TEAM-A

GUIDED BY: SANGEETHA MAM

DONE BY:

YEDDU DIVYA SRI

BOGGARAPU VENKATA SRUJANA

ARSHI SHARMA

Abstract:

- A web-based personal finance management system.
- Tracks, visualizes, and predicts monthly expenses.
- Uses Python Flask for backend and CSV for data storage.
- Machine Learning (Linear Regression) predicts future spending.
- Helps users make better budgeting decisions.
- → → → □ →

Problem Statement:

- People often struggle to track and manage their daily expenses.
- Manual tracking is time-consuming and error-prone.
- No visual insights to understand spending patterns.
- Users cannot estimate future expenses based on past trends.
- Lack of automated tools affects budgeting and financial planning.

❖ **So, to solve these financial struggles, we developed a smart expense tracking and forecasting system that helps users manage their money effortlessly.**

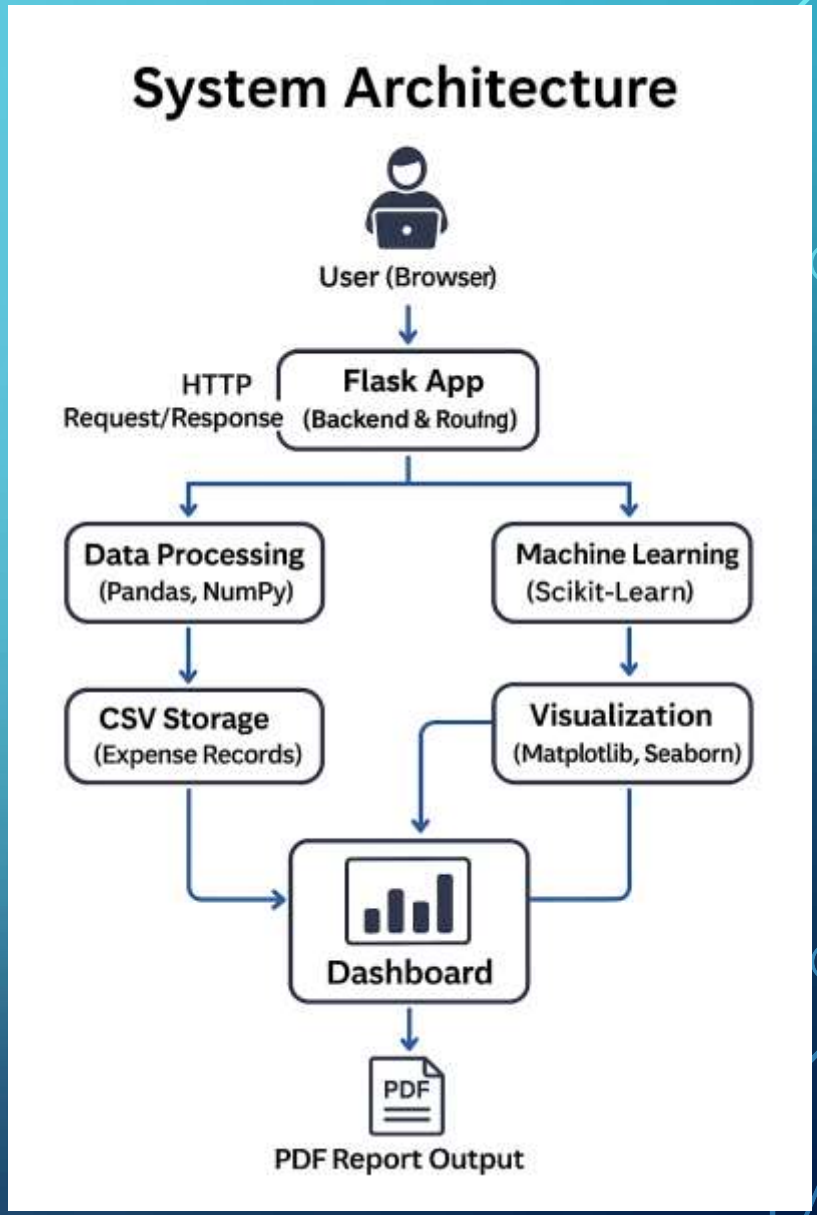
Proposed Solution:

- A web-based expense tracking and forecasting system.
- Allows users to add, edit, delete, and manage daily spending.
- Automatically generates visual insights using charts and graphs.
- Uses Machine Learning to predict next month's expenses.
- Provides downloadable reports to support financial decision-making.
- User-friendly dashboard for quick analysis and monitoring.

Technologies & Frameworks Used:

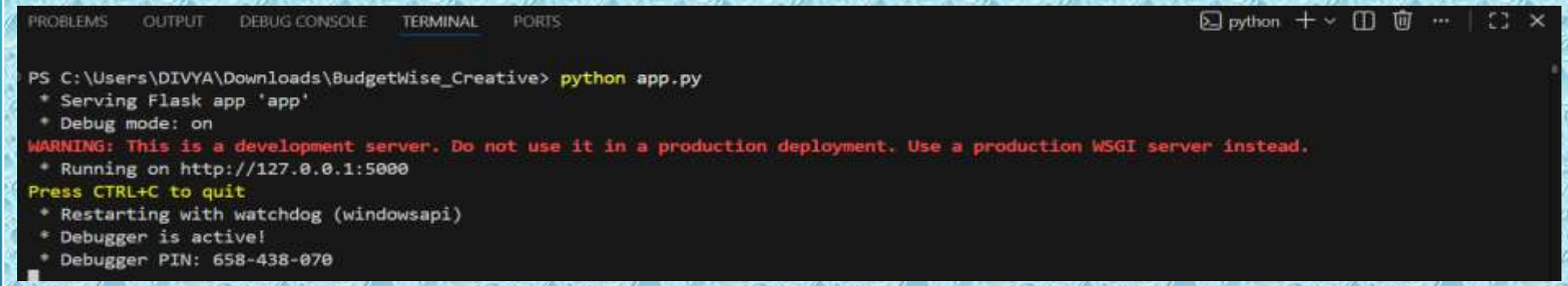
- **Python** — Core programming language used for backend logic, data analysis, and machine learning.
- **Flask** — Lightweight web framework used to build the application interface and handle routing.
- **Pandas** — Used for dataset handling, cleaning, grouping, and preprocessing operations.
- **NumPy** — Performs numerical computations and supports feature engineering for the ML model.
- **Matplotlib** — Generates bar charts, line graphs, and other data visualizations.
- **Seaborn** — Creates advanced and visually appealing statistical plots.
- **Scikit-Learn** — Used to build, train, and evaluate the Linear Regression machine learning model.
- **HTML/CSS** — Used for the front-end structure and styling of the dashboard and forms.

