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Text Summarization Llama2: how to Use LLama2 with Langchain

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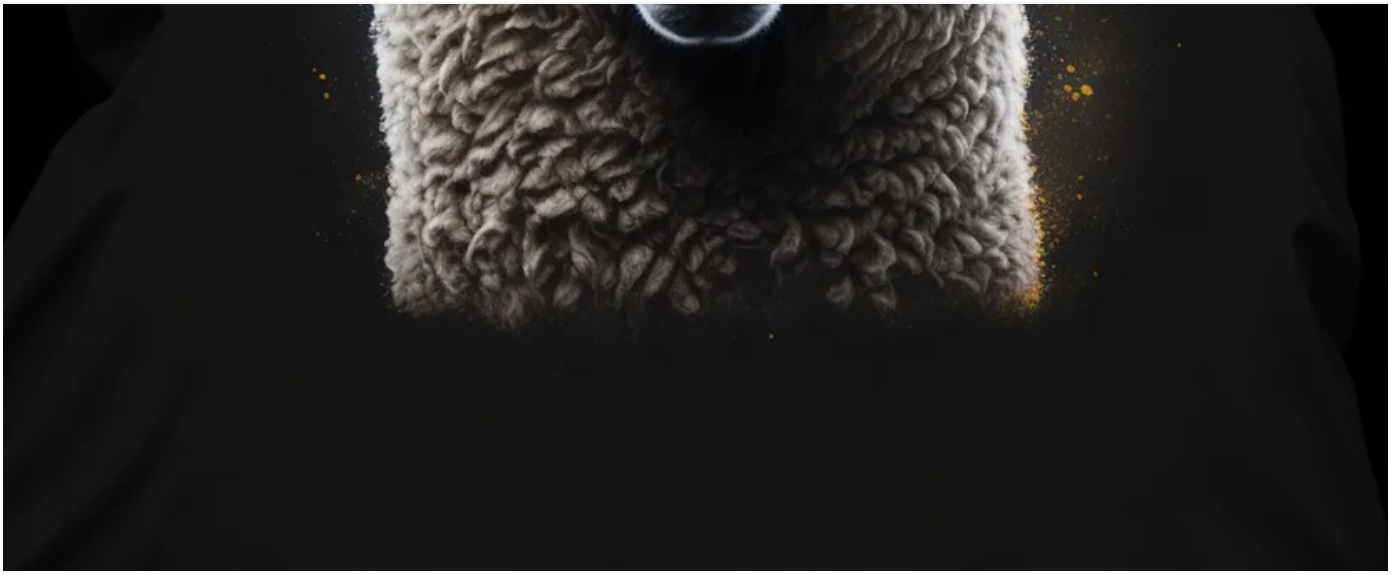

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In this Tutorial, I will guide you through how to use LLama2 with langchain for text summarization and named entity recognition using Google Colab Notebook:

Meta, better known to most of us as Facebook, has released a commercial version of Llama-v2, its open-source large language model (LLM) that uses artificial intelligence (AI) to generate text, images, and code.

What is LLama2?

Meta, better known to most of us as Facebook, has released a commercial version of Llama-v2, its open-source large language model (LLM) that uses artificial intelligence (AI) to generate text, images, and code.

Llama 2 is a successor to the Llama 1 model released earlier this year. However, Llama 1 was “closely guarded” and was only available on request.

Let’s start coding

Set Up Google Colab: Go to Google Colab (colab.research.google.com) and create a new notebook.

