Software Requirements Specification (SRS)

Project Name: Promptpie -AI-Driven Platform for Seamless Data Analysis and Interactive Insights

1. ABSTRACT

Title: Intelligent Data Analysis and Visualization Web Application with AI Integration

The development of our **"PromptPie"** web application designed to facilitate data analysis and visualisation for users. The **"PromptPie"** allows users to upload datasets, perform automated data processing and analysis, and generate interactive **charts** and **graphs.** Integrated with **advanced AI technologies**, including **natural language processing** (**NLP**), the platform enables users to ask questions in plain language and receive insightful answers. The **"PromptPie"** aims to make **data analysis** accessible and intuitive, bridging the gap between raw data and actionable insights.

In the rapidly evolving landscape of data-driven decision-making, **"PromptPie"** stands at the forefront of innovation, leveraging advanced language models and automation to transform raw data into actionable insights effortlessly. This cutting-edge application integrates Google's Gemini LLM to revolutionise how users interact with databases and derive meaningful analytics.

"PromptPie" makes it easy to analyse data by generating SQL queries with natural language input. The deep language AI understands what a user wants, puts that into precise SQL queries, and runs them to fetch desirable data from the database. Such seamless interactions take out the need for deep knowledge of SQL in interacting between a user and a machine, hence making data analytics more accessible.

On its retrieval, **"PromptPie"** uses a sophisticated pipeline to auto-suggest visualisations and analytics by way of Python modules and Chart.js. At the click of a button, the user will experience dynamic chart visualisations, hypothesis testing, and linear regression or classification analysis. This type of automation ensures that the entire path of analytics is covered, eliminating manual coding so users can focus on result interpretation and data-driven decision-making.

Advanced AI, robust data handling, and automated analytics pull **"PromptPie"** through to being a powerful tool for business individuals, researchers, and enthusiasts alike. It provides a simplified way of evaluating and visualising data, enables one to understand their data at a deeper level and derive more informed decisions.

2. INTRODUCTION

In today's fast-paced and data-rich environment, the ability to quickly and accurately transform raw data into actionable insights is a crucial competitive advantage. Traditional methods of data analysis, which often require extensive knowledge of programming languages and database management, pose significant barriers to many users. As organisations increasingly rely on data-driven decision-making, there is a growing need for tools that democratize data access and analysis.

“PromptPie” emerges as a solution to this context. By integrating Google’s Gemini LLM, **“PromptPie”** enables users to generate SQL queries through natural language input, thereby eliminating the need for deep technical expertise. This innovation transforms the user experience, making data analytics more intuitive and accessible.

Beyond query generation, **“PromptPie”** features an automated analytics pipeline that suggests appropriate visualisations and performs advanced statistical analyses using Python modules and Chart.js. This comprehensive approach ensures that users can seamlessly transition from data retrieval to interpretation and decision-making without the need for manual coding. The ability to generate charts, conduct hypothesis testing, and perform linear regression or classification analysis serves as a versatile tool for business professionals, researchers, and data enthusiasts.

3. PROBLEM SOLVING APPROACH

3.1 Problem Identification

- **Develop a web application** that offers easy data upload, analysis, and visualisation.
- **Incorporate AI** for natural language query responses and automated insights.

3.2 Requirements Gathering

- **Conduct user research** through surveys and interviews.
- **Identify key features** like data upload, automated analysis, interactive dashboards, and natural language processing.

3.3 Implementation

- **Develop core functionalities**: data upload, processing, and basic analytics.
- **Implement advanced features**: interactive charts, dashboards, and gain of insights.

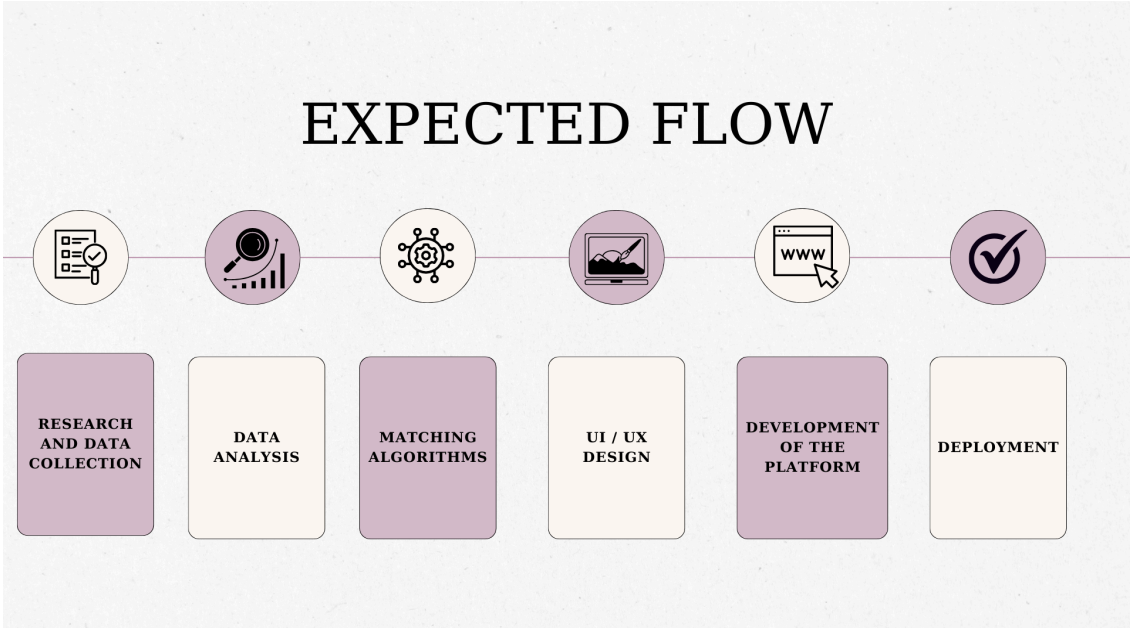
3.4 Testing and Feedback

- **Perform iterative testing** with real users to identify issues.
- **Collect feedback** and refine features based on user experiences and performance data.

