Hi Nate and Ty,

Thankyou for this opportunity to express my ideas and interests from this small project.

## **Problem** :

Imagine a busy store owner overwhelmed by data. Sales figures pile up, warehouse stock needs monitoring, and discount strategies require constant tweaking. LLMs can be of great use for them. By feeding sales data, inventory details, and discount information, retailers can get instant insights. LLMs can analyze past trends, identify areas for operational improvement, and answer questions about stock levels or optimal discount rates – all without needing to consult a data specialist. This frees up the owner's time to focus on what matters most – running a thriving business.

## **Solution** :

Large Language Models (LLMs) have the potential to be a game-changer in technology. By effectively utilizing their capabilities, we can achieve significant advancements. Imagine training an LLM with data and providing it with the necessary context about that data's meaning.With LLMs, you can forget complex tasks like writing SQL code, setting up databases, and maintaining software. Instead, you simply feed your data tables to the LLM and ask your questions in plain English. This lets you focus on the insights, not the technical hurdles.

## **Project** :

I built a Python project in Visual Studio Code utilizing cutting-edge technologies like LangChain, Google PaLM, Few-Shot Learning, and semantic similarity with word embeddings. To enhance my understanding and effectively integrate these technologies, I leveraged the 'Continue' extension, a large language model (LLM) built into VS Code.
Initially, I wrote a normal query and noticed that the generated output was wrong. The LLM model misinterpreted my question and column names. To address this, I created a few short training examples. By using semantics, Hugging Face query embedding, and chroma, I could help the model learn the clear intent of my queries.

For example, when I told my LLM to give me "the price of all Levi's T-shirts," the LLM assumed that the "price" column in my database referred to the total price. However, the actual meaning of "price" in my database is "price per unit." By training our custom model with more and more queries, we can significantly improve its performance and reduce hallucinations to a great extent.

## **Use of Continue** :

- The document provided by continue was so easy to read and understand : “https://continue.dev/docs/”.
- The 'Continue' extension significantly streamlined my learning process for the Python libraries used in my project.
- The 'Continue' extension seamlessly integrated into my Visual Studio Code environment
- With the ability to reference everything directly from the chatbot, I didn't have to constantly switch between windows or search through documentation. For example, when I needed to implement a specific function, I simply typed "@code" and the extension provided me with relevant snippets from my project, saving me time and effort.
- One of the most impressive features of "Continue" that helped me with this project was its integration with databases. By typing "@database" or "@postgres," I could easily verify my database queries right from the IDE. This was particularly useful when I was working on the inventory management module, as I could quickly ensure that my SQL queries were correct and efficient.
- The chatbot comes in very handy and is flexible in terms of allowing the use of a wide variety of custom LLMs.
- While the generated code is correct and clean, the process of updating or editing existing code within the tool could be improved.
- Editing code in 'Continue' could be more precise. When I tried to change one line, it rewrote the entire code.
- The code update won't modify your current code. Instead, it will be inserted below the line you select.
- While attempting to fix the code's syntax, the edit feature generated a different code entirely.

## **Key Learning from the project** :

- Understand the vast potential of LLMs for everyday use.
- By training LLMs, we can enhance their ability to perform tasks effectively.
- I gained a good understanding of the role vector embeddings play in NLP, including their underlying mechanics.
- Familiarized myself with the functionalities of LangChain libraries.