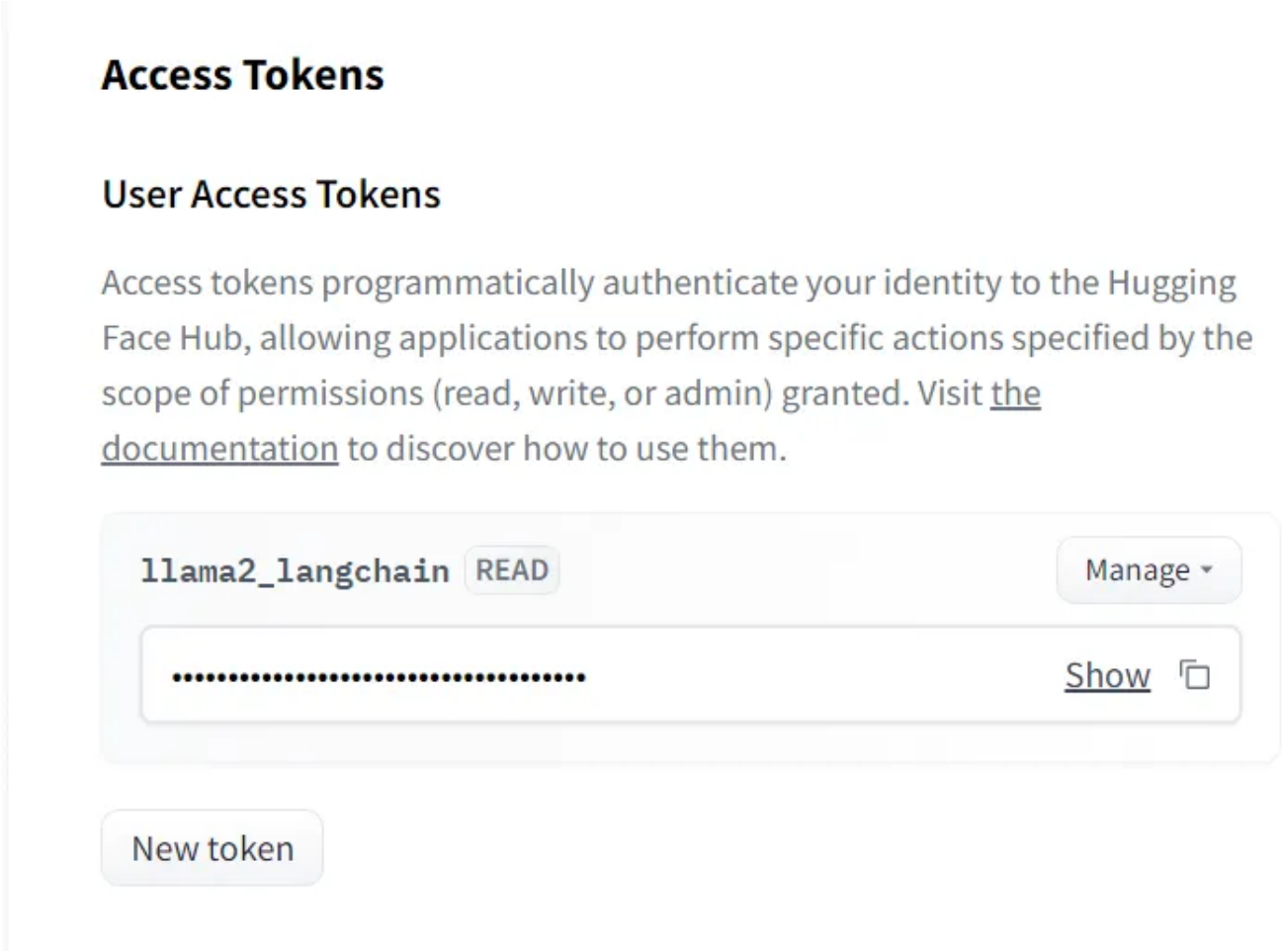
Install Required Libraries: In the first code cell of your Colab notebook, install the necessary libraries using the following code:

```
!pip install -q transformers einops accelerate langchain bitsandbytes
```

Login in !huggingface-cli login

```
!huggingface-cli login
```

If you already have a Hugging Face account, you can obtain your access token by going to the settings section on the Hugging Face website. From there, click on the “Access Tokens” tab, and you’ll be able to generate or copy your personal access token.



If you don't have a Hugging Face account yet, you can easily sign up for one on their website. Once you have an account, you can follow the same steps mentioned above to get your access token and use it to access private models and resources through the Hugging Face API or CLI.

installed the SentencePiece

If you haven't installed the SentencePiece

library, you can install it in your Colab notebook using:

```
!pip install sentencepiece
```

We going to set up a language generation pipeline using Hugging Face's transformers library and a specified model. The AutoTokenizer is used to fetch the tokenizer associated with the model. The pipeline is then configured with parameters such as

the text generation task, model, tokenizer, max_length of the generated text, and a few more.

```
from langchain import HuggingFacePipeline
from transformers import AutoTokenizer
import transformers
import torch

model = "meta-llama/Llama-2-7b-chat-hf"

tokenizer = AutoTokenizer.from_pretrained(model)

pipeline = transformers.pipeline(
    "text-generation", #task
    model=model,
    tokenizer=tokenizer,
    torch_dtype=torch.bfloat16,
    trust_remote_code=True,
    device_map="auto",
    max_length=1000,
    do_sample=True,
    top_k=10,
    num_return_sequences=1,
    eos_token_id=tokenizer.eos_token_id
)
```

We create an instance of the HuggingFacePipeline class, using the previously configured pipeline and setting the model's 'temperature' parameter, which influences the randomness of predictions.

```
llm = HuggingFacePipeline(pipeline = pipeline, model_kwargs = {'temperature':0})
```

The PromptTemplate class is used to create a template for a language model prompt. This is the instruction that the model will follow when generating text.