3.5 Deployment and Maintenance

- **Deploy the application** using cloud services for scalability.
- **Establish a maintenance plan** for updates, bug fixes, and user support.

4.



5. TECHNOLOGY STACK

5.1 UI/UX DESIGN:

Figma: Figma is a cloud-based design and prototyping tool used by designers to create user interfaces, prototypes, and interactive designs collaboratively. It offers a web-based platform where teams can work together in real-time, allowing for seamless collaboration and feedback.

5.2 LARGE LANGUAGE MODEL(LLM):

Google's Gemini LLM: For understanding natural language input and generating SQL queries.

5.3 DATABASE:

MYSQL : MySQL is a popular open-source relational database management system (RDBMS) that is widely used for storing and managing structured data. It provides a robust and scalable platform for building and deploying database-driven applications.

5.4 FRONTEND DEVELOPMENT:

React.js: React.js is a popular JavaScript library developed by Facebook for building user interfaces, particularly single-page applications. It allows developers to create reusable UI components and manage the state of complex applications efficiently.

5.5 BACKEND DEVELOPMENT:

Django: Django is a high-level Python web framework that encourages rapid development and clean, pragmatic design. It provides a robust set of tools and features out of the box, including an ORM, authentication, and an admin interface, making it easier to build secure and maintainable web applications.

5.6 VISUALISATION:

Chart.js: Chart.js is a popular JavaScript library used for creating simple, flexible, and responsive data visualisations. It supports a variety of chart types, including bar, line, pie, and radar charts, and allows developers to customise and animate their charts easily.

5.7 VERSION CONTROL:

Git: Git is a widely used distributed version control system that helps developers manage and track changes in their code. It enables collaborative development by allowing multiple contributors to work on a project simultaneously, with features like branching, merging, and version history to ensure efficient and organised code management.

6. EXPECTED OUTCOME

6.1 Enhanced User Experience:

- **Natural Language Querying**: Users can interact with the application using natural language, making it accessible even to those without technical expertise in SQL.
- **Automated Insights**: Users receive automated suggestions for visualisations and analyses, reducing the need for manual intervention and allowing them to focus on interpreting results.

6.2 Efficient Data Processing:

- **Seamless Data Retrieval**: The application translates natural language inputs into precise SQL queries, efficiently fetching the required data from the database.
- **Sophisticated Data Handling**: The backend handles large datasets, processes complex queries, and performs analytics quickly and reliably.

6.3 Comprehensive Analytics and Visualization:

- **Dynamic Visualisations**: Users can generate interactive charts and graphs with a single click, aiding in better data understanding and decision-making.
- **In-Depth Analysis**: The application offers hypothesis testing, linear regression, and classification analysis, providing users with detailed insights into their data.

6.4 Broad Accessibility:

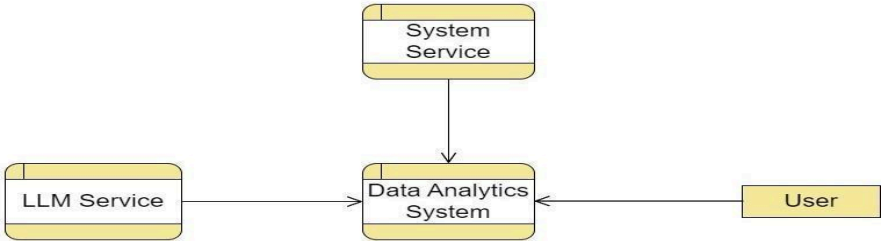
- **User-Friendly Interface**: The React-based frontend ensures a responsive and intuitive user experience.
- **Cross-Platform Compatibility**: The application can be accessed on various devices, ensuring flexibility and convenience for users.

6.5 Business Impact:

- **Informed Decision-Making**: Businesses can leverage the tool to gain deep insights into their data, leading to more informed and strategic decisions.
- **Time and Cost Efficiency**: Automation of data retrieval and analysis reduces the time and cost associated with manual data handling and analysis.

