

Plug into AI with AI21

SQLGenius

# SQLGenius

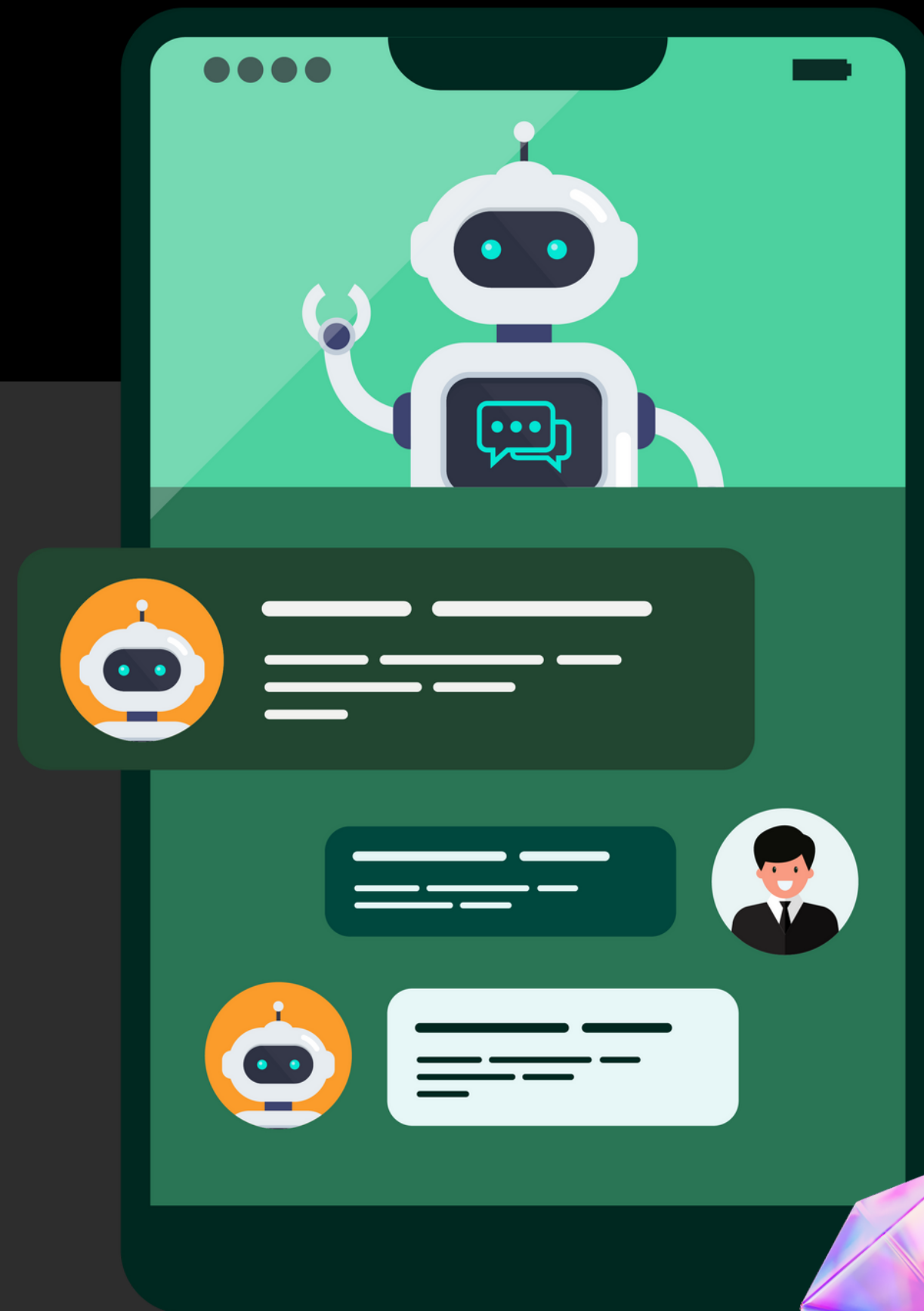
A smart C-Suite executives virtual assistant

AI21 labs

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# Agenda

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



# Use Case



## Problem

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



## Solution

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- 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

