**Food Waste Data Dashboard Documentation**

**Problems Encountered:**

* Missing data:
  + Many entries in the dataset were incomplete or missing, leading to limited analysis of a few selected categories.
* Data was inconsistent:
  + Inconsistent formatting across different entries, especially the quantity field where donated was in grams and taken was a numerical count of items.
  + Some numerical entries where characters, making it difficult to perform calculations directly.
* Confusing categories:
  + The original dataset had overly detailed categories, which made analysis cumbersome.
  + Some categories were too specific and could have been grouped under broader headings.
  + Irrelevant categories existed that could be merged into an "Other" category.
* User input errors:
  + Users faced difficulties operating the machine that records taken food, leading to errors in data entry.
  + Errors included incorrect quantities, mismatched categories, and missing user details.

Actions Taken:

* Data Cleaning:
  + Removed or imputed missing values to ensure completeness of the dataset.
  + Standardised date and time formats for consistency.
  + Converted non-standard characters in numerical fields to allow for accurate calculations.
* Category Simplification:
  + Created a mapping to condense and simplify categories for better readability and analysis.
  + Merged irrelevant or rarely used categories into an "Unknown Category" to streamline the data.
* Error Handling:
  + Identified and corrected user input errors where possible.
  + Created checks and balances to flag and handle future data entry errors.

Code Implementation:

* Data Loading and Preprocessing:
  + Loaded the cleaned data and added a column to identify whether the food was taken or donated.
  + Updated "Other" categories based on ProductID using a lookup table.
  + Converted quantities to numeric values and standardised date-time formats.
* Dashboard Metrics:
  + Calculated total quantity of taken food items.
  + Calculated the average daily quantity of taken food items.
  + Calculated the total number of first-time users who have taken food.
* Visualisations:
  + Created value boxes to display key metrics on the dashboard.
  + Generated bar plots and line plots to visualise data distributions and trends.
  + Used Plotly for interactive visualisations, allowing users to hover over data points for details.

Key Features of the Code:

* Setup and Data Loading:
  + Included necessary libraries for data manipulation and visualization.
  + Added functions for data cleaning and preprocessing.
* Value Boxes:
  + Displayed total number of food items saved, daily average number of food items saved, and cumulative number of unique users.
* Interactive Plots:
  + Distribution of food items by category.
  + Cumulative number of food items saved over time.
  + Unique users over time.