In this case, the template asks the model to summarize a text. The text to summarize is placed within triple backquotes (```). The model is asked to present the summary in bullet points. The {text} inside the template will be replaced by the actual text you want to summarize.

```
from langchain import PromptTemplate,  LLMChain

template = """
              Write a concise summary of the following text delimited by triple ba
              Return your response in bullet points which covers the key points of
              ```{text}```
              BULLET POINT SUMMARY:
            """

prompt = PromptTemplate(template=template, input_variables=["text"])

llm_chain = LLMChain(prompt=prompt, llm=llm)

text = """ As part of Meta's commitment to open science, today we are publicly re

Training smaller foundation models like LLaMA is desirable in the large language m

Over the last year, large language models — natural language processing (NLP) sys

Even with all the recent advancements in large language models, full research acc

Smaller models trained on more tokens — which are pieces of words — are easier to

Like other large language models, LLaMA works by taking a sequence of words as an

There is still more research that needs to be done to address the risks of bias, t

To maintain integrity and prevent misuse, we are releasing our model under a nonc

We believe that the entire AI community — academic researchers, civil society, po
"""

print(llm_chain.run(text))
```

Let's try it out
```

```
print(llm_chain.run(text))
```

```
/usr/local/lib/python3.10/dist-packages/transformers/generation/utils.py:1270: Use
  warnings.warn(
 • The article discusses the public release of LLaMA (Large Language Model Meta AI
            • Training smaller models like LLaMA requires less computing power and
```

```
text1 = """
Tesla, Inc. (/ˈtɛslə/ TESS-lə or /ˈtɛzlə/ TEZ-lə[a]) is an American multinational

Tesla is one of the world's most valuable companies and, as of 2023, was the world

Its subsidiary Tesla Energy develops and is a major installer of photovoltaic syst

Tesla was incorporated in July 2003 by Martin Eberhard and Marc Tarpenning as Tesl

Tesla began production of its first car model, the Roadster sports car, in 2008. T

Tesla has been the subject of lawsuits, government scrutiny, and journalistic crit
"""

print(llm_chain.run(text1))
```

```
 - Tesla is an American multinational automotive and clean energy company
            - Headquartered in Austin, Texas
            - Designs and manufactures electric vehicles, battery energy storage d
            - One of the world's most valuable companies
            - Led the battery electric vehicle market in 2022
            - Installed 6.5 gigawatt-hours of battery energy storage systems in 20
            - Founded in 2003 by Martin Eberhard and Marc Tarpenning
            - Elon Musk became CEO in 2008
            - Mission is to help expedite the move to sustainable transport and en
            - Produces the Model S sedan, Model X SUV, Model 3 sedan, Model Y cros
            - Plans production of the Cybertruck light-duty pickup truck in 2023
```

```
- Cumulative sales totaled 4 million cars as of April 2023
- Market capitalization temporarily reached $1 trillion in 2
```

sets up a task to detect named entities within a given text using the PromptTemplate and LLMChain classes from the langchain library.

The PromptTemplate lays out instructions for the language model to identify named entities and return results in JSON format, with details like the entity name, its type, and its location within the text. The placeholder {text} in the template will be replaced with the actual text to analyze.

The LLMChain class then binds the prepared prompt template with the specified language model (LLM). The resulting system aims to receive a text, identify the named entities in it, and return a detailed JSON file outlining each identified entity.

```
template = """
               Detect named entities in following text delimited by triple backquo
               Return your response in json format with spans of named entities wi
               Return all entities
               ```{text}```
               json format file:
           """

prompt = PromptTemplate(template=template, input_variables=["text"])

llm_chain = LLMChain(prompt=prompt, llm=llm)
print(llm_chain.run(text2))
```

```
 {
"namedEntity": [
{
"namedEntity": "Apple Inc.",
"type": "company",
"span": [
  {"start": 0, "end": 87}
]
```
```

```
  },
  {
  "namedEntity": "Steve Jobs",
  "type": "person",
  "span": [
    {"start": 109, "end": 141}
  ]
  },
  {
  "namedEntity": "Steve Wozniak",
  "type": "person",
  "span": [
    {"start": 168, "end": 183}
  ]
  },
  {
  "namedEntity": "Ronald Wayne",
  "type": "person",
  "span": [
```

Conclusion :

🚀 You are now well-positioned to begin experimenting with the massive potential that the collaboration of LLAM 2 and LangChain will bring to the industry!

