

HACKATHON SUBMISSION

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Problem Statement

This project addresses the optimization of United Airlines' Food & Beverage (F&B) service through data-driven insights. The objective is to identify opportunities that can elevate F&B service satisfaction. By identifying customer pain points and challenges in inventory planning, the project aims to provide actionable recommendations for improvement.

The main focus is on understanding the drivers behind F&B satisfaction scores during the summer months. Utilizing root cause analysis, the project aims to uncover key factors influencing customer satisfaction. Additionally, the analysis of survey comments will uncover prevalent themes in customer complaints related to F&B.

This initiative strives to empower United Airlines with data-backed strategies to enhance F&B service quality and customer experience.

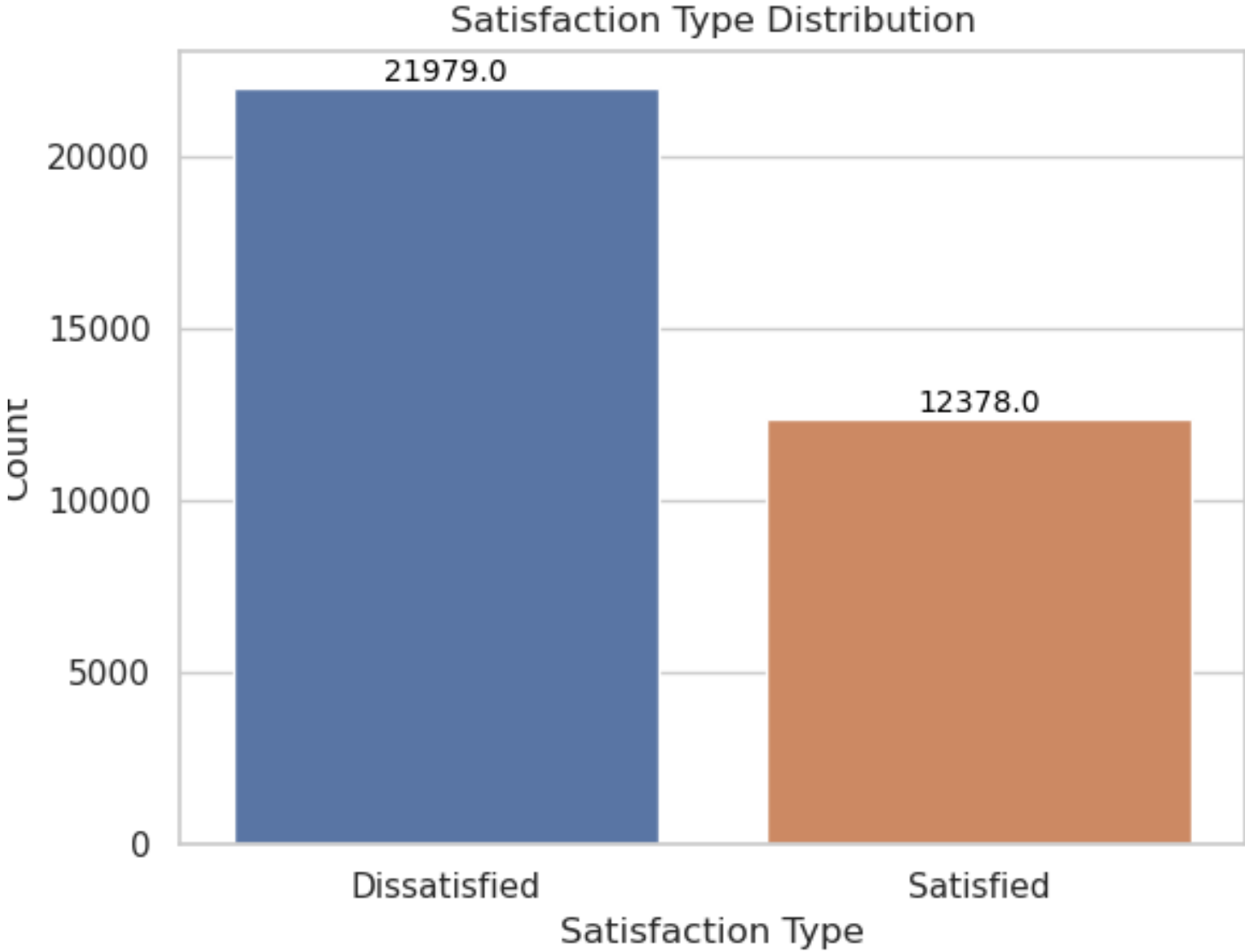
Insights

1. Inflight Satisfaction Score

- For ~35k people, ~22k people responded dissatisfied with the service (graph presented next slide).
- Out of those 22k negative responses, 18k people were born before 1980(silent,boomers,gen X).
- The score given by a passenger could be more dependent upon the arrival delay/early, membership, legs count, generation etc, which needs to be investigated further.
- the dislike to like ratio is around the same for both 'Mainline' and 'Express' flights i.e; around 36% for mainline and 34% for express.
- For the "question_text" two questions were asked, their rating for meal(~34.5k people) and what they ordered(~12k people).
- There are many columns that overall explain the same information and therefore can be clubbed together into new columns. For ex. 'arrival_delay_minutes' and 'arrival_delay_columns' and 'score' and 'satisfaction_type'.

The Satisfaction Type Distribution is presented below

It seems that overall passengers are highly upset with the Food and Beverage service being provided to them. Here we can observe that, out of total 34963 people that expressed their experiences, 21979 (that's 62.86%) felt dissatisfied with the either the quality, taste or overall exprience.



2. Inflight Service: Inventory data (only for Business/First Class - J)

- Not all flights Inventory data was there when cross checked with customer comments sheet for some flights(ex. flight_number 5, 2463 etc).
- I have divided the food items into 4 classes:

1.Nom-Nom : If (consumed amount-planned amount) < 0, that means the item was very liked by everyone and more of it was required on the plane, can't stop eating.

2. Chef's kiss : If the total consumed qty exceeds more than half the planned qty but still not all was consumed, Delicious! *poses chef's kiss.

