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Information Visuals and Dashboards for  
Business

# **DEVELOPING THE NEXT GENERATION OF INNOVATIVE SPORT DATA PRODUCTS**

PROJECT PROPOSAL

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## **Problem Statement**

The goal of this project is to increase the number of spectators attending IPL (Indian Premier League) matches in India and enhance their overall experience during the game by leveraging the culinary arts. The challenge is to design and develop a data-driven dashboard that can show the relationship between the purchase patterns of the IPL spectators, the availability of food options in the stadium, food sales based on the weather on game day, and how this information can be used to improve the overall experience for the spectator. The success of this project will be measured by the creation of a dashboard that accurately reflects the buying behaviour of IPL spectators, identifies key food options that can improve their experience, and provides insights into how food sales can be increased in real-time, specifically during IPL matches in India. The project aims to provide valuable insights to Chief Operating Officers to help them understand the potential of the culinary arts in sports arenas and make informed decisions to drive revenue and increase fan engagement.

## **Sport Selection**

Given the popularity of cricket and the Indian Premier League (IPL) both in India and globally, it presents a unique opportunity to explore the impact of culinary arts on the fan experience and spectator attendance. While cricket is already a widely followed and watched sport, the addition of unique and diverse food options in stadiums during IPL matches can enhance the overall fan experience, attract a broader range of fans, and potentially increase spectator attendance.

As of 2023, the IPL generates approximately \$500 million in revenue each year and comprises ten teams playing in the league. The average ticket price for IPL matches is around \$25, and major brands such as VIVO, Dream11, and Coca-Cola sponsor the league. With such a massive revenue stream and significant sponsorship, the IPL has the resources to leverage the culinary arts to improve fan engagement and enhance the overall cricket experience.

Service quality and satisfaction are crucial factors in the marketing of sporting events. Examining how the culinary arts can be leveraged to improve the overall experience for fans attending cricket matches in the IPL is a worthwhile endeavor. Given the COVID-19 pandemic and the resulting restrictions on stadium attendance, finding ways to make the cricket experience more engaging and exciting for fans who may be watching matches from home has become increasingly important.

## **Data Sources**

The dataset used for the dashboard was generated by using ChatGPT. It consists of 15 columns and 300 rows of data. The dataset was generated for a period of three years, covering the years 2019, 2020, and 2021.

## **Dataset & Description** (Check Exhibit 1 for dataset)

### Food Brought

- Unit of analysis: Food & Beverage
- Characteristics: The specific food and beverage that was brought during the game.

### Cost

- Unit of analysis: Cost in Millions
- Characteristics: The total cost of the food in millions that was purchased during the game.

### Type

- Unit of analysis: Food & Beverage
- Characteristics: The type or category of food that was purchased during the game such as chips, popcorn, lemonade, coconut water etc.

### Demographics

- Unit of analysis: Individual
- Characteristics: The demographic information of the person who bought the food, such as age & gender.

### Time

- Unit of analysis: Moment in time
- Characteristics: The specific time of the game when the food were purchased

### Buyer's Mood

- Unit of analysis: Individual
- Characteristics: The emotional state of the person who purchased the food

### Game Date

- Unit of analysis: Moment in time
- Characteristics: Date when the game was played on the day of the purchase

### Teams Playing

- Unit of analysis: Match
- Characteristics: The teams that played on the day of the purchase.

### Location

- Unit of analysis: Physical location
- Characteristics: The location where the cricket match and food were purchased, such as the name of the city

### Latitude

- Unit of analysis: Physical location
- Characteristics: The latitude of the location where the cricket match and food were purchased

### Longitude

- Unit of analysis: Physical location
- Characteristics: The longitude of the location where the cricket match and food was purchased

### Seat Number

- Unit of analysis: Physical location
- Characteristics: The specific seat number where the person who purchased the food was sitting in the stadium

### Plays Left

- Unit of analysis: Match
- Characteristics: The number of plays left in the cricket match at the specific time when the food was purchased.

### Weather Condition

- Unit of analysis: Moment in time
- Characteristics: The weather condition at the specific time the food was purchased

## Temperature

- Unit of analysis: Moment in time
- Characteristics: Temperature during the time of the purchase of the food

## **Data Wrangling:**

R was used for data wrangling in order to prepare the dataset for analysis and visualization in the dashboard. Specifically, the data was cleaned by removing duplicate values and handling missing values by imputing. Unnecessary columns were dropped from the dataset in order to improve performance during analysis to reduce the complexity of the dataset and improve the performance of the analysis. We also created new columns: seat numbers and plays left. These columns were used to analyze patterns in seating preferences and customer behavior which provided valuable information for building effective visualizations in the dashboard on tableau.

