installation of required libraries

```
!pip install PdfReader
!pip install langchain
!pip install PyPDF2
!pip install InstructorEmbedding
!pip install sentence_transformers
!pip install faiss
!pip install faiss-gpu
```

Requirement already satisfied: PdfReader in
/usr/local/lib/python3.10/dist-packages (0.1.12)
Requirement already satisfied: bitarray>=1.1.0 in
/usr/local/lib/python3.10/dist-packages (from PdfReader) (2.8.3)
Requirement already satisfied: pillow>=7.1.0 in
/usr/local/lib/python3.10/dist-packages (from PdfReader) (9.4.0)
Requirement already satisfied: pycryptodome>=3.9.9 in
/usr/local/lib/python3.10/dist-packages (from PdfReader) (3.19.0)
Requirement already satisfied: python-dateutil>=2.8.1 in
/usr/local/lib/python3.10/dist-packages (from PdfReader) (2.8.2)
Requirement already satisfied: six>=1.5 in
/usr/local/lib/python3.10/dist-packages (from python-dateutil>=2.8.1-
>PdfReader) (1.16.0)
Requirement already satisfied: langchain in
/usr/local/lib/python3.10/dist-packages (0.0.342)
Requirement already satisfied: PyYAML>=5.3 in
/usr/local/lib/python3.10/dist-packages (from langchain) (6.0.1)
Requirement already satisfied: SQLAlchemy<3,>=1.4 in
/usr/local/lib/python3.10/dist-packages (from langchain) (2.0.23)
Requirement already satisfied: aiohttp<4.0.0,>=3.8.3 in
/usr/local/lib/python3.10/dist-packages (from langchain) (3.8.6)
Requirement already satisfied: anyio<4.0 in
/usr/local/lib/python3.10/dist-packages (from langchain) (3.7.1)
Requirement already satisfied: async-timeout<5.0.0,>=4.0.0 in
/usr/local/lib/python3.10/dist-packages (from langchain) (4.0.3)
Requirement already satisfied: dataclasses-json<0.7,>=0.5.7 in
/usr/local/lib/python3.10/dist-packages (from langchain) (0.6.3)
Requirement already satisfied: jsonpatch<2.0,>=1.33 in
/usr/local/lib/python3.10/dist-packages (from langchain) (1.33)
Requirement already satisfied: langchain-core<0.1,>=0.0.7 in
/usr/local/lib/python3.10/dist-packages (from langchain) (0.0.7)
Requirement already satisfied: langsmith<0.1.0,>=0.0.63 in
/usr/local/lib/python3.10/dist-packages (from langchain) (0.0.67)
Requirement already satisfied: numpy<2,>=1 in
/usr/local/lib/python3.10/dist-packages (from langchain) (1.23.5)
Requirement already satisfied: pydantic<3,>=1 in
/usr/local/lib/python3.10/dist-packages (from langchain) (1.10.13)
Requirement already satisfied: requests<3,>=2 in
/usr/local/lib/python3.10/dist-packages (from langchain) (2.31.0)

```
Requirement already satisfied: tenacity<9.0.0,>=8.1.0 in
/usr/local/lib/python3.10/dist-packages (from langchain) (8.2.3)
Requirement already satisfied: attrs>=17.3.0 in
/usr/local/lib/python3.10/dist-packages (from aiohttp<4.0.0,>=3.8.3-
>langchain) (23.1.0)
Requirement already satisfied: charset-normalizer<4.0,>=2.0 in
/usr/local/lib/python3.10/dist-packages (from aiohttp<4.0.0,>=3.8.3-
>langchain) (3.3.2)
Requirement already satisfied: multidict<7.0,>=4.5 in
/usr/local/lib/python3.10/dist-packages (from aiohttp<4.0.0,>=3.8.3-
>langchain) (6.0.4)
Requirement already satisfied: yarl<2.0,>=1.0 in
/usr/local/lib/python3.10/dist-packages (from aiohttp<4.0.0,>=3.8.3-
>langchain) (1.9.2)
Requirement already satisfied: frozenlist>=1.1.1 in
/usr/local/lib/python3.10/dist-packages (from aiohttp<4.0.0,>=3.8.3-
>langchain) (1.4.0)
Requirement already satisfied: aiosignal>=1.1.2 in
/usr/local/lib/python3.10/dist-packages (from aiohttp<4.0.0,>=3.8.3-
>langchain) (1.3.1)
Requirement already satisfied: idna>=2.8 in
/usr/local/lib/python3.10/dist-packages (from anyio<4.0->langchain)
(3.4)
Requirement already satisfied: sniffio>=1.1 in
/usr/local/lib/python3.10/dist-packages (from anyio<4.0->langchain)
(1.3.0)
Requirement already satisfied: exceptiongroup in
/usr/local/lib/python3.10/dist-packages (from anyio<4.0->langchain)