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

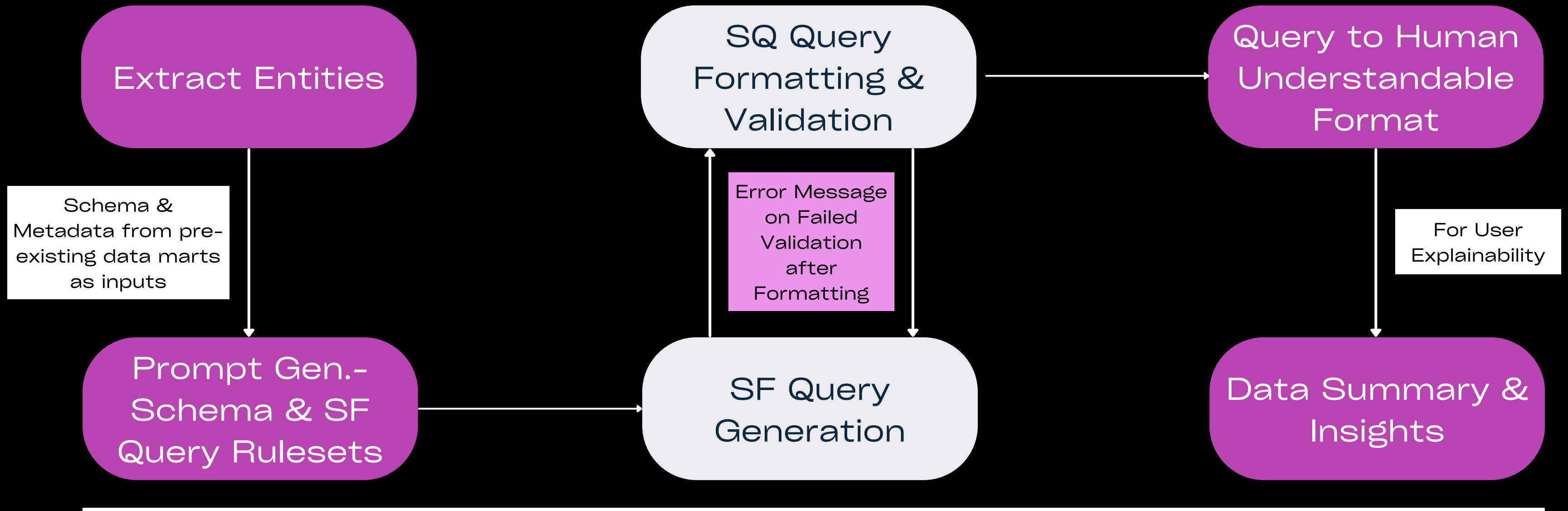


# Where We Are Now

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

User Query in Natural Language



Query Output with Visualization & Data Summary



# Demo

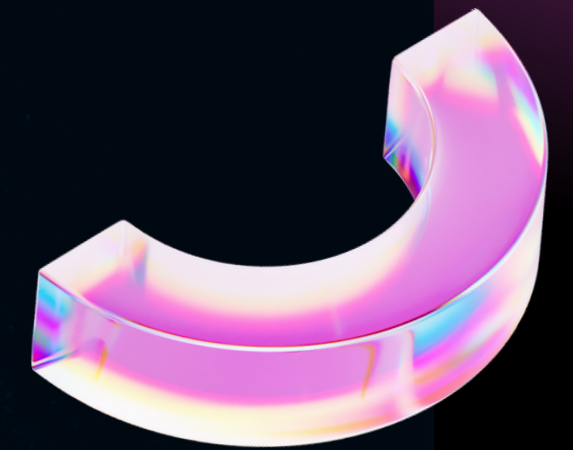
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## SQLGenius

