D.Y. PATIL COLLEGE OF ENGINEERING & TECHNOLOGY, KOLHAPUR

DEPARTMENT OF DATA SCIENCE

●PROJECT PRESENTATION●

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Third Year B.Tech (Data Science)

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VIZGENIUS

AN AUTOMATED VIZUALISATION TOOL

Automated Visualizations

PROBLEM STATEMENT

To Develop a free, open-source platform that combines interactive visualizations, comparative analysis, statistical testing, and machine learning algorithms, empowering users with data-driven insights

OBJECTIVE

- To Develop inclusive platform for visualization
- One stop platform for advanced visualizations, comparative studies, statistical testing, and machine learning integration
- Incorporate machine learning capabilities to enhance data analysis and insights generation.
- AI Integration Tool Accessibility Open Access Educational Support

REQUIREMENT SPECIFICATION

Flexible Platform: Handles diverse datasets from various domains.

Seamless Integration: Supports CSV file upload for user datasets.

Data Collection

Key Features

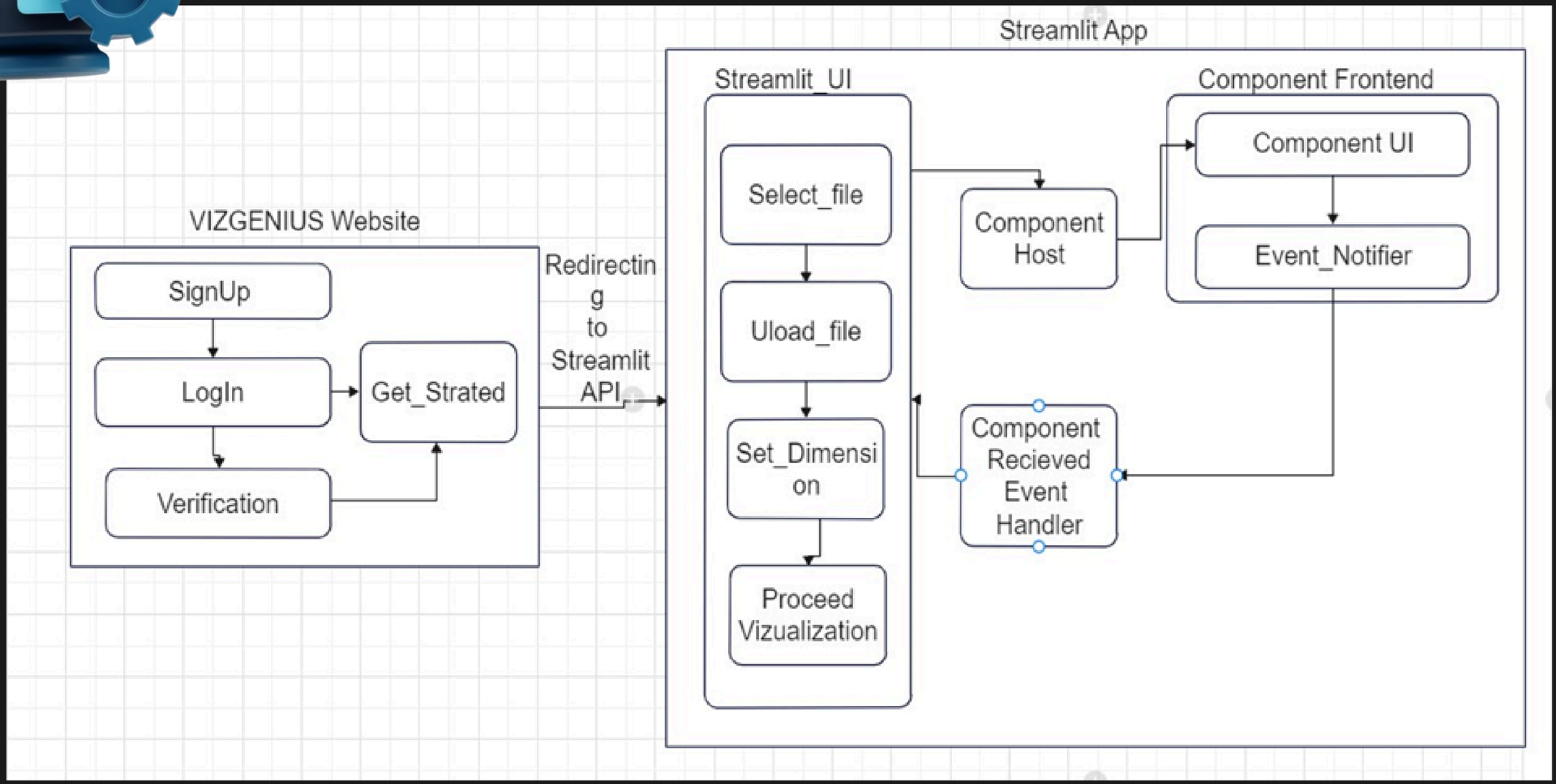
- Tabular data structure
- Mixed data type
- Large dataset support
- Missing value handling
- Outlier detection and removal

