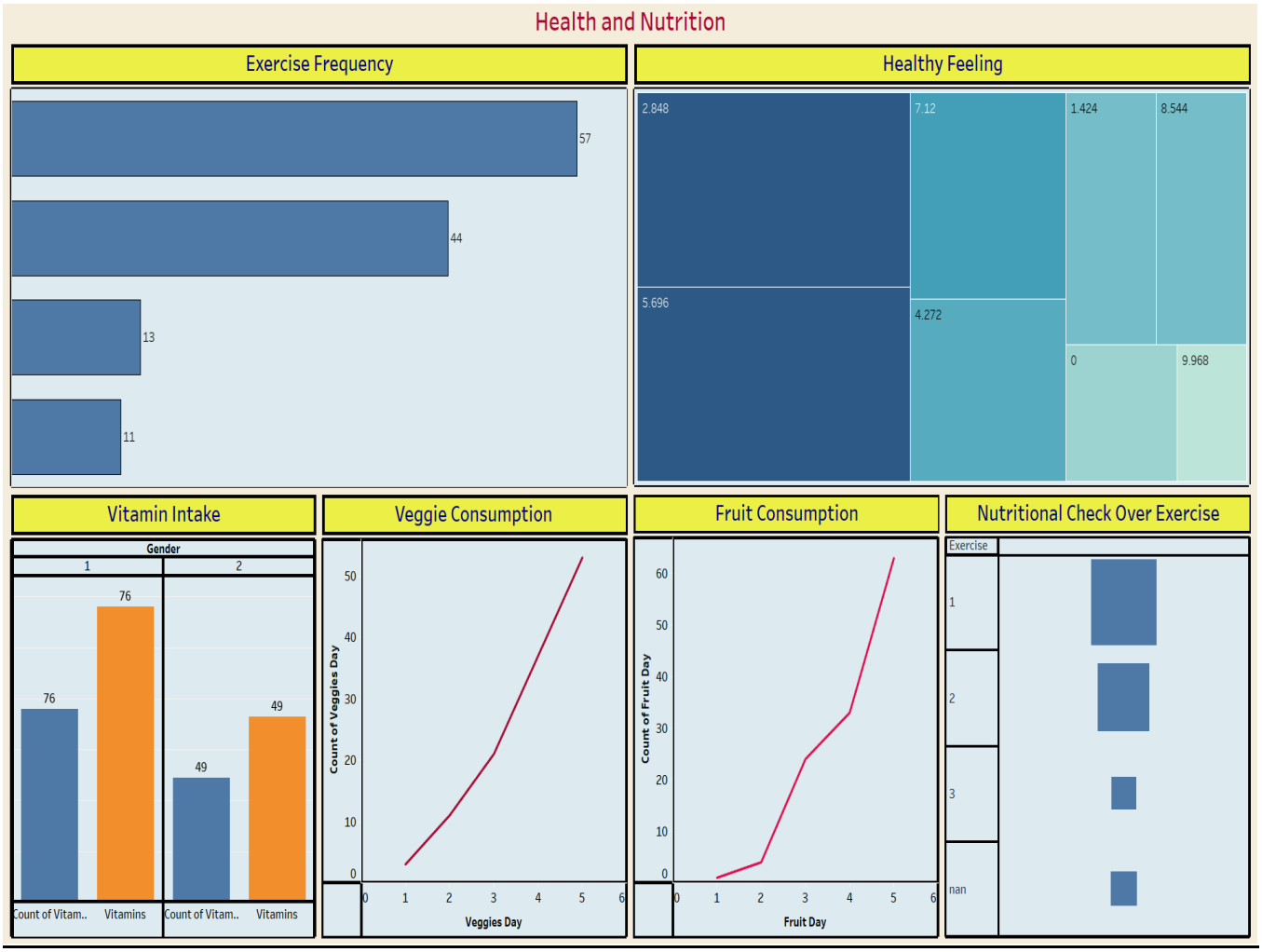
S.No.	Parameter	Screenshot / Values
1.	Data Rendered	CSV data from college food preference survey (food_ coded.csv) was rendered into Tableau. Dataset Size: 6MB No. of Rows :125 No. of Columns:61
2.	Data Preprocessing	1)Removed null values 2)Standardized categories (e.g., comfort food types). 3)Converted numeric fields (e.g., calorie intake, GPA).
3.	Utilization of Filters	Used: • Gender • Diet Type / Status • Cooking Frequency • Cuisine Preference • Comfort Food Types • Meal Payment Method • Parental Cooking Habits • Weight Self-Perception • Exercise Frequency • Vitamin Intake • Healthy Feeling • Life Rewarding Rating • Marital Status • Student GPA (using ranges)