Reference :

https://huggingface.co/meta-llama/Llama-2-7b-chat-hf
https://ai.meta.com/blog/large-language-model-llama-meta-ai/
https://python.langchain.com/docs/get_started/introduction.html
https://www.youtube.com/watch?v=fc7cAP5zrOY

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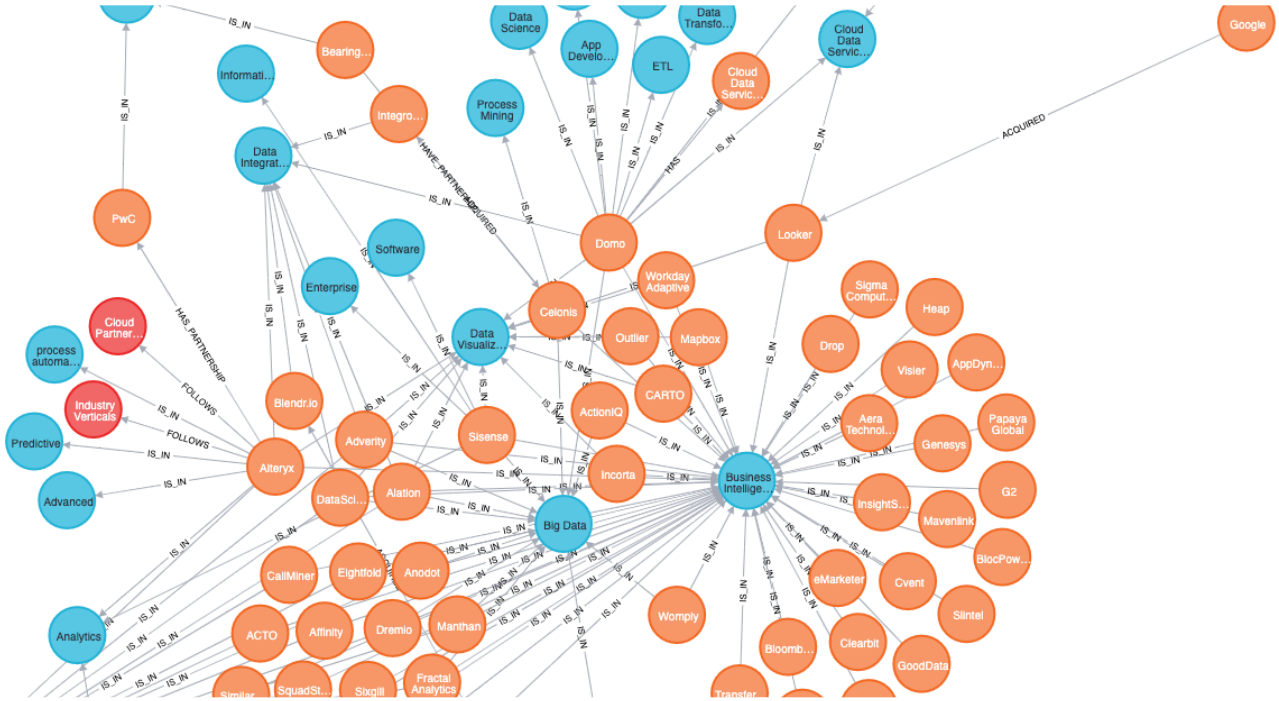

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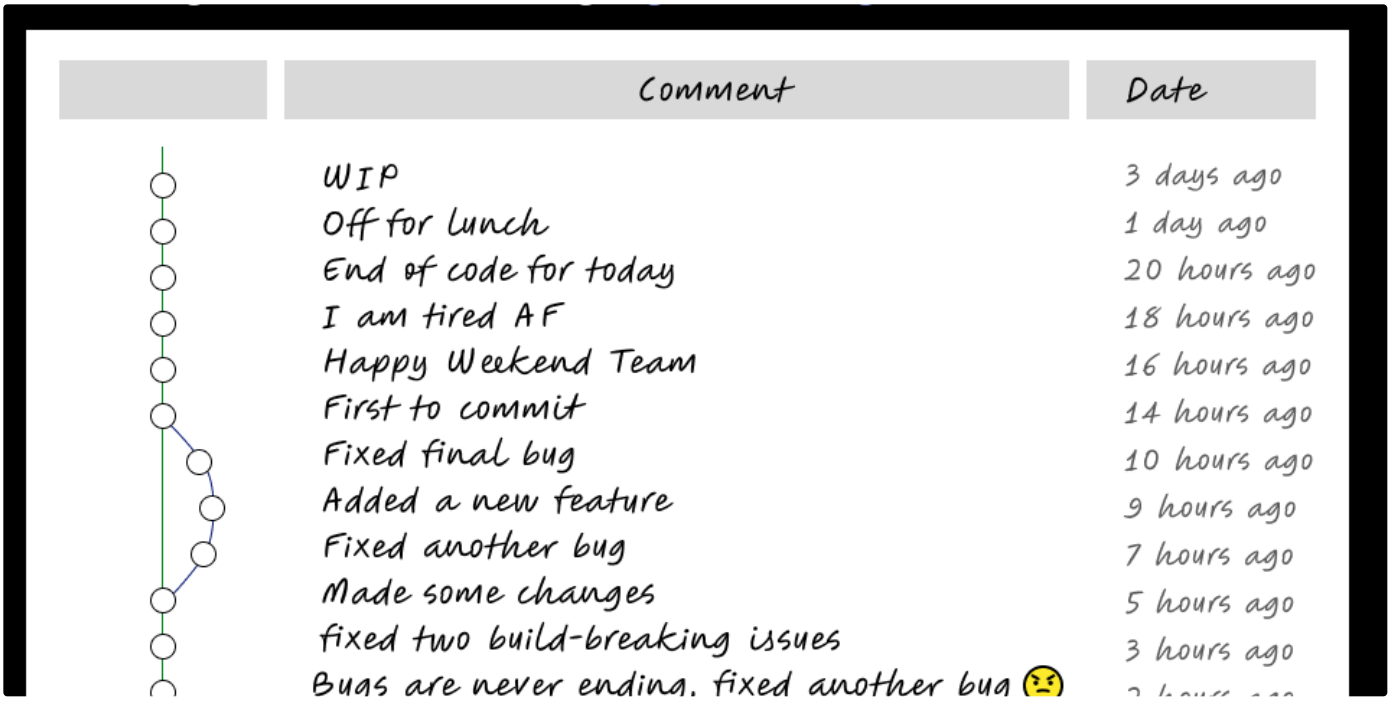

