Abstract

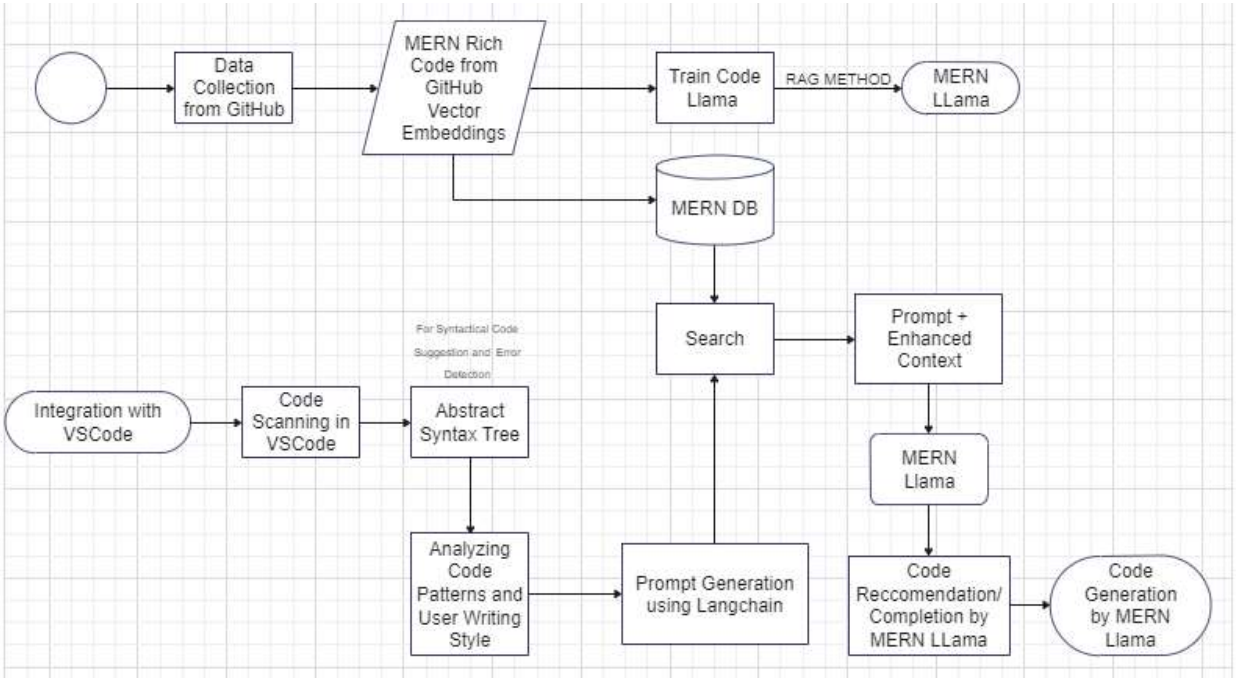
AI tools revolutionize the approach to code generation, offering efficient solutions for various tasks. However, existing models, like ChatGPT , encounter limitations when generating language-specific code for frameworks like MERN (MongoDB, Express.js, React.js , Node.js). This challenge arises due to a lack of context awareness, complexity in coding conventions, and the dynamic nature of evolving technologies .

We propose an innovative project redefining code generation and support in the MERN stack. Our method begins by using the **Abstract Syntax Tree** to accurately complete code and detect errors. We train **Code Llama with MERN rich datasets from GitHub**, enabling expertise in MERN-specific coding patterns. We utilize both user comments and Code Llama's capabilities in our proposed model. This allows our system to adapt dynamically, using **LangChain's analysis** to provide valuable recommendations through Code Llama. Going beyond functionality, we **analyze historical code styles** to enhance language classes.

Through rigorous training and seamless integration of tools, our approach sharpens the Language Model's accuracy and performance. The **RAG (Retrieval Augmented Generation) Method fine-tunes Code Llama for MERN stack**, reducing code hallucination and detecting out-of-context segments.

This approach reshapes developer innovation by enabling a **context-aware** Code Assistant and redefining accurate code production and assistance within the **dynamic MERN stack environment.**

Project Flowchart:



References :

1. Code Llama: Open Foundation Models for Code
https://ai.meta.com/research/publications/code-llama-open-foundation-models-for-code/

2. Retrieval-Augmented Generation for Knowledge-Intensive NLP tasks
https://arxiv.org/abs/2005.11401