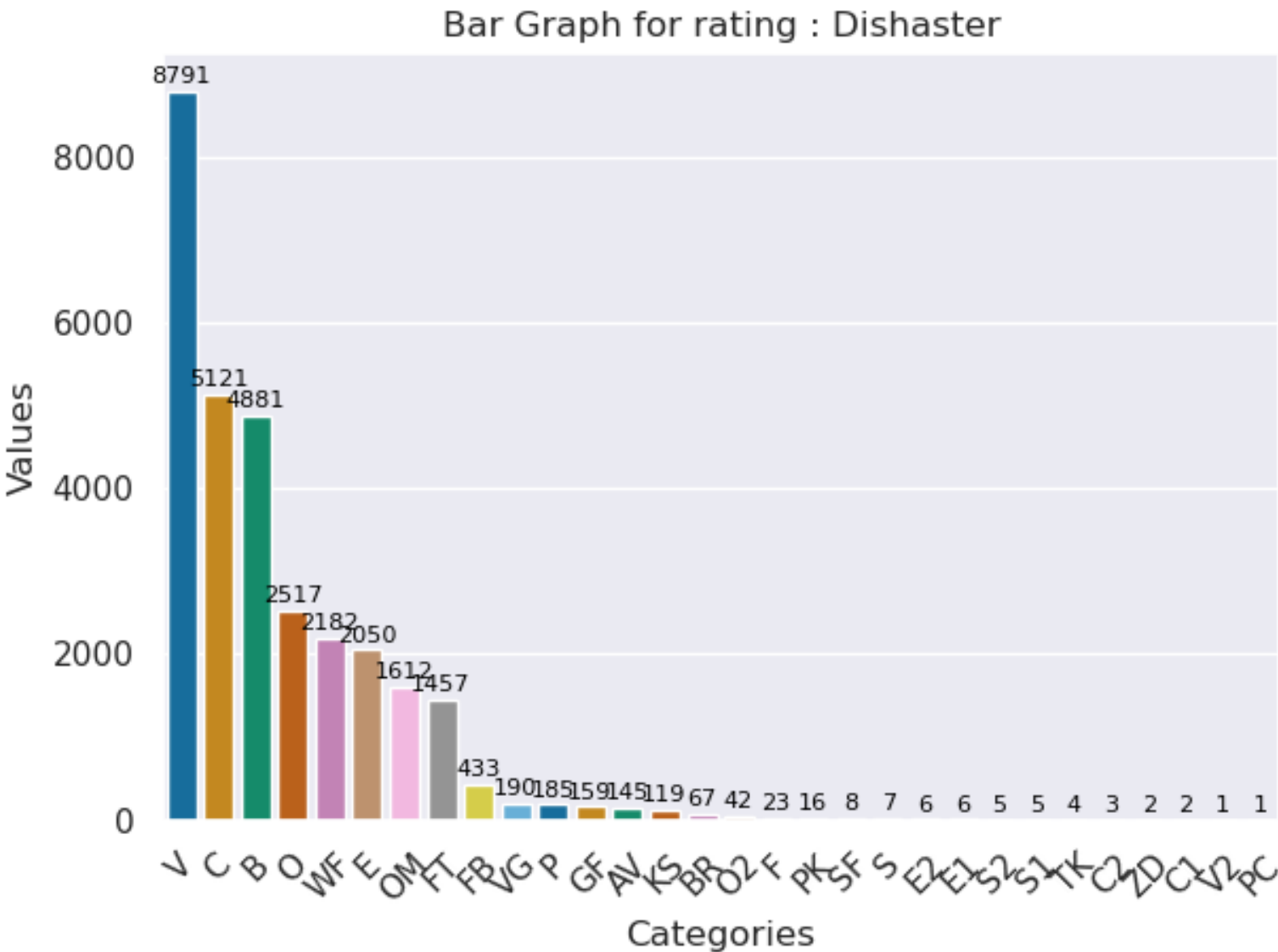
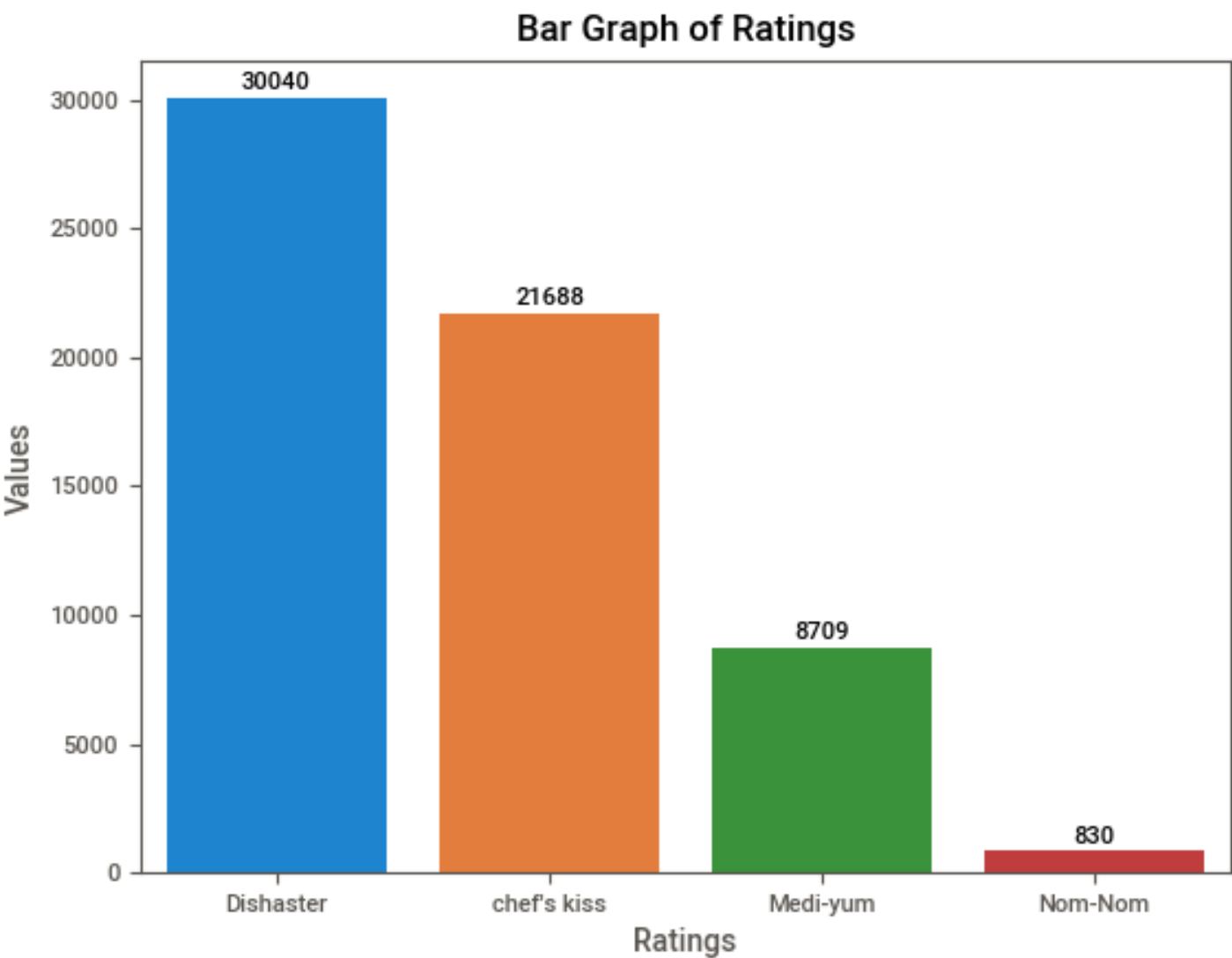
3. Medi-yum : If the total consumed qty is less than half the planned qty, ok-ok food item for the passengers.