## **Sales Pattern - Metrics**

Our goal was to analyze the timing of food and beverage sales during matches, identify the factors that impact sales, and determine the day of the week with the highest sales to ensure adequate staffing for faster service.

- **Sales pattern by Phase of Match:**

An important consideration arising from our data analysis was identifying the point during the match when there would be long queues at food counters. This information was crucial for the operations team to ensure that sufficient staff were deployed in the middle and end of the game, rather than at the start, to manage the peak demand. Our aim was to optimize the service and minimize wait times for customers, so that they could return to their seats promptly and enjoy the game.

We recognized that long lines at food counters may deter customers from buying food, as they may be concerned about missing the game. Hence, our analysis aimed to determine the timing of food sales to ensure that customers could purchase food without missing any important moments of the match.

- **Sales pattern by Seat Category:**

In the stadium, there are various seating categories available, such as VIP seating, lower level, and upper level. It is essential to identify which ticket category is purchasing the highest amount of food and beverages. By doing so, we can strategically place food stalls near those areas or explore the possibility of constructing new food stalls to increase sales to the lower levels.

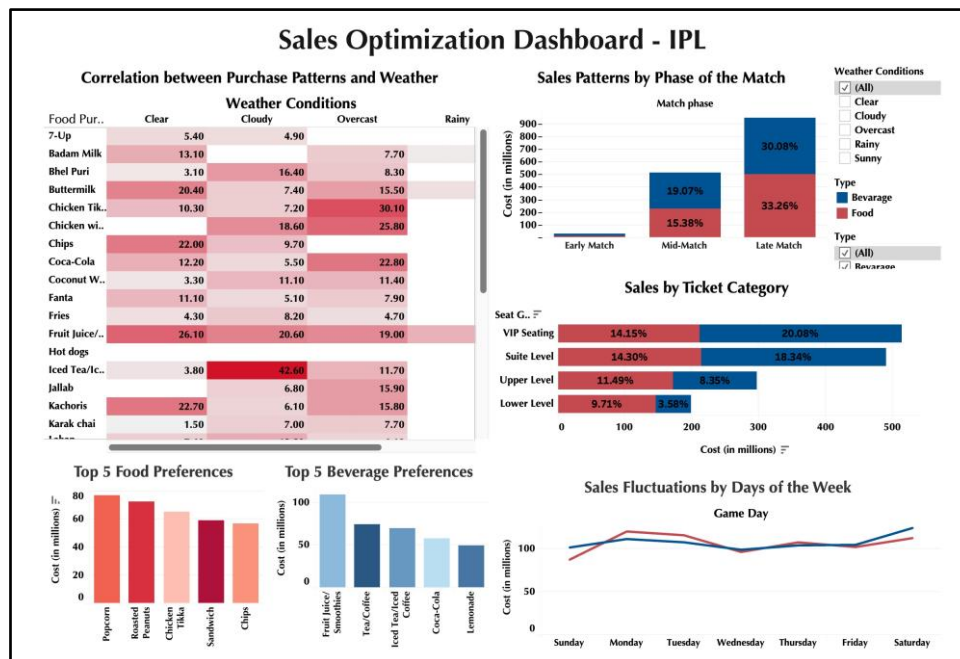
This information can be used to make informed decisions regarding the allocation of resources to enhance customer satisfaction and increase revenue. By identifying the areas with the highest demand for food and beverages, we can optimize the placement of food stalls to ensure that customers have convenient access to the desired products. Such efforts can significantly improve the overall customer experience and generate more revenue for the stadium.

- **Sales by Weather:**

Our analysis of the dashboard has revealed that weather conditions have a significant impact on the buying patterns of food and beverages. Specifically, we have found that customers' preferences for different types of food and beverages vary depending on the weather conditions, such as sunny, rainy, clear, or cloudy.

Understanding this relationship between weather and buying patterns is crucial for the operations team to optimize their food and beverage offerings. By identifying the types of food and beverages that are in demand during specific weather conditions, the operations team can adjust their inventory and offerings to cater to the customers' preferences. This can lead to higher sales and customer satisfaction, as customers will have access to their preferred food and beverage options.

