

15/06/2024

# **Presentation**

## **TP - BDA**

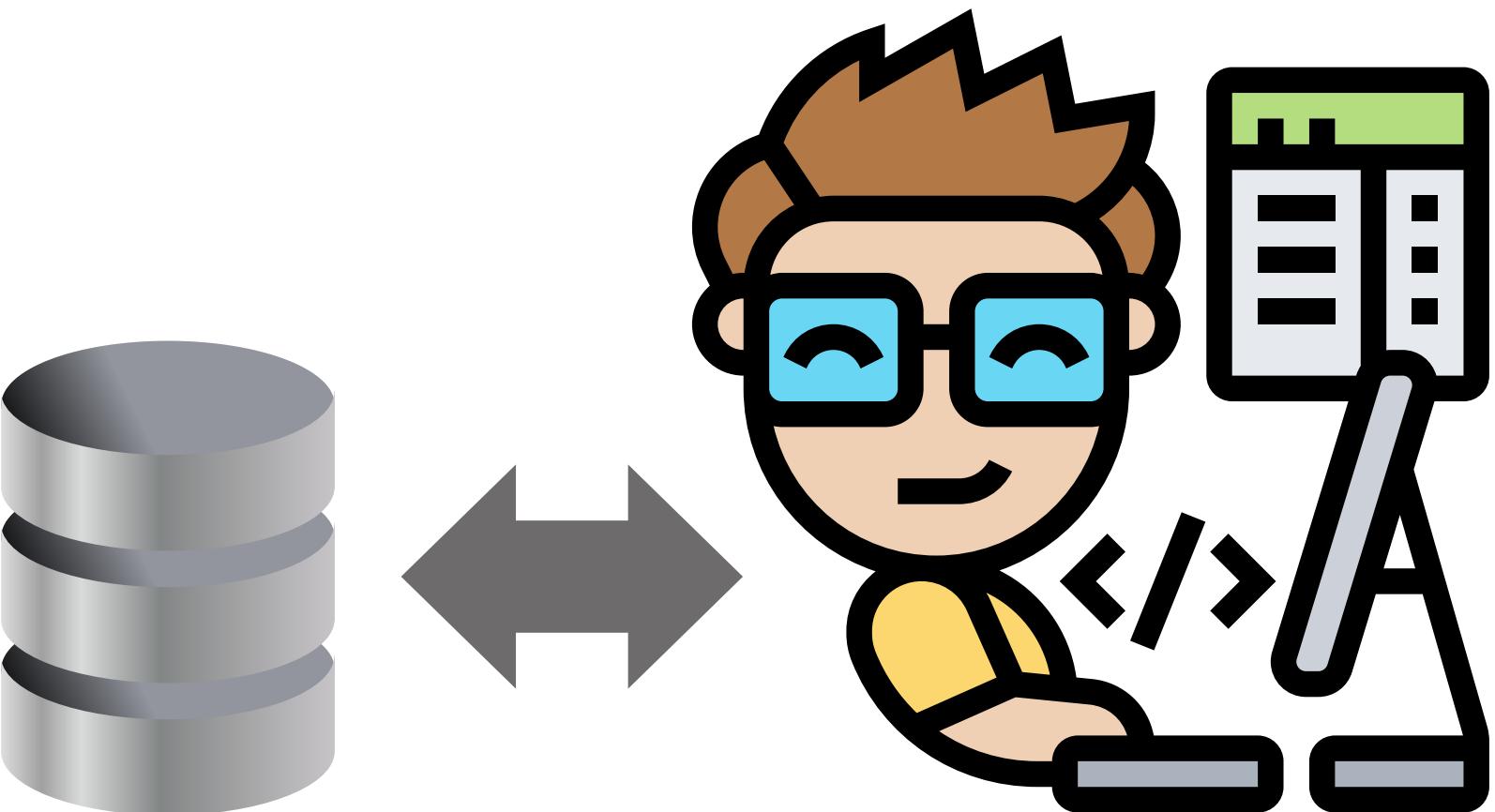
Presented by :