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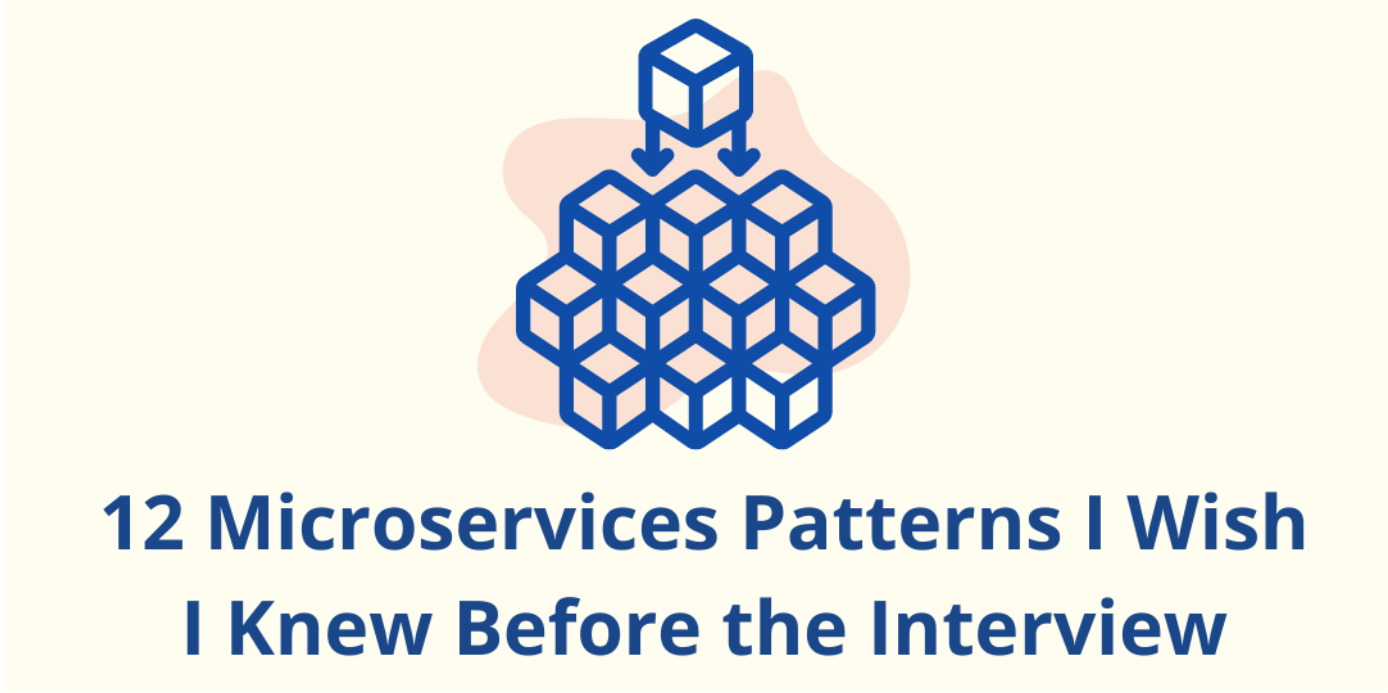

