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LLM App Development

LangChain and Embeddings

04 Jan 2024

Text Embedding

- Transforms natural language into numerical representations
- Capture the meaning, structure and context of the text
- Helps to perform various natural language processing tasks such as semantic search, text analysis, text generation and more
- LangChain provides a simple and consistent interface for building and deploying application using text embedding from different providers

Text Embeddings Models

- There are a variety of text embedding models available in LangChain
- Each embedder has it own advantages and disadvantages

Text Embedding models available for use in LangChain (01 Jan 2024)

LangChain Embeddings

- The base Embeddings class in LangChain provides two methods:
- Embedding documents
  - Multiple text inputs
- Embedding a query
  - Single text

```python
from langchain.embeddings import OpenAIEmbeddings

embeddings_model = OpenAIEmbeddings()

# embed_documents
embeddings = embeddings_model.embed_documents(
    [
        "Hi there!",
        "Oh, hello!",
        "What's your name?",
        "My friends call me World",
        "Hello World!"
    ]
)
len(embeddings), len(embeddings[0])

#embed_query
embedded_query = embeddings_model.embed_query("What is your name?")
embedded_query[:5]
```

(5, 1536)

```
[0.005358713679015636,
-0.004499904621392488,
0.038883671164512634,
-0.0030010775662958622,
-0.009008182212710381]
```

Embedding Methods

- embed_query()
  - Embed a single piece of text
  - Useful for tasks such as semantic search i.e. to find the most similar documents to a given query
- embed_documents()
  - Embed a batch of documents
  - Useful for tasks such as clustering i.e. want to group documents together based on their similarity

Text Embeddings Model

- Model uses a statistical method to represent text as a vector of real numbers.
- End goal is to capture the semantic meaning of words and phrases that is computationally efficient and easy to use
- As you can see, there are many different text embedding models, but they all work in a similar way
- Best embedding size depends on a number of factors, including the size of the dataset, the complexity of the task and the computational resources available
- Generally, a dataset with less than 100,000 sentences may benefit from a lower-dimensional embedding (e.g., 50-100 dimensions), while a larger dataset may benefit from a higher-dimensional embedding (e.g., 200-300 dimensions).

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Thank you!