

# Project Report

## 1. INTRODUCTION

### 1.1 Project Overview:

This project collects and analyzes food consumption data from students to identify dietary habits. Using Tableau dashboards, it presents clear and interactive visuals to support informed decision-making for both students and health coordinators. The goal is to promote nutrition awareness and improve wellness in college campuses.

### 1.2 Purpose:

The purpose of this project is to help college students make healthier food choices by analyzing their eating patterns using Tableau visualizations.

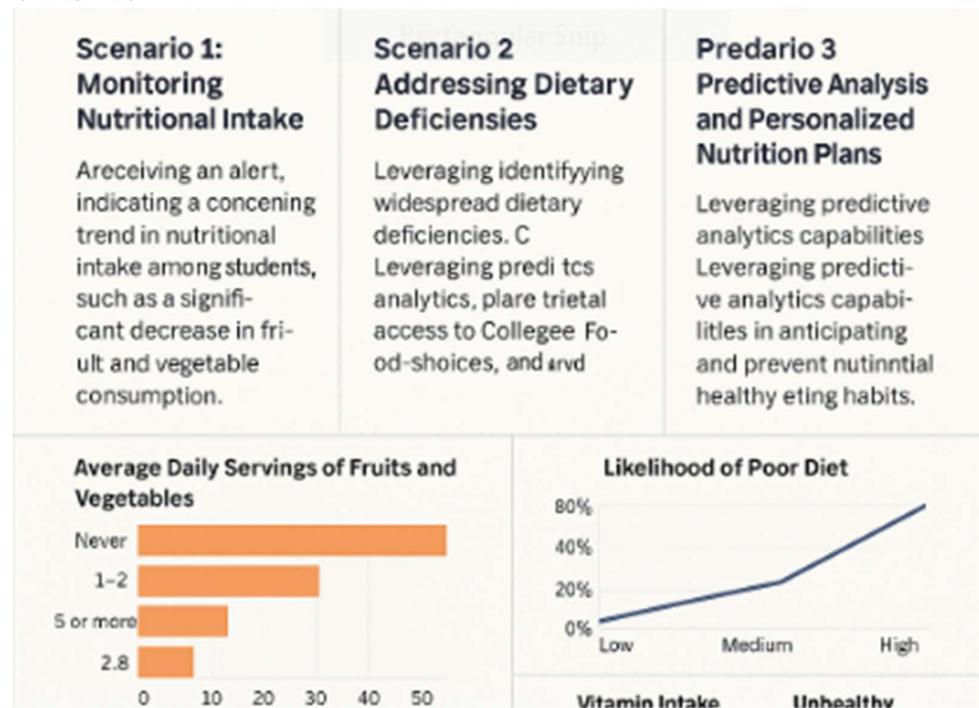
## 2. IDEATION PHASE

### 2.1 Problem Statement

DEFINE THE PROBLEM STATEMENTS					
Date	31 January 2025				
Team ID					
Project Name:	Comprehensive Analysis and Dietary Strategies with Tableau: A College Food Choices Case Study				
CUSTOMER PROBLEM STATEMENT TEMPLATE					
I am (Customer)	I'm trying to	But	Because	Which makes me feel	
A college student concerned about nutrition and wellness	Make informed food choices in the campus cafeteria	I lack access to clear, data-driven insights about the nutritional value and patterns of food options	there's no centralized system that analyzes food consumption and dietary impact	confused and unsure if my dietary habits support my academic goals	
A college health and wellness coordinator	Encourage students to adopt healthier eating habits		student food data is scattered and underutilized for proactive strategies	ineffective in influencing student behavior through existing methods	

Problem Statement (PS)	I am (Customer)	I'm trying to	But	Because	Which makes me feel
PS-1	A college student with limited time, budget, and nutritional knowledge	Make healthy and affordable food choices on campus.	The available options are often unhealthy, expensive, or lack variety.	Campus dining prioritizes convenience over nutrition, and healthy options are priced higher.	Frustrated and stressed about balancing diet, academics, and finances.
PS-2	A campus dining administrator responsible for student well-being.	Improve student satisfaction and health outcomes through better food offerings.	Student feedback is scattered, and trends are unclear.	There's no centralized tool to analyze food choice data effectively.	Overwhelmed and unsure how to make data-driven decisions

## 2.2 Empathy Map Canvas



## 2.3 Brainstorming

Idea	Idea Description	Group/Category
1	Analyze meal frequency (breakfast/lunch/dinner) patterns	Meal Timing
2	Compare healthy vs unhealthy food choices across genders	Gender Comparison
3	Identify departments with highest junk food consumption	Departmental Insights
4	Study stress levels and their relation to eating habits	Behavioral Impact
5	Use heat maps to show food preference intensity by host/region	Visualization Techniques
6	Embed the interactive dashboard in a Flask-based web app	Deployment / Web Integration
7	Create a Tableau story for dietary habit transformation journeys	Narrative & Communication
8	Use filters for department, gender, and BMI in dashboard	Dashboard Interactivity
9	Show seasonal or exam-time food intake trends	Seasonal/Academic Stress Patterns
10	Add calculated fields for daily calorie or nutrient totals	Data Processing / KPIs
11	Forecast future obesity or malnutrition risks using data	Predictive Analysis
12	Show total and average sugar/salt intake across students	KPI Overview / Health Indicators

### 3. REQUIREMENT ANALYSIS

#### 3.1 Customer Journey map

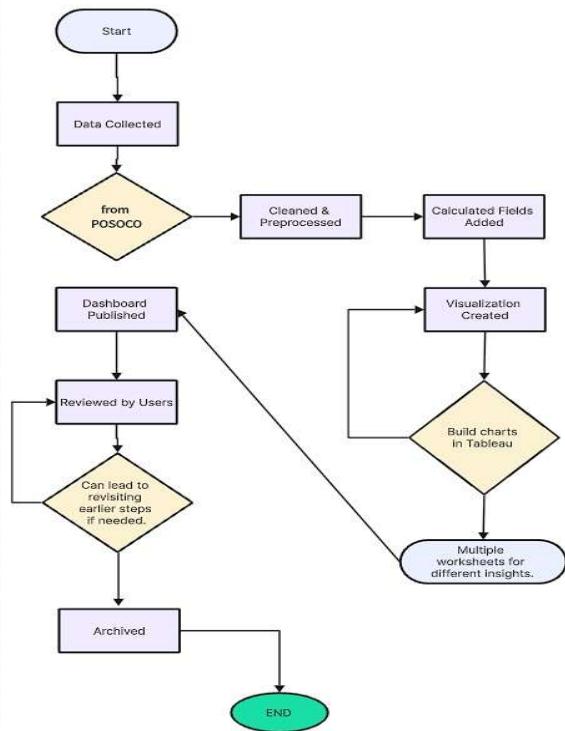
Comprehensive Analysis and Dietary Strategies with Tableau: A College Food Choices Case Study						
	Stage	Actions	Thoughts	Emotions	Pain Points	Opportunities
Persona 1 College student	Awareness	Notices fatigue, poor focus; wants to improve health	"Maybe my food choices affecting my health 🥗"	Curious, concerned	Provide information on diets' impact or student life	Informative outreach on diet's impact or student life
	Consideration	Searches for nutrition info; asks peers for health staff	"What's actually in the cafeteria food?"	No real/interested raw data	Informed about meal choices	Collect cafeteria data and student life
Persona 2 Campus Health & Wellness Coordinator	Decision	Learns about Tableau-based food choice visualizations	"I'll use this—today looks healthier!"	Unsure about meal recommendations or daily summaries	Add meal recommendations or daily summaries	
	Awareness	Notices increase in student health complaints	"How can we address this trend?"	Concerned, responsible	Relating dietary data on student diets	Collect cafeteria data and student food logs
	Consideration	Researches tools for tracking and improving food	"We need something visual and easy to understand"	Encouraged, optimistic	Integrate with cafeteria POS or student surveys	Automate reports suggest institutional strategies
Persona 3 Campus Health & Wellness Coordinator	Decision	Partners with project team using Tableau for insights	Existing tools are not tailored for student diets	Unsure about data collection methods	Automate reports suggestions	Automate reports suggestions

#### 3.2 Solution Requirement

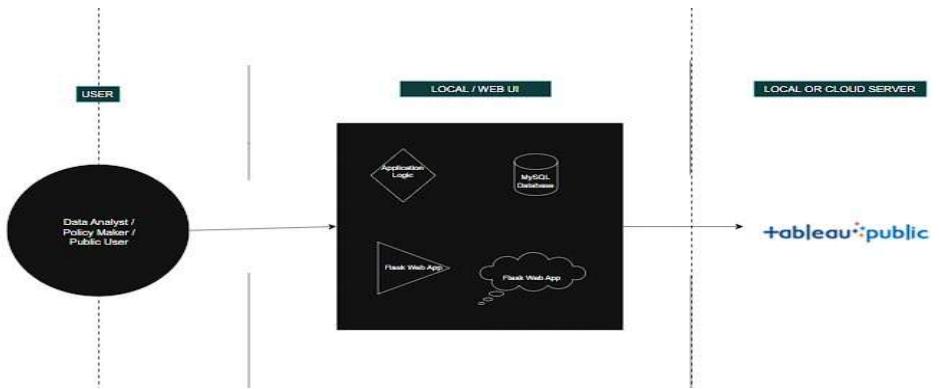
FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Registration through Form Registration through Gmail Registration through LinkedIn
FR-2	User Confirmation	Confirmation via Email Confirmation via OTP
FR-3	Data Upload & Storage	Upload CSV File Store into MySQL Database
FR-4	Data Visualization	Create visualizations in Tableau Integrate with dashboard Create time, region, and sector-based charts
FR-5	Dashboard Access	View interactive Tableau dashboard Use filters (Year, Region)
FR-6	Web Integration	Embed Tableau dashboard into Flask-based UI
FR-7	Insights & Reports	View data stories Access summary reports on usage patterns