DATA FLOW DIAGRAM

LEVEL 0



LEVEL 1

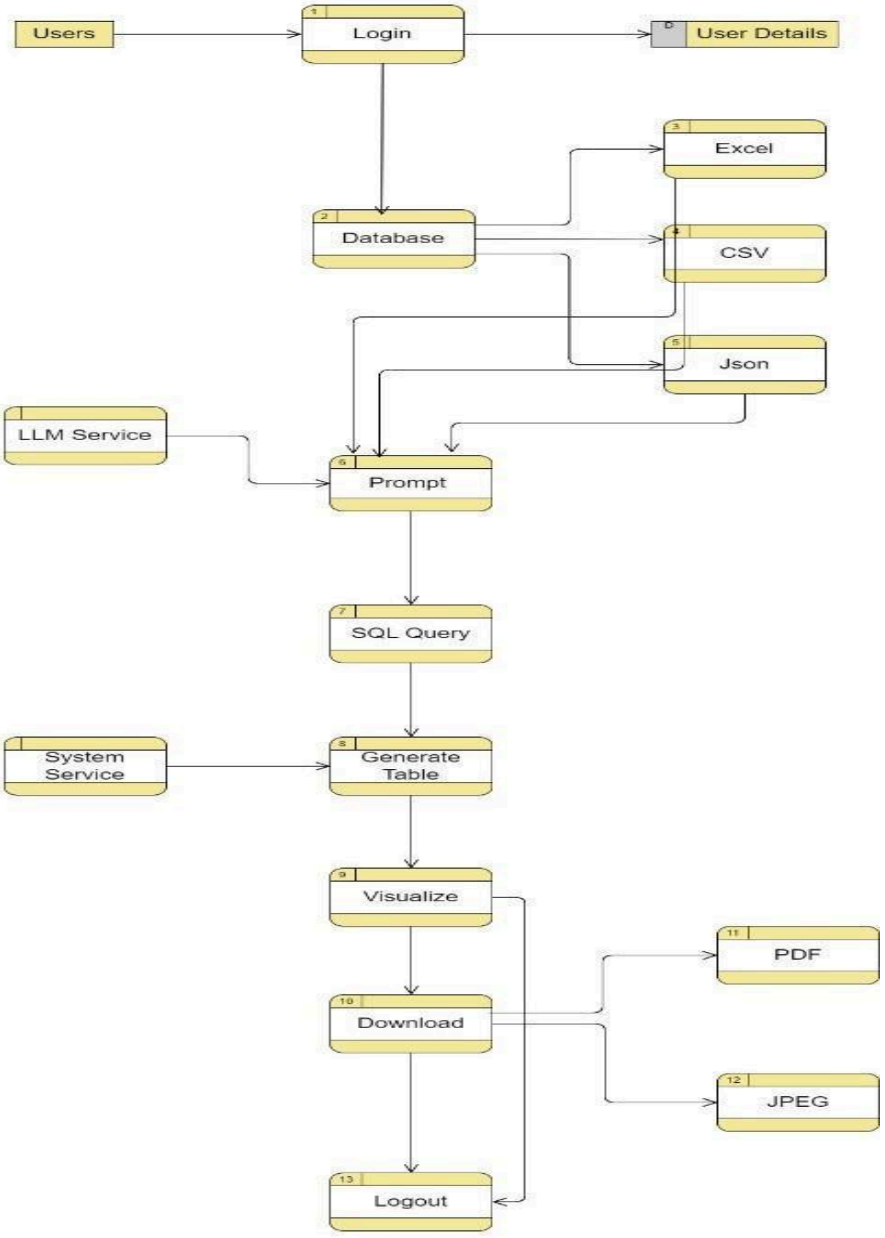


Table 1 - User Details :