Data Preprocessing

- Cleaning
- Transformation
- Feature engineering
- Data splitting

Automated Visualizations

SYSTEM ARCHITECTURE



Advanced Analytical Techniques

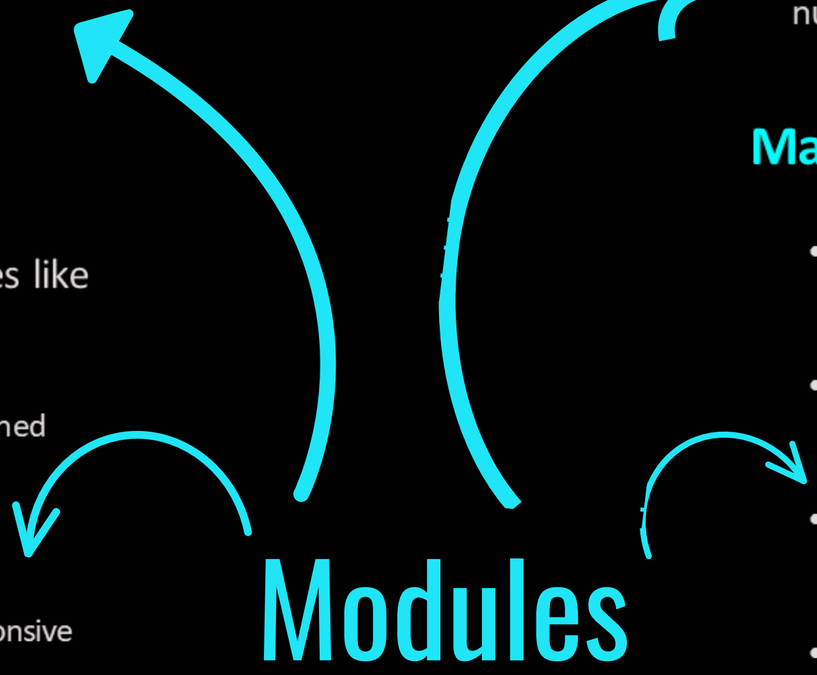
- Enabling comparative analysis between multiple datasets
- Implementing statistical tests (t-tests for numerical columns, chi-square tests for categorical columns)
- Providing interactive filtering and data sampling options
- Offering data export functionality (CSV, Excel)
- Enabling seamless interaction with visualizations and analytical components

Exploratory Data Analysis (EDA)

- Generating interactive visualizations (bar charts, line charts, scatter plots, histograms)
- Calculating and displaying summary statistics (mean, median, standard deviation)
- Analyzing missing value patterns and distributions
- Computing and visualizing correlation matrices for numerical features

Data Collection and Preprocessing

- Data collection through CSV file uploads
- Handling missing values using techniques like imputation or deletion
- Detecting and removing outliers based on user-defined thresholds
- Performing data type conversions as needed
- Utilizing Streamlit framework for intuitive and responsive user interface



Machine Learning Integration

- Integrating with Scikit-learn library for machine learning capabilities
- Allowing users to select target variables and train dummy classifiers
- Implementing train-test splitting and performance evaluation (accuracy scores)
- Exploring cross-validation techniques for model robustness

