

Plug into AI with AI21

SQLGenius

# SQLGenius

A smart C-Suite executives virtual assistant

AI21 labs

lab  
lab  
ai

# Agenda

- Use Case Description
- Where we are now
- Architecture
- Demo
- Future Scope
- Get in Touch



# Use Case



Problem

- Top executives and leaders have to depend on some analyst to get data or reports for them
- Little or no coding experience



Solution

- Smart virtual assistant which can provide them with reports and required data immediately
- Data can be downloaded and plots generated can be saved
- Voice Based Assistant
- Email Chat History or Data or Reports



Tech Stack

- AI21 - Large Language Models & LangChain
- Any cloud server to host application
- Database Credentials can be provided at run time
- Web App

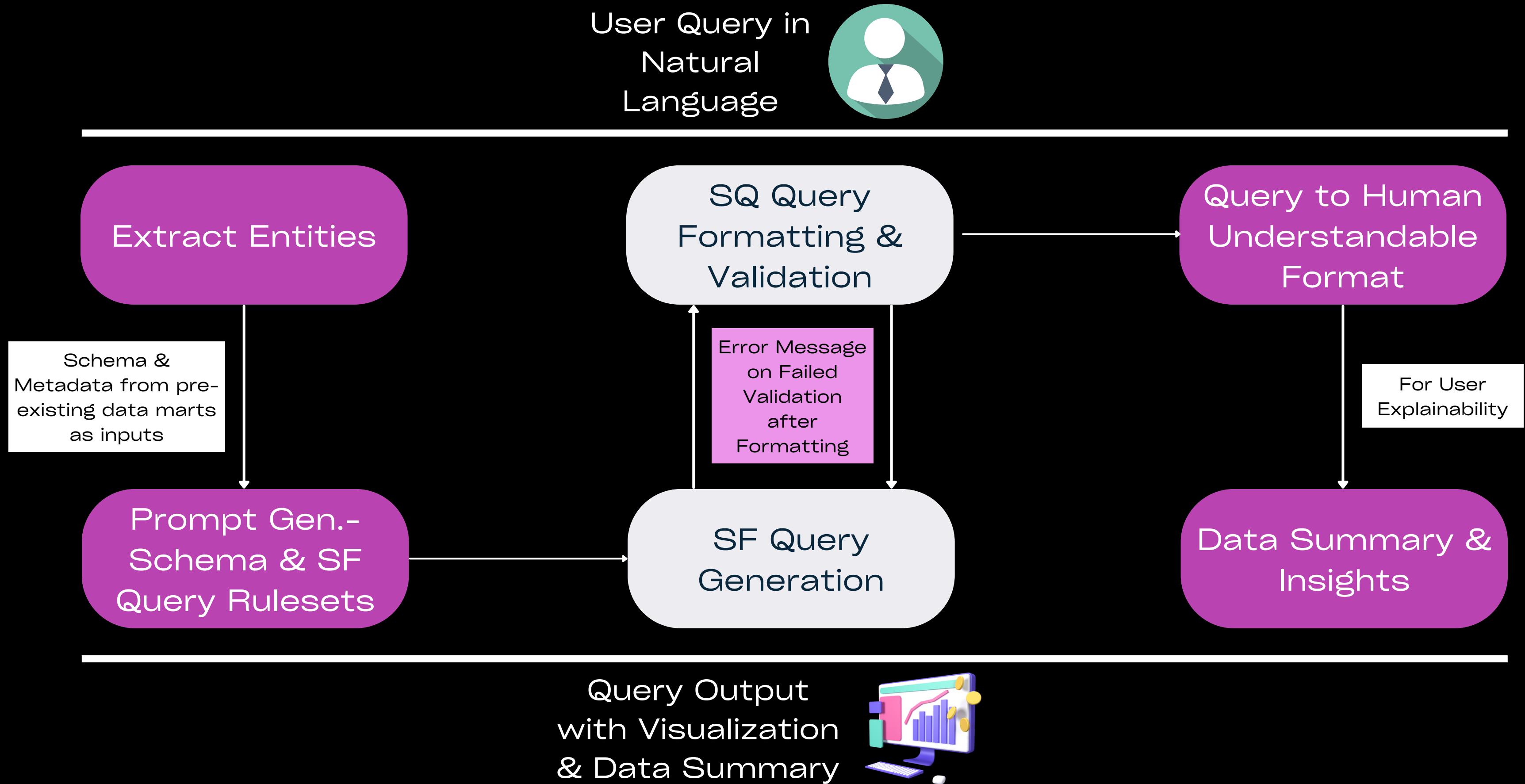


# Where We Are Now

Any Single Table Query Support at a time with an option to download the data



# LangChain Tools can be leveraged to Build Custom SQL AGENTS

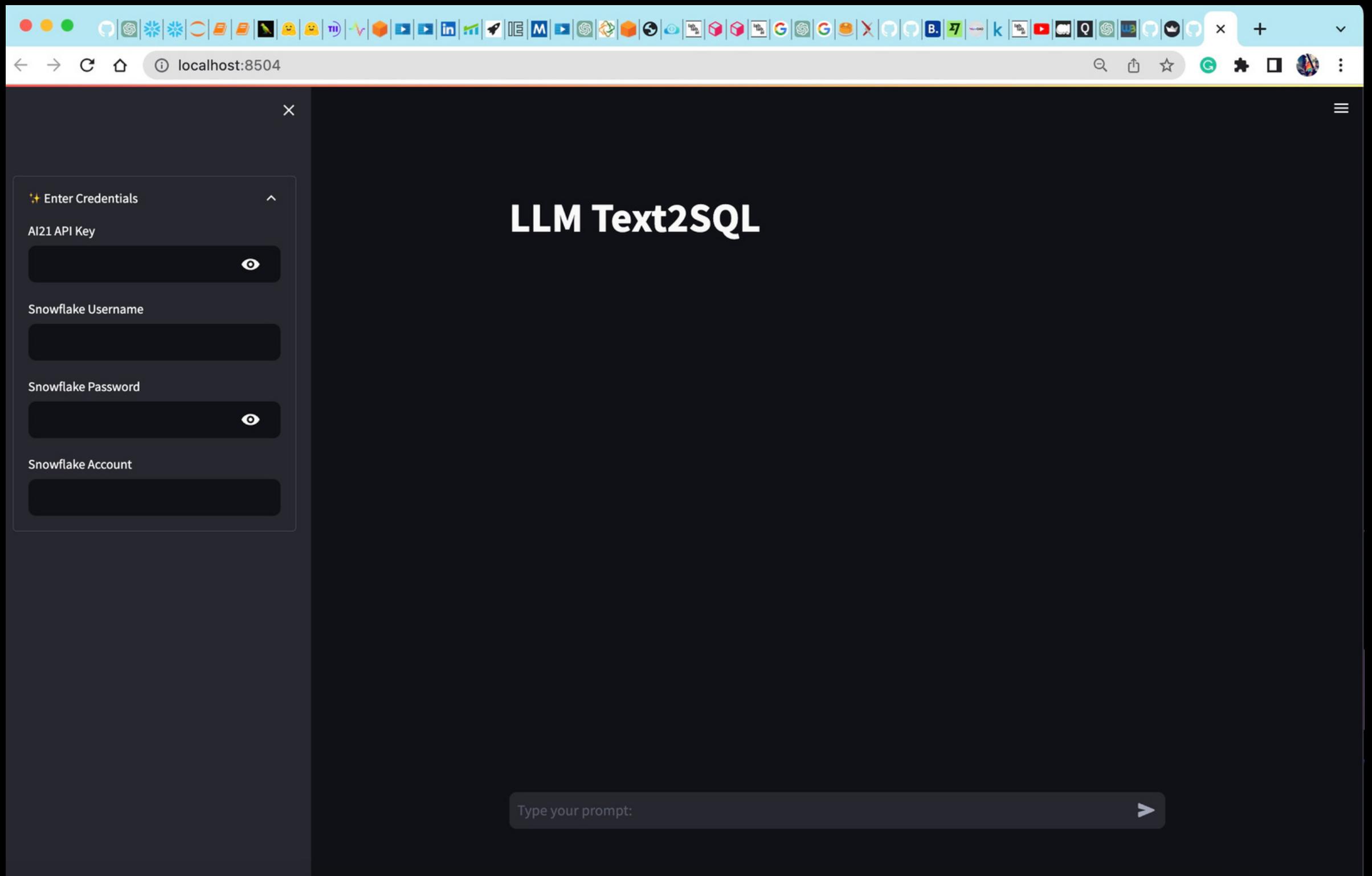


# Demo



# Landing Page

- Provide AI21 API key
- Provide Snowflake Credentials
  - Username
  - Password
  - Account URI without `snowflake.com`



# After Creds Verification

- Select Database
- Select Schema
- Select Tables/Views
- Select Table