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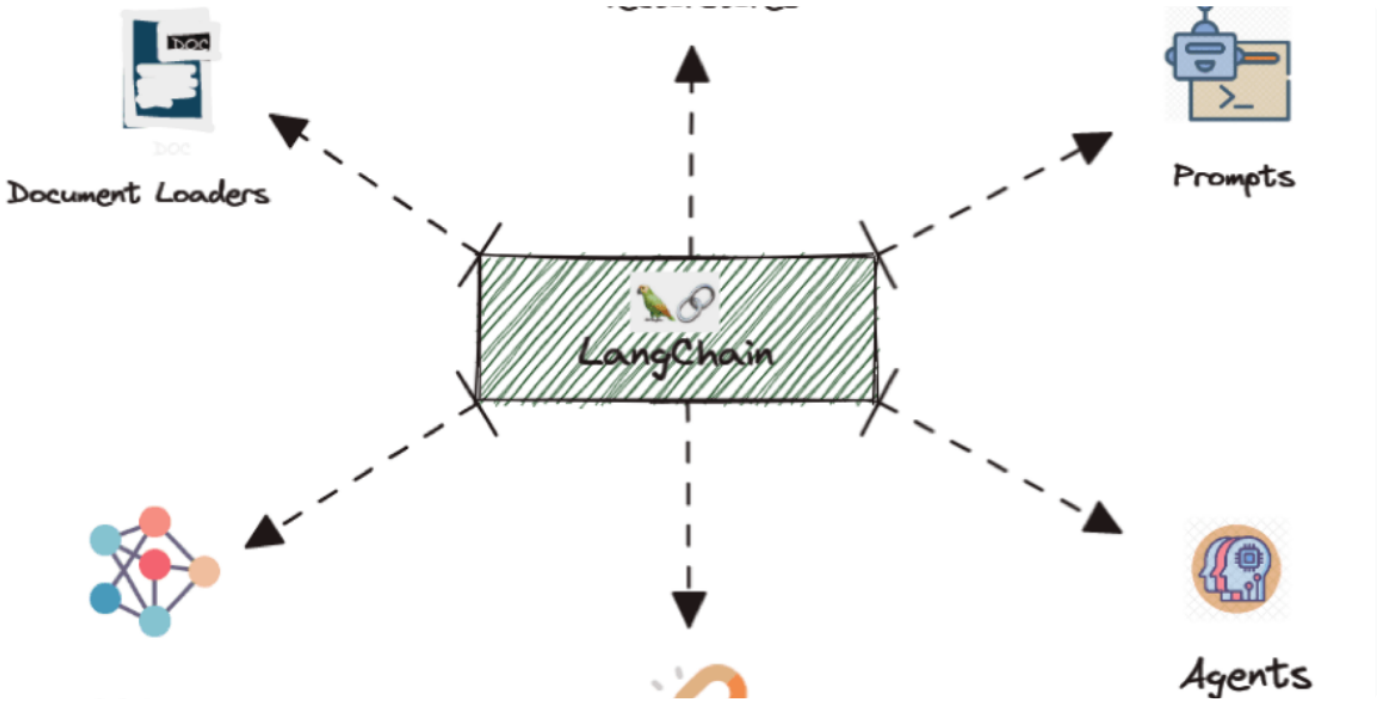

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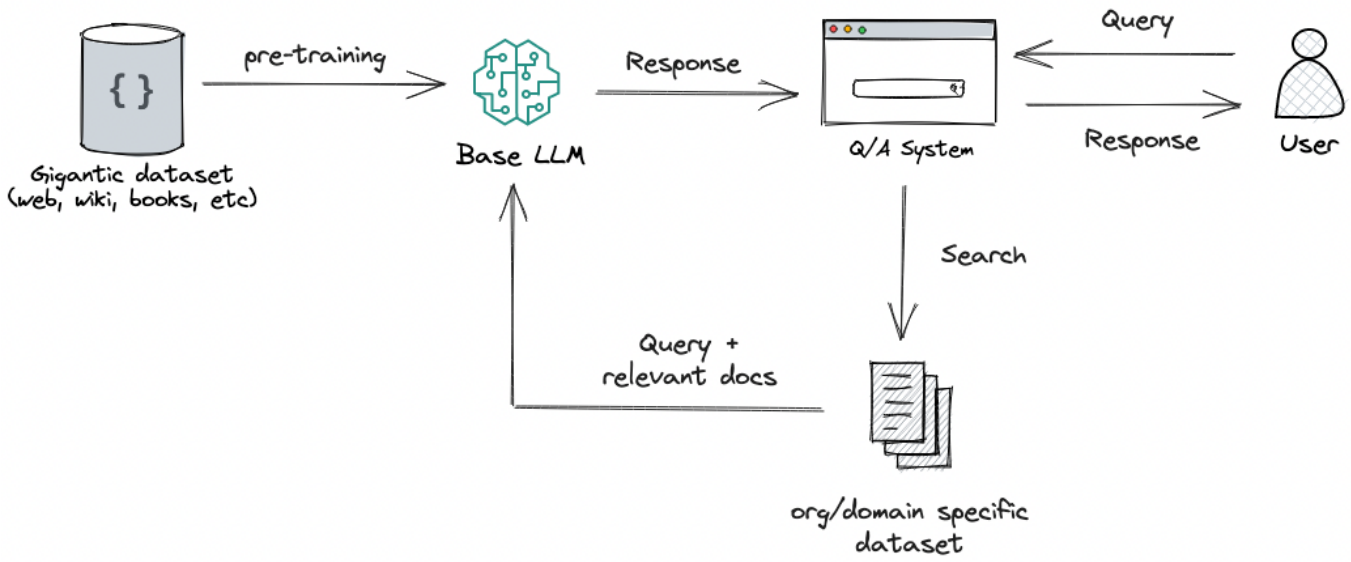