Email	Username	Password

LEVEL 2

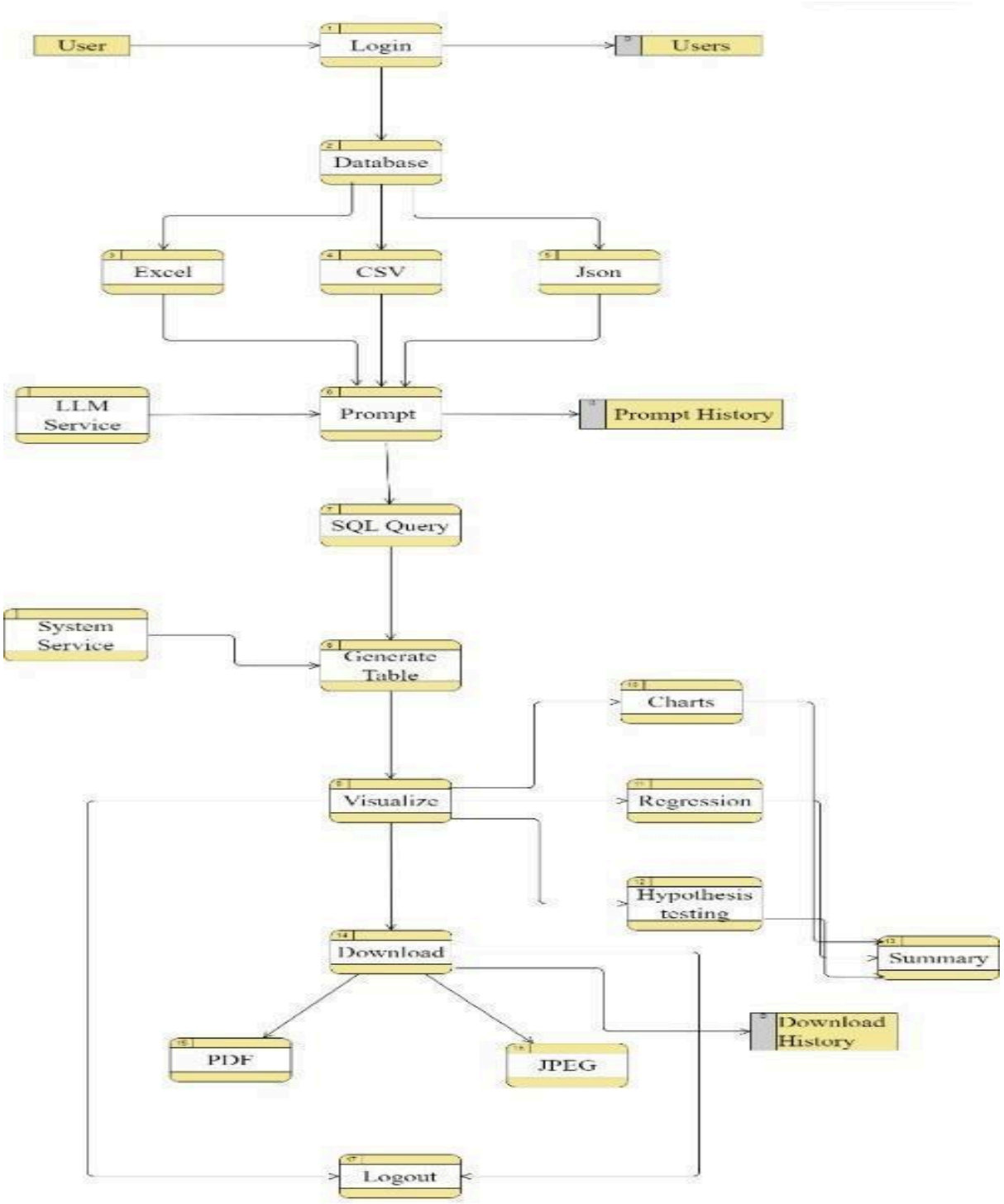


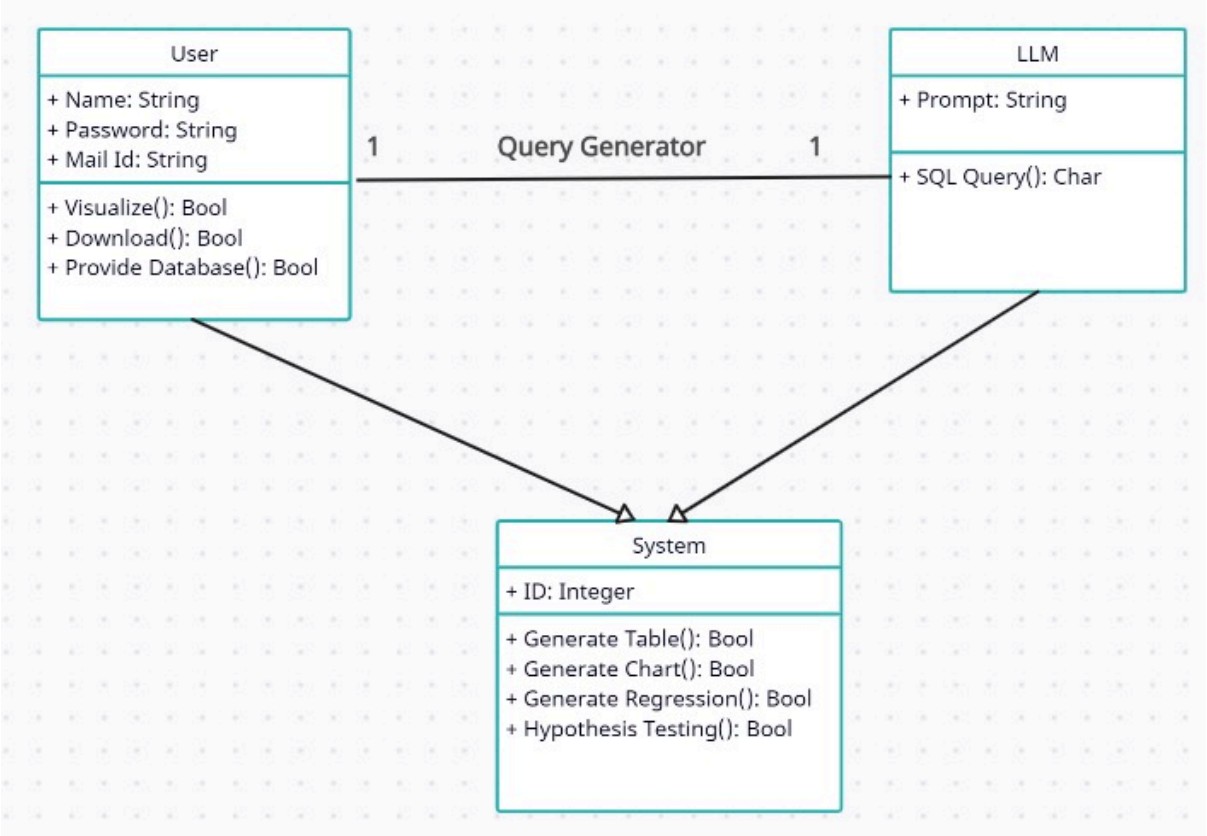