(1.1.3)
Requirement already satisfied: marshmallow<4.0.0,>=3.18.0 in
/usr/local/lib/python3.10/dist-packages (from dataclasses-
json<0.7,>=0.5.7->langchain) (3.20.1)
Requirement already satisfied: typing-inspect<1,>=0.4.0 in
/usr/local/lib/python3.10/dist-packages (from dataclasses-
json<0.7,>=0.5.7->langchain) (0.9.0)
Requirement already satisfied: jsonpointer>=1.9 in
/usr/local/lib/python3.10/dist-packages (from jsonpatch<2.0,>=1.33-
>langchain) (2.4)
Requirement already satisfied: typing-extensions>=4.2.0 in
/usr/local/lib/python3.10/dist-packages (from pydantic<3,>=1-
>langchain) (4.5.0)
Requirement already satisfied: urllib3<3,>=1.21.1 in
/usr/local/lib/python3.10/dist-packages (from requests<3,>=2-
>langchain) (2.0.7)
Requirement already satisfied: certifi>=2017.4.17 in
/usr/local/lib/python3.10/dist-packages (from requests<3,>=2-
>langchain) (2023.7.22)
Requirement already satisfied: greenlet!=0.4.17 in
/usr/local/lib/python3.10/dist-packages (from SQLAlchemy<3,>=1.4-
```

```
>langchain) (3.0.1)
Requirement already satisfied: packaging>=17.0 in
/usr/local/lib/python3.10/dist-packages (from
marshmallow<4.0.0,>=3.18.0->dataclasses-json<0.7,>=0.5.7->langchain)
(23.2)
Requirement already satisfied: mypy-extensions>=0.3.0 in
/usr/local/lib/python3.10/dist-packages (from typing-
inspect<1,>=0.4.0->dataclasses-json<0.7,>=0.5.7->langchain) (1.0.0)
Requirement already satisfied: PyPDF2 in
/usr/local/lib/python3.10/dist-packages (3.0.1)
Requirement already satisfied: InstructorEmbedding in
/usr/local/lib/python3.10/dist-packages (1.0.1)
Requirement already satisfied: sentence_transformers in
/usr/local/lib/python3.10/dist-packages (2.2.2)
Requirement already satisfied: transformers<5.0.0,>=4.6.0 in
/usr/local/lib/python3.10/dist-packages (from sentence_transformers)
(4.35.2)
Requirement already satisfied: tqdm in /usr/local/lib/python3.10/dist-
packages (from sentence_transformers) (4.66.1)
Requirement already satisfied: torch>=1.6.0 in
/usr/local/lib/python3.10/dist-packages (from sentence_transformers)
(2.1.0+cu118)
Requirement already satisfied: torchvision in
/usr/local/lib/python3.10/dist-packages (from sentence_transformers)
(0.16.0+cu118)
Requirement already satisfied: numpy in
/usr/local/lib/python3.10/dist-packages (from sentence_transformers)
(1.23.5)
Requirement already satisfied: scikit-learn in
/usr/local/lib/python3.10/dist-packages (from sentence_transformers)
(1.2.2)
Requirement already satisfied: scipy in
/usr/local/lib/python3.10/dist-packages (from sentence_transformers)
(1.11.3)
Requirement already satisfied: nltk in /usr/local/lib/python3.10/dist-
packages (from sentence_transformers) (3.8.1)
Requirement already satisfied: sentencepiece in
/usr/local/lib/python3.10/dist-packages (from sentence_transformers)
(0.1.99)
Requirement already satisfied: huggingface-hub>=0.4.0 in
/usr/local/lib/python3.10/dist-packages (from sentence_transformers)
(0.19.4)
Requirement already satisfied: filelock in
/usr/local/lib/python3.10/dist-packages (from huggingface-hub>=0.4.0-
>sentence_transformers) (3.13.1)
Requirement already satisfied: fsspec>=2023.5.0 in
/usr/local/lib/python3.10/dist-packages (from huggingface-hub>=0.4.0-
>sentence_transformers) (2023.6.0)
Requirement already satisfied: requests in
```

```
/usr/local/lib/python3.10/dist-packages (from huggingface-hub>=0.4.0-
>sentence_transformers) (2.31.0)
Requirement already satisfied: pyyaml>=5.1 in
/usr/local/lib/python3.10/dist-packages (from huggingface-hub>=0.4.0-
>sentence_transformers) (6.0.1)
Requirement already satisfied: typing-extensions>=3.7.4.3 in
/usr/local/lib/python3.10/dist-packages (from huggingface-hub>=0.4.0-
>sentence_transformers) (4.5.0)
Requirement already satisfied: packaging>=20.9 in