- The architecture is based on a simple client–server model using Flask.
- User inputs are handled through a web interface built with HTML and CSS.
- Data is stored and managed in a CSV file using Pandas and NumPy.
- A machine learning model (Scikit-Learn) analyzes past data to predict expenses.
- Visualizations and reports are generated using Matplotlib and displayed on the dashboard.



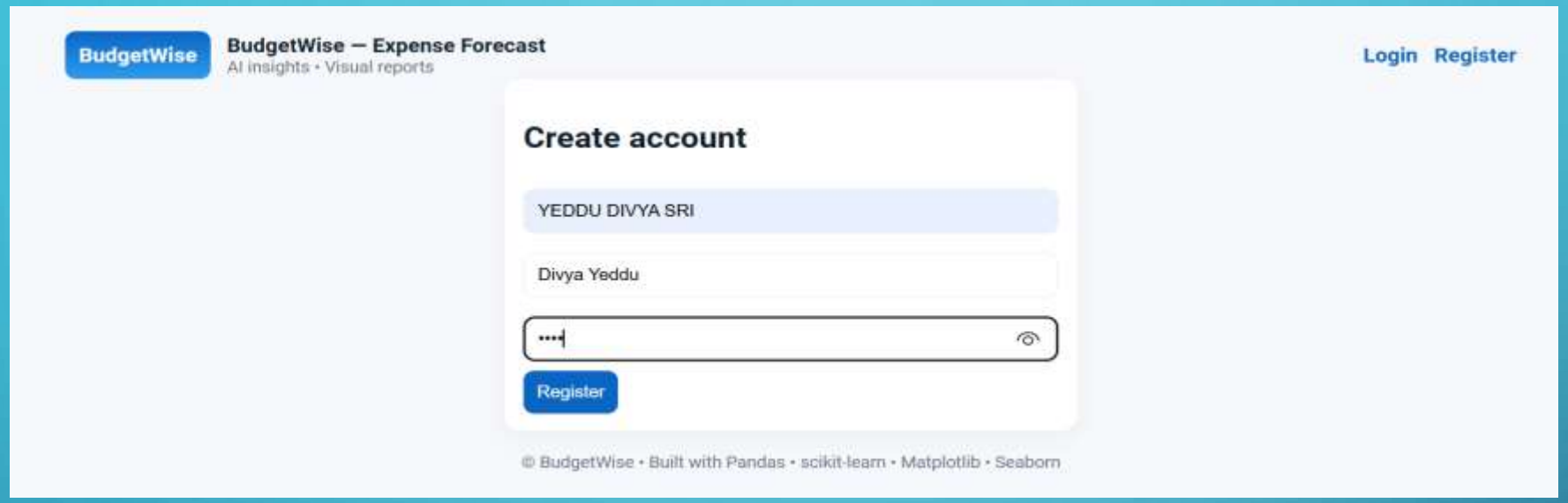
RESULTS AND OUTPUTS:

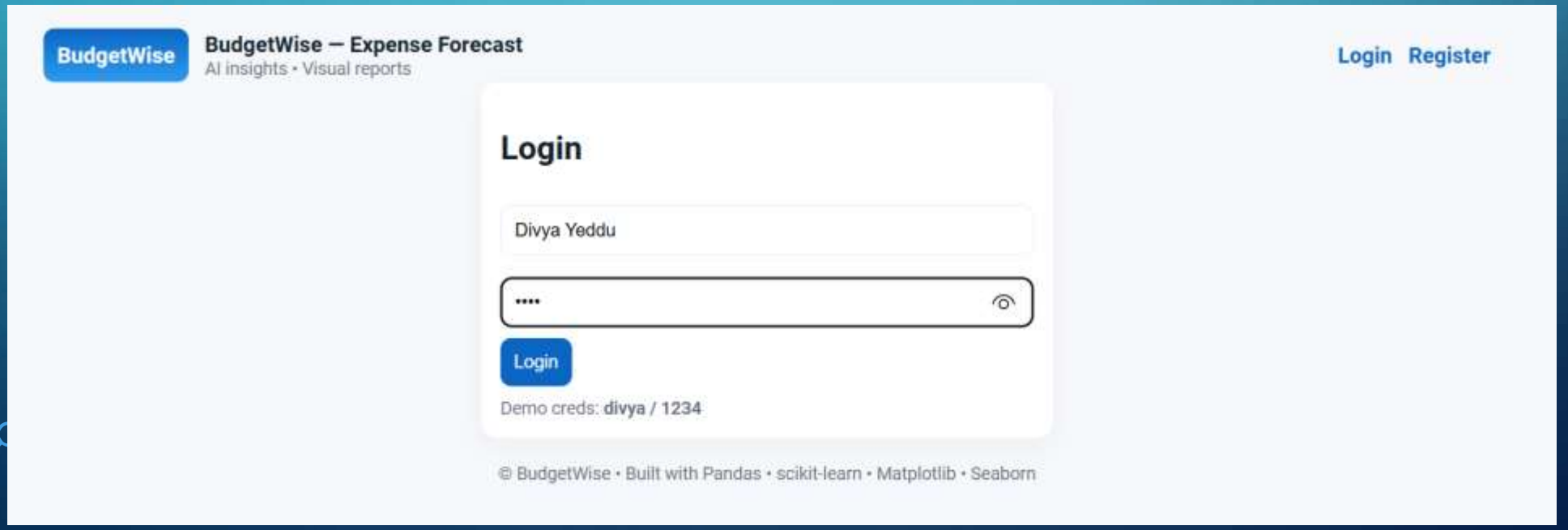
Step 1: Run python app.py in terminal. And it will generate a link **http://127.0.0.1:5000** or type **localhost:5000** in browser.
Click on that link it will direct into the login form.