Table 2 - : Prompt History

Prompt	Date	Time

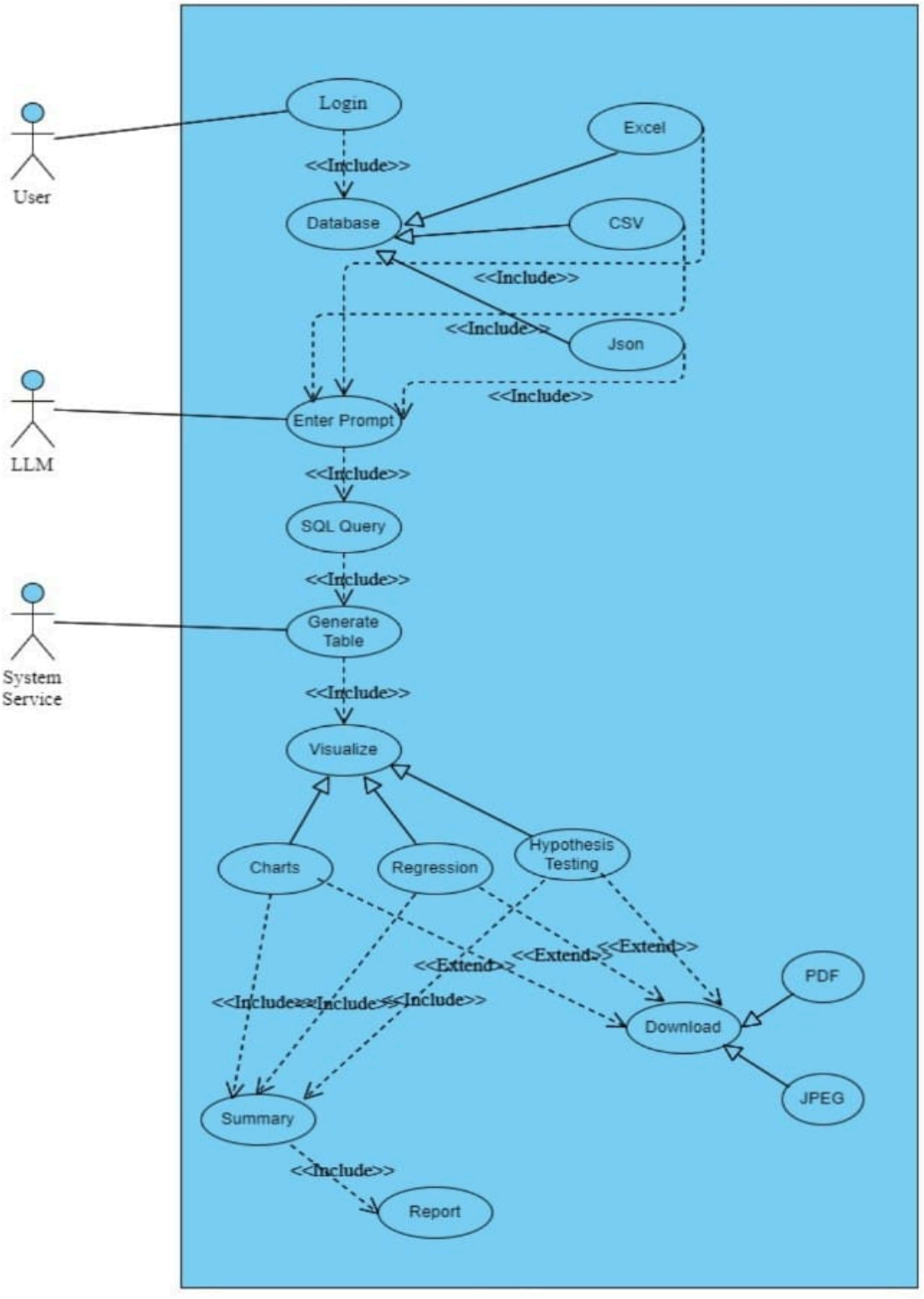
Table 3 - Download History :

