**Comprehensive Feature List for Optenalize**

**Implemented Features**

1. **File Upload Widget**:
   * Users can upload .csv and .xlsx files.
   * File preview with first few rows displayed.
2. **Live Deployment**:
   * The app is live and accessible on Heroku.

**Planned Features**

**1. Data Cleaning**

* Remove duplicates.
* Handle missing values:
  + Impute, drop, or flag.
* Standardize data formats:
  + Dates, text normalization, and numerical formatting.
* Detect and fix inconsistencies:
  + Typos, case issues, or schema mismatches.

**2. Data Transformation**

* Column operations:
  + Split, combine, rename, and drop columns.
* Aggregations:
  + Group by categories or time periods.
  + Summarize data (e.g., totals, averages).
* Export cleaned data:
  + Download as .csv or .xlsx.

**3. Exploratory Data Analysis (EDA)**

* **Visualizations**:
  + Histograms, scatter plots, bar charts, line charts, heatmaps.
* **Statistical Summaries**:
  + Mean, median, mode, variance, standard deviation.
* **Correlation Analysis**:
  + Identify relationships between variables.

**4. Machine Learning (ML)**

* **Predictive Models**:
  + Time-series forecasting (ARIMA, Prophet, SARIMA).
  + Regression models (Linear Regression, Random Forest, XGBoost).
  + Classification models (Logistic Regression, Support Vector Machines).
* **AutoML**:
  + Recommend the best model based on user data.
* **Visualization**:
  + Display forecasts with confidence intervals.
  + Trend and seasonality decomposition.
* **Hyperparameter Tuning**:
  + Allow advanced users to adjust ML model parameters.

**5. ChatGPT Integration**

* **ChatGPT for Data Insights**:
  + Summarize uploaded data.
  + Answer user queries about the dataset (e.g., "What is the average sales value for 2023?").
* **ChatGPT for Forecast Explanation**:
  + Explain ML predictions in plain language (e.g., "Sales are expected to increase by 10% next quarter based on historical trends.").
* **Interactive Suggestions**:
  + Suggest next steps, such as cleaning tasks or visualizations to create.

**Optional Features for Later Phases**

1. **User Accounts**:
   * Login and save workflows for returning users.
2. **Integration with Databases**:
   * Directly connect to SQL databases for importing/exporting data.
3. **Customizable Dashboards**:
   * Allow users to create dashboards with chosen widgets and visualizations.