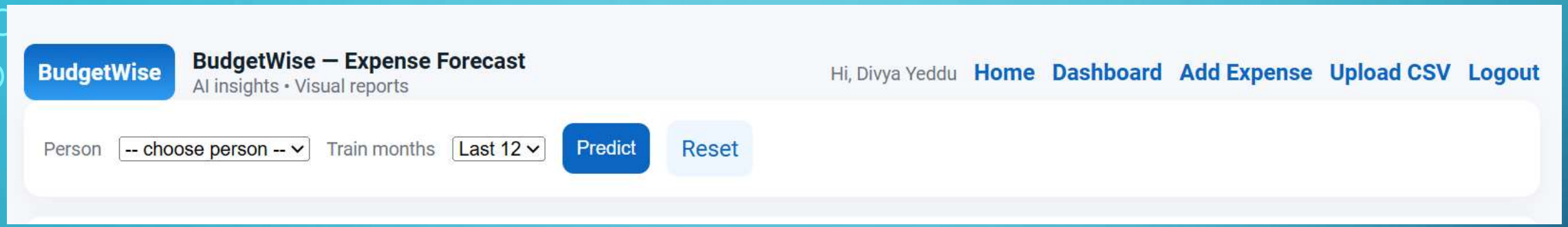
Step 2: The login form consists of default **username : divya** and **password:1234.** And there will be register form for the registration of new user. After the registration we can login and open the home page.

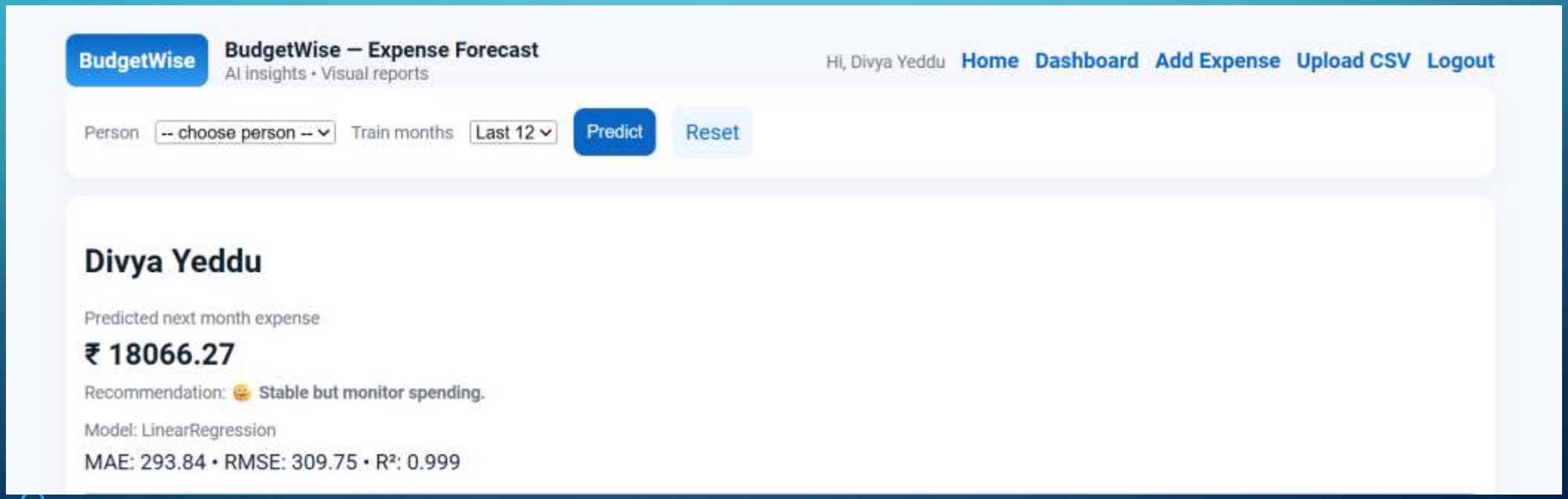
Register Form and Login Form:





Step 3: It will appear as shown in figure after login.
Click the person and select the train months and click predict to see the information and plots..

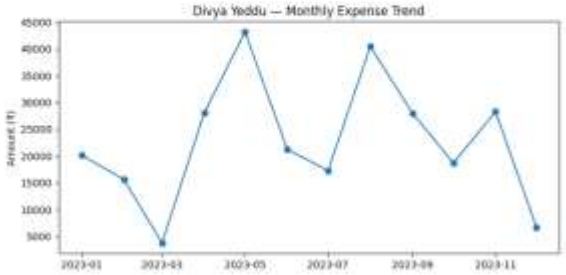




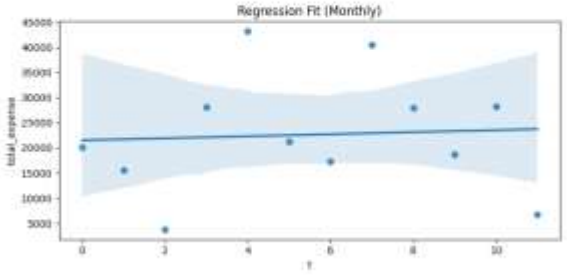
VISUALS OF PLOTS:

