



Food Waste Management Project

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PROJECT TYPE – DATA ANALYSIS & MACHINE LEARNING.

TOOLS USED – PYTHON, PANDAS, SCIKIT-LEARN, STREAMLIT, NGROK,
SQL.

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Abstract

- ▶ Food waste is a major global issue, impacting **economy, environment, and society**.
- ▶ This project analyzes food waste data to identify **patterns, causes, and solutions**.
- ▶ Techniques used: **Python, exploratory data analysis (EDA), Pandas, SQL, streamlit and Ngrok**.
- ▶ Goal: Provide **insights and recommendations** to minimize food waste.

Objectives

- ▶ Understand **factors contributing** to food waste.
- ▶ Perform **data cleaning and preprocessing**.
- ▶ Apply **statistical analysis & visualization** to identify trends.
- ▶ Build **predictive models** to forecast food waste.
- ▶ Suggest **practical solutions** for waste reduction.

Tools & Technologies

Python → Data analysis, scripting.

SQL → Data storage, queries, pivoting & aggregations.

Pandas → Cleaning, transformation, feature engineering.

Streamlit → Interactive dashboard creation.

Ngrok → Public sharing of Streamlit app.

Methodology

- ▶ **Data Collection & Import**

Load dataset to our google colab.

- ▶ **Data Cleaning**

Handle missing values, duplicates, inconsistencies.

- ▶ **Exploratory Data Analysis (EDA)**

Statistical summaries & analyse various features of data.

- ▶ **Modeling**

Machine learning models for prediction.

Dashboard (Streamlit + Ngrok)

- ▶ Interactive filters: food category, time period.
- ▶ Live statistics: total waste, top contributors.
- ▶ Export functionality for reports.
- ▶ Ngrok integration for remote access.

Key Insights

- ▶ Certain categories (e.g., snacks and bread) contribute the most to waste.
- ▶ Improper storage time strongly correlates with waste.
- ▶ Seasonal trends affect consumption & wastage.
- ▶ Better inventory tracking can reduce unnecessary purchases.

Conclusion

- ▶ Food waste management is achievable with data-driven approaches.
- ▶ The developed dashboard helps monitor, track, and minimize waste.
- ▶ Insights can be used by households, restaurants, and NGOs for sustainable practices.

Future Work

- ▶ Integration with IoT (smart fridges, sensors) for real-time monitoring.
- ▶ Machine learning for predictive waste analysis.
- ▶ Cloud deployment for large-scale adoption.
- ▶ Mobile app integration for wider accessibility.