Downloaded Format	Downloaded File	Date	Time

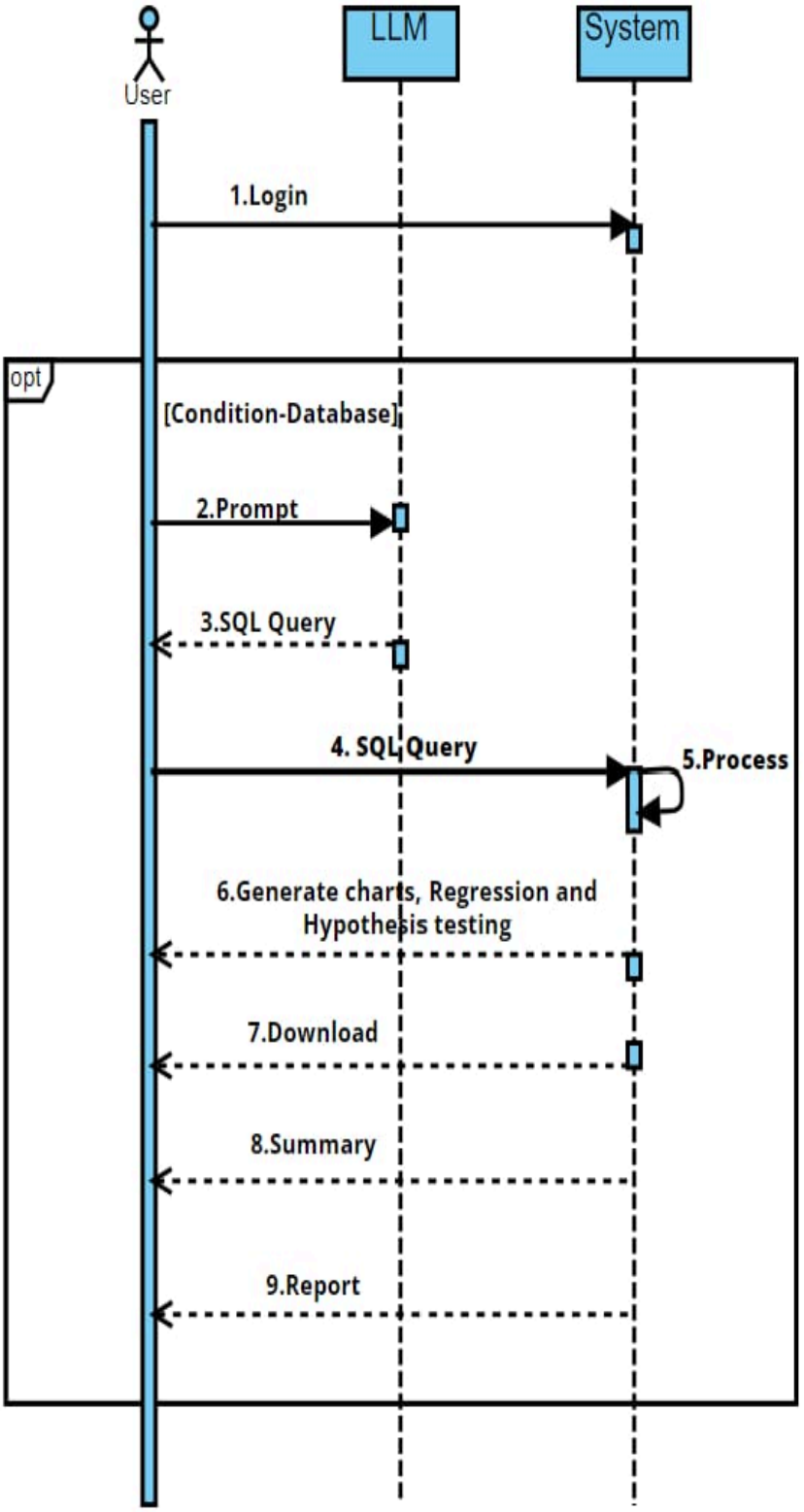
CLASS DIAGRAM



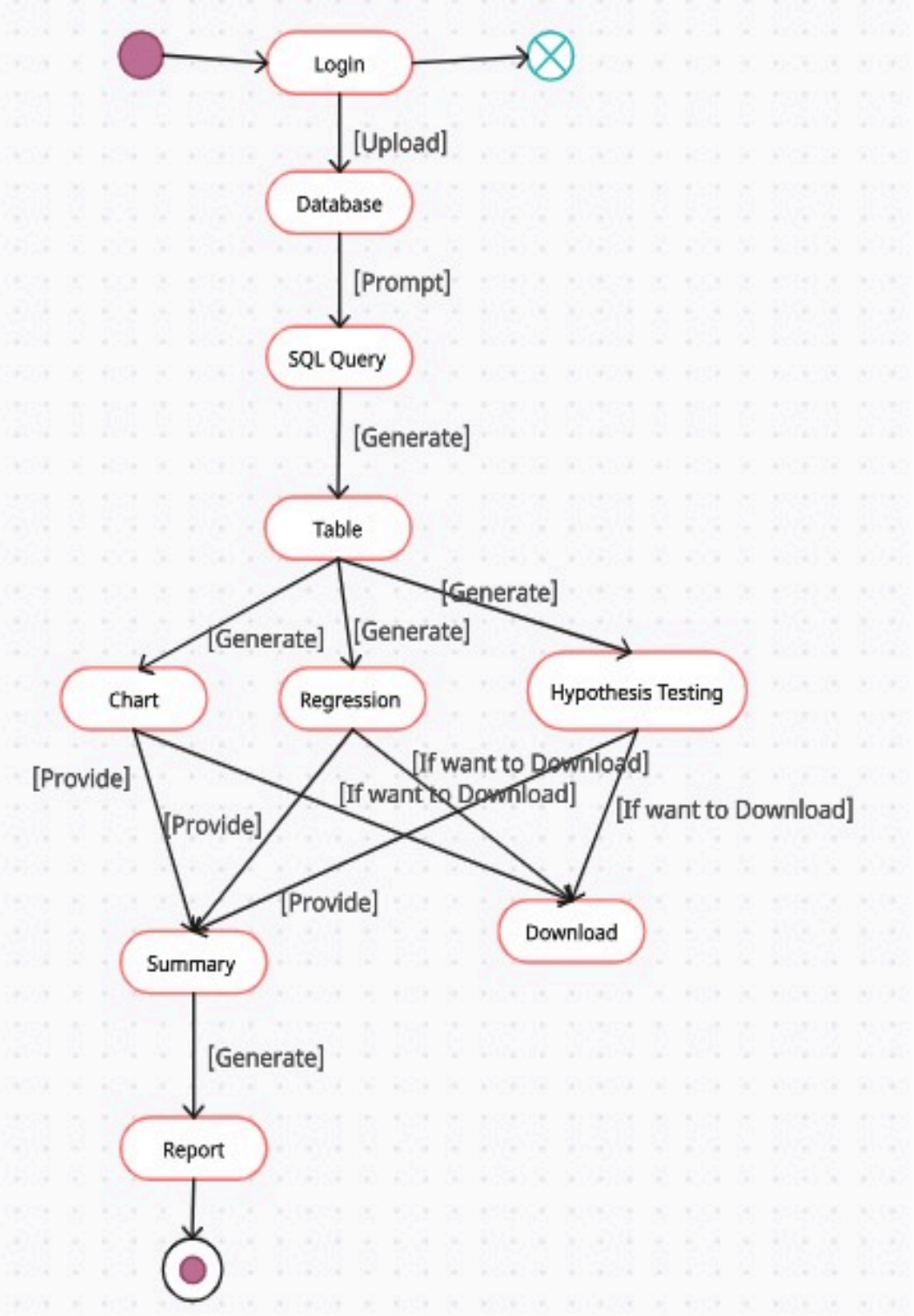
USE CASE DIAGRAM



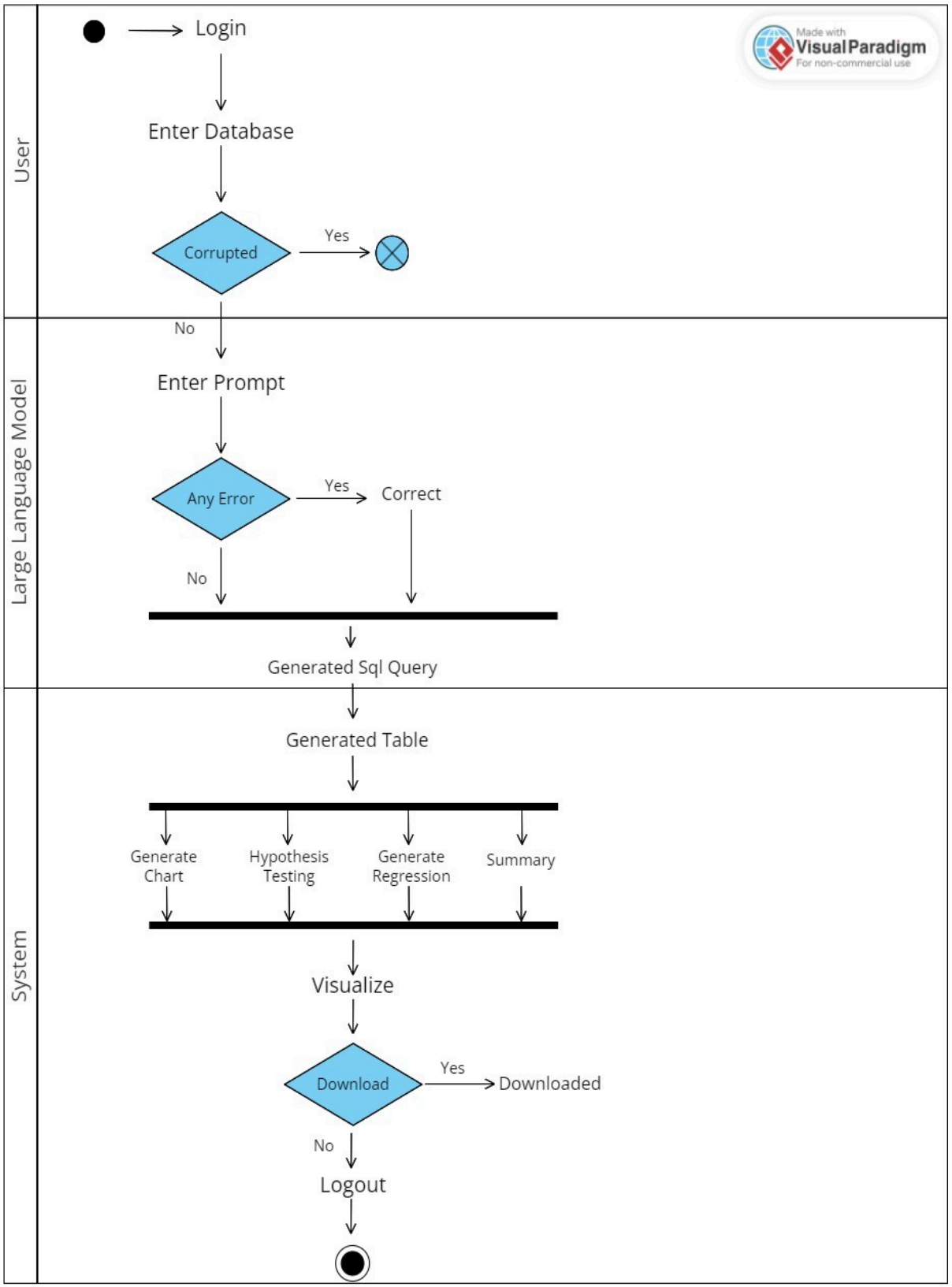
SEQUENCE DIAGRAM



STATE CHART DIAGRAM



ACTIVITY DIAGRAM



UI/UX

1. HOME PAGE

2. Sign Up Page

PROMPTPIE

First Name *

Email Address *

Password *

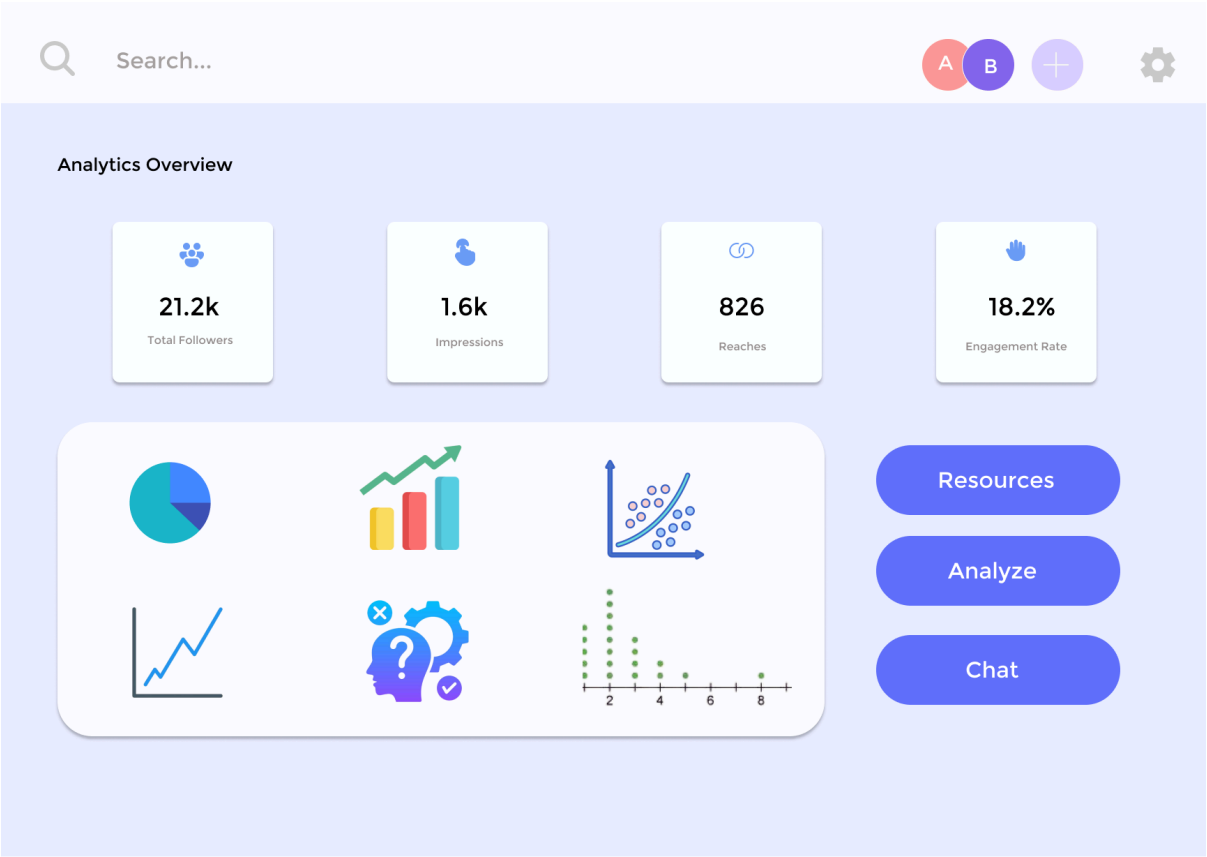