**Lydia Mouhoun & Serine Gheddou**

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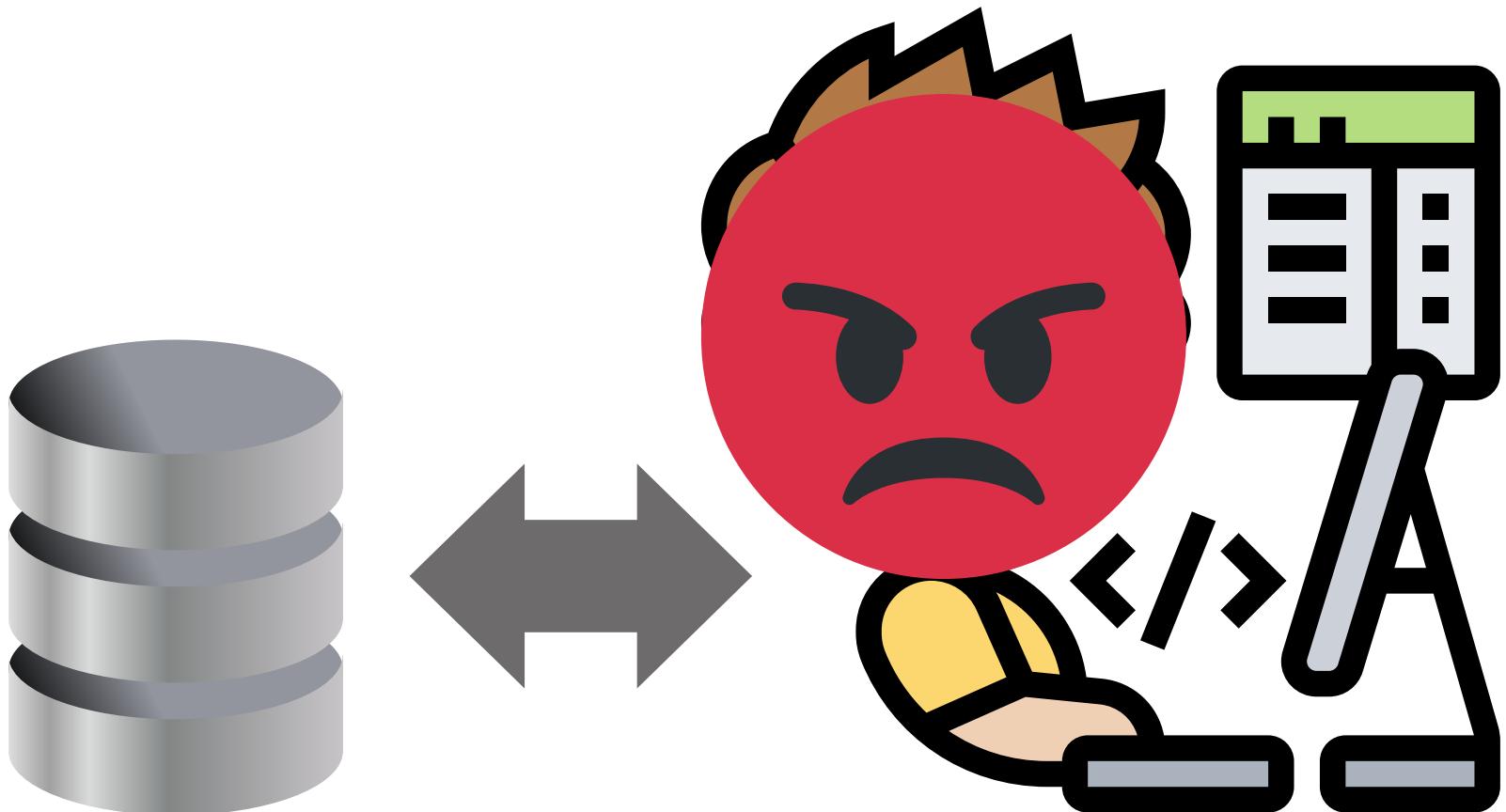
# Context

- Most nowadays applications use databases
- As of 2020, the global database management systems (DBMS) market size was valued at \$63.1 billion.
- The need to build a robust, fast and user-friendly db is crucial



# Problematic

- Huge, complex and repetitive query tasks to respond in the shortest amount of time
- Many db communication protocols and languages (SQL, NoSQL, PL/SQL...)
- Different DBMS for the same language = dialects (sqlite, oracle... )



# Solutions



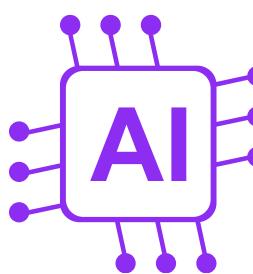
## Parser-based Validators

~compiler pipeline : Check the grammar of your SQL query for typos, missing keywords, and structural issues. This is done by passing through many steps: lexical analysis --> syntax analysis--> semantic analysis--> code generation --> ...