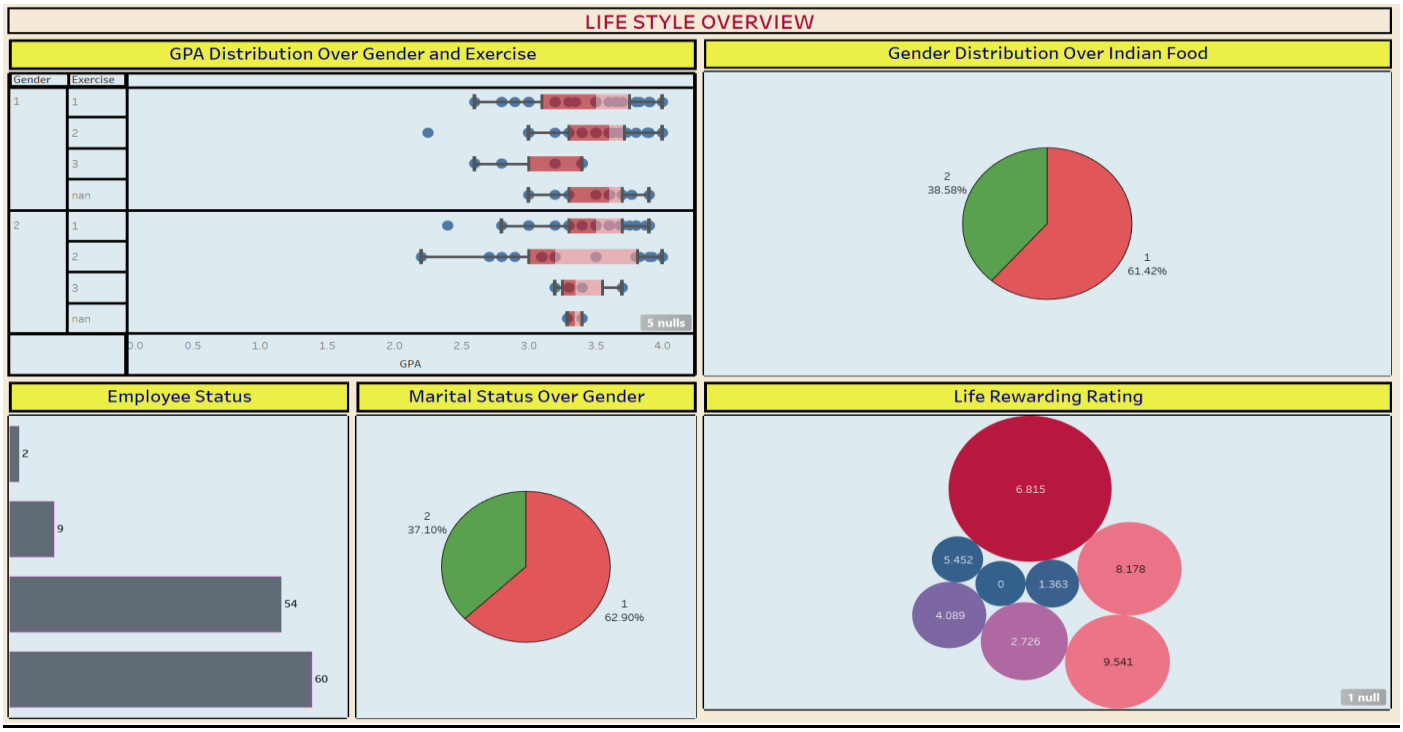
4.	Calculation fields Used	Created calculated fields: BMI Category Comfort Food Count Healthy Eating Index.
5.	Dashboard design	No of Visualizations / Graphs – 1. GPA Distribution 2. Gender Distribution 3. Breakfast distribution 4. Calorie Consumption per day 5. Favourite Comfort Foods 6. Comfort Food Reasons 7. Cooking Frequency per week 8. Cuisine Preferences 9. Diet Status 10. Exercise Frequency 11. Employee Status 12. Healthy Feeling 13. Life Rewarding Rating 14. Marital Status 15. Nutritional Check 16. Parental Cooking Habits 17. Meal Payment Habits 18. Weight Self Perception 19. Sports Participation 20. Vitamin Intake 21. Weight Distribution 22. Eating out 23. Coffee Consumption No of Dash Boards- 1. Responsive and Design of Dash Board: 6 visualizations 2. Dietary Habits and Preferences: 6 Visualizations 3. Health and Nutrition: 5 Visualizations 4. Parental Influence and Eating Out: 3 Visualizations