FR No.	Non-Functional Requirement	Description
NFR-1	<b>Usability</b>	Interface should be intuitive and user-friendly for both technical and non-technical users
NFR-2	<b>Security</b>	Secure login with OTP/Email, protected data access
NFR-3	<b>Reliability</b>	System should consistently provide correct visualization
NFR-4	<b>Performance</b>	Dashboards should load within 3–5 seconds even for I
NFR-5	<b>Availability</b>	The platform should be available 24/7 without major d
NFR-6	<b>Scalability</b>	Should support addition of new datasets and visualization

### 3.3 Data Flow Diagram



### 3.4 Technology Stack



## 4 .PROJECT DESIGN

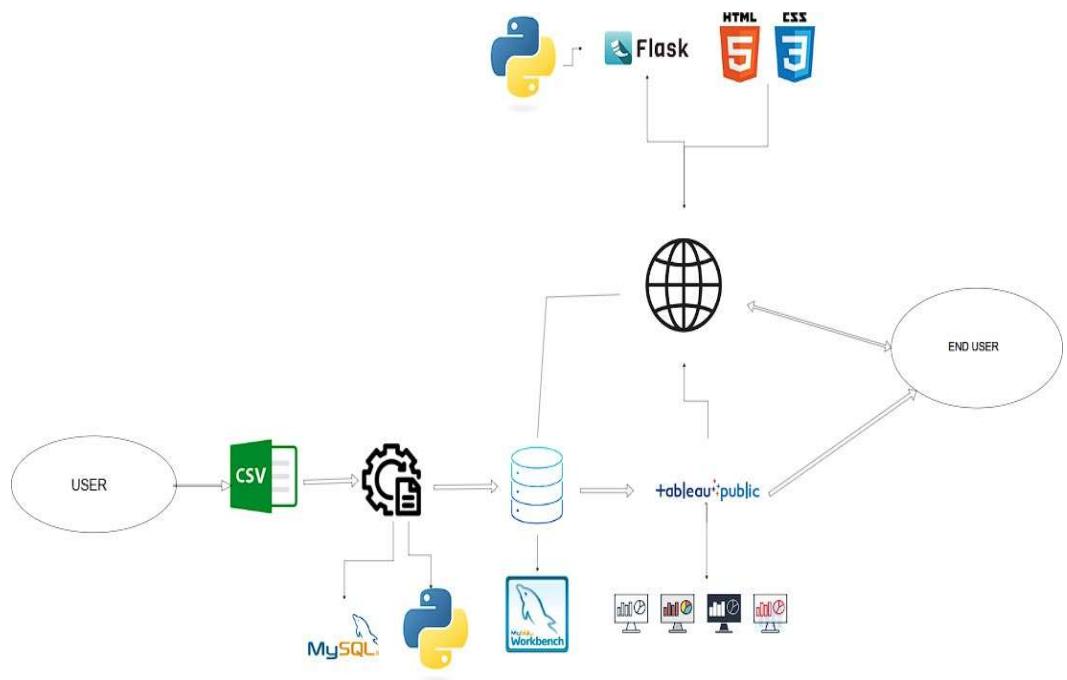
### 4.1 Problem Solution Fit

Comprehensive Analysis and Dietary Strategies with Tableau		
A College Food Choices Case Study - Revolutionizing dietary data visualization to drive informed decision-making and enhance student health and academic performance		
1 KEY STAKEHOLDERS	2 CURRENT CHALLENGES	3 PROJECT TRIGGERS
<b>KS</b> <ul style="list-style-type: none"> <li>University administration and health services</li> <li>Student nutrition counselors and dietitians</li> <li>Cafeteria and food service management</li> <li>Student wellness programs coordinators</li> <li>Academic performance tracking departments</li> </ul>	<b>CC</b> <ul style="list-style-type: none"> <li>Limited visibility into student dietary patterns</li> <li>Difficulty tracking nutritional intake trends</li> <li>Lack of real-time dietary monitoring systems</li> <li>Insufficient data for evidence-based nutrition programs</li> <li>Poor correlation analysis between diet and academic performance</li> </ul>	<b>PT</b> <ul style="list-style-type: none"> <li>Rising concerns about student health and nutrition</li> <li>Need for data-driven dietary intervention strategies</li> <li>Growing awareness of diet-academic performance correlation</li> <li>University mandate for comprehensive student wellness tracking</li> <li>Availability of advanced visualization tools like Tableau</li> </ul>
<b>UCS</b> <ul style="list-style-type: none"> <li>Real-time monitoring of nutritional intake patterns</li> <li>Swift response to widespread dietary deficiencies</li> <li>Predictive analysis for personalized nutrition plans</li> <li>Proactive identification of at-risk student populations</li> <li>Evidence-based cafeteria menu optimization</li> </ul>	<b>TS</b> <ul style="list-style-type: none"> <li>Interactive dashboards for dietary trend visualization</li> <li>Real-time alerts for nutritional intake anomalies</li> <li>Predictive analytics for health risk assessment</li> <li>Comprehensive student dietary profile creation</li> <li>Automated reporting for health service interventions</li> </ul>	<b>EB</b> <ul style="list-style-type: none"> <li>Enhanced student health and well-being outcomes</li> <li>Improved academic performance through better nutrition</li> <li>Reduced healthcare costs through preventive measures</li> <li>Data-driven decision making for university policies</li> <li>Increased student satisfaction with campus dining</li> </ul>
<b>KDI</b> <ul style="list-style-type: none"> <li>Dietary pattern correlation with academic performance</li> <li>Nutritional deficiency prevalence across demographics</li> <li>Seasonal variations in food consumption habits</li> <li>Exercise habits impact on dietary choices</li> <li>Health perception influence on eating behaviors</li> </ul>	<b>TO</b> <ul style="list-style-type: none"> <li>20% improvement in student nutritional awareness</li> <li>15% increase in healthy food choices on campus</li> <li>Reduction in diet-related health issues by 25%</li> <li>Enhanced cafeteria menu satisfaction scores</li> <li>Establishment of evidence-based nutrition programs</li> </ul>	<b>IS</b> <ul style="list-style-type: none"> <li>Phase 1: Data collection and Tableau dashboard setup</li> <li>Phase 2: Pilot testing with select student groups</li> <li>Phase 3: Full deployment across campus</li> <li>Phase 4: Training for staff and stakeholders</li> <li>Phase 5: Continuous monitoring and optimization</li> </ul>

## 4.2 Proposed Solution

S.No.	Parameter	Description
1	<b>Problem Statement</b>	College students often struggle to make healthy food choices due to limited nutritional awareness, budget constraints, and lack of accessible dietary data. This leads to poor eating habits, health issues, and decreased academic performance.
2	<b>Idea / Solution Description</b>	This project aims to analyze the dietary patterns of college students using data visualization with Tableau. By collecting data from surveys and food consumption logs, the system provides personalized nutritional insights, visual patterns, and suggested improvements.
3	<b>Novelty / Uniqueness</b>	The uniqueness lies in integrating dietary analysis with intuitive data visualization tools like Tableau specifically for a college demographic. Unlike generic health apps, this approach focuses on academic environments, providing insights that combine nutrition, affordability, and accessibility.
4	<b>Social Impact / Customer Satisfaction</b>	This solution promotes better health among college students, potentially reducing stress and improving focus, energy levels, and academic outcomes. It encourages healthy living habits at a critical life stage.
5	<b>Business Model (Revenue Model)</b>	The project can adopt a freemium model where basic visual insights are free, while advanced features (like detailed dietary tracking, custom meal plans, and integration with campus cafeterias) are offered as premium services.
6	<b>Scalability of the Solution</b>	The model is scalable across different institutions by adapting data input formats and user preferences. It can be expanded to include meal logging integrations, cross-campus comparisons, and even regional health initiatives.

