Project Title: ML Analyzer: Predict & Classify Any Dataset

GUI Pages and Components (Tkinter)

◇ **Page 1 – Welcome Screen**

Components:

- Label: "ML Analyzer: Predict & Classify Any Dataset"
- Button: **Start**
    - Action: Navigates to Page 2 (Dataset & Configuration)

◇ **Page 2 – Dataset Upload & Configuration**

Components:

1. **File Upload**
    - Button: "Upload CSV"
    - Action: Opens file dialog and loads CSV into a Data Frame
2. **Display Column Names**
    - Scrollable Listbox or Text: Shows all column names from the CSV
3. **Task Selection**
    - Radio Buttons: Classification ☐ / Regression ☐
    - Action: Updates the algorithm dropdown accordingly
4. **Algorithm Selection (Dynamic)**
    - Dropdown (Combobox):
        - Shown options depend on task:
            - If **Classification** selected:
                - KNN, SVM, Decision Tree
            - If **Regression** selected:
                - Linear Regression
5. **Data Preview**
    - Text Box / Table Widget: Shows first few rows (e.g., df.head())
6. **Continue Button**
    - Navigates to Page 3

7. **Automatic Preprocessing (Behind-the-scenes)**
    - Detect and handle missing values
    - Encode categorical columns
    - Normalize numeric features (if needed)

◇ **Page 3 – Model Training, Prediction & Evaluation**

Components:

1. **Train Model**
    - Button: "Train"
    - Action: Splits dataset into X (features) and y (target), fits selected model
2. **Manual Data Entry for Prediction**
    - Entry Widgets: Dynamically generated for each feature column
3. **Predict Button**
    - Uses trained model to predict from manual input
4. **Evaluation Output (Label/Text)**
    - If **Classification:**
        - Accuracy, Precision, Recall, F1 Score
        - Confusion Matrix (shown in text or as heatmap)
    - If **Regression:**
        - MAE, RMSE, R^2 Score
        - Scatter plot: Predicted vs Actual