/usr/local/lib/python3.10/dist-packages (from huggingface-hub>=0.4.0-
>sentence_transformers) (23.2)
Requirement already satisfied: sympy in
/usr/local/lib/python3.10/dist-packages (from torch>=1.6.0-
>sentence_transformers) (1.12)
Requirement already satisfied: networkx in
/usr/local/lib/python3.10/dist-packages (from torch>=1.6.0-
>sentence_transformers) (3.2.1)
Requirement already satisfied: jinja2 in
/usr/local/lib/python3.10/dist-packages (from torch>=1.6.0-
>sentence_transformers) (3.1.2)
Requirement already satisfied: triton==2.1.0 in
/usr/local/lib/python3.10/dist-packages (from torch>=1.6.0-
>sentence_transformers) (2.1.0)
Requirement already satisfied: regex!=2019.12.17 in
/usr/local/lib/python3.10/dist-packages (from
transformers<5.0.0,>=4.6.0->sentence_transformers) (2023.6.3)
Requirement already satisfied: tokenizers<0.19,>=0.14 in
/usr/local/lib/python3.10/dist-packages (from
transformers<5.0.0,>=4.6.0->sentence_transformers) (0.15.0)
Requirement already satisfied: safetensors>=0.3.1 in
/usr/local/lib/python3.10/dist-packages (from
transformers<5.0.0,>=4.6.0->sentence_transformers) (0.4.0)
Requirement already satisfied: click in
/usr/local/lib/python3.10/dist-packages (from nltk-
>sentence_transformers) (8.1.7)
Requirement already satisfied: joblib in
/usr/local/lib/python3.10/dist-packages (from nltk-
>sentence_transformers) (1.3.2)
Requirement already satisfied: threadpoolctl>=2.0.0 in
/usr/local/lib/python3.10/dist-packages (from scikit-learn-
>sentence_transformers) (3.2.0)
Requirement already satisfied: pillow!=8.3.*,>=5.3.0 in
/usr/local/lib/python3.10/dist-packages (from torchvision-
>sentence_transformers) (9.4.0)
Requirement already satisfied: MarkupSafe>=2.0 in
/usr/local/lib/python3.10/dist-packages (from jinja2->torch>=1.6.0-
>sentence_transformers) (2.1.3)
Requirement already satisfied: charset-normalizer<4,>=2 in
/usr/local/lib/python3.10/dist-packages (from requests->huggingface-
```

```python
from PyPDF2 import PdfReader
from langchain.text_splitter import CharacterTextSplitter
from langchain.embeddings import OpenAIEmbeddings,
HuggingFaceInstructEmbeddings
from langchain.vectorstores import FAISS
from langchain.chat_models import ChatOpenAI
from langchain.memory import ConversationBufferMemory
from langchain.chains import ConversationalRetrievalChain
from langchain.chains import RetrievalQA
from langchain.llms import HuggingFaceHub
import os
from langchain.prompts.prompt import PromptTemplate

## extracting text from pdf files
def get_pdf_text(pdf_docs):
    text = ""
    for pdf in pdf_docs:
        pdf_reader = PdfReader(pdf)
        for page in pdf_reader.pages:
            text += page.extract_text()
    return text

## creating overlapping text chunks
def get_text_chunks(text):
    text_splitter = CharacterTextSplitter(
        separator="\n",
        chunk_size=1000,
        chunk_overlap=200,
        length_function=len
    )
```

```python
    chunks = text_splitter.split_text(text)
    return chunks

## creating embeddings for chunks of text
def get_vectorstore(text_chunks):
    #embeddings = OpenAIEmbeddings()
    embeddings =
HuggingFaceInstructEmbeddings(model_name="hkunlp/instructor-xl")
    vectorstore = FAISS.from_texts(texts=text_chunks,
embedding=embeddings)
    return vectorstore

## ceating a retrival llm chain
def retrieval_qa_chain(db,return_source_documents):
    llm = HuggingFaceHub(repo_id="tiiuae/falcon-7b-instruct",
model_kwargs={"temperature":0.6,"max_length":500,
"max_new_tokens":700})
    qa_chain = RetrievalQA.from_chain_type(llm=llm,
                                           chain_type='stuff',
                                           retriever=db,

return_source_documents=return_source_documents,
                                          )
    return qa_chain
```