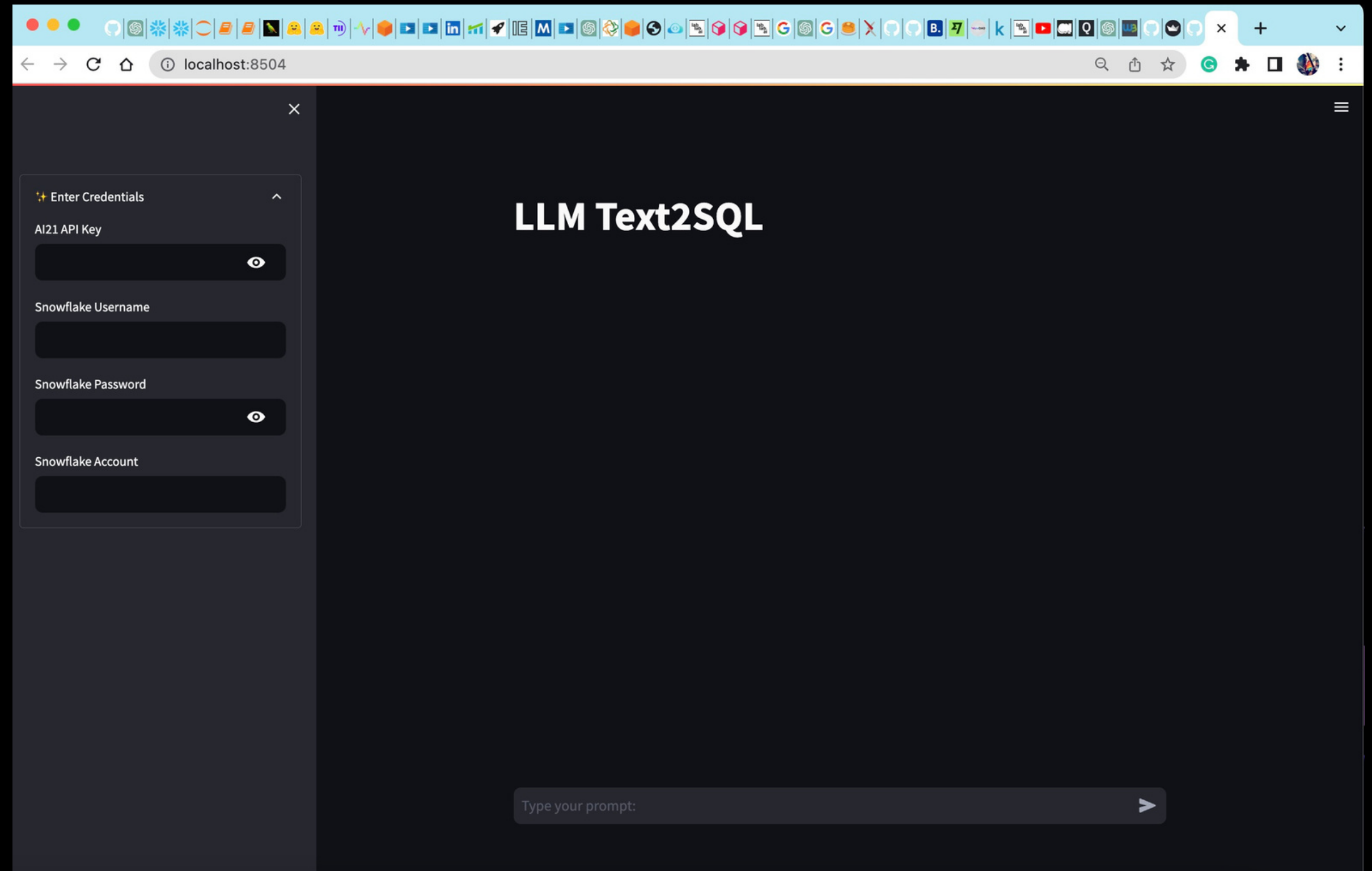
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# Landing Page

- 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 interface for LLM Text2SQL. The interface is dark-themed and consists of a sidebar on the left and a main content area on the right.

**Left Sidebar:**

- Enter Credentials:**
  - AI21 API Key: [Redacted]
  - Snowflake Username: `awsllm`
  - Snowflake Password: [Redacted]
  - Snowflake Account: `mfb28682.us-east-1`
- Select Table:**
  - Select Database: `SNOWFLAKE_SAMPLE_DATA`
  - Select Schema: `TPCDS_SF10TCL`
  - Select Table or View: `tables`
  - Select Tables: `CATALOG_SALES`

**Main Content Area:**

## LLM Text2SQL

Ask any question related to the table, and the AI will provide a response.

Expand for sample data:

	CS_SOLD_DATE_SK	CS_SOLD_TIME_SK	CS_SHIP_DATE_SK	CS_BILL_CUSTOMER_SK	CS_BILL_C
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	

Type your prompt: [Input field with arrow]



# 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 screenshot shows the LLM Text2SQL interface on localhost:8504. On the left, there are configuration panels for 'Enter Credentials' and 'Select Table'. The 'Enter Credentials' panel includes fields for AI21 API Key, Snowflake Username (awsllm), Snowflake Password, and Snowflake Account (mfb28682.us-east-1). The 'Select Table' panel shows 'SNOWFLAKE\_SAMPLE\_DATA' selected as the database, 'TPCDS\_SF10TCL' as the schema, 'tables' as the table or view, and 'CATALOG\_SALES' as the selected table.