## Database-specific Linters

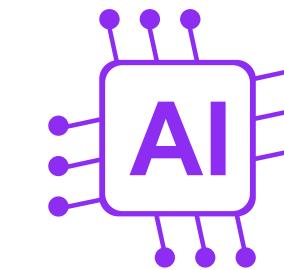
~plugin: Go beyond syntax and use your database's knowledge to catch errors like referencing non-existent columns. This has to be specifically designed for a certain DBMS



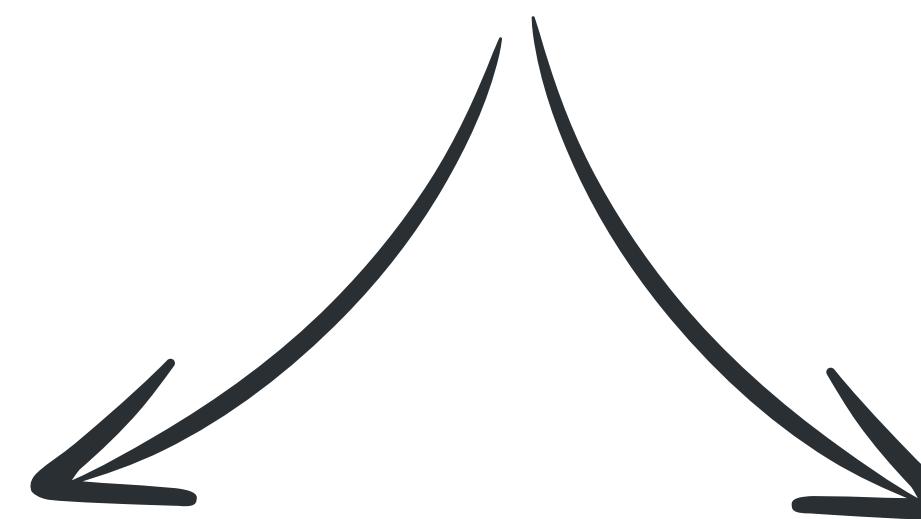
## AI-powered Correction Tools

~model: Like a smart spell-checker for SQL, they learn from examples or even the database schema and samples and suggest fixes for your queries.

# Solution 3 -



Based on a pre-trained model (LLM)



## Commercial Models



ex: gpt-3.5, gpt-4 ....

## Open-Source Models



Hugging Face

cohere



ex: Llama, Cohere...

# Solution 3 -

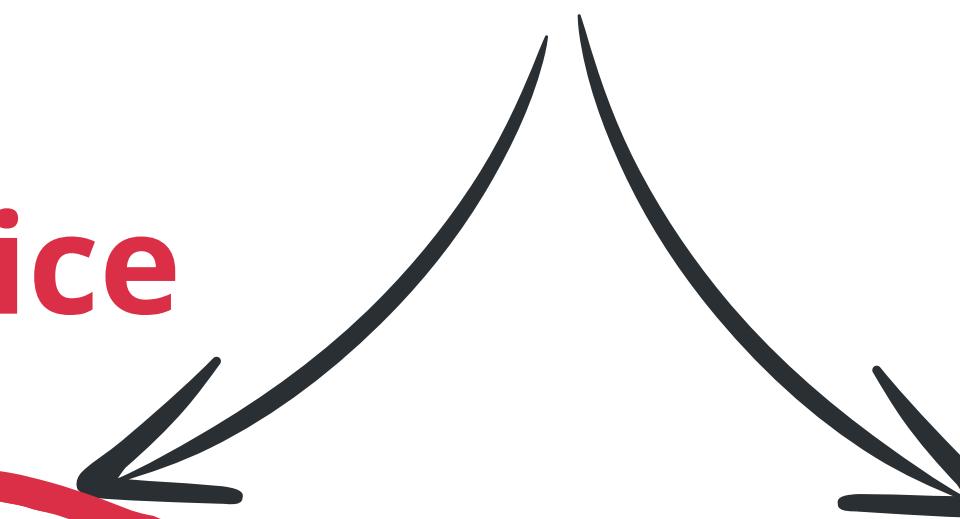
Based on a pre-trained model (LLM)

**Our Choice**

**Commercial  
Models**



ex: gpt-3.5, gpt-4 ....