## 4.3 Solution Architecture



## 5. PROJECT PLANNING & SCHEDULING

### Project Planning

Sprint	Epic	User Story No.	User Story / Task	Points	Priority	Assigned To
Sprint-1	Registration	USN-1	As a user, I can register with my name and email	2	High	R.Sindhu
Sprint-1	Upload CSV	USN-2	As a user, I can upload dietary data in CSV format	3	High	K.Vishwanath
Sprint-1	Data Cleaning	USN-3	As a developer, I can clean and preprocess uploaded data using Python	4	High	A.Guru Rama Supradhika
Sprint-1	Database Storage	USN-4	As a developer, I can store cleaned data into MySQL	2	Low	K.Bala Muni Ranga
Sprint-2	Tableau Dashboard	USN-5	As a user, I can view dashboards generated using Tableau	5	High	K.Vishwanath
Sprint-2	Web Integration	USN-6	As a user, I can access the dashboard via Flask UI	3	High	R.Sindhu
Sprint-2	Add Filters	USN-7	As a user, I can filter the data by gpa _ numeric, breakfast, drink	2	Medium	K.Bala Muni Ranga
Sprint-3	Data Story	USN-8	As a user, I can view a Tableau Story with key food diet insights	2	Low	A.Guru Rama Supradhika
Sprint-3	Forecasting	USN-9	As a developer, I can forecast usage using Prophet	3	Low	K.Vishwanath
Sprint-3	Documentation	USN-10	As a team, we can prepare final project documentation	2	Medium	A.Guru Rama Supradhika
Sprint-4	Deployment	USN-11	As a developer, I can deploy the Flask app and publish the Tableau dashboard online	3	High	R.Sindhu
Sprint-4	Demo Prep	USN-12	As a team, we can prepare a live demo walkthrough for stakeholders	2	Medium	K.Bala Muni Ranga
Sprint-4	Bug Fixing	USN-13	As a developer, I can test and fix UI/visual bugs from user feedback	2	Medium	R.Sindhu

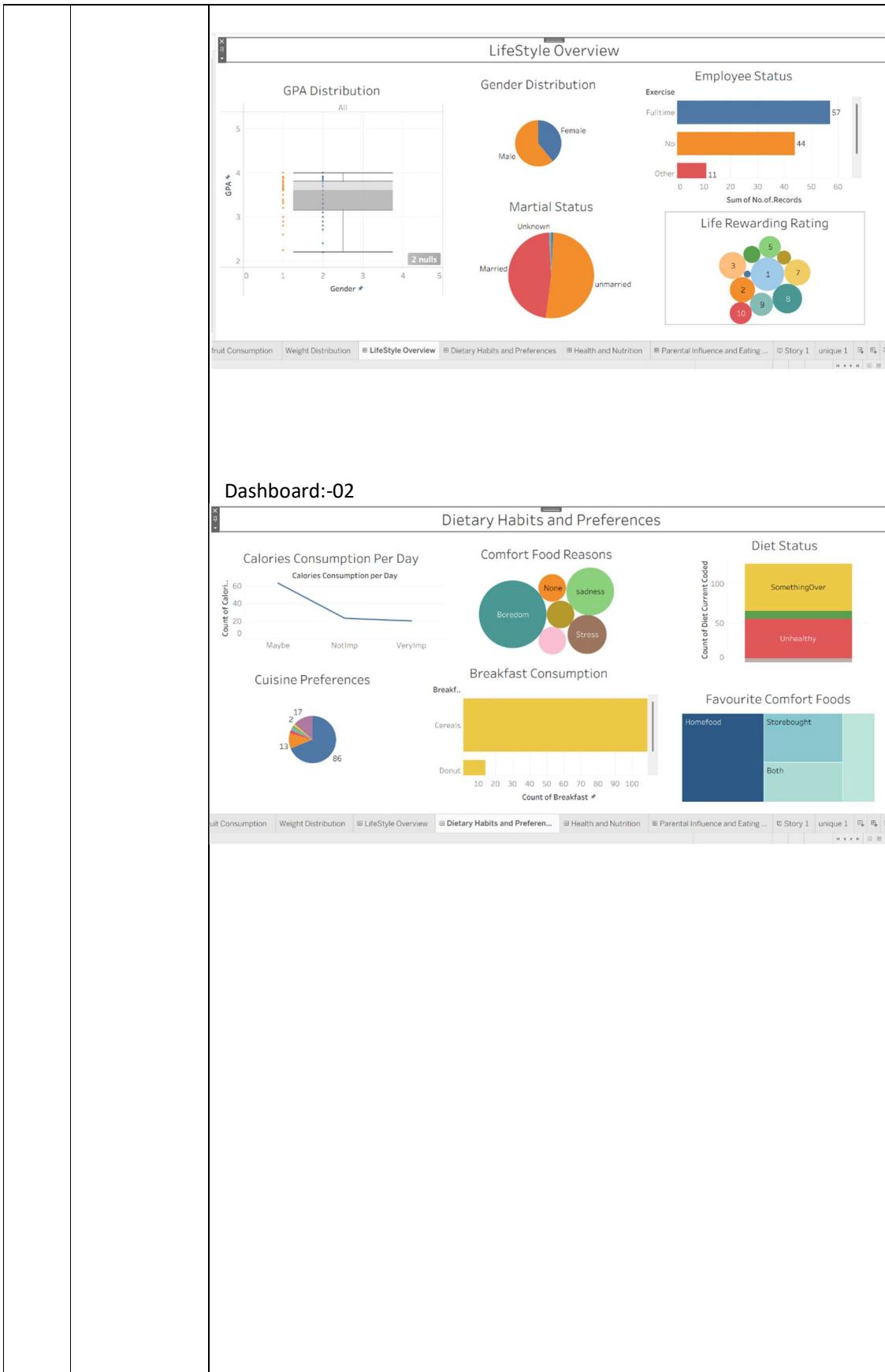
## 6. FUNCTIONAL AND PERFORMANCE TESTING

### 6.1 Performance Testing

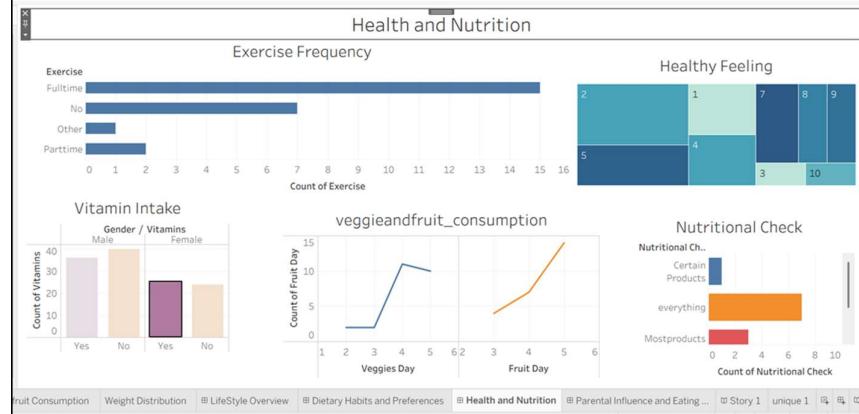
S.No	Parameter	Screenshot / Values
1.	Data Rendered	The data rendered in this project includes information on cafeteria food items such as names, ingredients, and nutritional values like calories, proteins, and fats. It also captures student food choices, analyzing their daily and weekly meal patterns. Additional data includes consumption trends, such as the most and least preferred foods and peak dining times. Where available, basic health metrics like BMI and student feedback on energy levels or meal satisfaction are also considered. Demographic details, such as age and gender, may be used to identify specific trends across student groups. All of this data is visualized using interactive Tableau dashboards to provide insights into nutritional breakdowns, evolving food preferences, and personalized or group-based dietary recommendations.

2.	Data Preprocessing	<p>Data preprocessing involved cleaning and organizing raw data collected from cafeteria records and student food logs. Missing values were handled by either imputing averages or removing incomplete entries. Duplicates were eliminated to ensure accuracy, and food item names were standardized for consistency. Nutritional information was cross-verified and formatted into structured categories such as calories, proteins, fats, and carbohydrates. Date and time fields were converted into a consistent format to analyse food consumption trends over time. Finally, the cleaned dataset was transformed into a format suitable for Tableau visualization, enabling effective analysis and insights.</p>
3.	Utilization of filters	<p><b>Date Filter</b></p> <ul style="list-style-type: none"> <li>Allows users to select a specific day, week, or month to view food consumption trends over time.</li> </ul> <p><b>Meal Type Filter</b></p> <ul style="list-style-type: none"> <li>Enables filtering data by meal category (breakfast, lunch, dinner, snacks) for focused analysis.</li> </ul> <p><b>Food Category Filter</b></p> <ul style="list-style-type: none"> <li>Used to display specific food groups such as fruits, vegetables, fast food, and beverages.</li> </ul> <p><b>Calorie Range Filter</b></p> <ul style="list-style-type: none"> <li>Lets users view meals within a specific calorie range (e.g., under 500 kcal).</li> </ul> <p><b>Protein/Fat/Carb Filter</b></p> <ul style="list-style-type: none"> <li>Nutrient-based filters to view foods based on macronutrient composition.</li> </ul> <p><b>Student Group Filter</b></p> <ul style="list-style-type: none"> <li>Filters consumption patterns by different student categories (e.g., year of study, gender – if available).</li> </ul> <p><b>Satisfaction/Rating Filter</b></p> <ul style="list-style-type: none"> <li>Allows filtering based on student feedback or ratings of meals (if collected).</li> </ul> <p><b>Time of Day Filter</b></p> <ul style="list-style-type: none"> <li>Helps analyze which foods are preferred during morning, afternoon, or evening hours.</li> </ul>