A sample data will be shown on the main page based on which we can query in the chat placeholder.

The screenshot shows a web application titled "LLM Text2SQL" running at localhost:8504. On the left, there is a sidebar for "Enter Credentials" with fields for AI21 API Key (redacted), Snowflake Username (awsllm), Snowflake Password (redacted), and Snowflake Account (mfb28682.us-east-1). Below this is a "Select Table" sidebar with dropdowns for Select Database (SNOWFLAKE\_SAMPLE\_DATA), Select Schema (TPCDS\_SF10TCL), Select Table or View (tables), and Select Tables (CATALOG\_SALES). On the right, the main area has a title "LLM Text2SQL" and a subtitle "Ask any question related to the table, and the AI will provide a response." It features a "Expand for sample data:" button above a table with 5 rows of data from the CATALOG\_SALES table. The table has columns CS SOLD DATE SK, CS SOLD TIME SK, CS SHIP DATE SK, CS BILL CUSTOMER SK, and CS BILL CUSTO. The data is as follows:

	CS SOLD DATE SK	CS SOLD TIME SK	CS SHIP DATE SK	CS BILL CUSTOMER SK	CS BILL CUSTO
0	2,450,849	68,224	2,450,901	57,821,627	
1	2,450,849	61,134	2,450,926	50,143,236	
2	2,450,849	69,915	2,450,928	24,517,705	
3	2,450,849	27,448	2,450,930	5,973,204	
4	2,450,849	58,117	2,450,900	22,351,841	

At the bottom, there is a "Type your prompt:" input field with a send arrow icon.