The main area displays the title 'LLM Text2SQL' and the instruction 'Ask any question related to the table, and the AI will provide a response.' Below this, there is an 'Expand for sample data:' section containing a table with 5 columns: CS\_LIST\_PRICE, CS\_SALES\_PRICE, CS\_EXT\_DISCOUNT\_AMT, CS\_EXT\_SALES\_PRICE, and CS\_EXT\_WHOLESALE\_PRICE. The table contains 5 rows of data.

	CS_LIST_PRICE	CS_SALES_PRICE	CS_EXT_DISCOUNT_AMT	CS_EXT_SALES_PRICE	CS_EXT_WHOLESALE_PRICE
0	81.41	78.15	146.70	3516.75	1869.30
1	218.53	54.63	1639.00	546.30	758.80
2	96.82	86.16	735.54	5945.04	2403.27
3	166.27	53.20	5653.50	2660.00	3630.50
4	79.09	17.39	2899.90	817.33	1286.39

Below the table, a prompt 'Average sales price' is entered in a text box.

The screenshot shows the LLM Text2SQL interface on localhost:8504. The configuration panels on the left are the same as in the previous screenshot, but the 'Select Tables' panel now shows 'INVENTORY' selected.

The main area displays the title 'LLM Text2SQL' and the instruction 'Ask any question related to the table, and the AI will provide a response.' Below this, there is an 'Expand for sample data:' dropdown menu.

The first query is 'Average sales price'. The AI response is: 'Answer- The average sales price is \$50.49307022.' Below the answer, the SQL query is shown: `SELECT AVG(CS_SALES_PRICE) FROM "SNOWFLAKE_SAMPLE_DATA"."TPCDS_SF10TCL"."CATALOG_SALES";`

The second query is 'Unique warehouses in inventory'. The AI response is: 'Answer- 25 unique warehouses were found in the inventory.' Below the answer, the SQL query is shown: `SELECT COUNT(DISTINCT INV_WAREHOUSE_SK) FROM "SNOWFLAKE_SAMPLE_DATA"."TPCDS_SF10TCL"."INVENTORY";`

At the bottom, there is a text input field labeled 'Type your prompt:' with a green circular icon and a right arrow button.

# 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 interface for connecting to Snowflake. On the left, there are sections for 'Enter Credentials' and 'Select Table'. The 'Enter Credentials' section includes fields for AI21 API Key, Snowflake Username (awsllm), Snowflake Password, and Snowflake Account (mfb28682.us-east-1). The 'Select Table' section includes 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 prompt: "Select all data for item with max count". Below this, the SQL query is shown: `(SELECT * FROM "SNOWFLAKE_SAMPLE_DATA"."TPCDS_SF10TCL"."INVENTORY" WHERE "INV_ITEM_SK" = (SELECT MAX("INV_ITEM_SK") FROM "SNOWFLAKE_SAMPLE_DATA"."TPCDS_SF10TCL"."INVENTORY"));`. An error message is displayed: "Error Message- Error: 001003 (42000): SQL compilation error: syntax error line 1 at position 0 unexpected 'QUERY1!'".