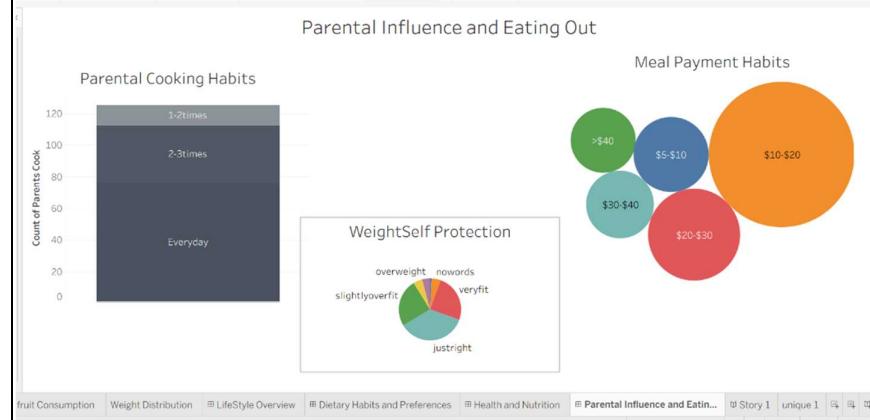
4.	Calculated field used	Calculated Field Name	Formula (in Tableau syntax)
		All_Students	"All Students"
		All_Comfort_Reasons	STR([comfort_food_reason]) + ", " + STR([reason2])
		Calories Importance Level	IF [calories_day] > 2500 THEN "High" ELSEIF [calories_day] > 1800 THEN "Medium" ELSE "Low"
		Clean Comfort Reason	TRIM(LOWER([comfort_food_reason]))
		Cleaned Exercise	IF [exercise] >= 3 THEN "Active" ELSE "Inactive"
		Comfort Food Reasons - Split 1	SPLIT([comfort_food_reason], ", ", 1)
		Comfort Food Reasons - Split 2	SPLIT([comfort_food_reason], ", ", 2)
		Comfort Food Source	IF CONTAINS(LOWER([comfort_food]), "home") THEN "Home" ELSE "Outside"
		Comfort Reason Combined	IF CONTAINS([comfort_food_reason], "stress") THEN "Stress" ELSE "Other"
		Constant	"1" or "All"
		Cooking Frequency Label	IF [cook] >= 5 THEN "Frequent" ELSEIF [cook] >= 2 THEN "Occasional" ELSE "Rare"
		DietStatus	IF [diet_current_coded] = 1 THEN "Vegetarian" ELSE "Non-Vegetarian"
		employment	IF [employment_coded] = 1 THEN "Employed" ELSE "Unemployed"
		Gender_Label	IF [gender] = 1 THEN "Male" ELSE "Female"
		GPA Category	IF [GPA] >= 3.5 THEN "High" ELSEIF [GPA] >= 2.5 THEN "Medium" ELSE "Low"
		gpa_numeric	FLOAT([GPA])
		martial status (marital status)	IF [marital_status] = 1 THEN "Single" ELSE "Married"
		nutritionalcheck	IF [fruit_day] + [veggies_day] >= 4 THEN "Yes" ELSE "No"
		Record count	1 (Tableau auto-generated field used for counting records)
5.	Dashboard Design	No of Dashboards :-04 Dashboard:-01	