## **Dashboard**



By visualizing the sales data of various food and beverage items during IPL matches, our dashboard provides valuable insights, making it easier for decision-makers to understand the spectators' preferences and the significance of their emotions for the match experience and sales. Here is how our dashboard connects to the problem and aids decision-making:

- Sales Revenue by Food, Weather, and Buyer's Mood:** The dashboard presents a section that helps stakeholders identify popular food and beverage items among buyers based on weather conditions and moods. For instance, iced tea/iced coffee is less in demand during cloudy weather conditions, while fruit juice/smoothies are in high demand during all weather conditions. This also depicts the connection between spectators' emotions and their food choices, which can be analyzed by the sales data during different moments of the matches. For example, they might find that comfort food sales increase during tense moments in the game. This information can be useful to adjust the inventory and promotions to better meet customer demands and preferences, and ultimately increase sales revenue. enhance the overall experience for spectators.
- Sales Pattern by Phase of the Match:** The sales patterns reveal a spike in snack and beverage sales during the late match phase, while overall sales decrease in the early match phase. This information can be used to plan and allocate resources effectively. For instance, during the late match phase, more staff can be deployed to handle the higher demand for snacks and beverages. During the mid-match phase, vendors can prioritize the main course items to meet the steady demand, and during the early-match phase, resources can be allocated to focus on other aspects of the event, such as security or crowd management, enhancing the enjoyment of IPL matches for fans and potentially boosting attendance.
- Top Five Food and Beverage Items:** Identifying the most profitable and popular food and beverage items helps stakeholders make informed decisions about sales and inventory management. By analyzing the cost of food and beverages, they can determine which items are more profitable to sell. For instance, fruit juice/smoothies have an inflated cost but are also in high demand, indicating that they are profitable items to sell, which helps to ensure that popular items are well-stocked, and readily available during matches. This section is also helpful to explore opportunities for improvement for less popular items, such as introducing

new food options or adjusting the taste and presentation of existing items to cater to a wider range of tastes and preferences. Improved culinary offerings can lead to a better experience.

- **Sales by Seat Number:** The dashboard allows stakeholders to identify popular seating categories and the types of food and beverages in high demand based on different weather conditions. For instance, in VIP Seating category, beverages account for a higher percentage of sales compared to food across all weather conditions, stakeholders can take this information into account and offer a wide variety of beverages in the VIP Seating section to increase sales. In this way, it will help stakeholders to make data-driven decisions regarding the menu items to offer and the seating arrangements for customers, enhancing the overall experience for spectators. It can also help them to optimize their pricing strategies to maximize profits.
- **Sales Fluctuations on Different Game Days:** Understanding customer preferences during different match phases and on different game days can help stakeholders provide a better experience for fans. For example, the graph shows that sales of both beverages and food are highest on Saturdays, followed by Mondays and Tuesdays. This suggests that stakeholders may want to allocate more inventory and staff for these days to maximize sales. Similarly, the graph also shows that sales of both beverages and food are generally lower on cloudy and rainy days, which may indicate that pricing strategies or promotions could be implemented to boost sales, such as offering discounts on specific items or creating special combos on days when sales are lower to attract more spectators and drive revenue.

The dashboard provides valuable insights into food and beverage sales during IPL matches, allowing decision-makers to understand spectators' preferences and buying behavior. Furthermore, the dashboard can also be helpful in adapting to changing preferences and sales trends of different food and beverage items, allowing stakeholders to stay informed about changes in spectator preferences. The information from the dashboard can assist in updating the culinary offerings, aid in innovating new offerings, and remain relevant to the target audience. By creating more targeted and appealing culinary experiences, the culinary offerings become an integral part of the overall IPL match experience, improving attendance, and boosting fan engagement.

## **Project Scope**

The scope of our project was to increase spectator attendance at the Indian Premier League (IPL) cricket matches in the stadiums by focusing on the culinary arts. The project will involve collecting data on the food preferences of IPL fans, identifying and analyzing the impact of weather on the purchase patterns of the spectators, and how the in-stadium demand can be met on match day. The project will involve visualizing the data on a dashboard to provide insights to make informed decisions. The project aims to provide an improved overall experience for the audience attending IPL matches, which will increase the likelihood of repeat attendance and attract new viewers to IPL games. By understanding the food preferences of IPL fans and anticipating their demand, the project aims to increase viewership and revenue for the league and its teams.

## **Project Limitations**

There are several limitations to the project for increasing viewership at the IPL through the introduction of new culinary items, including:

- **Data Collection:** The accuracy and completeness of the data collected on the food preferences of IPL fans may be limited by the sample size and demographics of the audience surveyed.

