Short Write-up of a Smart Cookbook System

Our project is a retrieval-augmented generation (RAG) system, specifically targeted towards cooking recipes from PDF documents. It aims to teach people cook by providing them with a detailed recipe on dish preparation along with a picture of the desired final product. The program trains GPT-4 with our own data (a cookbook found online), employing common Natural language Processing (NLP) techniques such as vector embedding and document splitting to extract the relevant content from the training data in response to user's questions. We also employed chromadb, a database to store vector values and initialising them. This part is crucial for creating a searchable database of embeddings that can be used for similarity searches and other retrieval tasks. The text and image data will be saved locally in the form of a pdf file.

The user is able to change the inputs (dish name) and the system will output correspondingly. Should the user give a dish that is out of the scope of the cookbook, the system will not provide further information and ask the user to prompt again. The final file is saved locally for user's ease of reference.

Our project is also innovative because it provides a short feedback loop as the user is able to modify inputs with convenience, which is much more efficient than the conventional way of browsing through numerous online tutorials to find the right dish.

Our project is also easy to update and maintain as the user is able to put in more cookbooks in the form of pdf to increase training volume, such that the model is able to provide even more accurate tutorials over time.

Our project is also valuable in industrial fields. For example, our project is easy-to-use and easy-to-popularise, thus more and more people can learn cooking skills, which may leads to a boost in workers in cooking industry. What's more, our project is helpful and attractive to modern people that don't know cooking really well. So it can be made into apps which may change the current situation in internet industry.

With cooking a universal need, this project taps into a large and evergrowing market of cooking enthusiasts, home cooks, and culinary students. This system can significantly impact users by making it easier to access a wide range of cooking knowledge, from simple dishes to complex culinary techniques. It supports lifelong learning and promotes healthier eating habits by providing easy access to diverse recipes.

While the current application focuses on cooking recipes, the underlying code is applicable to any domain where information is locked in unstructured text documents, such as legal documents, scientific research, or educational materials. This versatility demonstrates great industrial value, created by unlocking access to information.

Hope the prototype and codes we design will be pleasing and enlightening.

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