4. Dishaster :the consumed qty is 0, or no one on the plane ate that food, quite a disaster.

Here's the formula that I used to get this information in a new coloumn on excel:

```
=IF(B1 = 0, "Dishaster",  
  IF(A1 - B1 < 0, "Nom-Nom",  
    IF(A1 - B1 < A1/2, "chef's kiss",  
      IF(A1 - B1 >= A1/2, "Medi-yum", ""))) )
```

- The graph is presented below:



Further EDA and insights generated had been documented in my Jupyter Notebook (check resources page).

Recommendations and Future Plan of Action

- It seems that customers really didn't liked some dishes, as the consumed quantity=0 for "Dishaster" category. Most of the dishes in this category comes from entree_code = V or C. By finding out the dishes that were served but nobody consumed them, we can exclude them from the menu list.
- By aplying NLP methods on the consumers comments and cross mapping it with the particular food item on the menu , we can generalise customer's pain points, expectations and the pattern towards the dissatisfaction and ratings:
 - a. What went wrong with the item, was it taste,texture, smell etc.
 - b. People ordered something but was given something else to eat.
 - c. People expected more of a certain food item but the demand was not fulfilled.
 - d. They expected a certain item to be on the menu based upon the cabin/class but it wasn't there.

Resources and Annexure:

1. **Github Repository** : <https://github.com/Mohit-921/unitedairlines>
 - a. Jupyter Notebook explaining the EDA, data cleaning and visualizations and instructions explaining each step and how to run the notebook.
 - b. Data visualization reports created using sweetviz library.
 - c. EDA reports of datasets created using pandas profiling.
 - d. Datasets compressed in zip format.

Tools and References Used

1. Python and Jupyter Notebooks.
2. Excel
3. Python EDA related libraries (sweetviz, pandas-profiling).
4. United airlines food reviews on various platforms such as youtube, google ,etc.
 - ex. https://youtu.be/uRjW_hBsIOs?feature=shared
5. Kaggle for datasets and notebooks refernces
 - Python Sentiment Analysis Project with NLTK and huggingface Transformers. Classify Amazon Reviews!!
 - a. <https://www.kaggle.com/code/robikscube/sentiment-analysis-python-youtube-tutorial>
 - b. <https://www.youtube.com/watch?v=QpzMWQvxXWk>
 - Airline Reviews EDA and Preprocessing
 - a. <https://www.kaggle.com/code/divyansh22/airline-reviews-eda-and-preprocessing-pt-1>
6. Assistance provided by ChatGPT, an AI language model developed by OpenAI. www.openai.com.