- **Culinary Expertise:** The introduction of new culinary items may require expertise in food preparation and menu design, which may be limited within the project team. Collaboration with food experts and vendors will be essential for this project.
- **Time:** The time required to research and collect data according to different regions for the new culinary items may be a limiting factor in the project timeline.
- **Data Quality:** The quality of the data used for the project may be a limitation. The data may be incomplete, contain errors or inconsistencies, or may not be representative of the entire population of IPL fans.
- **Data Interpretation:** The interpretation of the data may be a limitation, particularly if the data is complex or difficult to understand. Visualizations may need to be designed in a way that is easy to understand.

## Exhibit 1: Dataset

Food Brought	Cost (in millions)	Type	Demographics	Time	Buyer's Mood	Game Date	Teams Playing	Location	Latitude	Longitude	Seat Number	Plays Left	Weather Condition	Temper
Bhel Puri	2.1	Food	Female, 34	3:27 PM	Excited	4/21/19	Mumbai Indians vs Kings XI Punjab	Kolkata	22.5726	88.3639	105	10	Sunny	32°C
Chicken Tikka	4.5	Food	Male, 45	9:12 AM	Anxious	5/1/19	Chennai Super Kings vs Royal Challengers Bangalore	Bangaluru	12.9716	77.5946	209	12	Overcast	25°C
Roasted Peanuts	3.2	Food	Female, 22	8:49 PM	Bored	5/9/19	Delhi Capitals vs Rajasthan Royals	Mohali	30.7046	76.7179	312	8	Clear	28°C
Samosas	6.8	Food	Male, 28	11:06 AM	Happy	4/28/19	Sunrisers Hyderabad vs Kolkata Knight Riders	Hyderabad	17.385	78.4867	408	15	Cloudy	31°C
Mirchi Bajji	1.9	Food	Female, 39	1:18 AM	Focused	4/19/19	Kings XI Punjab vs Kolkata Knight Riders	Dahi	28.7041	77.1025	517	5	Clear	29°C
Kachoris	5.6	Food	Male, 51	5:59 PM	Tired	4/17/19	Rajasthan Royals vs Mumbai Indians	Mumbai	19.076	72.8777	616	2	Sunny	33°C
Pizza	7.3	Food	Female, 48	10:33 AM	Hungry	5/10/19	Chennai Super Kings vs Sunrisers Hyderabad	Jaipur	26.9124	75.7873	718	6	Overcast	30°C
Sandwich	2.4	Food	Male, 32	6:48 PM	Relaxed	4/24/19	Delhi Capitals vs Royal Challengers Bangalore	Chennai	13.0827	80.2707	823	9	Clear	27°C
Chips	4.1	Food	Female, 27	2:07 AM	Energetic	5/12/19	Kings XI Punjab vs Royal Challengers Bangalore	Thiruvananthapuram	8.5241	76.9366	924	1	Sunny	31°C
Popcorn	3.5	Food	Male, 36	7:11 AM	Excited	4/27/19	Kolkata Knight Riders vs Rajasthan Royals	Mumbai	19.076	72.8777	1030	13	Cloudy	33°C
Bhel Puri	8.9	Food	Female, 31	4:54 PM	Tired	4/22/19	Mumbai Indians vs Chennai Super Kings	Chennai	13.0827	80.2707	300	6	Sunny	27°C
Kachoris	6.2	Food	Male, 50	12:38 AM	Anxious	5/6/19	Sunrisers Hyderabad vs Delhi Capitals	Hyderabad	17.385	78.4867	205	33	Overcast	29°C
Chicken Tikka	1.7	Food	Female, 19	8:22 PM	Focused	4/26/19	Kolkata Knight Riders vs Mumbai Indians	Kolkata	22.5726	88.3639	410	19	Clear	32°C
Sandwich	5.8	Food	Male, 43	9:45 AM	Relaxed	5/3/19	Rajasthan Royals vs Kings XI Punjab	Bangaluru	12.9716	77.5946	611	8	Cloudy	25°C