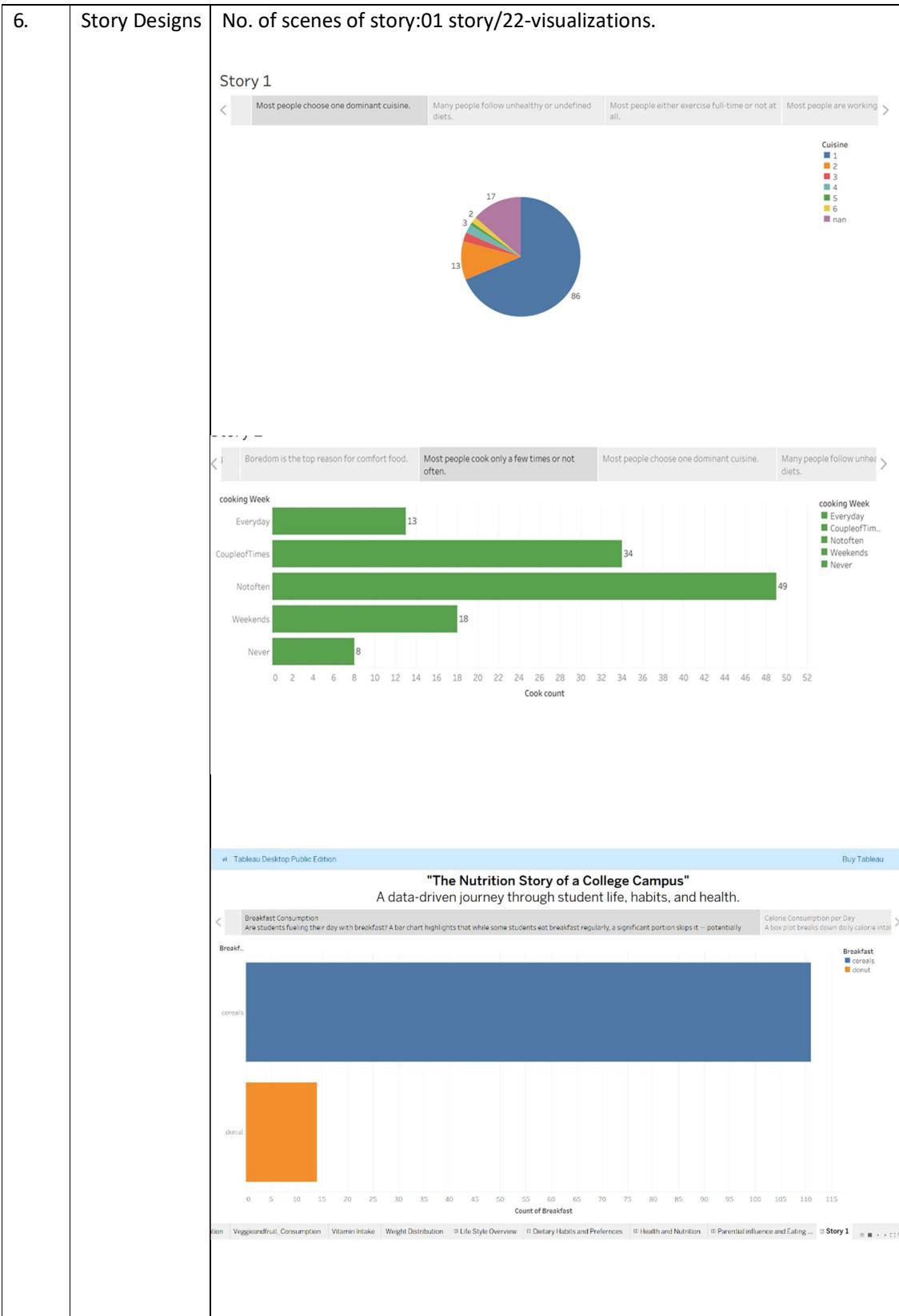


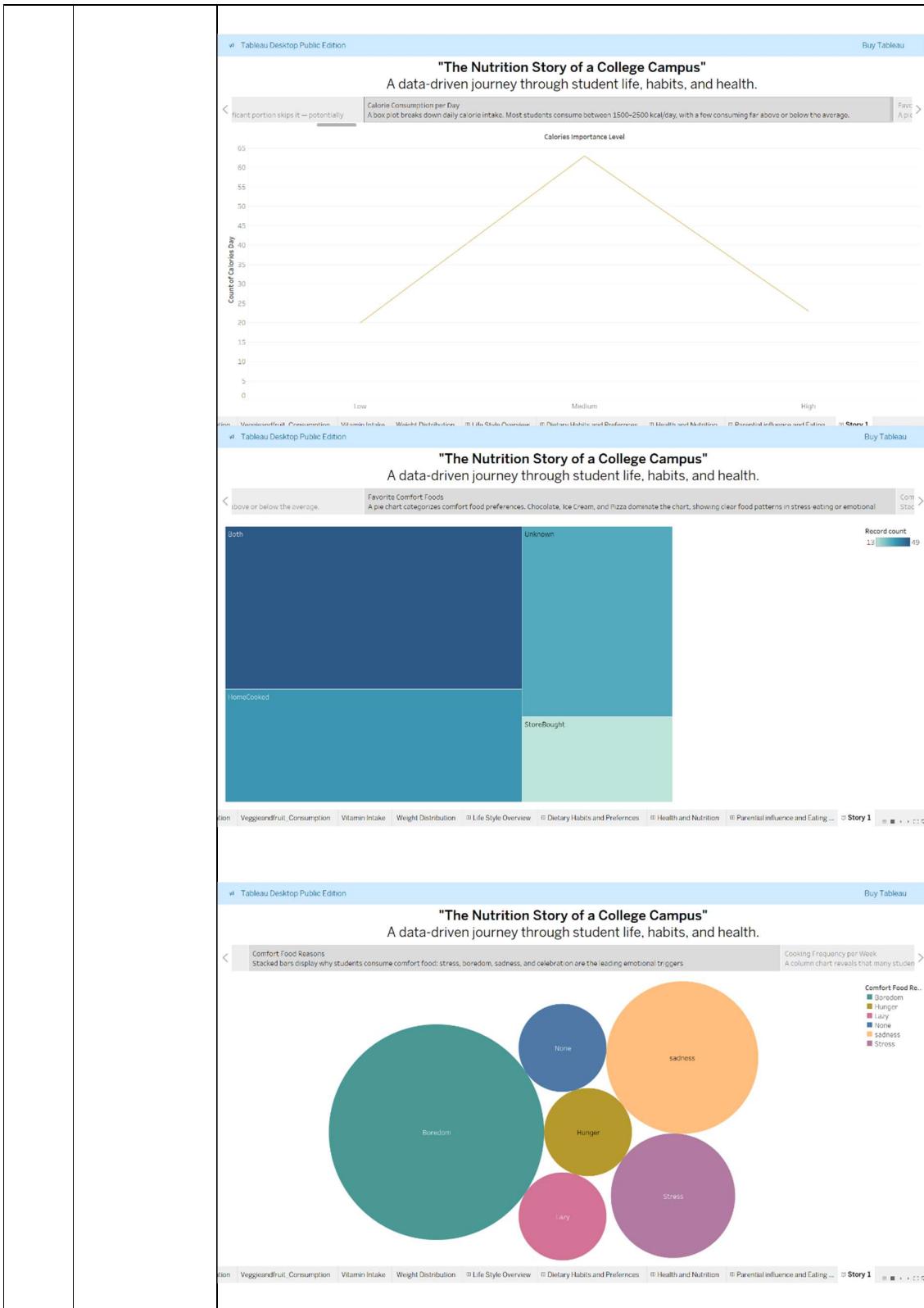
## Dashboard:-03

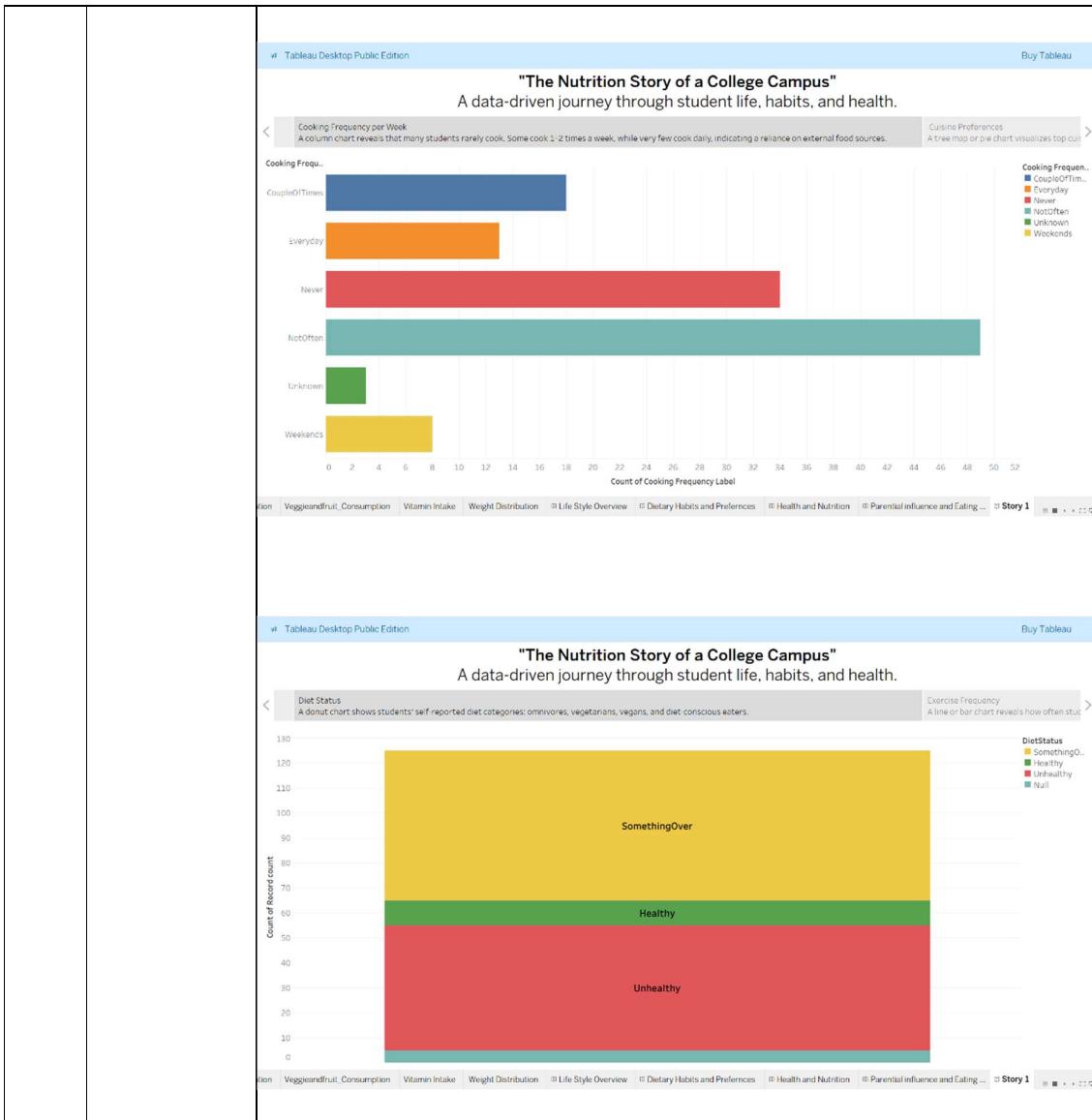


