PROJECT REPORT

Insight Genie

AI-Powered Data Analysis Assistant

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Executive Summary

Insight Genie is a Streamlit-based web application developed to automate and enhance the data analysis experience for non-technical users. It enables users to upload datasets and receive insightful visualizations, AI-generated summaries, and detailed reports. Using tools like pandas, seaborn, plotly, and Gemini (Google Generative AI), the application facilitates interactive exploration and conversational data insights.

Introduction

With the increasing availability of datasets, there is a growing need for intelligent systems that can assist users in understanding their data. Insight Genie is created to bridge this gap by offering a no-code interface where users can upload datasets and get an AI-powered breakdown including cleaning, profiling, visualization, and insights.

Problem Statement: Users often lack tools or skills to analyze datasets effectively.

Scope: The application supports CSV and Excel files, basic data cleaning, automatic visualizations, and AI-generated insights.

Limitations: Requires internet access for AI features, and advanced analytics may be limited by model capabilities.

Methodology/Approach

- Tools: Python, Streamlit, Pandas, Plotly, Seaborn, Google Generative AI.
- Frameworks: Streamlit frontend, Gemini LLM for AI-driven answers and summaries.
- Steps:
  1. Data Upload and Preview.
  2. Data Cleaning (Missing values, Outliers).
  3. Automatic and custom visualizations.
  4. AI Insight generation using Gemini API.
  5. Report generation in HTML format.

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Analysis & Results

Insight Genie was tested with datasets to validate its capabilities. Users were able to see statistical summaries, handle missing/outlier values, and receive interactive visualizations. The AI generated high-quality summaries and recommendations, enhancing interpretability. Below is an example of typical insights produced:
- Feature X is strongly correlated with Y (r = 0.89).
- Column A contains 12% missing values; filled with median.
- The most frequent category in Column B is "Retail" (35%).

These insights help drive decisions quickly without requiring advanced data science expertise.

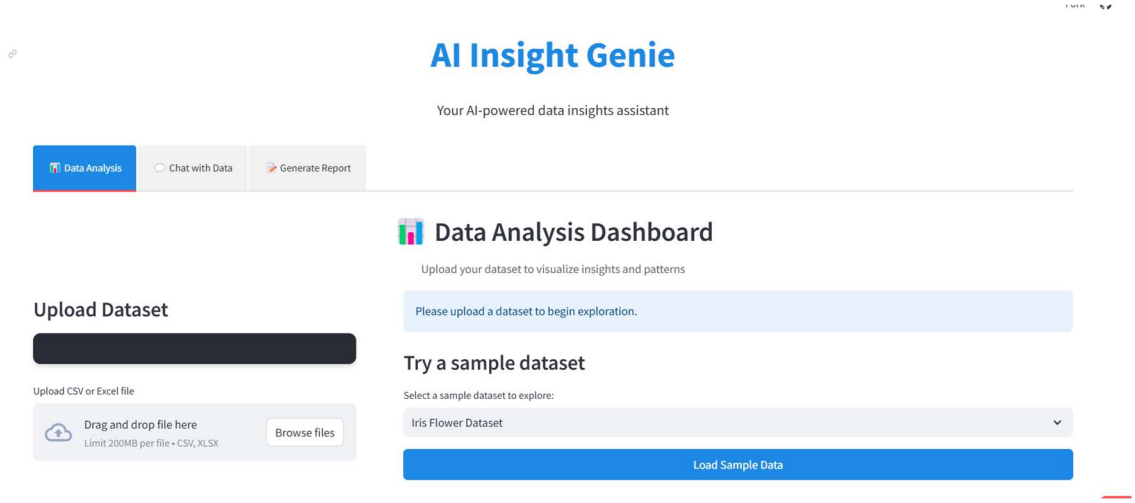
Conclusion & Recommendations

Insight Genie effectively demonstrates how AI can be integrated into data analysis workflows to empower non-technical users. Its ability to produce interactive, interpretable outputs with minimal input is a major strength.