Visuals

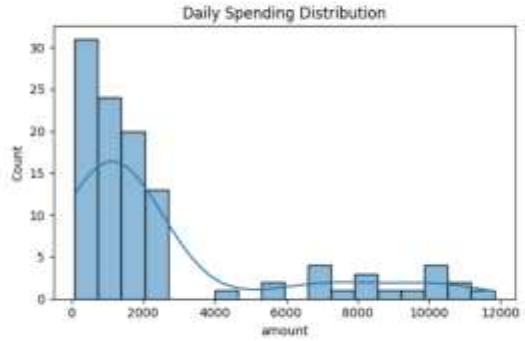
Trend



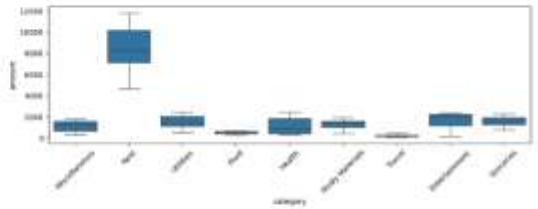
Regression



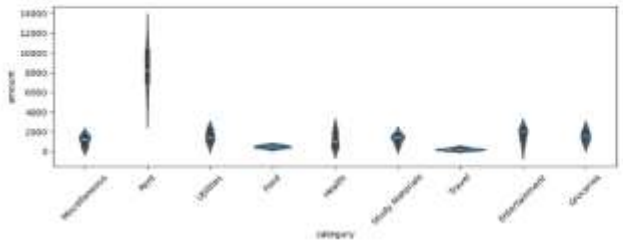
Histogram



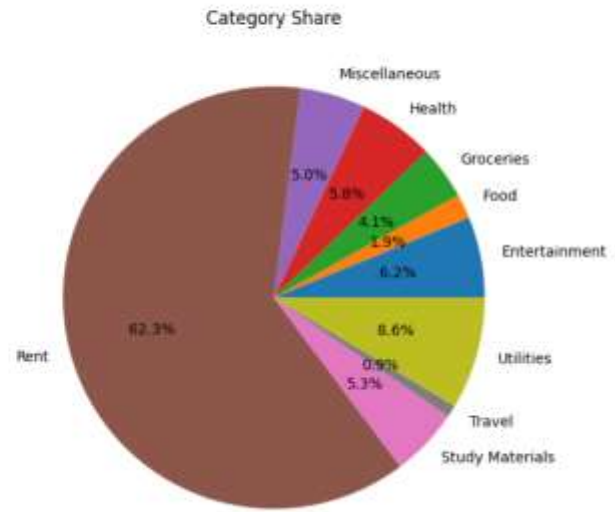
Boxplot



Violin



Pie



Here we can download the report and open the dashboard

Download PDF Report

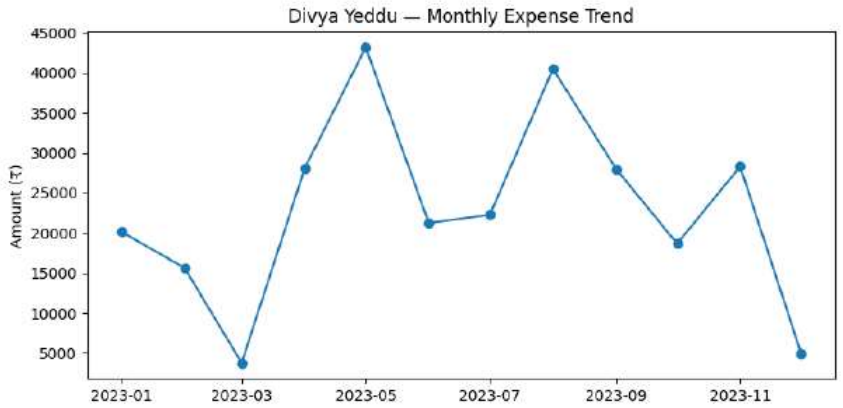
Open Divya Yeddu's dashboard

DOWNLOADED REPORT APPERS LIKE THIS:

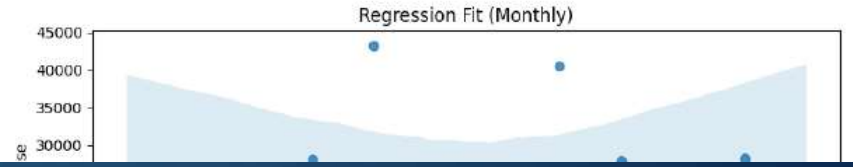
BudgetWise — Expense Report for Divya Yeddu

Metric	Value
Predicted next month expense (■)	17994.66
Model used	LinearRegression
MAE	305.75
RMSE	324.61
R^2	0.999