S/W & H/W REQUIREMENTS

- **Programming Language:** Python
- **Libraries:** Numpy, Pandas, Matplotlib, Scipy, Seaborn, Scikit-learn
- **Web- Framework:** Streamlit
- **Development Environment:** Visual Studio code, pycharm, Jupyter Notebook
- **Version control:** Git, Git-Hub
- **Web-Browser:** Chrome, Firefox, Edge
- **System:** Intel i5 & above core or AMD, 8 GB RAM, SSD 256GB+ , Integrated Graphics
- Stable Internet Connection

PROCESS

01
Select CSV File

02
Upload CSv File

03
Visualizations

04
Take Insights

Automated Visualizations

RESULT ANALYSIS

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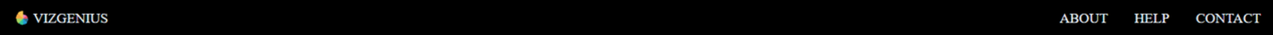
OUR SERVICES

BASIC

PRO

ENTERPRIZE



VizGenius

VIZGENIUS incorporates advanced techniques and algorithms to empower users with unprecedented analytical capabilities. The platform's basic visualization module generates standard plots from CSV data using interactive visualizations such as bar charts, line charts, scatter plots, and histograms. The advanced visualization module enables comparative analysis and statistical testing between datasets, employing techniques like t-tests for numerical columns and chi-square tests for categorical columns. VIZGENIUS integrates machine learning capabilities through the inclusion of dummy classifiers, serving as a foundation for more advanced predictive modeling tasks. By implementing algorithms for train-test splitting, performance evaluation using metrics like accuracy scores, and cross-validation techniques, VIZGENIUS lays the groundwork for robust and reliable machine learning models