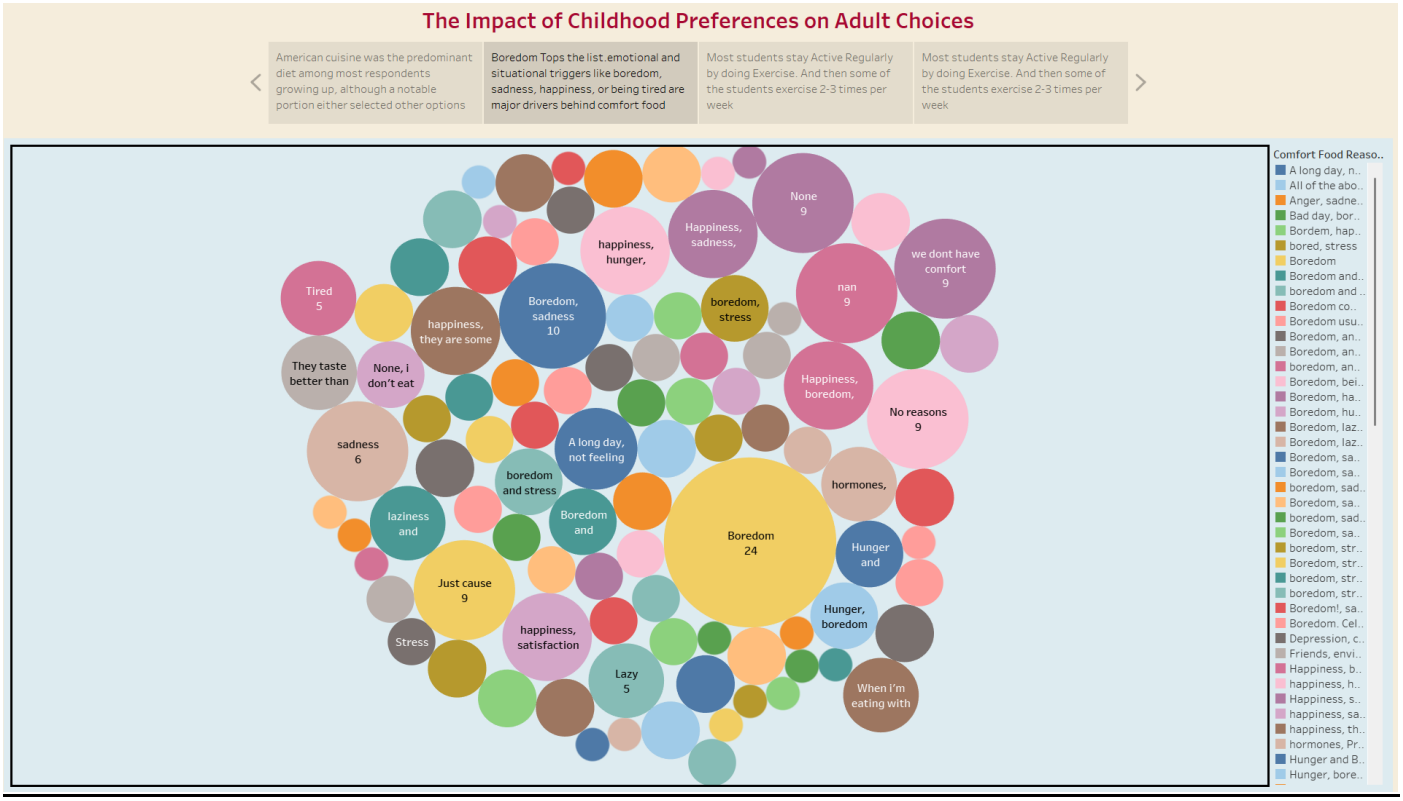
6	Story Design	No of Stories: 1) A day in a life of Student: 5 Visualizations • Gender Distribution • Breakfast Consumption • Coffee Consumption • Exercise • Employment Status 2)The Impact of Childhood Food Preferences on Adult Choices: 4 Visualizations • Cusinie Students Grew • Comfort Food • Nutritional Check • Healthy Feeding