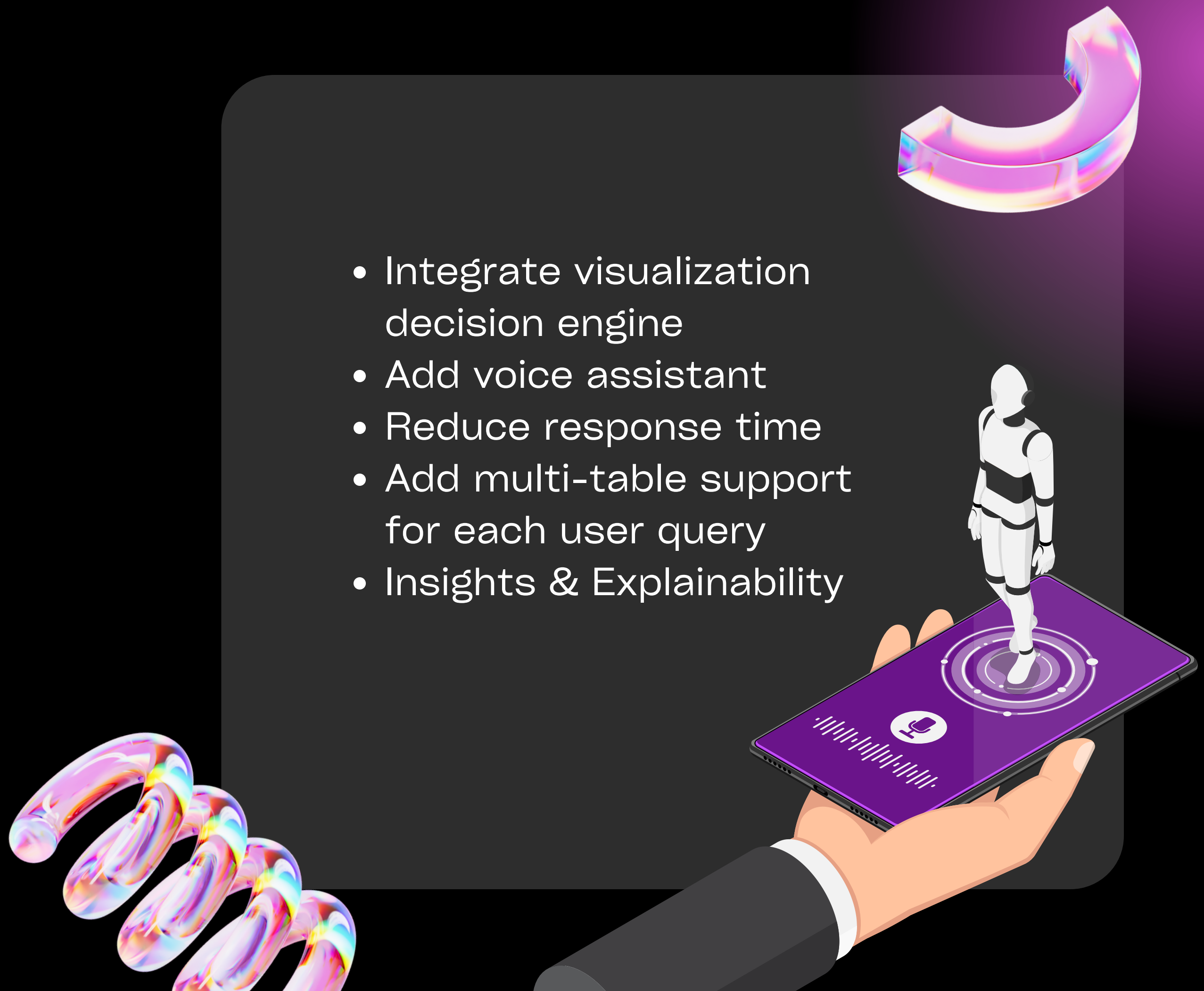
The 'Answer-' section shows the SQL query: `1. SELECT * FROM table_name WHERE count = (SELECT MAX(count) FROM table_name)`. Below this, a table of results is displayed:

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

Below the table, there is a link to "Download CSV". At the bottom, there is a prompt: "Type your prompt:" with a right arrow button.

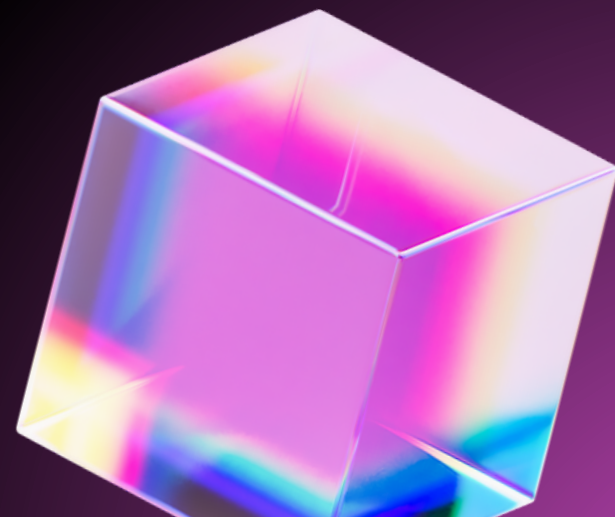
# Future Scope

- 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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