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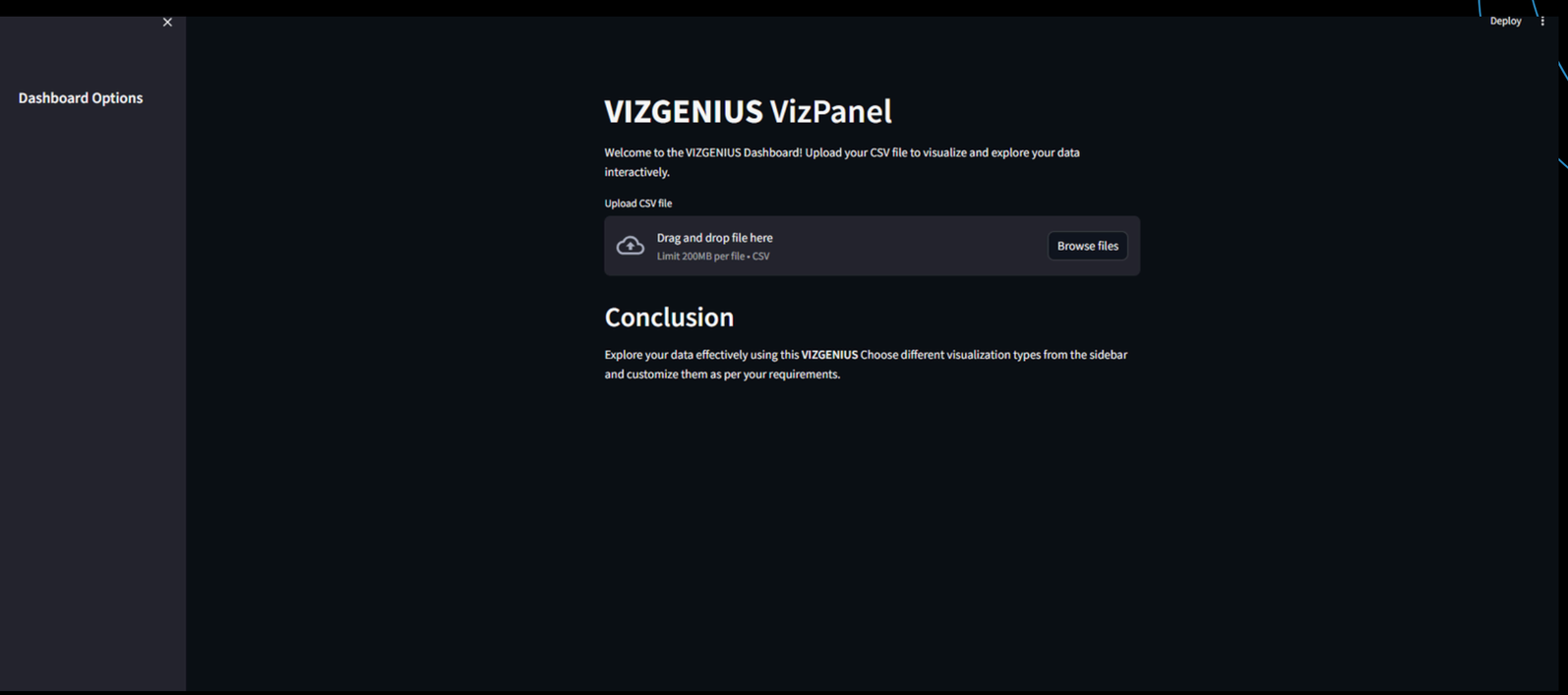
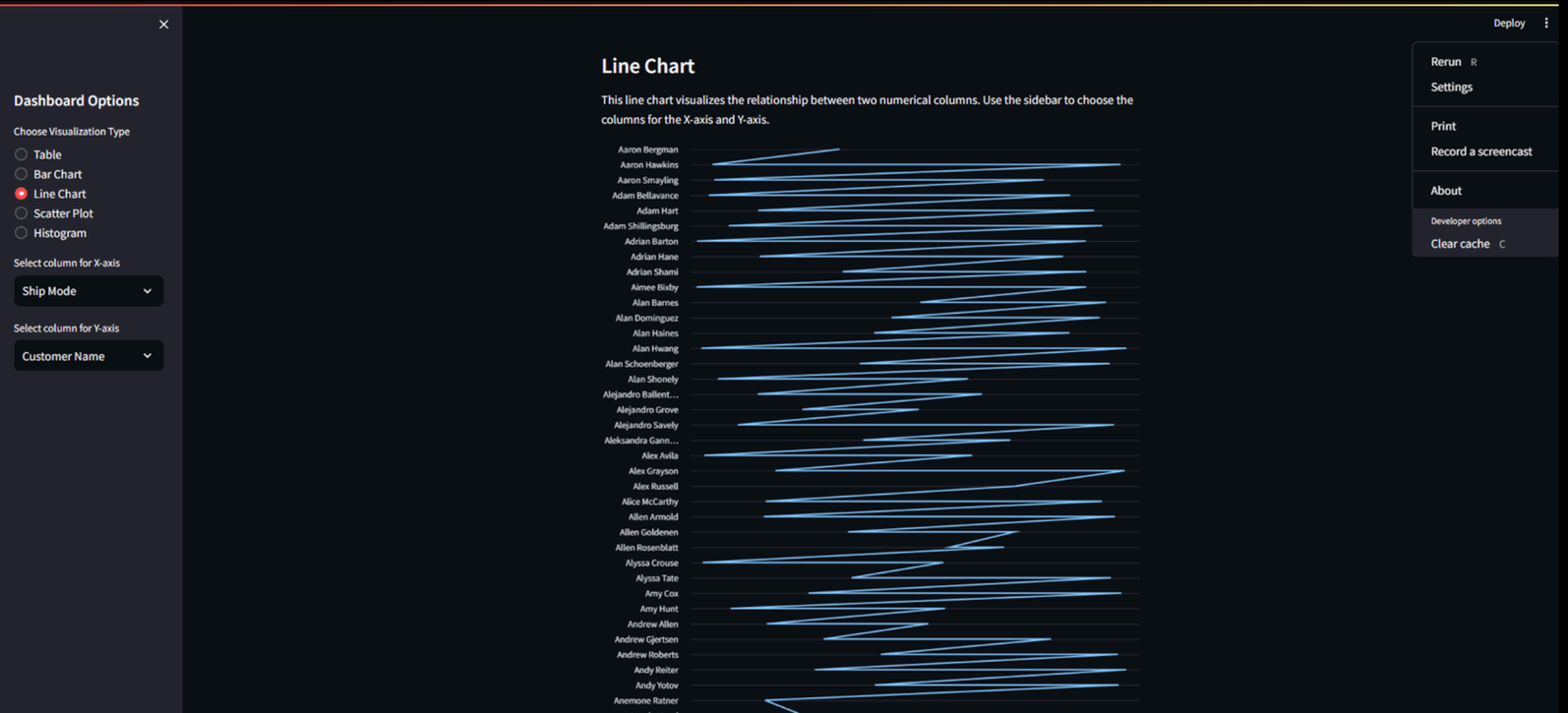
Web View