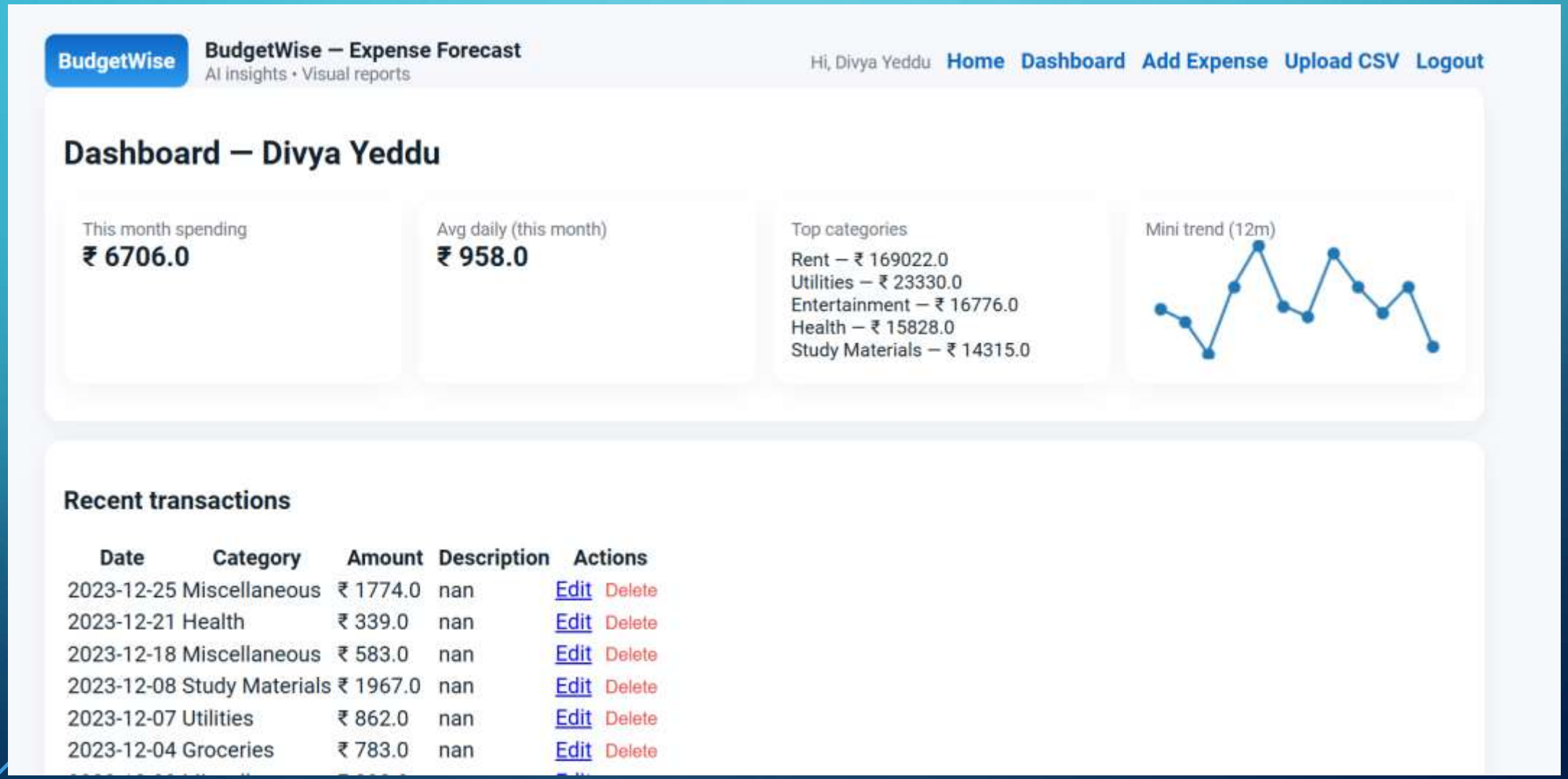
Trend



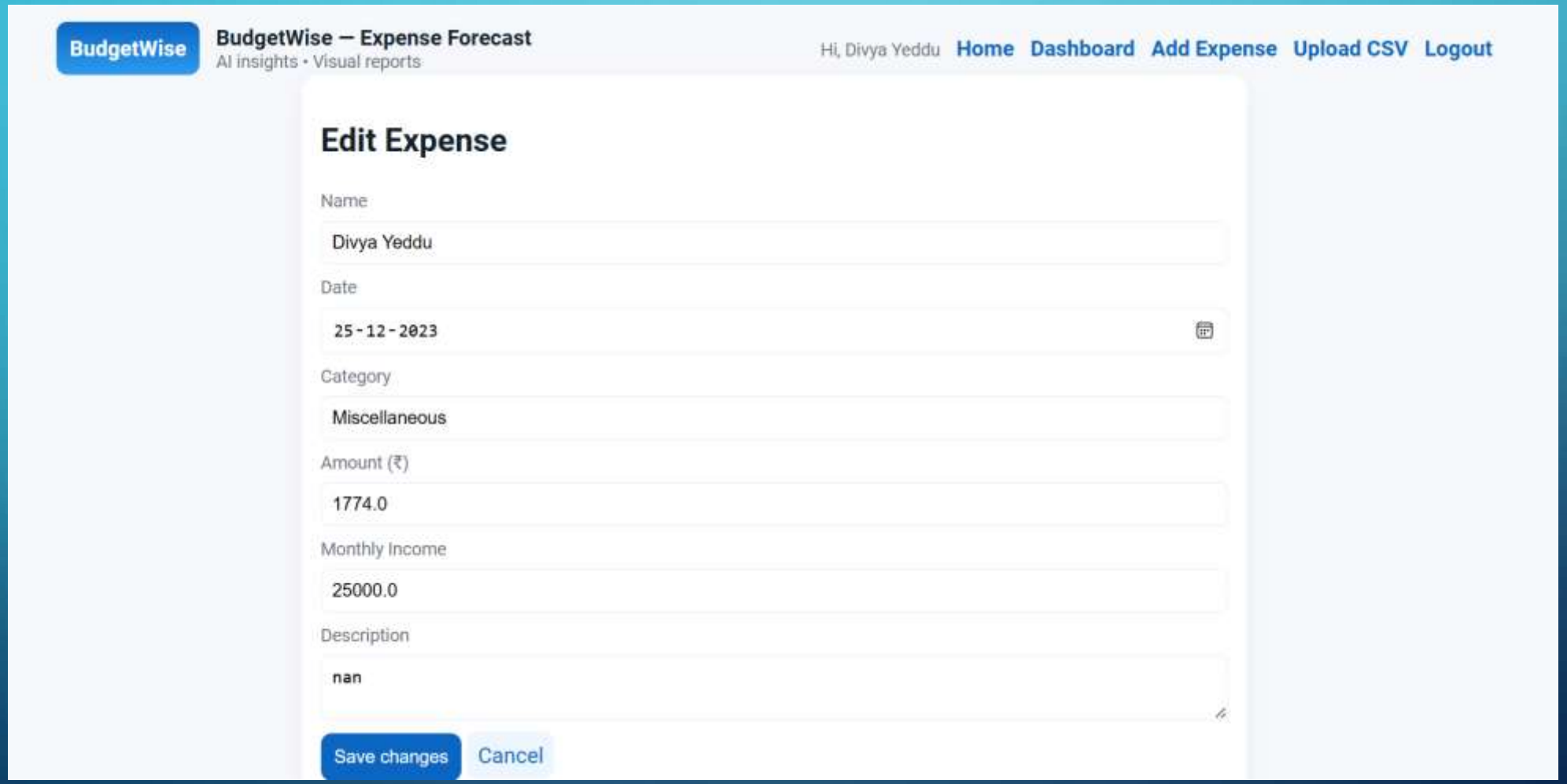
Regplot



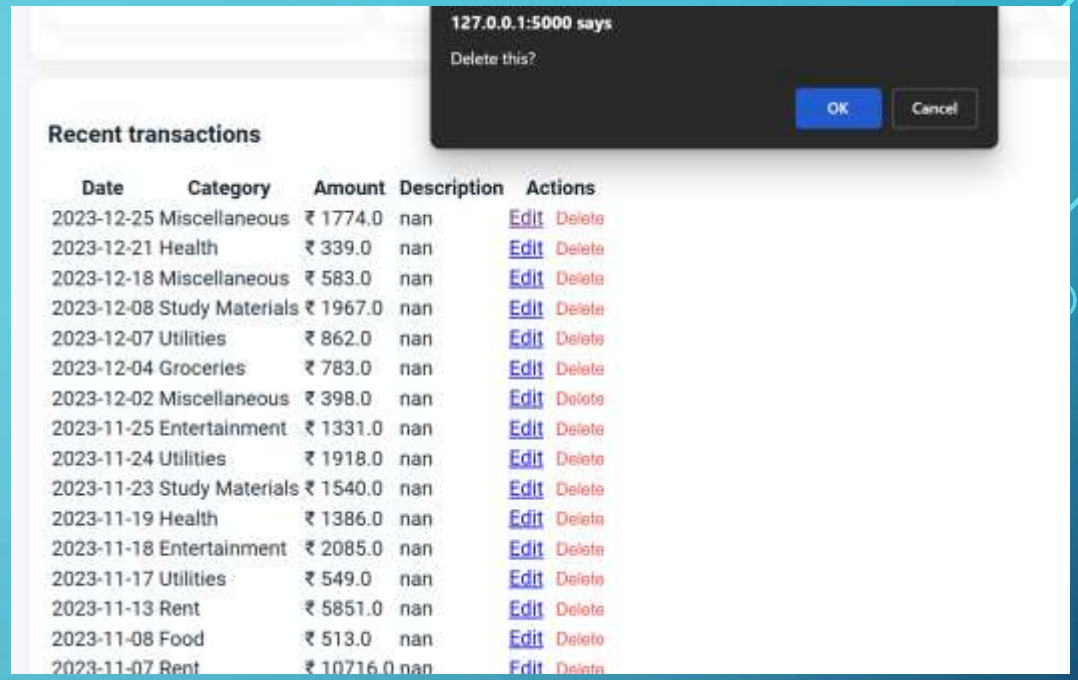
Step 4: Dashboard Overview



Step 5: Editing the particular Expense from the Transactions



Step 6: Delete the particular transaction



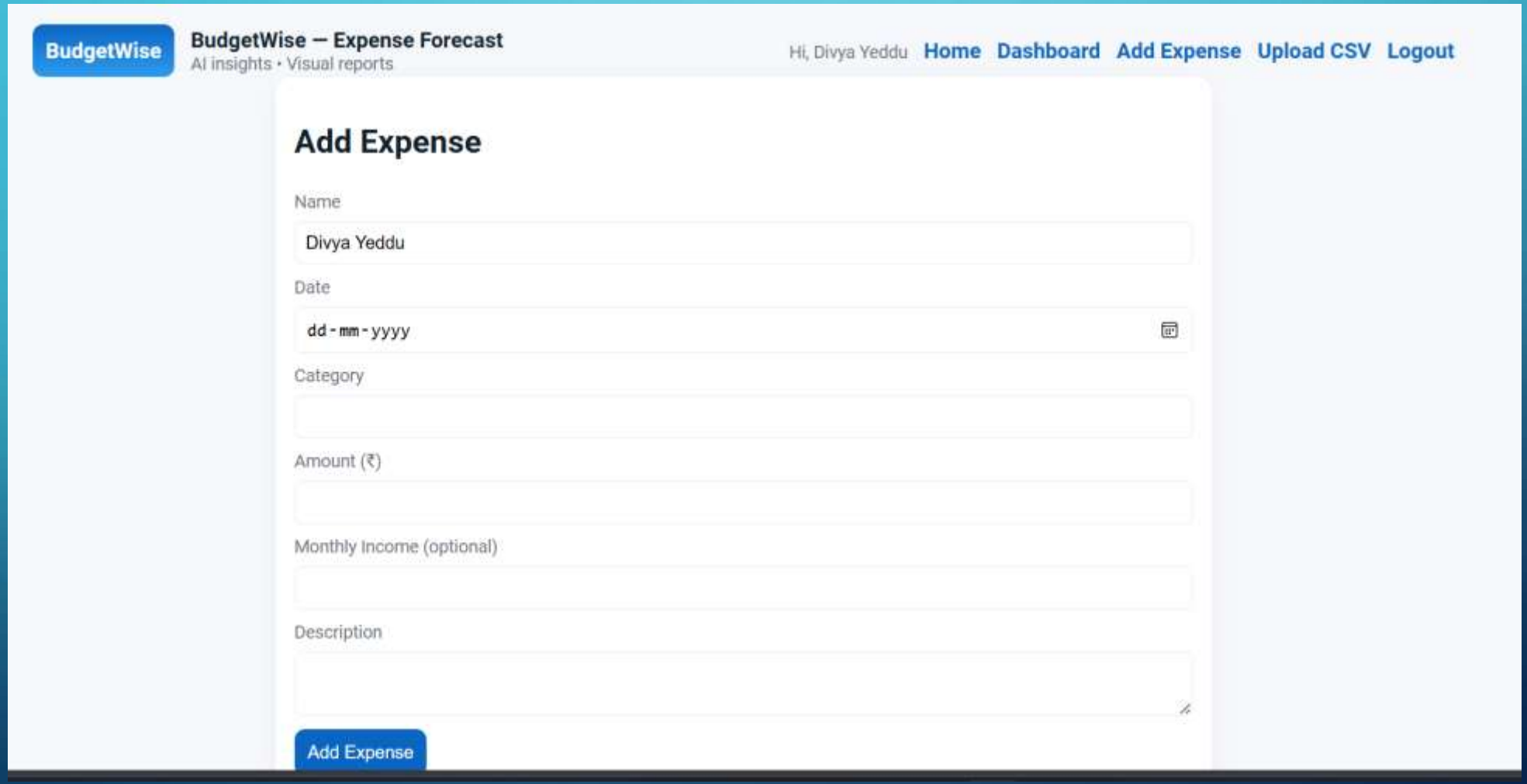
Recent transactions

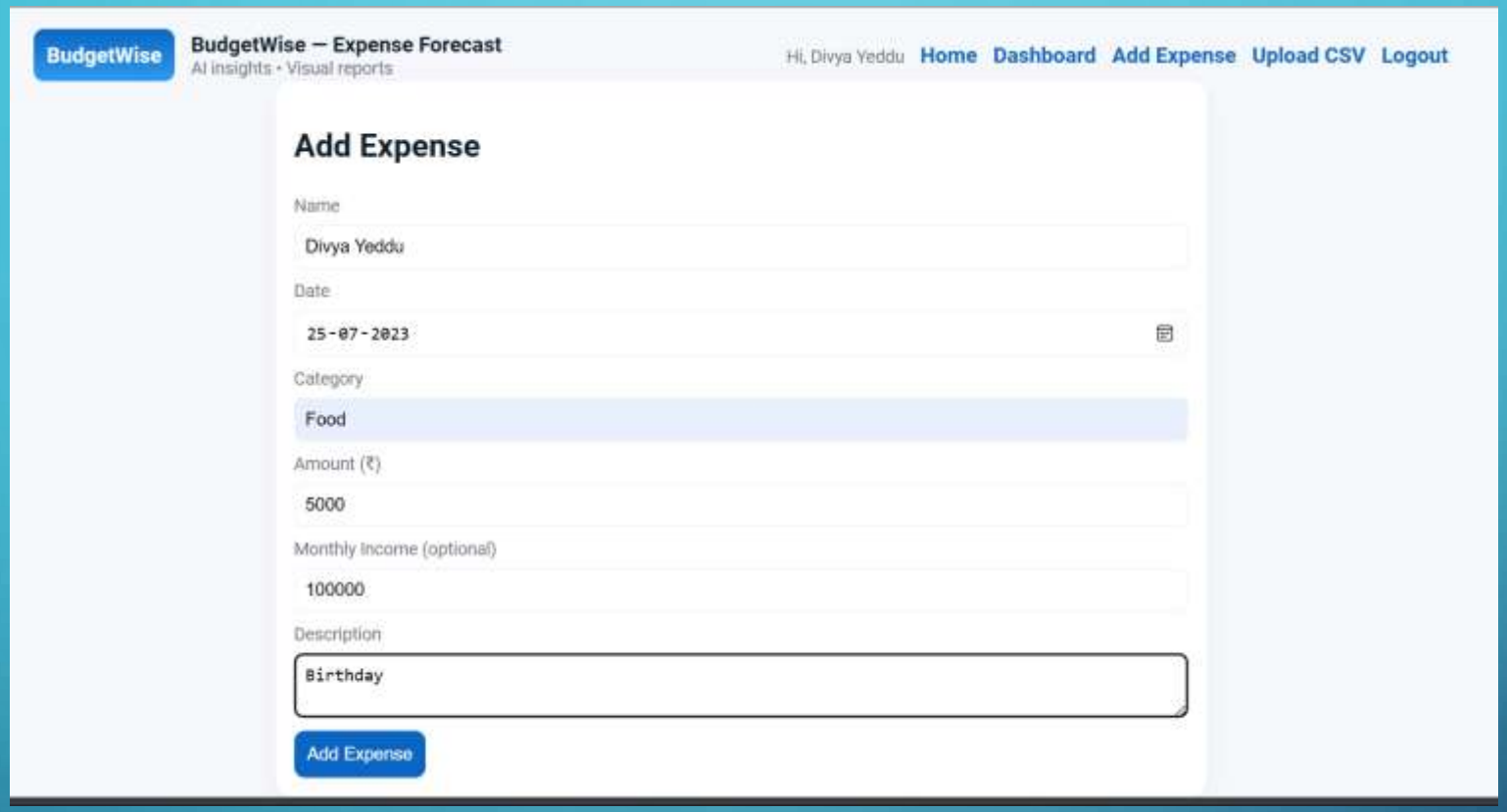
Date	Category	Amount	Description	Actions
2023-12-25	Miscellaneous	₹ 1774.0	nan	Edit Delete
2023-12-21	Health	₹ 339.0	nan	Edit Delete
2023-12-18	Miscellaneous	₹ 583.0	nan	Edit Delete
2023-12-08	Study Materials	₹ 1967.0	nan	Edit Delete
2023-12-07	Utilities	₹ 862.0	nan	Edit Delete