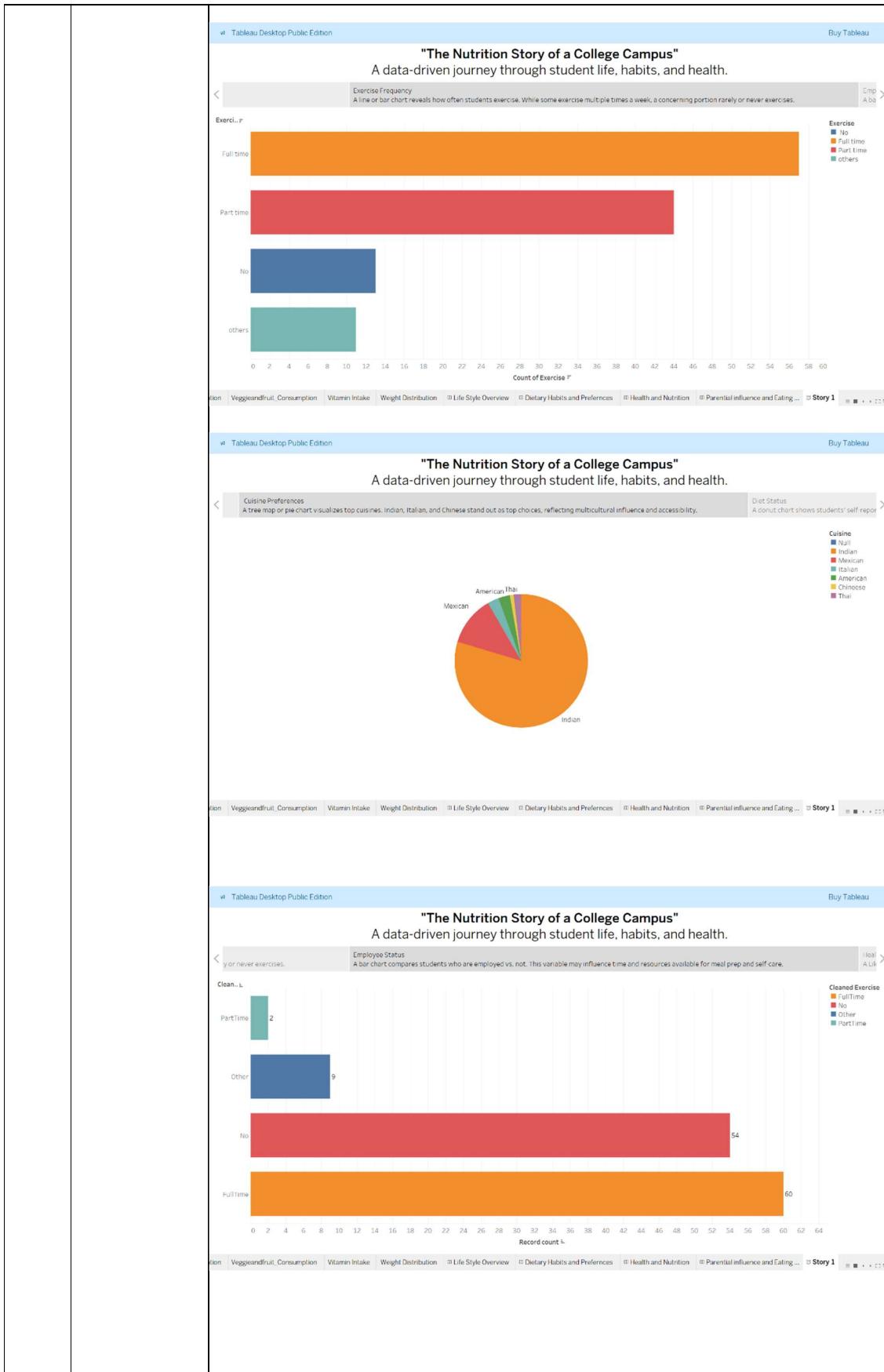
## Dashboard:-04

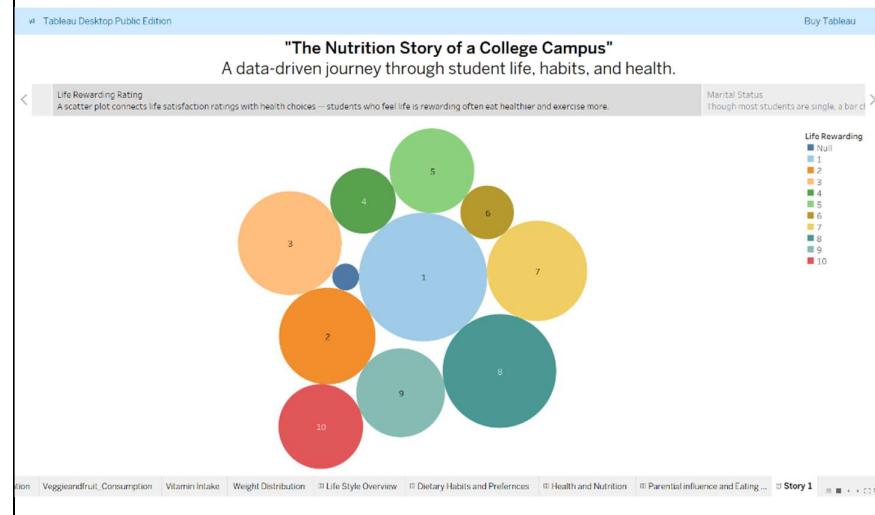
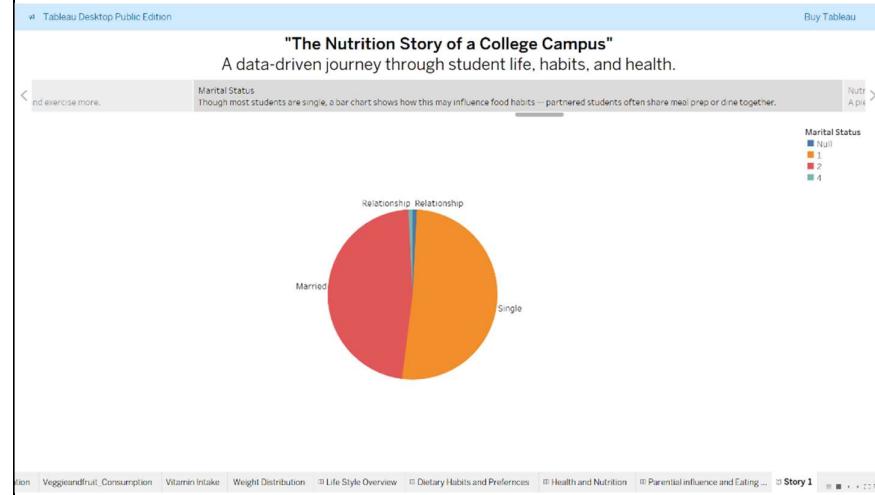
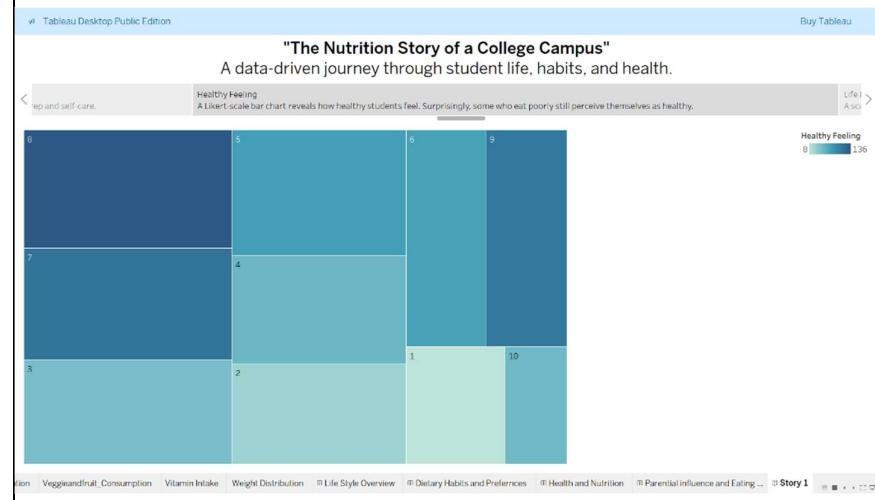


