Reflection on the GPT-4o Multiplication Bot

The GPT-4o multiplication bot was designed to perform repeated multiplications, with the AI sometimes returning incorrect results. This was done intentionally to create a "bad mathematician" persona, where the bot responds humorously when it makes mistakes. The purpose of the assignment was to explore how GPT-4, while powerful in natural language processing, struggles with tasks requiring precise calculations, such as iterated multiplication.

The primary reason GPT-4o fails is that it's not optimized for mathematical precision. While GPT-4 can handle simple arithmetic, its training on general language data makes it prone to errors in more complex, iterative tasks. This becomes evident when the bot produces results that are plausible at first but become increasingly inaccurate with each iteration, especially as numbers grow exponentially.

Errors were often patterned. GPT-4o's mistakes included vague or nonsensical answers, reflecting its limitations in numerical calculations. It would sometimes give incorrect intermediate results, which were far from the correct answer. This demonstrated how the model's lack of specialized mathematical training leads to consistent mistakes when performing repeated multiplications.

To improve the bot, I could integrate a proper computational engine, like Python's built-in arithmetic functions, to handle the calculations while using GPT-4o solely for personality and humor. This would ensure accuracy while keeping the playful, error-prone nature of the bot intact. Additionally, refining the prompts could reduce some errors by guiding the AI more clearly.

The self-deprecating humor was an essential part of the design, turning potential user frustration into fun. By acknowledging its mistakes, the bot became more engaging and human-like. Ultimately, while GPT-4o fails in accuracy, its role as a "bad mathematician" made the interaction entertaining, providing insight into both AI's strengths and weaknesses.