Hostel Food Wastage Management System - Documentation

# 1. Problem Statement:

Food wastage in hostels is a significant issue, leading to economic losses, environmental impact, and ethical concerns. This program aims to address this problem by providing tools for:  
- Analyzing food wastage patterns: Identifying trends and hotspots of wastage at both state and hostel levels.  
- Understanding the causes of wastage: Pinpointing reasons for food waste, such as over-preparation, poor quality, or inadequate planning.  
- Evaluating the effectiveness of prevention measures: Assessing the impact of interventions like food donation programs and quality control.  
- Providing data-driven recommendations: Suggesting strategies to minimize wastage and optimize food management.

# 2. Solution Overview:

The Hostel Food Wastage Management System is a Python-based application that utilizes data analysis and visualization techniques to provide insights into food wastage. It consists of the following modules:  
- Data Analysis: Processes data from CSV files, performs calculations, and generates statistical summaries.  
- Visualization: Creates various plots and charts to visualize data trends and patterns.  
- Reporting: Generates reports summarizing key findings and recommendations.  
- User Interface: Provides a menu-driven command-line interface for user interaction.

# 3. Program Explanation:

The program is structured as a class Hostel\_food\_wastage\_managemnet with several methods, each responsible for a specific analysis or visualization task.

## 3.1. Class Hostel\_food\_wastage\_managemnet:

statewise\_food\_wastage\_analysis():  
- Reads data from state\_wise\_food\_wastage\_analysis.csv, which contains information about food cooked, consumed, and wasted in different states.  
- Uses seaborn and matplotlib to create bar plots visualizing total food cooked, consumed, and wasted per state.  
- Identifies states with high wastage rates.  
  
hostel\_food\_management\_analysis():  
- Reads data from food\_wastage\_sheet.csv and food\_wastage\_data.csv.  
- Generates various visualizations like pie charts, bar plots, and 3D bar charts.  
- Helps understand wastage patterns within hostels.  
  
food\_wastage\_prevention\_steps():  
- Reads data from data2.csv related to food quality, donation programs, and NGO feedback.  
- Generates visualizations to evaluate prevention measures.  
  
main():  
- Provides a menu-driven interface for users to select analysis options.  
- Handles user input and exits the program cleanly.

# 4. Data Files:

state\_wise\_food\_wastage\_analysis.csv:  
- Columns: State, Total\_Food\_Cooked, Total\_Food\_Consumed, Total\_Food\_Wasted, Avg\_Wastage\_Percentage.  
  
food\_wastage\_sheet.csv:  
- Columns: Total Food Prepared (kg), Food Served (kg), Food Wasted (kg), Reasons for Waste.  
  
food\_wastage\_data.csv:  
- Columns: Meal Prepared, Food Wasted (kg), Type of Cuisine, Meal Type.  
  
data2.csv:  
- Columns: Date, HostelName, MealType, QualityCheck, NGOName, CostIncurred, LeftoverQty, NGOFeedback, TransportMode.

# 5. How to Run the Program:

- Ensure you have Python 3.x installed.  
- Install the required libraries: pandas, matplotlib, seaborn, numpy.  
 pip install pandas matplotlib seaborn numpy  
- Place the CSV files in the same directory as the Python script.  
- Run the script:  
 python your\_script\_name.py  
- Follow the menu prompts to select analysis options.

# 6. Potential Improvements:

- Implement data validation and cleaning.  
- Enhance visualization with interactive plots.  
- Generate detailed reports in PDF or HTML.  
- Add time series analysis and predictive modeling.  
- Develop a GUI for improved user experience.  
- Add functions that give data-based recommendations.  
- Add functions to save the graphs.  
- Add more robust error handling.

# 7. Conclusion:

This program provides a valuable tool for analyzing and managing food wastage in hostels. By providing data-driven insights, it can help hostels and policymakers implement effective strategies to reduce wastage and promote sustainable food practices.