**Hugging Face**

 **cohere**

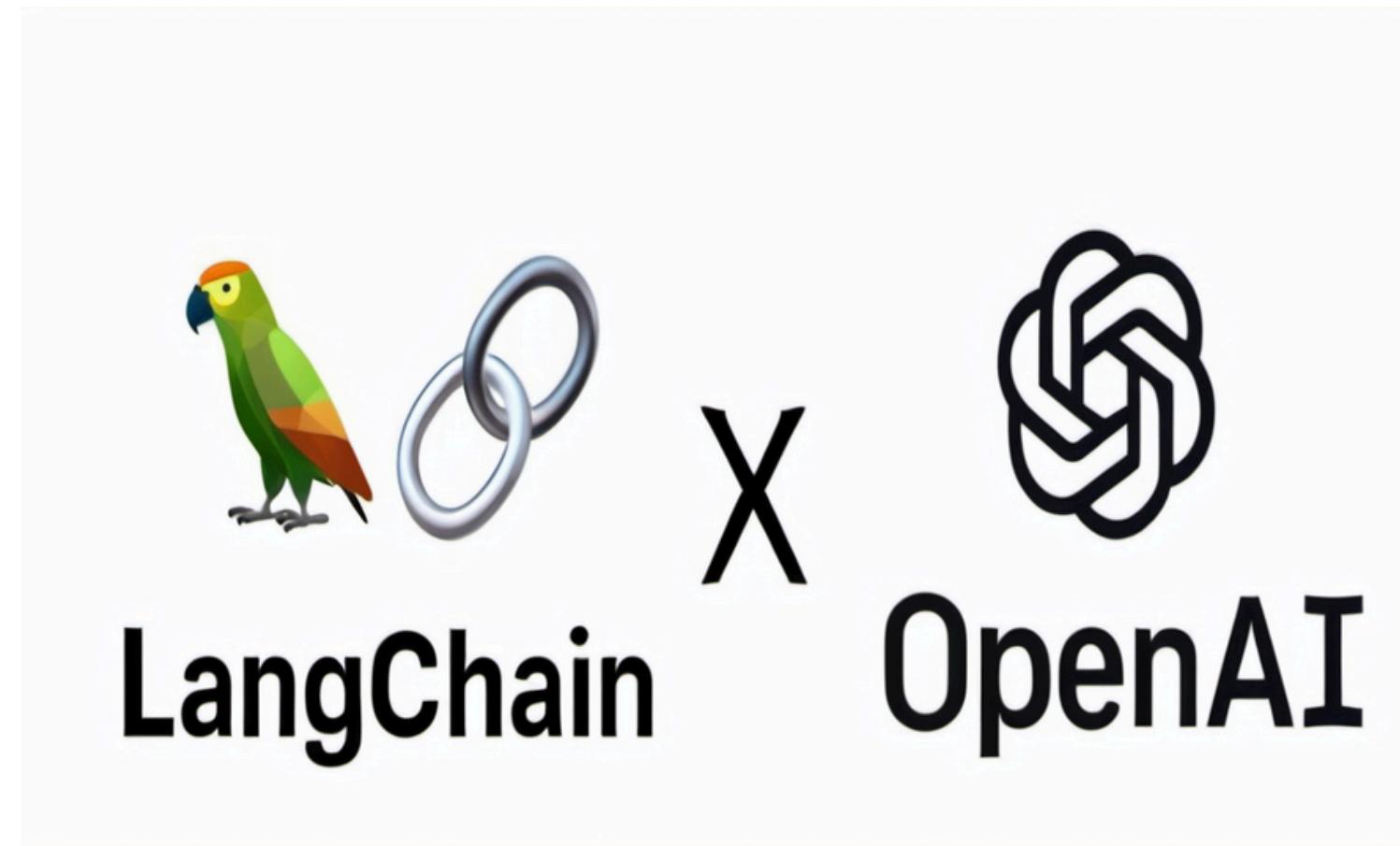
**Open-Source  
Models**



ex: Llama, Cohere...