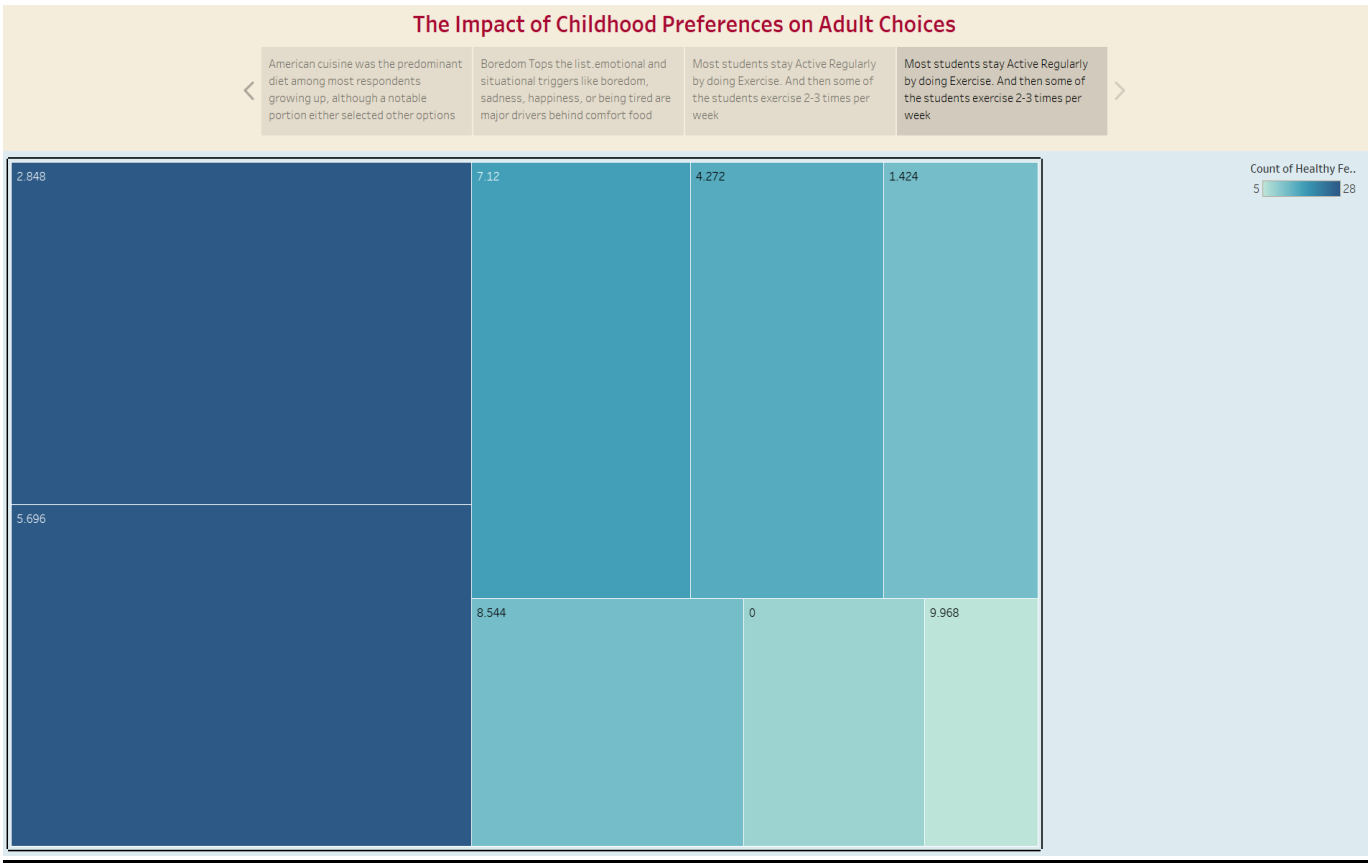
7.RESULTS

7.1 OUTPUT SCREENSHOTS




LIFE STYLE OVERVIEW
GPA Distribution Over Gender and Exercise
Gender
Exercise
1
2
3
nan
5 nulls
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
GPA
Gender Distribution Over Indian Food
2
38.58%
1
61.42%
Employee Status
2
9
54
60
Marital Status Over Gender
2
37.10%
1
62.90%
Life Rewarding Rating
6.815
5.452
0
1.363
8.178
4.089
2.726
9.541
1 null


The Impact of Childhood Preferences on Adult Choices
American cuisine was the predominant diet among most respondents growing up, although a notable portion either selected other options
Boredom Tops the list.emotional and situational triggers like boredom, sadness, happiness, or being tired are major drivers behind comfort food
Most students stay Active Regularly by doing Exercise. And then some of the students exercise 2-3 times per week
Most students stay Active Regularly by doing Exercise. And then some of the students exercise 2-3 times per week
Tired 5
happiness, they are some
Boredom, sadness 10
happiness, hunger,
Happiness, sadness,
None 9
boredom, stress
nan 9
we dont have comfort 9
They taste better than
None, i don't eat
Happiness, boredom,
No reasons 9
sadness 6
A long day, not feeling
boredom and stress
hormones,
laziness and
Boredom and
Boredom 24
Hunger and
Just cause 9
Hunger, boredom
happiness, satisfaction
Stress
Lazy 5
When i'm eating with
Comfort Food Reaso..
A long day, n..