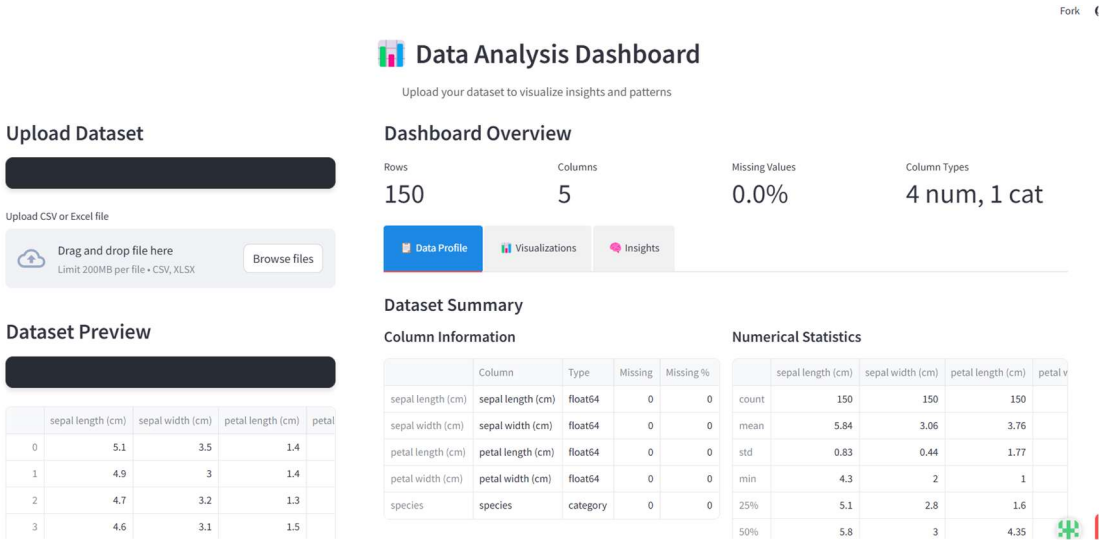
Recommended future enhancements include support for multi-file analysis, integration with cloud storage, UI enhancements and PDF report generation.

SCREENSHOTS OF UI

The UI works better with light mode



Dataset loaded



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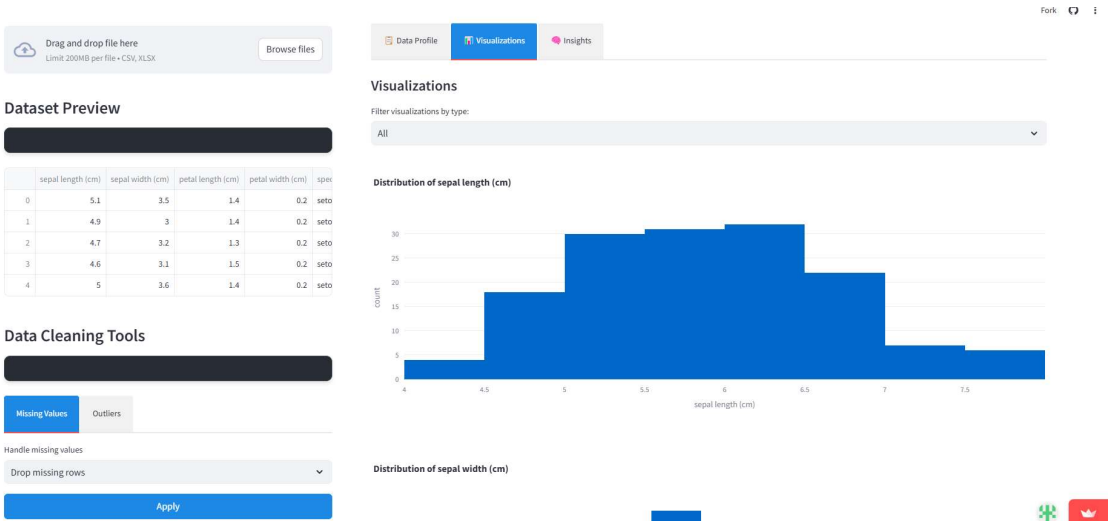
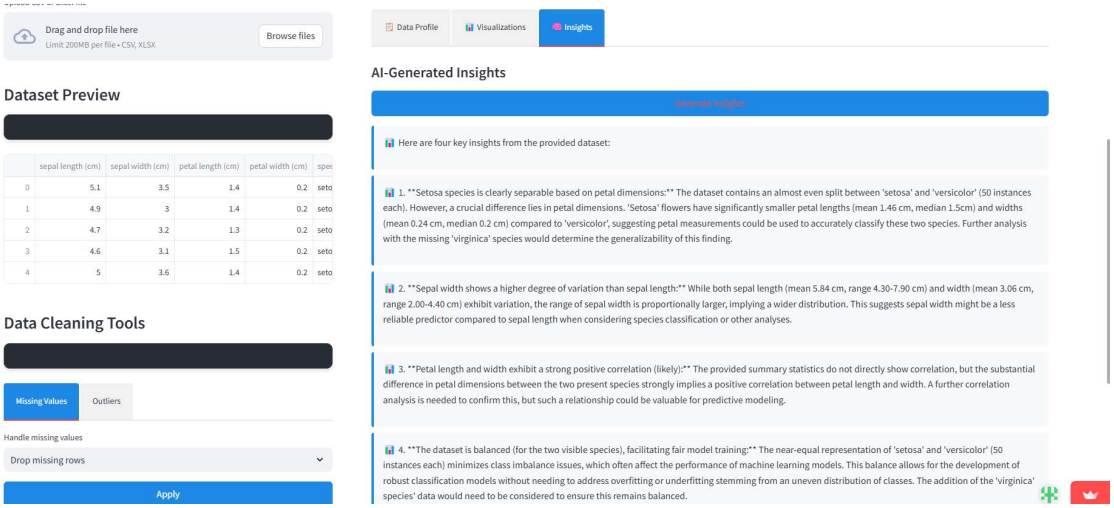
Visualization tab