# Conversation Flow

- Users can ask questions, and results will be given along with the query executed
- If case of any error in the query, in that case in place of result, the error message will be displayed

The image displays two screenshots of the LLM Text2SQL application interface, showing the user interaction flow.

**Screenshot 1:** The application title is "LLM Text2SQL". It says "Ask any question related to the table, and the AI will provide a response." On the left, there is a sidebar titled "Enter Credentials" with fields for "AI21 API Key", "Snowflake Username" (set to "awsllm"), "Snowflake Password" (redacted), and "Snowflake Account" (set to "mfb28682.us-east-1"). Below this is a section titled "Select Table" with dropdown menus for "Select Database" (set to "SNOWFLAKE\_SAMPLE\_DATA"), "Select Schema" (set to "TPCDS\_SF10TCL"), "Select Table or View" (set to "tables"), and "Select Tables" (set to "CATALOG\_SALES"). On the right, there is a table titled "Expand for sample data:" with columns: CS\_LIST\_PRICE, CS\_SALES\_PRICE, CS\_EXT\_DISCOUNT\_AMT, CS\_EXT\_SALES\_PRICE, and CS\_EXT\_WHOL. The table contains 5 rows of sample data. Below the table is a button labeled "Average sales price" with a circular icon containing a bar chart.

**Screenshot 2:** The application title is "LLM Text2SQL". It says "Ask any question related to the table, and the AI will provide a response." On the left, there is a sidebar titled "Enter Credentials" with fields for "AI21 API Key", "Snowflake Username" (set to "awsllm"), "Snowflake Password" (redacted), and "Snowflake Account" (set to "mfb28682.us-east-1"). Below this is a section titled "Select Table" with dropdown menus for "Select Database" (set to "SNOWFLAKE\_SAMPLE\_DATA"), "Select Schema" (set to "TPCDS\_SF10TCL"), "Select Table or View" (set to "tables"), and "Select Tables" (set to "INVENTORY"). On the right, there is a section titled "Query-" with a code block: 

```
SELECT AVG(CS_SALES_PRICE) FROM "SNOWFLAKE_SAMPLE_DATA"."TPCDS_SF10TCL"."CATALOG_SALES";
```

. Below the code is the answer: "Answer- The average sales price is \$50.49307022." There is also a section titled "Unique warehouses in inventory" with a code block: 

```
SELECT COUNT(DISTINCT INV_WAREHOUSE_SK) FROM "SNOWFLAKE_SAMPLE_DATA"."TPCDS_SF10TCL"."INVENTORY";
```

. Below the code is the answer: "Answer- 25 unique warehouses were found in the inventory." At the bottom, there is a text input field with placeholder text "Type your prompt:" and a green "Send" button with a circular icon.

# Download Data

- When the result returned is a data frame, the result can be downloaded as a CSV file too if needed for future reference or sharing

The screenshot shows a web browser window at `localhost:8504`. On the left, there's a sidebar for 'Enter Credentials' with fields for AI21 API Key (redacted), Snowflake Username (`awsllm`), Snowflake Password (redacted), and Snowflake Account (`mfb28682.us-east-1`). Below it is a 'Select Table' sidebar with dropdowns for Select Database (`SNOWFLAKE_SAMPLE_DATA`), Select Schema (`TPCDS_SF10TCL`), Select Table or View (`tables`), and Select Tables (`INVENTORY`). The main area displays a query input field containing:  
`"SNOWFLAKE_SAMPLE_DATA"."TPCDS_SF10TCL"."INVENTORY";`  
An error message follows:  
`Error Message- Error: 001003 (42000): SQL compilation error: syntax error line 1 at position 0 unexpected 'QUERY1'.`  
Below the error is a button labeled 'Select all data for item with max count'. A 'Query-' section shows the generated SQL code:  
`(SELECT * FROM "SNOWFLAKE_SAMPLE_DATA"."TPCDS_SF10TCL"."INVENTORY" WHERE "INV_ITEM_SK" =  
(SELECT MAX("INV_ITEM_SK") FROM "SNOWFLAKE_SAMPLE_DATA"."TPCDS_SF10TCL"."INVENTORY"));`  
A 'Answer-' section contains the first row of the query results:

1. `SELECT * FROM table_name WHERE count = (SELECT MAX(count) FROM table_name)`

INV_DATE_SK	INV_ITEM_SK	INV_WAREHOUSE_SK	INV_QUANTITY_ON_HAND
2452481	402000	6	419.0
2452481	402000	20	758.0
2452481	402000	1	874.0
2452481	402000	24	659.0

A 'Download CSV' button is located at the bottom of the table. At the very bottom, there's a text input field with placeholder text 'Type your prompt:' and a right-pointing arrow button.

# Future Scope

- Integrate visualization decision engine
- Add voice assistant
- Reduce response time
- Add multi-table support for each user query
- Insights & Explainability



# Get In Touch

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