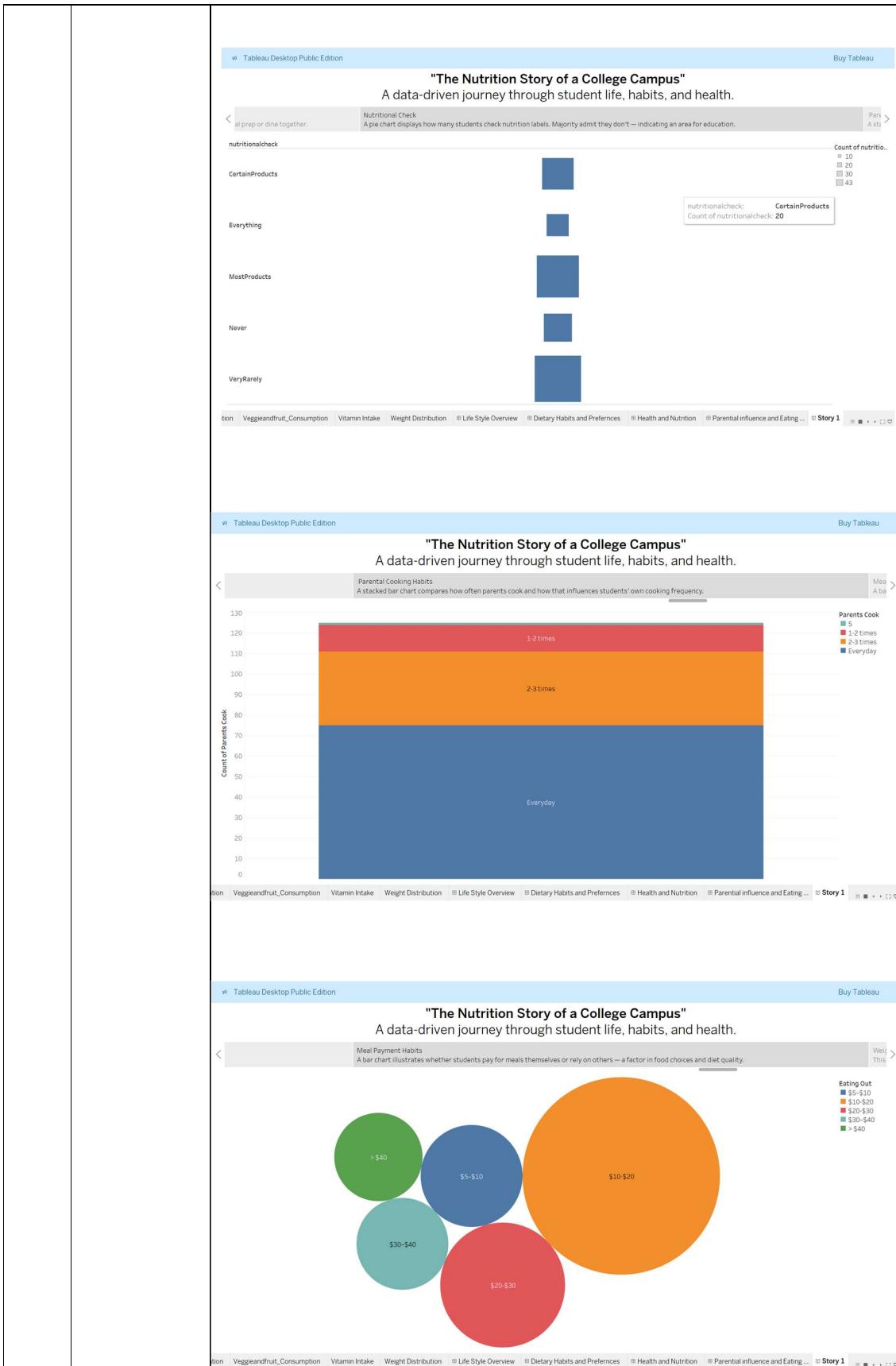


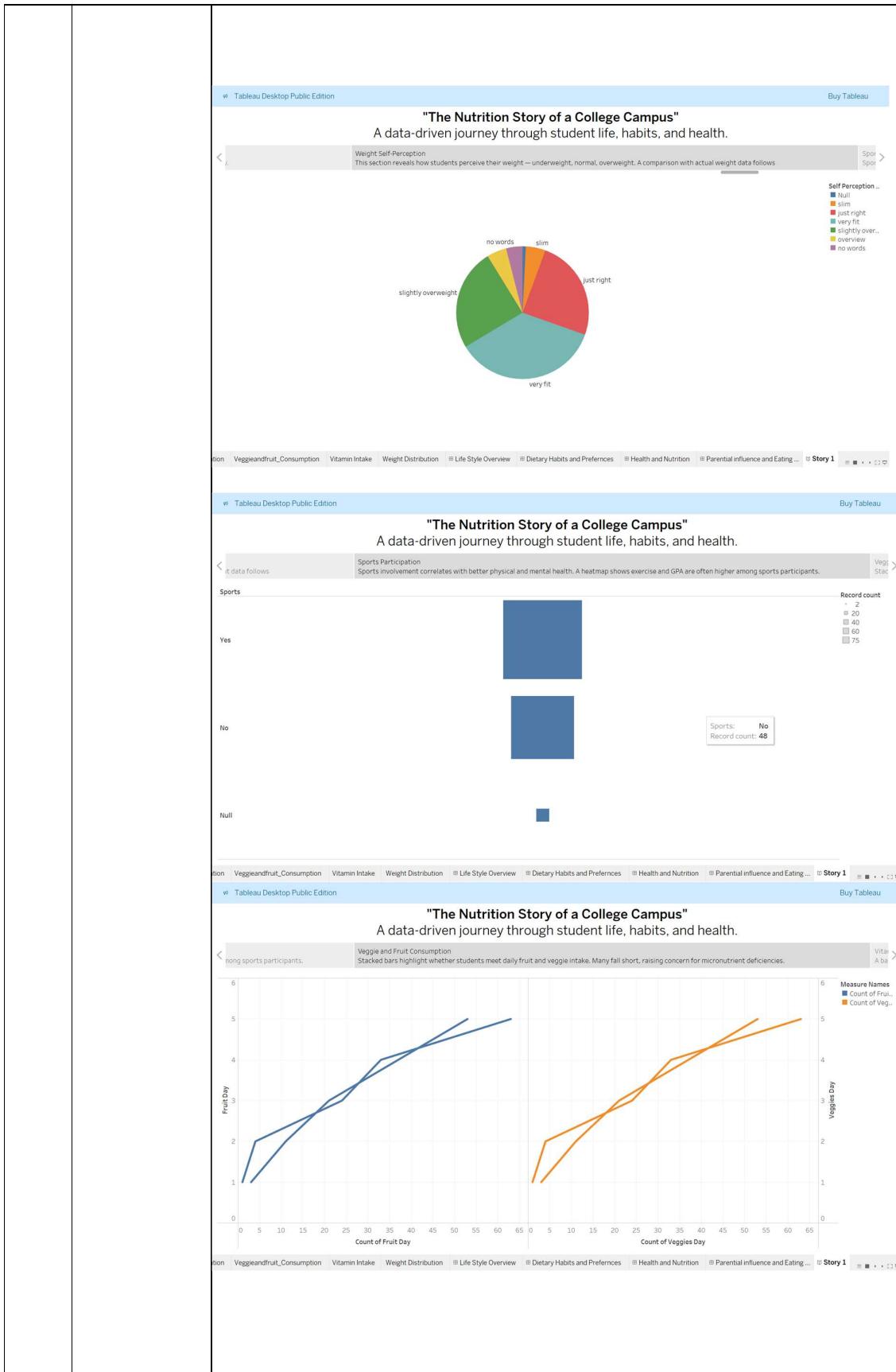










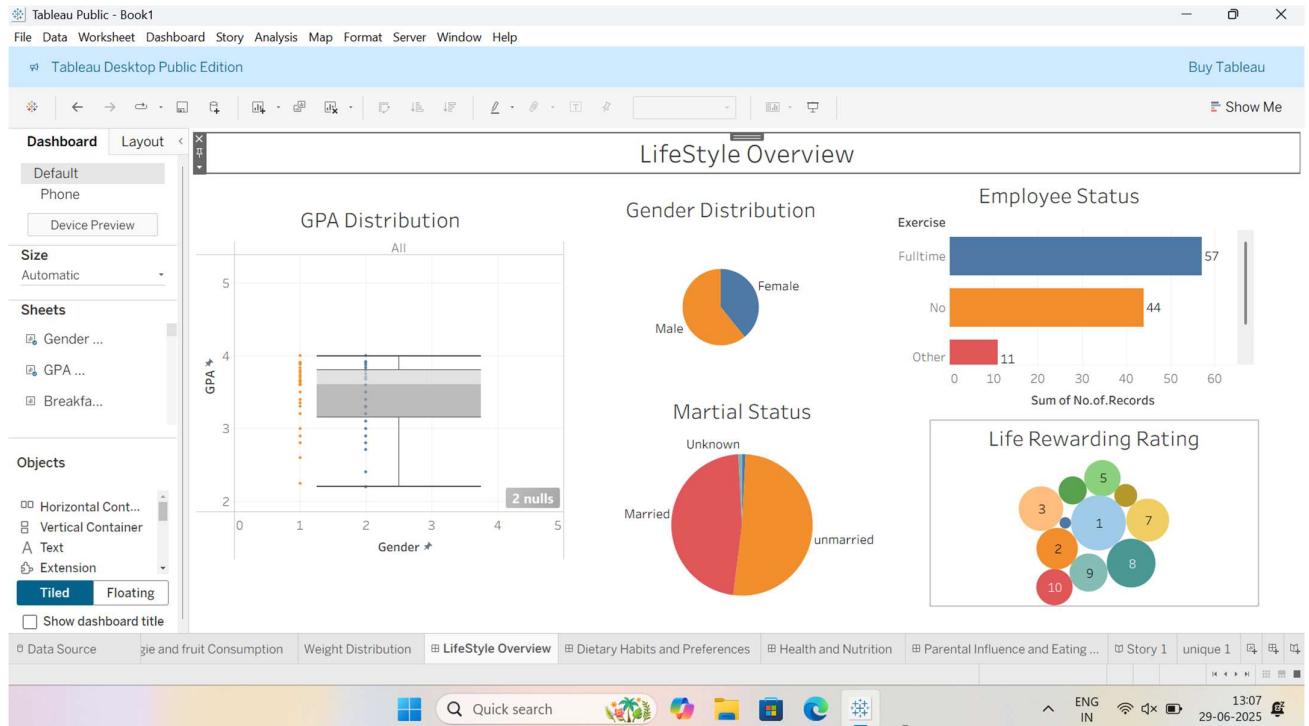




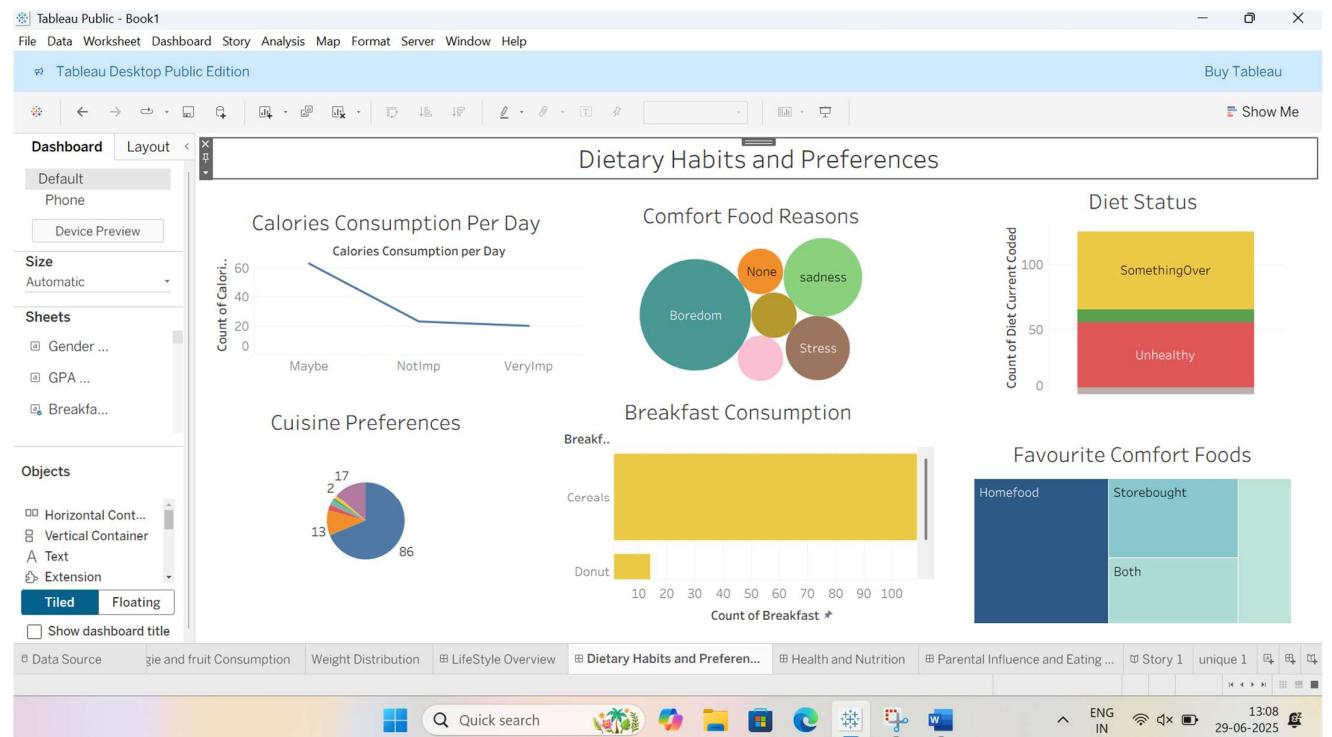
## 7. RESULTS

### 7.1 Output Screenshots

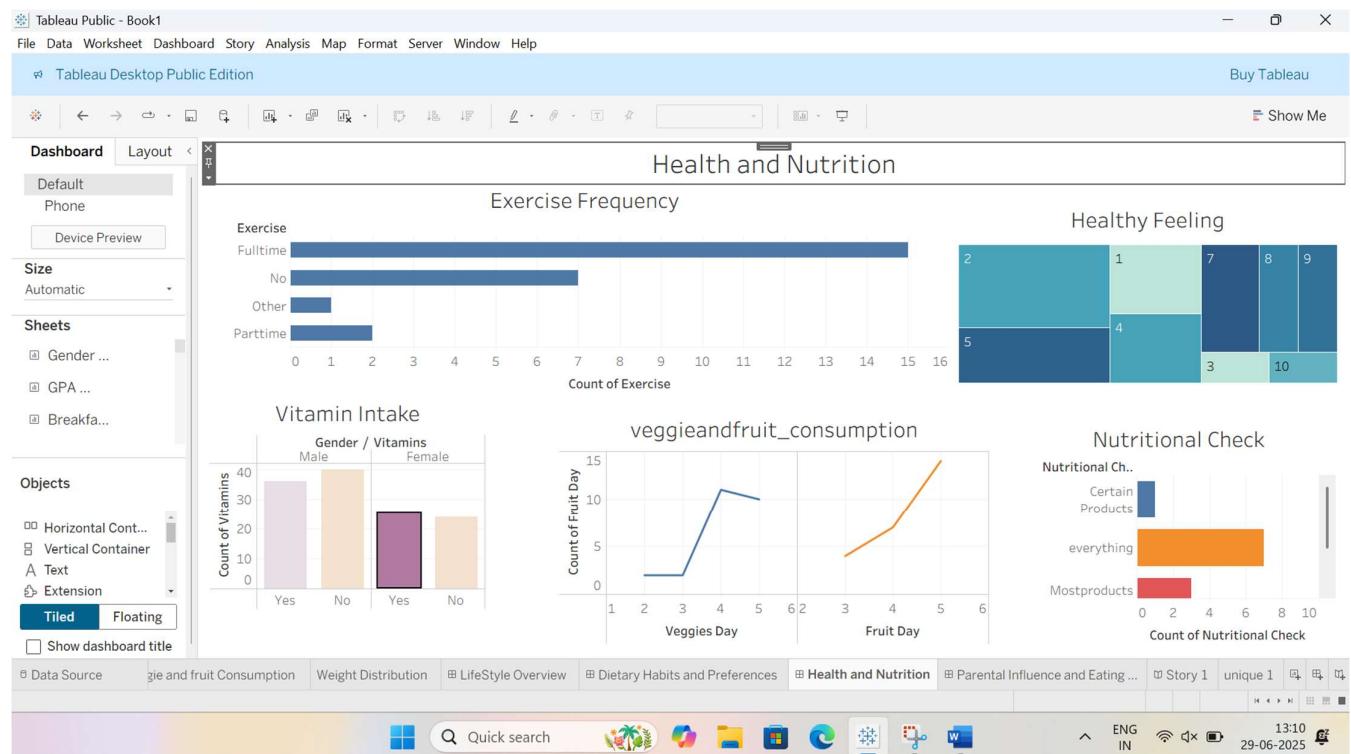
#### Dashboard:



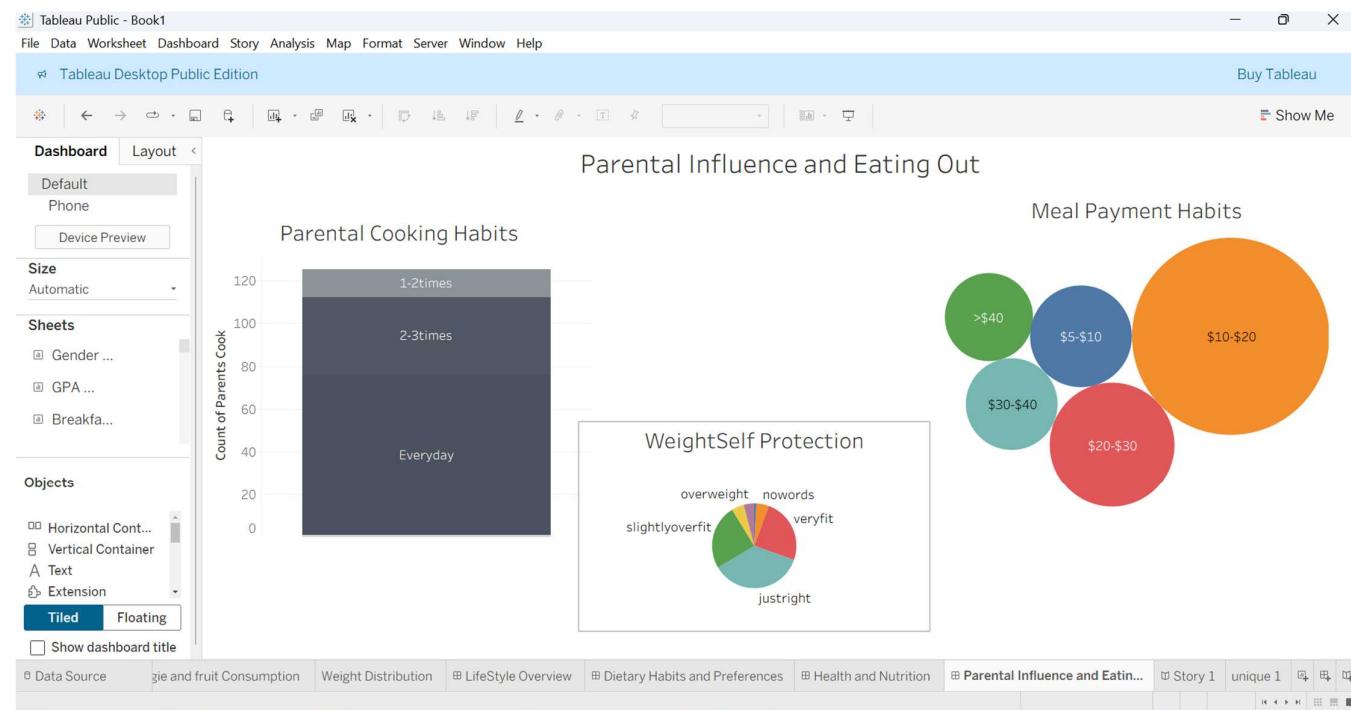
#### Dashboard:-02



### Dashboard:-03



### Dashboard:-04



#### Dashboard links:

- [https://public.tableau.com/views/Book1\\_17508502349150/LifeStyleOverview?:language=en-US&publish=yes&:sid=&:redirect=auth&:display\\_count=n&:origin=viz\\_share\\_link](https://public.tableau.com/views/Book1_17508502349150/LifeStyleOverview?:language=en-US&publish=yes&:sid=&:redirect=auth&:display_count=n&:origin=viz_share_link)
- [https://public.tableau.com/views/Book1\\_17508502349150/DietaryHabitsandPreferences?:language=en-US&publish=yes&:sid=&:redirect=auth&:display\\_count=n&:origin=viz\\_share\\_link](https://public.tableau.com/views/Book1_17508502349150/DietaryHabitsandPreferences?:language=en-US&publish=yes&:sid=&:redirect=auth&:display_count=n&:origin=viz_share_link)
- [https://public.tableau.com/views/Book1\\_17508502349150/HealthandNutrition?:language=en-US&publish=yes&:sid=&:redirect=auth&:display\\_count=n&:origin=viz\\_share\\_link](https://public.tableau.com/views/Book1_17508502349150/HealthandNutrition?:language=en-US&publish=yes&:sid=&:redirect=auth&:display_count=n&:origin=viz_share_link)
- [https://public.tableau.com/views/Book1\\_17508502349150/ParentalInfluenceandEatingOut?:language=en-US&publish=yes&:sid=&:redirect=auth&:display\\_count=n&:origin=viz\\_share\\_link](https://public.tableau.com/views/Book1_17508502349150/ParentalInfluenceandEatingOut?:language=en-US&publish=yes&:sid=&:redirect=auth&:display_count=n&:origin=viz_share_link)

#### Story links:

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## 8.ADVANTAGES & DISADVANTAGES

Advantages	Disadvantages
