

# Local Food Wastage Management System: Final Project Report

This project delivers a full-stack data management and analysis system designed to combat local food wastage. By connecting food providers with receivers, the platform facilitates efficient food redistribution and provides data-driven insights to improve operations.

## Project Objectives

- **Platform Development:** Create a user-friendly Streamlit application to serve as the front-end for the system.
- **Database Management:** Utilize a SQL database (SQLite) to store, manage, and query food donation data.
- **Data Analysis:** Provide valuable insights into food donation trends, provider contributions, and claim statuses.
- **CRUD Operations:** Implement functionalities for adding, updating, and deleting food listings.

## Skills Demonstrated

- **Python:** Used for data processing, application logic, and interacting with the database.
- **Streamlit:** Built the interactive, web-based user interface for the application.
- **SQL (SQLite):** Managed data storage and performed complex queries for trend analysis.
- **Data Analysis:** Analyzed key metrics such as food quantities, provider types, and claim statuses.

## Application Features

The Streamlit app is organized into four main sections, each serving a specific purpose:

1. **Dashboard & Analysis:** This section presents the core data analysis from the project. It displays the results of the 15+ SQL queries in tables and charts, providing a clear overview of food wastage trends.
2. **Find Food:** An interactive search and filter tool that allows users to find available food listings based on location, food type, and meal type. The results include direct contact information for providers.
3. **Manage Listings:** This is the core management area for food providers. It features a user-friendly interface to perform **Create**, **Update**, and **Delete** (CRUD) operations on food listings.
4. **SQL Query Runner:** A dedicated tab for users to execute their own `SELECT` queries directly on the database and view the results. This feature demonstrates the power of the underlying data structure.

## Key Insights from Data Analysis

The SQL queries and EDA revealed several key findings:

- The total quantity of food available from all providers is **45,395 units**, highlighting the significant amount of surplus food in the system.
- The top food provider type by total quantity donated is **Restaurant**, followed by **Grocery Store** and **Supermarket**.
- The most commonly available food types are **Bread**, **Fruits**, and **Vegetables**.

- The majority of food claims are **Pending**, indicating a potential need for faster coordination between providers and receivers.
- The city with the highest number of listings is **New Christopherberg**, while the city with the most receivers is **North Jacobhaven**, suggesting areas of high activity.

## How to Run the Application

To run the Streamlit application locally, ensure you have Python installed and follow these steps:

1. **Clone this repository** to your local machine.
2. Navigate to the project directory in your terminal.
3. **Install the required libraries:** `pip install -r requirements.txt`
4. **Run the application:** `streamlit run app.py`

## Live Application

A live version of the application has been deployed to Streamlit Cloud for easy access and demonstration.

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## Project Files

- `app.py`: The main Streamlit application file.
- `requirements.txt`: Lists the Python dependencies required to run the app.
- `providers_cleaned.csv`: Cleaned data for food providers.
- `receivers_cleaned.csv`: Cleaned data for food receivers.
- `food_listings_cleaned.csv`: Cleaned data for food listings.
- `claims_cleaned.csv`: Cleaned data for food claims.
- `EDA.ipynb`: Jupyter Notebook containing the Exploratory Data Analysis.
- `SQL.ipynb`: Jupyter Notebook with the 15+ SQL queries and their outputs.