Insights tab



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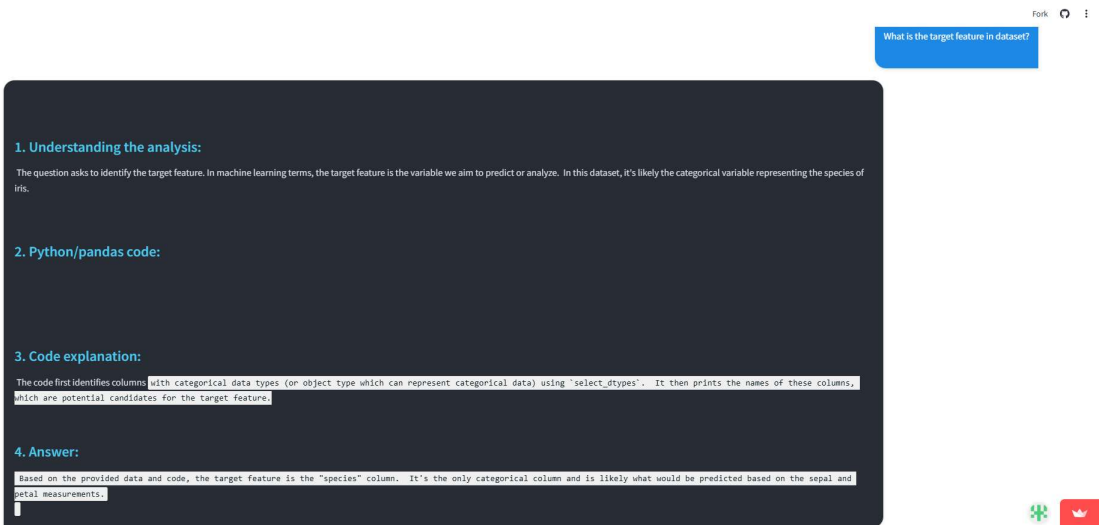
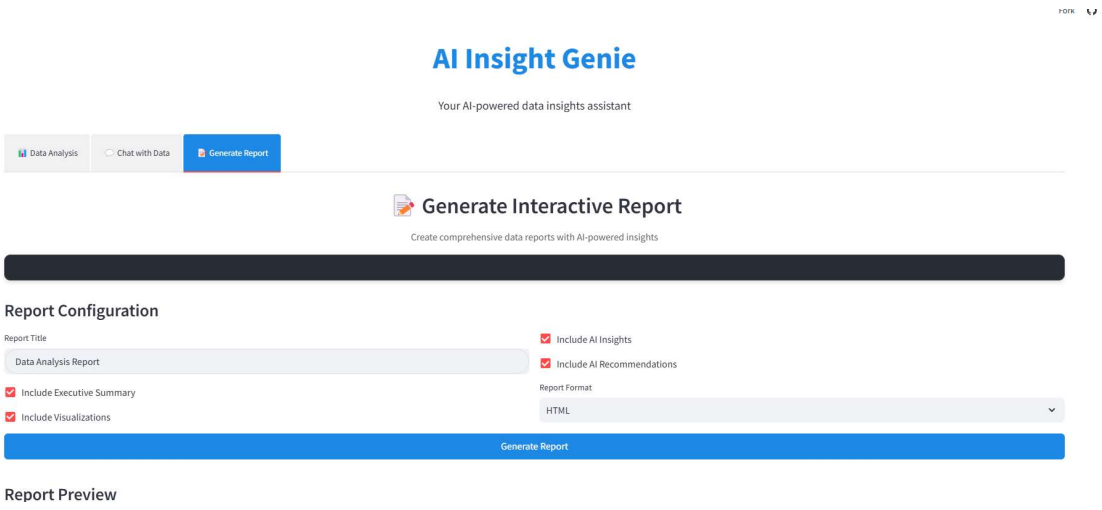
Chat tab requires some enhancements but it uses Gemini model “gemini-1.5-flash-latest” for answering the queries.



Generate Reports tab
Generates report in html format but in future upgradation, pdf format is also available.



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