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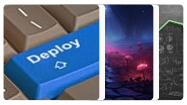

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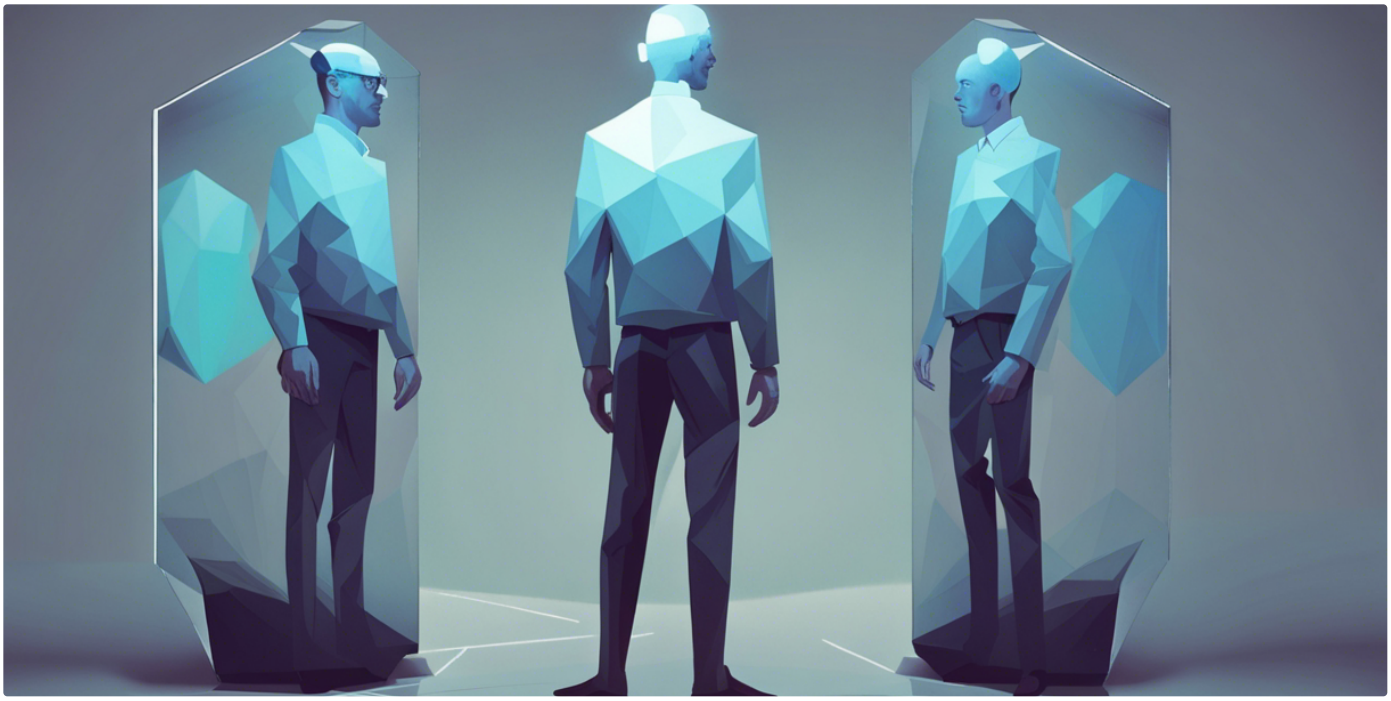