Sign Up

Already Have An Account? Log In

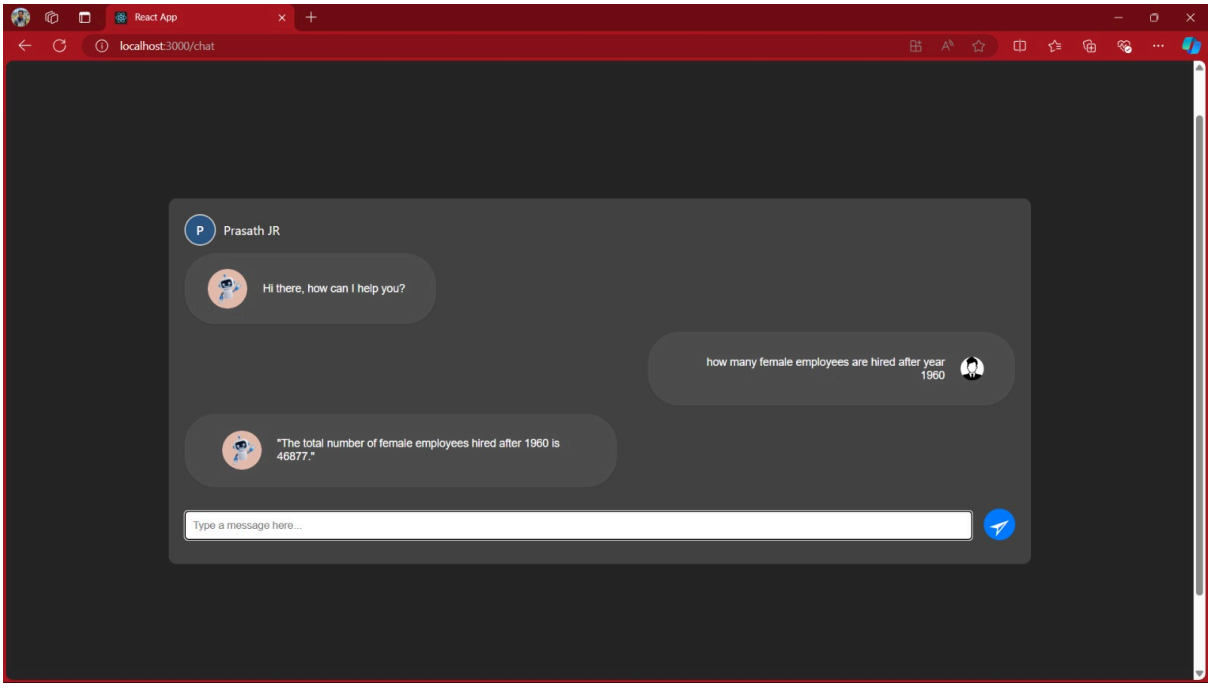
Or

Sign In with google

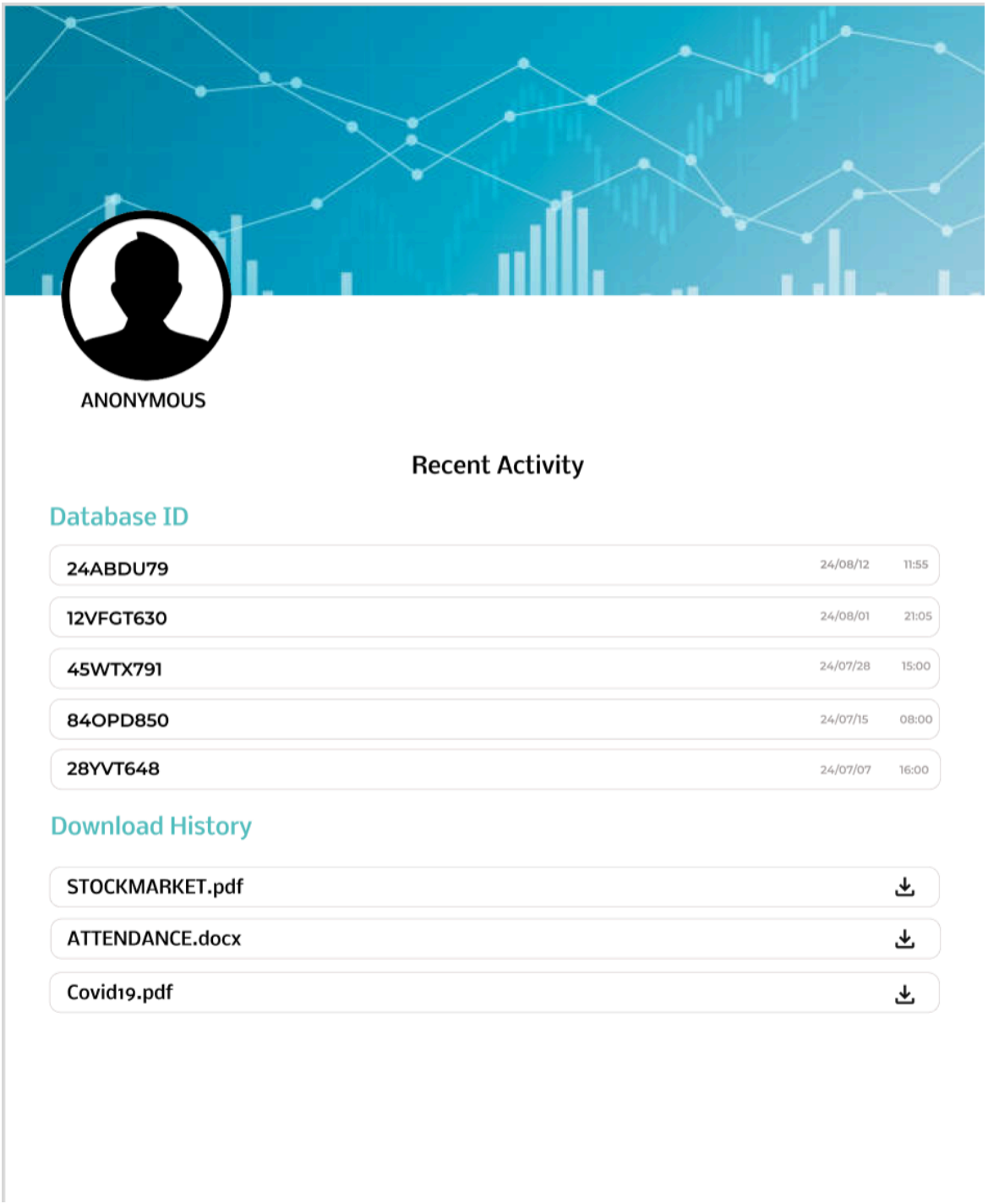
3. DashBoard



4. CHATBOT



5. Profile History



7. CONCLUSION

From seamless data uploads to dynamic visualisations and advanced analytics, "PromptPie" bridges the gap between raw data and actionable insights. This innovative tool not only enhances user experience and accessibility but also empowers businesses to make informed, strategic decisions swiftly and cost-effectively. "PromptPie" stands as a testament to the future of intelligent data analysis and visualisation, setting a new standard for user-friendly, AI-driven solutions.

8. REFERENCES

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