2023-12-04	Groceries	₹ 783.0	nan	Edit Delete
2023-12-02	Miscellaneous	₹ 398.0	nan	Edit Delete
2023-11-25	Entertainment	₹ 1331.0	nan	Edit Delete
2023-11-24	Utilities	₹ 1918.0	nan	Edit Delete
2023-11-23	Study Materials	₹ 1540.0	nan	Edit Delete
2023-11-19	Health	₹ 1386.0	nan	Edit Delete
2023-11-18	Entertainment	₹ 2085.0	nan	Edit Delete
2023-11-17	Utilities	₹ 549.0	nan	Edit Delete
2023-11-13	Rent	₹ 5851.0	nan	Edit Delete
2023-11-08	Food	₹ 513.0	nan	Edit Delete
2023-11-07	Rent	₹ 10716.0	nan	Edit Delete
2023-11-02	Travel	₹ 247.0	nan	Edit Delete
2023-11-01	Utilities	₹ 2160.0	nan	Edit Delete
2023-10-31	Health	₹ 956.0	nan	Edit Delete
2023-10-27	Miscellaneous	₹ 1595.0	nan	Edit Delete
2023-10-23	Food	₹ 411.0	nan	Edit Delete
2023-10-21	Rent	₹ 8478.0	nan	Edit Delete

Recent transactions

Date	Category	Amount	Description	Actions
2023-12-21	Health	₹ 339.0	nan	Edit Delete
2023-12-18	Miscellaneous	₹ 583.0	nan	Edit Delete
2023-12-08	Study Materials	₹ 1967.0	nan	Edit Delete
2023-12-07	Utilities	₹ 862.0	nan	Edit Delete
2023-12-04	Groceries	₹ 783.0	nan	Edit Delete
2023-12-02	Miscellaneous	₹ 398.0	nan	Edit Delete
2023-11-25	Entertainment	₹ 1331.0	nan	Edit Delete
2023-11-24	Utilities	₹ 1918.0	nan	Edit Delete

Step 7: Add Expense— we can add a new transaction.