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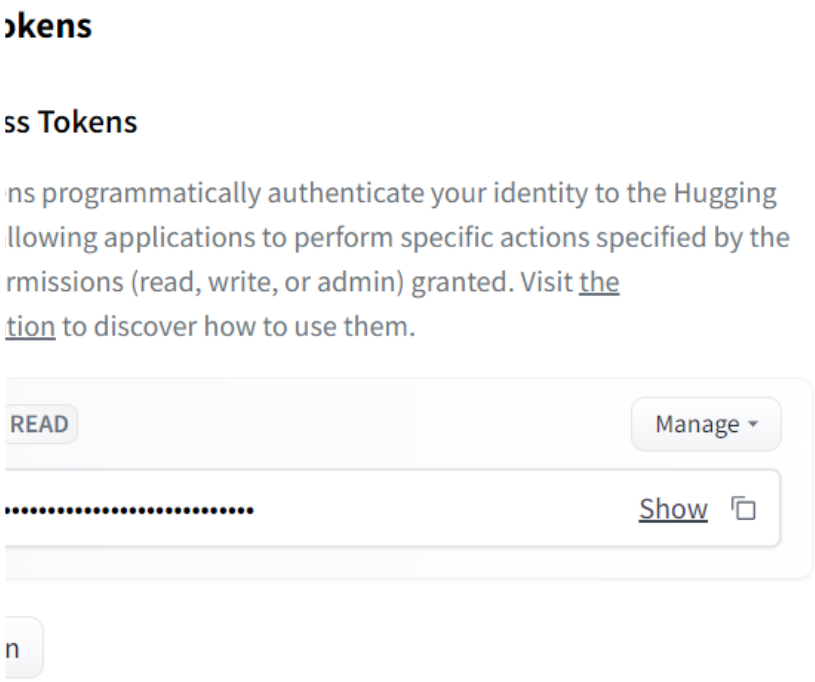

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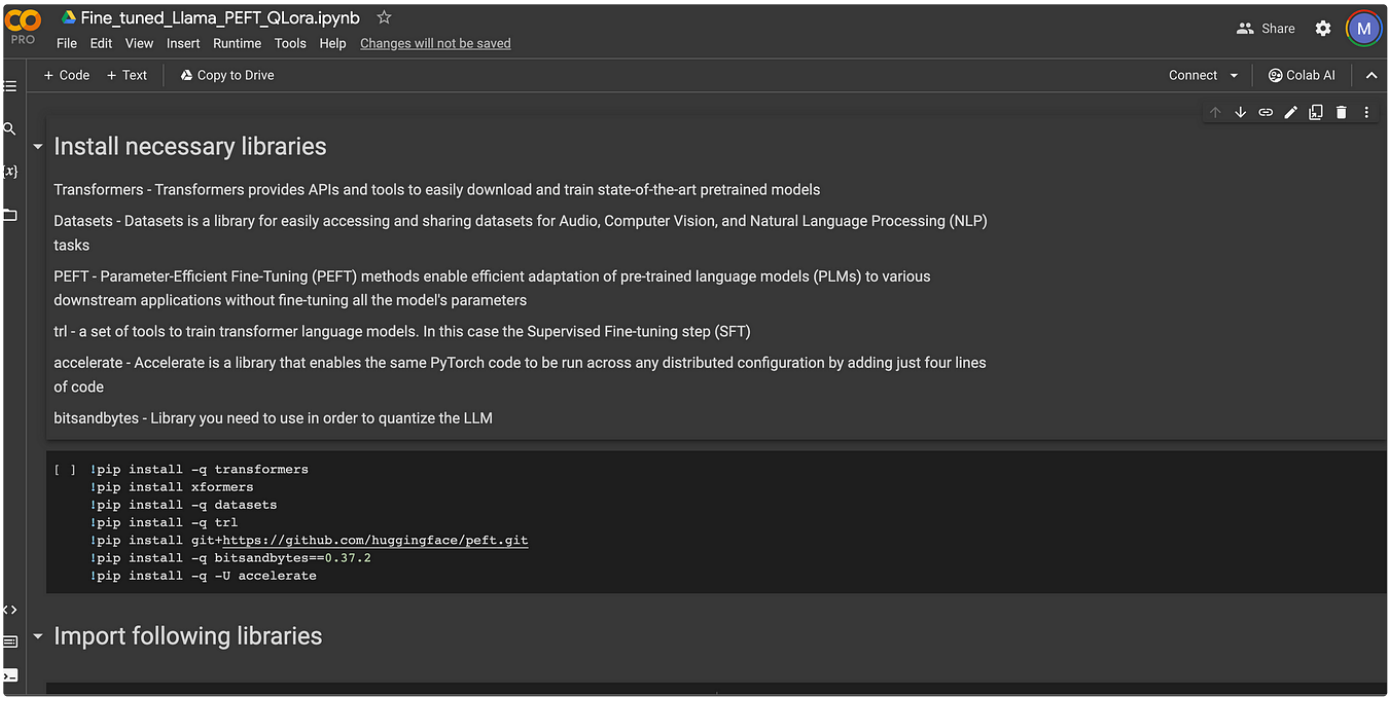

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