DATA VECTORIZATION AND INDEX CREATION

```python
os.environ["HUGGINGFACEHUB_API_TOKEN"] =
"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"
```

####pass document path

```python
path_to_pdf = ['/content/Updated_health_pdf.pdf']

raw_text = get_pdf_text(path_to_pdf)

# get the text chunks
text_chunks = get_text_chunks(raw_text)

# create vector store
vectorstore = get_vectorstore(text_chunks)

## creating a db with similarity search and obtaining top 3 most
matched vectors of all the vectors present in vector index
db = vectorstore.as_retriever(search_kwargs={'k': 3})

/usr/local/lib/python3.10/dist-packages/InstructorEmbedding/
instructor.py:7: TqdmExperimentalWarning: Using
`tqdm.autonotebook.tqdm` in notebook mode. Use `tqdm.tqdm` instead to
```

```
force console mode (e.g. in jupyter console)
  from tqdm.autonotebook import trange
```

```
{"model_id":"f882fdeb05b744c7b6953eb4b19a7619","version_major":2,"version_minor":0}

{"model_id":"45601ed9161549359330122b482416a6","version_major":2,"version_minor":0}

{"model_id":"b959dd6bd5c34ec3bfca7fe4526386f1","version_major":2,"version_minor":0}

{"model_id":"dbf20ea905ec405e9a2798a17bf7a225","version_major":2,"version_minor":0}

{"model_id":"34b2007758054487b17665cb3436978c","version_major":2,"version_minor":0}

{"model_id":"cce81fb2a6b346f494e91cdaa335164e","version_major":2,"version_minor":0}

{"model_id":"f82c2be606ce48718c34040a389d7e4e","version_major":2,"version_minor":0}

{"model_id":"2d4319627e95432f88b3f6050ee741d3","version_major":2,"version_minor":0}

{"model_id":"133f7b2960d94ac9a06b693c26931950","version_major":2,"version_minor":0}

{"model_id":"8a859a40d5474b8d95ff6d0c8eccde07","version_major":2,"version_minor":0}

{"model_id":"140ff37c1d7c457f8471021f3df71d49","version_major":2,"version_minor":0}

{"model_id":"7a3336e9376642deb4b5303353137be1","version_major":2,"version_minor":0}

{"model_id":"2fee49385d7f41e08f3d1d2099ba5657","version_major":2,"version_minor":0}

{"model_id":"42050b6eaca742fe93829f654fa29bc9","version_major":2,"version_minor":0}
```

```
load INSTRUCTOR_Transformer
max_seq_length  512
```

passing database to bot as input and initializing the bot

```
bot = retrieval_qa_chain(db,True)
```

```
/usr/local/lib/python3.10/dist-packages/huggingface_hub/utils/
_deprecation.py:127: FutureWarning: '__init__' (from
'huggingface_hub.inference_api') is deprecated and will be removed
from version '1.0'. `InferenceApi` client is deprecated in favor of
the more feature-complete `InferenceClient`. Check out this guide to
learn how to convert your script to use it:
https://huggingface.co/docs/huggingface_hub/guides/inference#legacy-
inferenceapi-client.
  warnings.warn(warning_message, FutureWarning)
```