BudgetWise

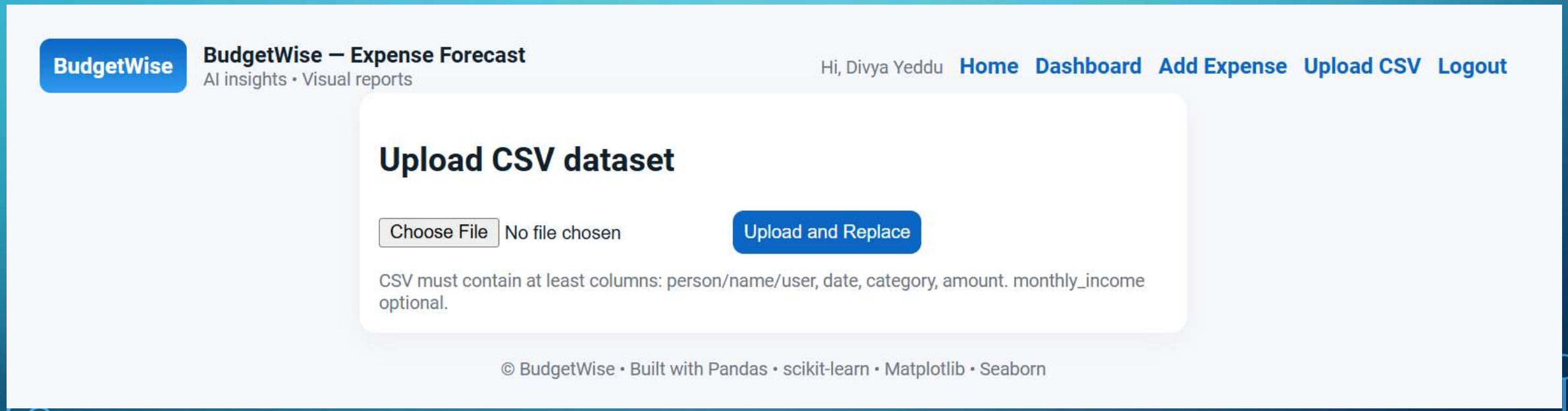
BudgetWise — Expense Forecast

AI insights • Visual reports

Hi, Divya Yeddu **Home** **Dashboard** **Add Expense** **Upload CSV** **Logout**

Expense added.

Step 8: Here we can upload the CSV.



Model Evaluation:

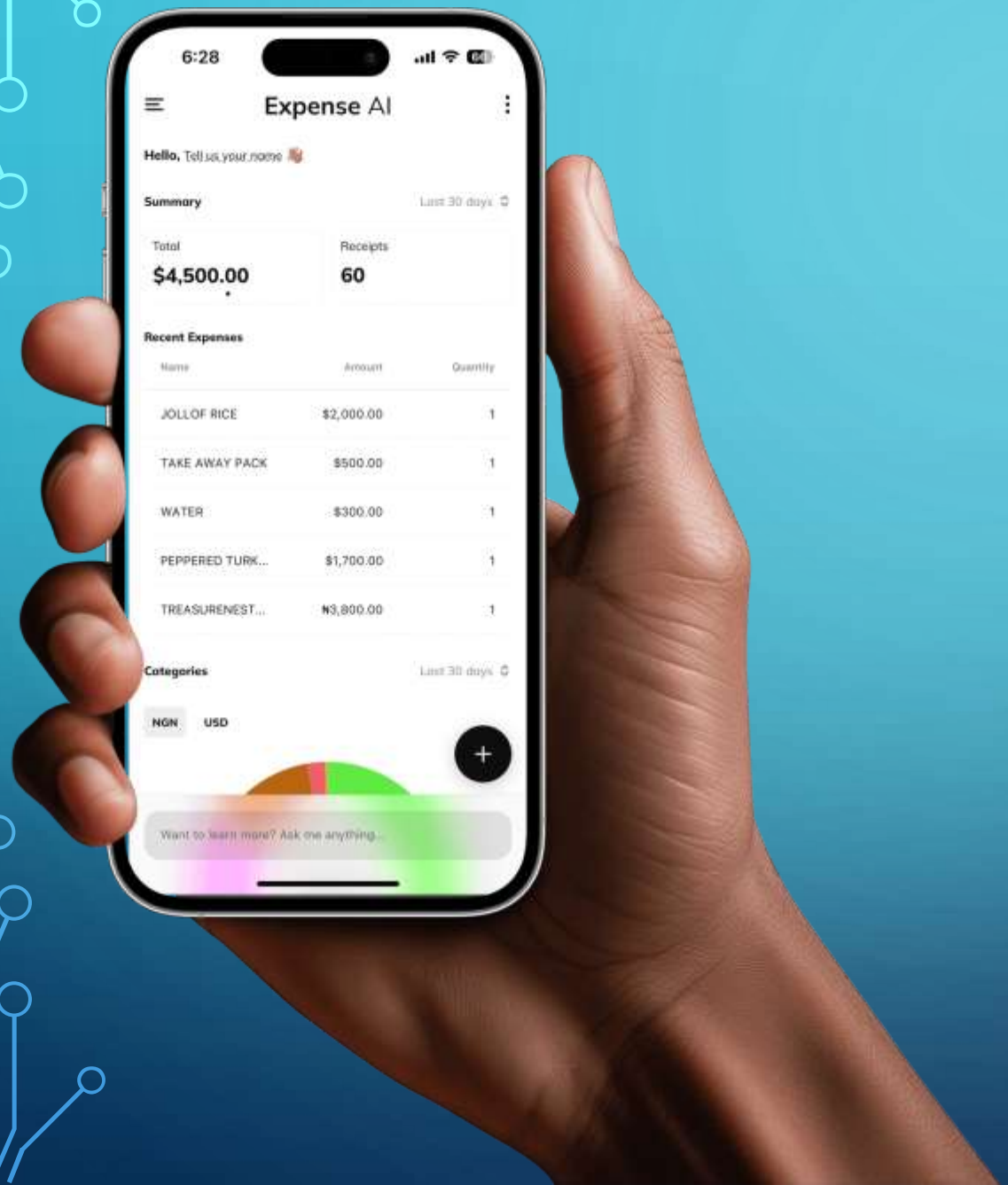
- The model accuracy was measured using standard **ML** metrics.
- **MAE** (Mean Absolute Error): Shows the average difference between actual and predicted values.
- **RMSE** (Root Mean Square Error): Measures error while giving more weight to larger mistakes.
- **R^2 Score** (Coefficient of Determination): Indicates how well the model fits the data.
- Results show the model provides reliable expense predictions.

Advantages:

- Simple and user-friendly interface suitable for any user.
- Machine Learning helps predict future expenses accurately.
- Visual charts make it easy to understand spending patterns.
- Lightweight system using CSV, no complex database required.
- Can be easily extended or upgraded with more features in the future.

Challenges Faced During Development:

- Handling CSV data updates without overwriting or losing records.
- Integrating machine learning prediction with Flask routing.
- Rendering multiple plots and ensuring they update correctly.
- Managing errors when users entered invalid or missing input.
- Fixing UI alignment and ensuring smooth navigation between pages.



Future Enhancements:

- Add a **mobile app** version for easier access on smartphones.
- Integrate a real database like MySQL or Firebase instead of CSV storage.
- Use advanced machine learning models like Random Forest or LSTM for better prediction accuracy.
- Add automatic expense categorization using NLP or OCR for reading bills/receipts.
- Enable multi-user cloud support with email login and secure authentication.

Conclusion

The system proves that automation and machine learning can simplify financial planning and improve budgeting accuracy.


THANK
YOU


Project Completed