# Implementation

Development Environment



# Implementation

Class of Solutions

**General**

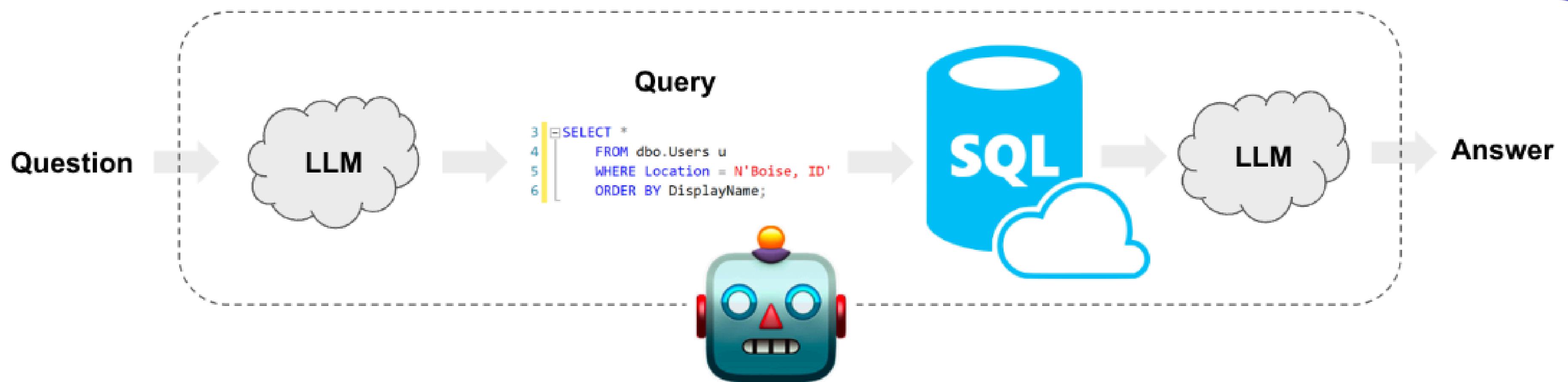
Responds to  
Natural Language  
queries

**Specific**

Customised to  
handle SQL  
query errors

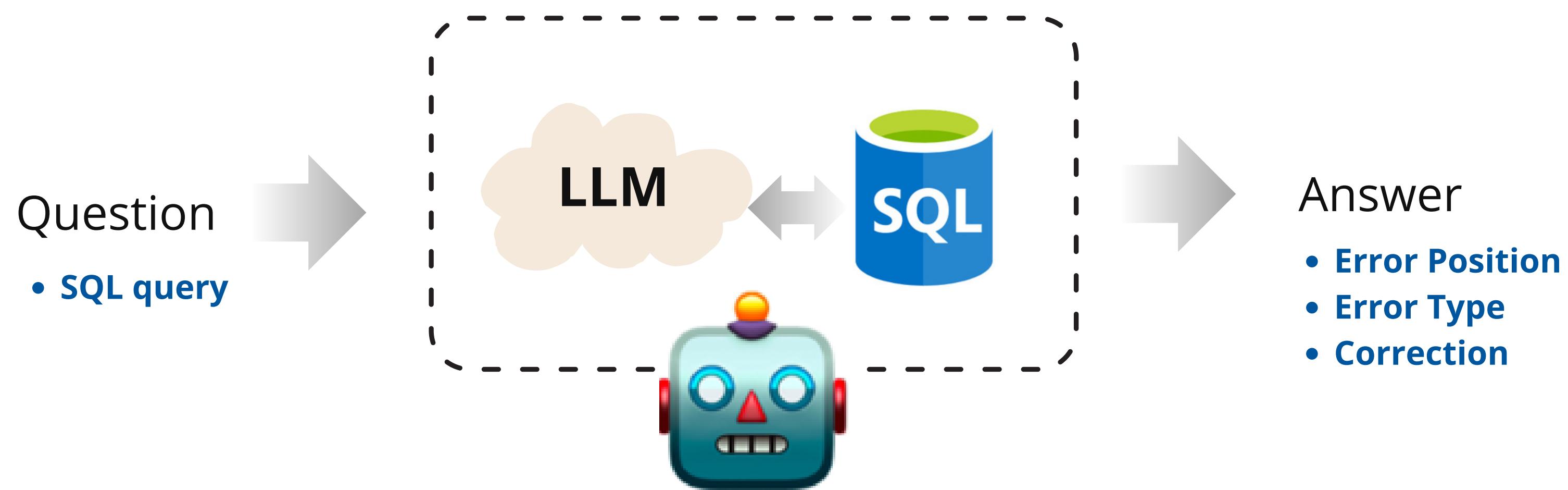
# Implementation

## General Solution



# Implementation

Specfic Solution - overview -



# Implementation

Specefic Solution - details -

<< Demo Time >>

**Chain  
based  
Model**

**Agent  
based  
Model**

# Conclusion

Thank you



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