All of the abo..
Anger, sadne..
Bad day, bor..
Bordem, hap..
bored, stress
Boredom
Boredom and..
boredom and ..
Boredom co..
Boredom usu..
Boredom, an..
Boredom, an..
boredom, an..
Boredom, bei..
Boredom, ha..
Boredom, hu..
Boredom, laz..
Boredom, laz..
Boredom, sa..
Boredom, sa..
boredom, sad..
Boredom, sa..
boredom, sad..
Boredom, sa..
boredom, str..
boredom, str..
boredom, str..
boredom, str..
Boredom!, sa..
Boredom. Cel..
Depression, c..
Friends, envi..
Happiness, b..
happiness, h..
Happiness, s..
happiness, sa..
happiness, th..
hormones, Pr..
Hunger and B..
Hunger, bore..



8.ADVANTAGES & DISADVANTAGES

8.1 Advantages

- Interactive Visual Insights

  Tableau enables interactive dashboards that allow users (students, administrators, or researchers) to explore food preferences, health indicators, and dietary patterns visually.
- **Data-Driven Decision Making**

  By Analyzing dietary habits with real student data, institutions can make informed decisions for cafeteria menus, wellness programs, and student health initiatives.
- **Promotes Health Awareness**

  The analysis helps students reflect on their own eating habits and compare them with peers, potentially encouraging better dietary decisions.
- **Time-Efficient Analysis**

8.2 DisAdvantages

- Privacy Concerns
  If not anonymized properly, sharing dashboards with sensitive student data (e.g., health or dietary info) could raise ethical or privacy issues.