Mirchi Bajji	2.9	Food	Female, 57	6:02 PM	Hungry	5/8/19	Royal Challengers Bangalore vs Sunrisers Hyderabad	Dahi	28.7041	77.1025	714	26	Sunny	28°C
Chips	7.1	Food	Male, 23	11:15 AM	Bored	4/14/19	Chennai Super Kings vs Delhi Capitals	Jaipur	26.9124	75.7873	824	14	Clear	30°C
Roasted Peanuts	4.3	Food	Female, 42	2:52 AM	Energetic	4/20/19	Kings XI Punjab vs Sunrisers Hyderabad	Mohali	30.7046	76.7179	927	47	Overcast	28°C
Samosas	3.6	Food	Male, 39	1:29 PM	Happy	5/4/19	Rajasthan Royals vs Kolkata Knight Riders	Mumbai	19.076	72.8777	1031	6	Sunny	32°C
Popcorn	9.4	Food	Female, 25	10:08 PM	Anxious	5/2/19	Royal Challengers Bangalore vs Mumbai Indians	Chennai	13.0827	80.2707	1110	53	Cloudy	27°C
Pizza	6.3	Food	Male, 47	4:17 AM	Focused	4/30/19	Delhi Capitals vs Kings XI Punjab	Thiruvananthapuram	8.5241	76.9366	1206	71	Clear	31°C
Bhel Puri	15	Food	Female, 53	7:41 PM	Relaxed	5/5/19	Kolkata Knight Riders vs Sunrisers Hyderabad	Kolkata	22.5726	88.3639	1315	11	Overcast	32°C
Chicken Tikka	4.7	Food	Male, 41	12:59 PM	Tired	5/11/19	Mumbai Indians vs Rajasthan Royals	Jaipur	26.9124	75.7873	1409	39	Sunny	28°C
Sandwich	8.2	Food	Female, 20	3:07 AM	Excited	4/25/19	Chennai Super Kings vs Kings XI Punjab	Dahi	28.7041	77.1025	550	12	Sunny	30°C
Kachoris	3.9	Food	Male, 56	5:46 PM	Energetic	4/18/19	Royal Challengers Bangalore vs Rajasthan Royals	Bangaluru	12.9716	77.5946	205	33	Overcast	29°C
Popcorn	5.1	Food	Female, 38	8:13 AM	Bored	5/7/19	Sunrisers Hyderabad vs Mumbai Indians	Hyderabad	17.385	78.4867	410	19	Clear	33°C
Roasted Peanuts	2.6	Food	Male, 33	11:39 PM	Happy	4/23/19	Kings XI Punjab vs Kolkata Knight Riders	Mohali	30.7046	76.7179	611	8	Cloudy	26°C
Chips	7.6	Food	Female, 24	2:22 PM	Hungry	5/13/19	Rajasthan Royals vs Chennai Super Kings	Chennai	13.0827	80.2707	714	26	Sunny	28°C
Mirchi Bajji	6.9	Food	Male, 44	7:56 AM	Tired	5/14/19	Delhi Capitals vs Sunrisers Hyderabad	Mumbai	19.076	72.8777	824	14	Clear	30°C
Pizza	1.2	Food	Female, 30	1:04 AM	Excited	4/16/19	Mumbai Indians vs Royal Challengers Bangalore	Thiruvananthapuram	8.5241	76.9366	927	47	Overcast	31°C
Samosas	4.9	Food	Male, 52	9:29 PM	Anxious	5/15/19	Kolkata Knight Riders vs Delhi Capitals	Hyderabad	17.385	78.4867	1031	6	Sunny	25°C
Bhel Puri	2.2	Food	Female, 46	4:30 AM	Focused	4/15/19	Chennai Super Kings vs Mumbai Indians	Mohali	30.7046	76.7179	1110	53	Cloudy	33°C
Sandwich	8.7	Food	Male, 21	12:51 PM	Relaxed	5/16/19	Sunrisers Hyderabad vs Rajasthan Royals	Kolkata	22.5726	88.3639	1206	71	Clear	26°C
Kachoris	5.7	Food	Female, 55	10:16 PM	Energetic	4/29/19	Kings XI Punjab vs Delhi Capitals	Bangaluru	12.9716	77.5946	1315	11	Overcast	29°C
Roasted Peanuts	3.4	Food	Male, 37	6:08 AM	Hungry	4/12/19	Royal Challengers Bangalore vs Kolkata Knight Riders	Dahi	28.7041	77.1025	1409	39	Sunny	31°C
Chicken Tikka	6.5	Food	Female, 40	3:35 PM	Bored	4/13/19	Rajasthan Royals vs Royal Challengers Bangalore	Jaipur	26.9124	75.7873	345	9	Clear	27°C