Automated Visualizations

Basic

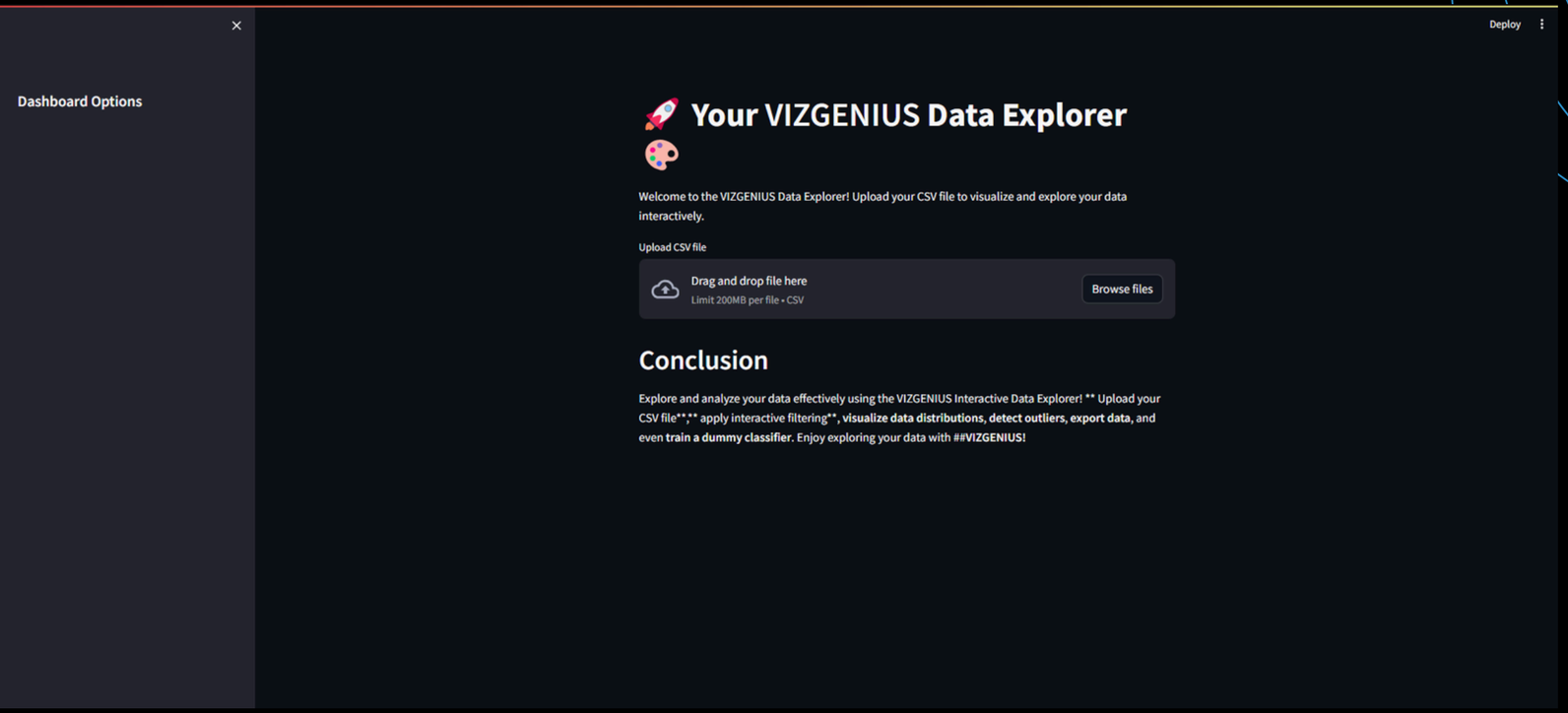


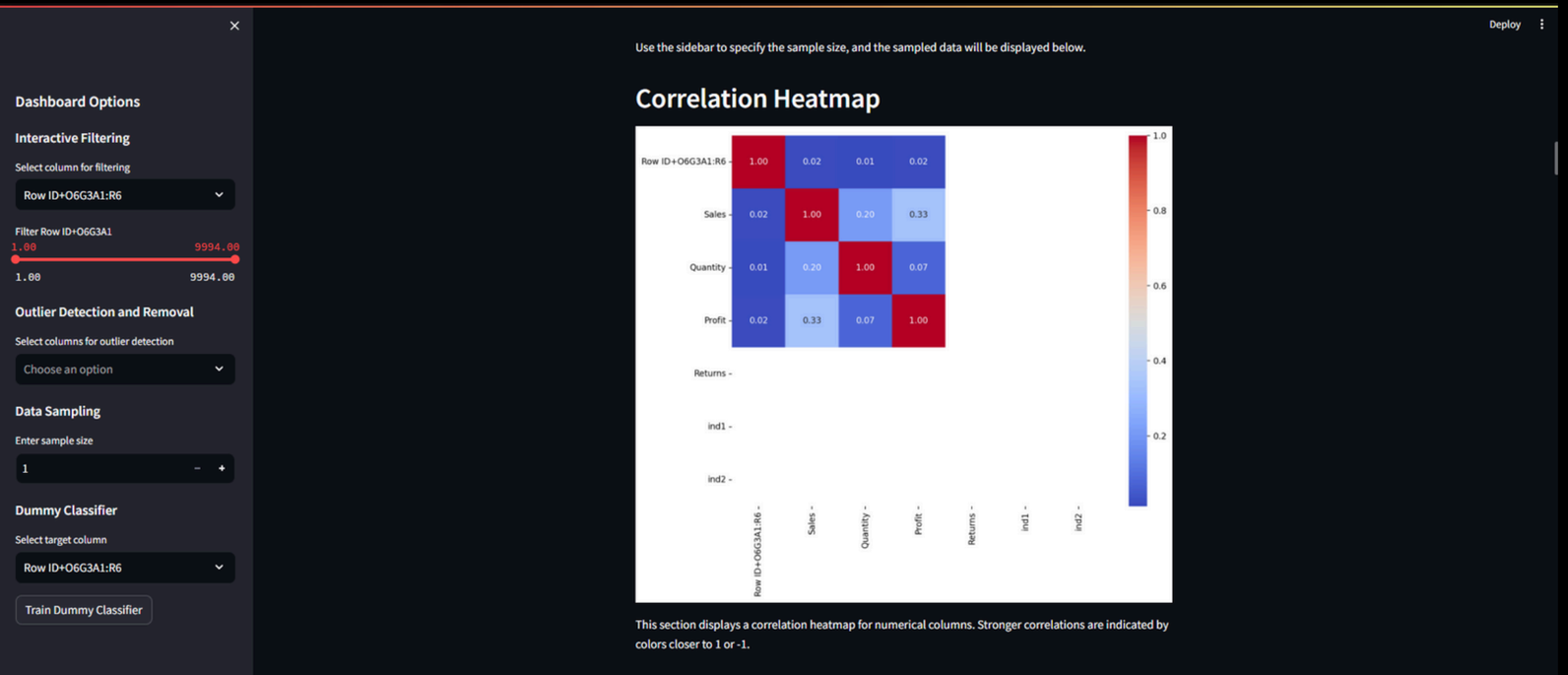


Facilitating Data-Driven Decision-Making: Examples of insights and patterns uncovered from data through visualizations and analytical techniques. Comparison with traditional methods, showcasing how VIZGENIUS empowers data-driven decision-making.