9. CONCLUSION

The project successfully utilized Tableau to perform a comprehensive analysis of college students' dietary habits and preferences. By transforming raw survey data into interactive visualizations, we were able to uncover key insights into food choices, meal patterns, caloric intake, and self-perceptions of health among students.

Through the use of various charts—such as donut charts, area graphs, heat maps, and funnel diagrams—we not only identified trends and behaviours but also highlighted areas where dietary improvements can be encouraged. This project demonstrates how data visualization tools like Tableau can bridge the gap between raw data and meaningful strategies, ultimately supporting health awareness and informed decision-making within educational institutions.

Overall, the project emphasizes the value of data-driven approaches in addressing real-world issues such as nutrition and wellness among young adults, while also strengthening analytical and visualization skills essential for modern data science and public health research.

"Healthy Choices Through Smart Data: A Tableau-Driven Food Study"

10. FUTURE SCOPE

Expansion to Larger and Diverse Populations

Future studies can incorporate data from multiple colleges or universities across different regions to improve the generalizability of insights and identify broader trends in student nutrition.

Integration with Real-Time Data Sources

By integrating real-time data from food tracking apps, cafeteria systems, or wearable health devices, the analysis can become more dynamic and actionable.

Predictive Modelling and Machine Learning

Future projects can incorporate predictive analytics to forecast potential health risks, dietary deficiencies, or food behaviour trends using tools like Python or R alongside Tableau.

Personalized Dietary Recommendations

With additional data such as health conditions or activity levels, the system can be extended to provide personalized food recommendations for students.

Mobile and Web Dashboard Access

Making the Tableau dashboards accessible via mobile-friendly platforms can allow students and administrators to interact with insights on the go.

Collaboration with Campus Health Services

The insights can be used to support health promotion campaigns, wellness programs, and cafeteria planning based on student needs and feedback.

Gamification and Awareness Campaigns

Visual analytics can be combined with gamified experiences to encourage students to track and improve their eating habits in an engaging way.

11.APPENDIX

Tableau public link

https://public.tableau.com/views/2_twbxfile/Story1?:language=en-US&:sid=&:redirect=auth&:display_count=n&:origin=viz_share_link

Tableau Public Link ID(OR) Shareable URL Code

<noscript></noscript><object class='tableauViz' style='display:none;'><param name='host_url' value='https%3A%2F%2Fpublic.tableau.com%2F' /> <param name='embed_code_version' value='3' /> <param name='site_root' value='' /><param name='name' value='2_twbxfile/Story1' /><param name='tabs' value='yes' /><param name='toolbar' value='yes' /><param name='static_image' value='https://public.tableau.com/static/images/2_/2_twbxfile/Story1/1.png' /> <param name='animate_transition' value='yes' /><param name='display_static_image' value='yes' /><param name='display_spinner' value='yes' /><param name='display_overlay' value='yes' /><param name='display_count' value='yes' /><param name='language' value='en-US' /></object>   <script type='text/javascript'>   var divElement = document.getElementById('viz1751209496651');   var vizElement = divElement.getElementsByTagName('object')[0];   vizElement.style.width='100%';vizElement.style.height=(divElement.offsetWidth*0.75)+'px';   var scriptElement = document.createElement('script');   scriptElement.src = 'https://public.tableau.com/javascripts/api/viz_v1.js';   vizElement.parentNode.insertBefore(scriptElement, vizElement);   </script>

DATASET LINK

https://www.kaggle.com/datasets/borapajo/food-choices?select=food_coded.csv

PROJECT DEMO LINK

https://drive.google.com/file/d/1GwOa-zHDwBg4TR8scrbvn5Ql4Gwsp0cP/view?usp=drivesdk

GITHUB LINK

https://github.com/pavanikamani/Comprehensive-Analysis-Dietary-Strategies

THANK YOU