Paper ID: ICAIES-

Conversational Database Interaction Using Lang Chain and NLP

C.P. Susmitha[1], C.Jyoshitha[2], J.Hemasree[3] ,R. Ramya[4],

Department of Computer Science and Engineering (Data Science)

Sreenivasa Institute of Technology and Management Studies, Autonomous

Chittoor, Andhra Pradesh517127, India

*Corresponding Author Email: jyoshitha136@gmail.com

Abstract – In the era of AI-driven data accessibility, natural language processing (NLP) is revolutionizing how users interact with databases. This project explores the integration of Lang Chain with SQL databases to facilitate conversational data retrieval through natural language queries. By leveraging Lang Chain's advanced language models, the system translates user queries into structured SQL statements, eliminating the need for SQL expertise and enabling intuitive data exploration. For demonstration, the project utilizes the Chinook dataset, a sample database modeled after a digital media store, containing structured information about customers, employees, artists, albums, tracks, invoices, and sales transactions. This dataset is ideal for simulating real-world applications such as e- commerce analytics, customer insights, and business intelligence. The system is implemented with SQLite but is designed to scale seamlessly to more robust database management systems like MySQL or PostgreSQL. Users interact via a chat-based interface, querying the dataset with questions like "List all albums by The Beatles" or "Show the top 5 customers by total purchases". Lang Chain processes these requests by dynamically generating SQL queries, retrieving the relevant data, and presenting the results in a user-friendly format. This approach enhances accessibility, enabling business professionals, analysts, and non-technical users to extract valuable insights effortlessly. By combining natural language understanding with database management, the project lays the foundation for AI-powered data exploration, streamlining decision-making processes and democratizing access to structured information.

Index Terms - *Lang Chain, SQL databases, Natural language queries, Conversational data retrieval, Chinook dataset, MySQL, Dynamic SQL query generation, Chat-based interface, AI-powered data exploration.*