Enables data-driven decision making for food choices	Data collection from cafeteria and students can be inconsistent
Promotes healthier eating habits among students	Potential privacy concerns with food consumption data
Uses Tableau for intuitive and interactive data visualization	Some users may resist using or learning the dashboard
Provides actionable insights to health coordinators and campus staff	Initial setup requires technical skills and effort
Supports personalized dietary suggestions	Requires ongoing maintenance and regular data updates
Educes students about nutrition and wellness	Limited impact if students do not engage with the tool
Scalable model for other educational institutions	Relies heavily on institutional support and collaboration

## 9.CONCLUSION

This project helps students choose healthier food using easy-to-understand Tableau dashboards. It supports better eating habits and wellness on campus. In the future, it can be improved and used in more colleges.

## 10.FUTURE SCOPE

- **Personalized Diet Plans** using AI/ML for student-specific recommendations
- **Mobile App** for real-time access and convenience
- **Gamification** to promote healthy eating habits
- **Behavior Tracking** through long-term analytics

- **Cafeteria Insights** for menu improvements
- **Fitness App Integration** for a holistic health profile
- **Admin Dashboards** for institutional health reporting
- **Multi-Campus Expansion** to replicate in other colleges
- **Live Feedback** from students on meals
- **Sustainability Tracking** via food waste and consumption data

Source Code : NIL

Dataset link : [https://www.kaggle.com/datasets/borapajo/food-choices?select=food\\_coded.csv](https://www.kaggle.com/datasets/borapajo/food-choices?select=food_coded.csv)

GitHub link: <https://github.com/sindhu3125/Data-Tableau-.git>

Project Demo Link:

[https://drive.google.com/file/d/1MYueVSaYqYjmHlMFmdhebRFmluzpX9Pr/view?usp=drive\\_link](https://drive.google.com/file/d/1MYueVSaYqYjmHlMFmdhebRFmluzpX9Pr/view?usp=drive_link)