Chips	4.4	Food	Male, 49	11:57 PM	Happy	5/17/19	Mumbai Indians vs Sunrisers Hyderabad	Chennai	13.0827	80.2707	239	14	Sunny	33°C
Popcorn	1.3	Food	Female, 26	8:40 AM	Anxious	5/19/19	Delhi Capitals vs Chennai Super Kings	Mumbai	19.076	72.8777	239	14	Sunny	25°C
Pizza	7.9	Food	Male, 54	1:53 PM	Focused	5/18/19	Kolkata Knight Riders vs Kings XI Punjab	Thiruvananthapuram	8.5241	76.9366	105	10	Overcast	29°C
Samosas	2.8	Food	Female, 35	5:28 AM	Tired	5/20/19	Chennai Super Kings vs Rajasthan Royals	Bangaluru	12.9716	77.5946	209	12	Clear	30°C
Mirchi Bajji	5.2	Food	Male, 30	10:59 PM	Relaxed	4/11/19	Sunrisers Hyderabad vs Royal Challengers Bangalore	Hyderabad	17.385	78.4867	312	8	Cloudy	32°C
Bhel Puri	3.1	Food	Female, 41	7:02 AM	Excited	4/10/19	Kings XI Punjab vs Mumbai Indians	Kolkata	22.5726	88.3639	408	15	Clear	28°C
Kachoris	9.3	Food	Male, 58	4:45 PM	Hungry	5/21/19	Rajasthan Royals vs Delhi Capitals	Mohali	30.7046	76.7179	517	5	Clear	31°C
Chicken Tikka	6.1	Food	Female, 28	12:20 AM	Tired	4/9/19	Royal Challengers Bangalore vs Chennai Super Kings	Jaipur	26.9124	75.7873	616	2	Sunny	27°C
Samosas	1.8	Food	Male, 39	9:37 PM	Anxious	4/8/19	Mumbai Indians vs Kolkata Knight Riders	Mumbai	19.076	72.8777	718	6	Overcast	30°C
Sandwich	4.6	Food	Female, 44	2:15 AM	Energetic	5/22/19	Delhi Capitals vs Sunrisers Hyderabad	Chennai	13.0827	80.2707	823	9	Clear	32°C
Popcorn	8.1	Food	Male, 24	11:24 AM	Relaxed	4/7/19	Kings XI Punjab vs Rajasthan Royals	Delhi	28.7041	77.1025	924	1	Sunny	26°C
Roasted Peanuts	3.7	Food	Female, 51	6:37 PM	Happy	5/23/19	Kolkata Knight Riders vs Royal Challengers Bangalore	Thiruvananthapuram	8.5241	76.9366	1030	13	Sunny	32°C
Mirchi Bajji	5.9	Food	Male, 42	1:51 AM	Focused	4/6/19	Rajasthan Royals vs Sunrisers Hyderabad	Hyderabad	17.385	78.4867	105	10	Overcast	27°C
Pizza	2.5	Food	Female, 23	8:04 AM	Hungry	4/5/19	Chennai Super Kings vs Mumbai Indians	Kolkata	22.5726	88.3639	209	12	Clear	31°C
Chips	7.4	Food	Male, 48	3:12 PM	Bored	5/24/19	Sunrisers Hyderabad vs Kings XI Punjab	Bangaluru	12.9716	77.5946	312	8	Cloudy	29°C
Iced Tea/Iced Coffee	3.8	Beverage	Female, 29	9:14 PM	Relaxed	5/29/19	Mumbai Indians vs Rajasthan Royals	Mohali	30.7046	76.7179	408	15	Clear	30°C
Buttermilk	7.2	Beverage	Male, 36	5:22 PM	Excited	4/4/19	Delhi Capitals vs Royal Challengers Bangalore	Chennai	13.0827	80.2707	517	5	Clear	28°C
Lemonade	2.7	Beverage	Female, 45	9:57 AM	Anxious	4/3/19	Kings XI Punjab vs Royal Challengers Bangalore	Jaipur	26.9124	75.7873	616	2	Sunny	26°C
Fruit Juice/Smoothies	5.3	Beverage	Male, 34	2:41 AM	Bored	5/25/19	Kolkata Knight Riders vs Rajasthan Royals	Mumbai	19.076	72.8777	718	6	Overcast	29°C
Tea/Coffee	9.2	Beverage	Female, 50	8:08 PM	Happy	4/2/19	Chennai Super Kings vs Sunrisers Hyderabad	Thiruvananthapuram	8.5241	76.9366	823	9	Clear	31°C
Coca-Cola	4.8	Beverage	Male, 33	10:49 AM	Energetic	5/28/19	Rajasthan Royals vs Kings XI Punjab	Delhi	28.7041	77.1025	924	1	Sunny	27°C



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