Project Title : Global Food Wastage Analysis & Prediction Using Machine Learning..

Objective:

To analyse and visualize global food wastage patterns across countries, food categories, and years, and build a machine learning model that predicts total food waste in tons based on economic, demographic, and categorical features.

📊 **Dataset Overview:**

- Source: Global Food Wastage Dataset (CSV format)
- Total Records: 5,000
- Features:
    - Country, Year, Food Category, Total Waste (Tons)
    - Economic Loss (Million $), Avg Waste per Capita (Kg)
    - Population (Million), Household Waste (%)

🔧 **Tech Stack:**

- Language: Python
- Libraries: Pandas, NumPy, Matplotlib, Seaborn, Scikit-learn
- Tools: Jupyter Notebook, VS Code

🔍 **Data Cleaning & Preprocessing:**

- Handled missing values and duplicates
- Label-encoded categorical features (Country, Food Category)
- Scaled numeric features using StandardScaler for ML modeling

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📈 **Exploratory Data Analysis (EDA):**

- Correlation Heatmap: Identified relationships among numeric features
- Pairplot: Visual insights between population, waste, and loss
- Line Chart: Economic loss trends over years for top countries
- Key Insight: Household waste % and population have strong influence on total food waste

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🤖 Machine Learning:

- Model Used: Random Forest Regressor
- Target Variable: Total Waste (Tons)
- Model Accuracy: Achieved ~90% R^2 Score on test data
- Feature Importance: Economic loss and population were top predictors

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✅ Outcome:

- Built an interpretable and highly accurate model to forecast food waste
- Generated valuable insights on economic and environmental impact
- Visualized key trends to support policy and sustainability decision-making

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📌 Summary:

This end-to-end data science project covers EDA, preprocessing, modeling, and visualization, making it an excellent showcase of real-world analytical and machine learning skills with a practical sustainability focus.