Project Report: Daily Diet Log Analyzer

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# 1.0 Executive Summary

This project report presents the design, implementation, and findings of the Daily Diet Log Analyzer. The system was developed using Python libraries (Pandas, Matplotlib, Seaborn) to process, analyze, and visualize dietary data. A dataset of 100 dietary entries was generated and used to build an interactive analysis tool.  
  
The project successfully provides insights into caloric intake patterns, meal composition, and food habits. The outcome includes a dashboard with slicers, charts, and summary cards that allow users to explore their dietary behavior dynamically. The analyzer fulfills its objective of serving as a digital nutrition assistant by enabling data-driven decision-making about diet.

# 2.0 Introduction & Objectives

The Daily Diet Log Analyzer is a tool designed to translate raw dietary data into meaningful insights. Its primary purpose is to help users track and understand their eating habits through data analysis.  
  
Objectives:  
- Maintain a systematic record of daily dietary intake.  
- Analyze the caloric content of consumed food items.  
- Identify dietary patterns and imbalances (e.g., caloric distribution across meals).  
- Generate visual reports to aid informed dietary choices.  
- Provide interactivity through filters and slicers for personalized exploration.

# 3.0 Methodology & Process

The project followed a structured data analysis pipeline:  
  
3.1 Data Generation & Ingestion  
- Dataset file: diet\_log\_100.csv  
- Records: 100 rows × 4 columns (Date, Meal, Food, Calories).  
  
3.2 Data Loading & Inspection  
- Data imported into Pandas DataFrame.  
- Inspected using .head(), .tail(), .info(), .describe().  
- Confirmed: 100 rows, 4 columns, no null values.  
  
3.3 Data Transformation & Feature Engineering  
- Date column converted to datetime format.  
- New measures calculated:  
 - Total Calories (~39K)  
 - Average Daily Calories (~1.57K)  
- Derived Week feature for weekly trend analysis.  
  
3.4 Data Analysis & Visualization  
- Meal-wise Calorie Share → Donut Chart.  
- Daily/Weekly Trends → Line & Bar Charts.  
- Food Count by Meal → Bar Chart (e.g., Breakfast count = 20).  
  
3.5 Dashboard & Interactivity  
- Summary Cards → Total & Average Calories.  
- Slicers → Meal type & Date range.  
- Button Slicer → Quick calorie filters.

# 4.0 Key Findings & Insights

1. Total Caloric Intake: 39,339 calories.  
2. Average Daily Intake: ~1,573 calories/day.  
3. Meal Contribution (Donut Chart):  
 - Lunch → ~27.7%  
 - Dinner → ~26.1%  
 - Snacks → ~24.4%  
 - Breakfast → ~21.9%  
 Insight: Calories are fairly evenly distributed, with Lunch slightly higher.  
4. Daily Volatility: Ranged between ~1192 and ~2093 calories/day.  
5. Food Frequency: Certain meals (e.g., Breakfast = 20 instances) indicate staple food choices.

# 5.0 Technical Implementation

Libraries Used:  
- pandas – data manipulation & aggregation.  
- matplotlib.pyplot – bar, pie, and donut charts.  
- seaborn – statistical visualization (e.g., pairplot).  
  
Core Functions & Methods:  
- df.groupby().sum() / df.groupby().count() – aggregations.  
- plt.pie(), plt.bar() – visualization.  
- pd.to\_datetime() – datetime conversion.  
- .dt.to\_period('W') – weekly analysis.

# 6.0 Dashboard Overview

The final dashboard consolidated all features into an interactive interface:  
  
- Summary Cards:  
 - Average Daily Calories (~1.57K)  
 - Total Calories (~39K)  
- Charts:  
 - Donut Chart → meal contribution.  
 - Line/Bar Charts → daily/weekly calories.  
- Interactive Filters:  
 - Meal Slicer (Breakfast, Lunch, Dinner, Snack).  
 - Date Slicer (specific date range).  
 - Button Slicer (predefined calorie filters).

# 7.0 Conclusion

The Daily Diet Log Analyzer successfully transformed dietary records into a clear, interactive visualization system. It identified meal patterns, caloric distribution, and daily fluctuations. The inclusion of slicers and filters enhanced user engagement, enabling personalized insights.  
  
This project demonstrates how Python-based data analysis can serve as the foundation for a more comprehensive digital nutrition assistant.