Automated Visualizations

Pro

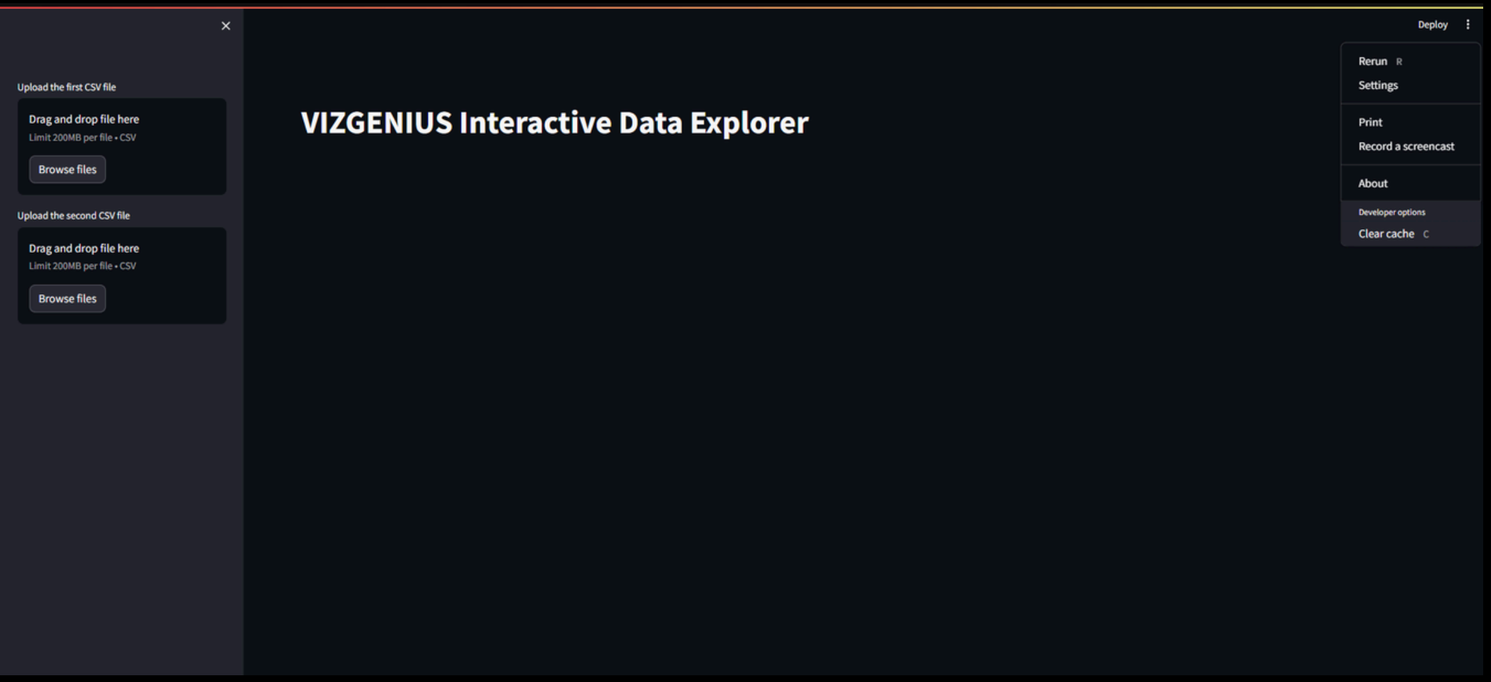


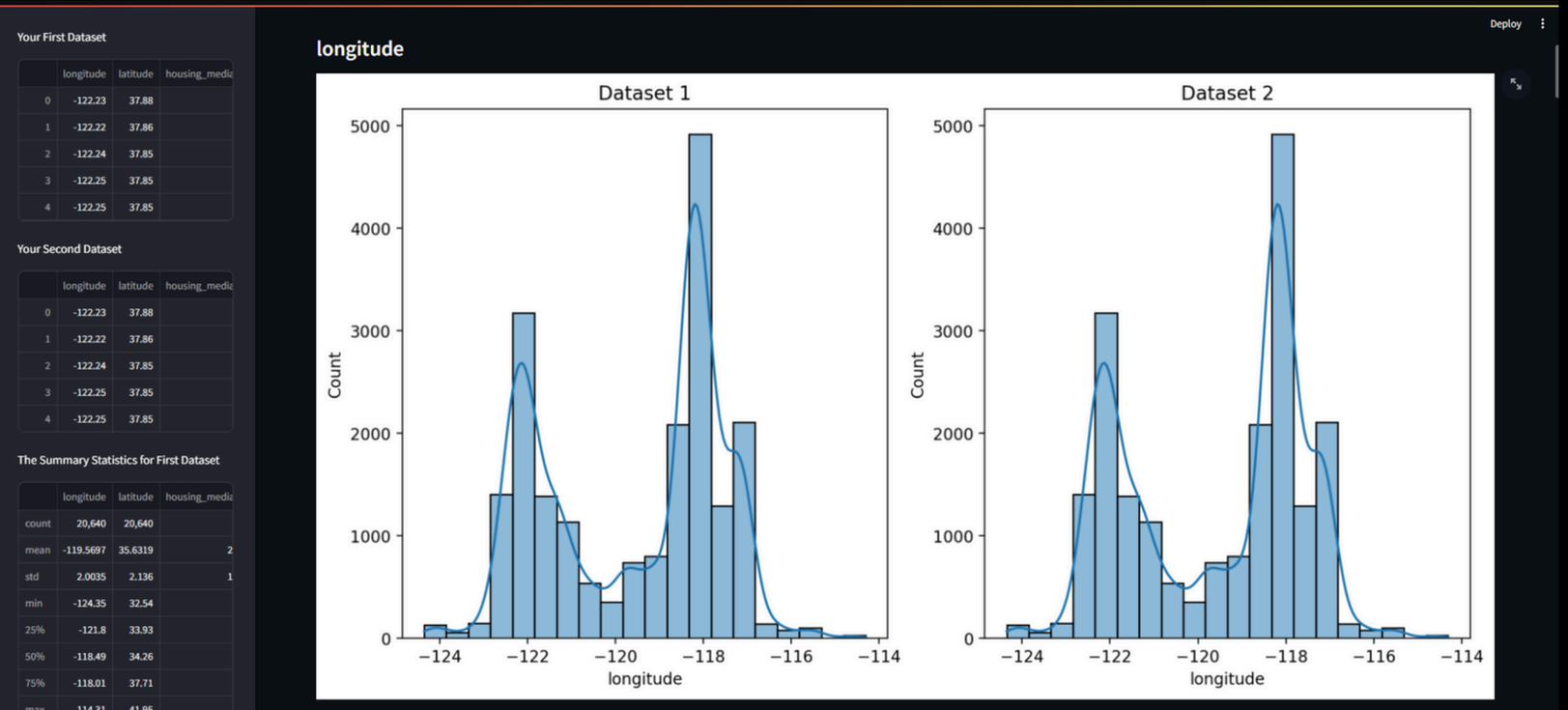


Machine Learning Integration: Screenshots/code snippets demonstrating dummy classifiers and performance metrics for trained models. Comparison with other ML platforms, highlighting seamless integration with data science workflows.

Automated Visualizations

Enterprise





Accessible and Comprehensive Data Visualization Platform: Screenshots showcasing interactive visualizations like bar charts, line charts, and histograms for different datasets. Comparison with paid tools like Tableau, highlighting VIZGENIUS' accessibility as a free and open-source platform.

Conclusion & Future Scope

Conclusion:

VIZGENIUS leverages open-source tools to create a powerful, accessible data exploration platform. It integrates visualizations, analysis, and machine learning, empowering users to gain insights and make data-driven decisions.

Future Scope:

- **Scalability & Performance:** Handle larger datasets efficiently and optimize performance.
- **Unstructured Data:** Analyze text data like social media posts and documents.
- **Automated Insights:** Develop algorithms to automatically identify patterns and insights from data.

REFERENCES

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[7] A Model Driven Approach to Automate data visualization, Matteo Golfarelli & Stefano Rizzi

[8] An Automated Visualization Feature-Based Analysis Tool,August 2021,DOI:10.1007/978- 3-030-82196-8_28

THANK YOU!!

Automated Visualizations

DATA IS THE FUEL OF MODERN WORLD!