

# Assessing GenAI's capacity to assist users in crafting databases across MySQL and NoSQL platforms.

Nidhi Iyer; Gen AI: ChatGPT

May 8, 2024

## 1 Abstract

This report examines how well GenAI helps users create databases in MySQL and NoSQL (MongoDB). It was found that GenAI is better at guiding through MySQL than MongoDB. A smoother experience was seen with MySQL, while GenAI seemed confused and less helpful with MongoDB. This highlights the challenges GenAI faces in adapting to different database systems. Understanding these differences can help improve GenAI's support for NoSQL databases like MongoDB.

## 2 Problem statement

In order to explore GenAI's ability with databases we were tasked with creating a database for the popular video game series "Pokemon". We were given a simplified version of the game with the following information.

Pokemon can have one or two 'types,' which decide whether they're more effective or less effective against other Pokemon types. Every pokemon has a primary type; some also have a secondary type.

The game involves using moves to attack other Pokemon, and each move has a certain power and type. Every move has a set of Pokemon who are capable of learning it; and every Pokemon has a set of moves it can learn.

Question: At the very least, we'd need database tables to store Pokemon, Type, and Move. However, 'Pokemon' and 'Move' have a classic many-to-many relationship. How can we deal with this?

- Create all the tables needed. (5)
  - Pokemon
  - Type
  - Move
- With the following details, populate the tables: (5)
  - Bulbasaur is a pokemon of Grass type.
  - Charmander is a pokemon of Fire type.
  - Squirtle is a pokemon of Water type.
  - Eevee is a pokemon of Normal type.
  - Pidgey is a pokemon of the Normal/Flying type.
  - Bulbasaur can learn Tackle, Vine Whip, and Return.

- Charmander can learn Tackle, Ember, and Return.
  - Squirtle can learn Tackle, Water Gun, and Return.
  - Eevee can learn Tackle, Headbutt, and Return.
  - Pidgey can learn Tackle, Wing Attack, and Return.
  - Tackle has 35 power and is Normal type.
  - Water Gun has 40 power and is Water type.
  - Ember has 40 power and is Fire type.
  - Vine Whip has 40 power and is Grass type.
  - Wing attack has 65 power and is Flying type.
  - Headbutt has 70 power and is Normal type.
  - Return has 100 power and is Normal type.
  - Fire is powerful against Grass but weak to Water.
  - Grass is powerful against Water but weak to both Fire and Flying.
  - Water is powerful against Fire but weak to Grass.
  - Normal is not weak to anything but not powerful against anything either.
  - Flying is powerful against Grass and has no weaknesses.
- Write a query that returns all the Pokemon who can learn ‘Return’. (5)
  - Write a query that returns all the moves in the game that are powerful against Grass. (5)

### 3 MySQL

Designing a database with MySQL was pretty straightforward. My prompt started with "Give me step by step instructions to write the queries to design a database with 5 tables for Pokemon [problem statement from discourse]".

The response for this prompt was on point and I could easily create a database and the 5 required tables (Pokemon, Type, Move, PokemonMove, and TypeEffectiveness)

After this I prompted ChatGPT individually to generate all the commands for the assignment. I was able to get the queries for the two questions at the first try.

### 4 NoSQL - MongoDB

Despite lacking prior experience with NoSQL, I anticipated better guidance from ChatGPT. However, after encountering confusion and consulting documentation, I successfully utilized MongoDB Compass and the Mongosh terminal to create the database and its five collections. While this process taught me a great deal about NoSQL database design, I found ChatGPT’s assistance to be less helpful than anticipated.

### 5 Analysis and Conclusion

MySQL proved straightforward for designing the database, following step-by-step instructions. However, guidance for NoSQL with MongoDB was lacking, requiring extra effort and reliance on documentation. Despite challenges, the experience provided valuable learning opportunities in database design and management.