passing query to llm and llm repliying the query write exit to stop esle pass question

```python
while True:
  query = input("enter your query:" )
  if query == "exit":
    break
  else:
    sol = bot(query)
    print("answer given by bot",sol['result'])
    print("reference taken from this chunk of document
",sol['source_documents'])
```

```
enter your query:suggest me a diet plan
answer given by bot
You can follow this sample diet plan to maintain a healthy lifestyle:
- Breakfast: Greek yogurt parfait with mixed berries and granola
- Mid-morning snack: Apple slices with peanut butter
- Lunch: Baked salmon with vegetables or soup
- Afternoon snack: Hummus with vegetables or nuts
- Dinner: Baked salmon with vegetables or quinoa
- Evening snack: Smoothie or cottage cheese with pineapple
- Snacks: Nuts, fruits, vegetables, and yogurt
reference taken from this chunk of document
[Document(page_content="stay motivated. Additionally, consider your
fitness level and any underlying health conditions.  \nConsult a
healthcare professional or fitness expert if you're unsure about the
right exercises for  \nyour specific needs. Remember that a balanced
exercise regimen should include  \ncardiovascular, strength,
flexibility, and balance components to promote overall health.  \n \
n## Sample Healthy Diet Plan:  \nA well -balanced diet is crucial for
supporting overall health, providing essential nutrients, and \
ncomplementing your exercise routine. Here's a sample daily diet plan
to help you maintain a healthy \nlifestyle:  \n \n1. ** Breakfast:
** \nOption 1: Greek Yogurt Parfait  \n \n1 cup Greek yogurt  \nMixed
berries (blueberries, strawberries)  \n1 tablespoon honey  \nGranola
sprinkled on top  \nOption 2: Oatmeal with Fruit  \n \n1/2 cup rolled
oats  \n1 cup almond milk  \nSliced bananas and a handful of
almonds  \n2.** Mid-Morning Snack: ** \nOption 1: Apple Slices with
```

Peanut Butter"), Document(page_content='Document on maintaining a healthy lifestyle with tips and suggestions: \n--- \n# **Maintaining a Healthy Lifestyle: Tips and Recommendations** \nA healthy lifestyle is the foundation for overall well-being and a high quality of life. It involves \nmaking choices that promote physical, mental, and emotional health. Incorporating healthy \nhabits into your daily routine can lead to increased energy, improved mood, and a reduced risk \nof chronic diseases. Here are some tips and recommendations for maintaining a healthy \nlifestyle: \n## **1. Balanced Diet:** \n* **Eat a Variety of Foods:** Consume a wide range of fruits, vegetables, whole grains, lean \nproteins, and healthy fats to ensure your body receives essential nutrients. \n* **Portion Control:** Be mindful of portion sizes to prevent overeating and maintain a healthy \nweight. \n* **Stay Hydrated:** Drink plenty of water throughout the day to keep your body well-hydrated.'), Document(page_content="Fresh carrot sticks \nHummus for dipping \nDinner: \nBaked Salmon with Vegetables: \n \nBaked salmon fillet \nSteamed broccoli, carrots, and asparagus \nQuinoa or brown rice on the side \nVegetarian Stir-Fry: \n \nTofu or tempeh stir-fried with colorful vegetables (bell peppers, broccoli, snap peas) Brown rice or whole-grain noodles \n5.** Evening Snack: ** \nOption 1: Smoothie \n \nBanana, spinach, almond milk, and a scoop of protein powder \nOption 2: Cottage Cheese with Pineapple \n \nLow-fat cottage cheese \nFresh pineapple chunks \nRemember to adapt the portions according to your individual needs and energy requirements. \nAdditionally, listen to your body's hunger and fullness cues, and stay hydrated by drinking water \nthroughout the day. It's essential to consult with a healthcare pro fessional or a registered dietitian \nbefore making significant changes to your diet, especially if you have any existing health conditions.")]
enter your query:suggest me some exercises to stay fir
answer given by bot
1. Lunges: Lunges are great for building strength and flexibility in your legs and core. They are easy to do and can be modified to suit your fitness level.

2. Squats: Squats are a great way to build strength in your legs, glutes, and core. They can be modified to suit your fitness level and are easy to do.

3. Planks: Planks are a great way to strengthen your core, back, and shoulders. They can be modified to suit your fitness level and are easy to do.

4. Push-ups: Push-ups are a great way to build strength in your arms and chest. They are easy to do and can be modified to suit your fitness level.

5. Dumbbell Workouts: Dumbbell workouts are a great way to build strength and flexibility in your arms and shoulders. They are easy to do and can be modified to suit your fitness level.

6. Cycling: Cycling is a great way to get your heart pumping and build strength in your legs, glutes, and core. It's easy to do and can be modified to suit your fitness level.

7. Yoga: Yoga is a great way to improve flexibility, balance, and relaxation. It's easy to do and can be modified to suit your fitness level.

reference taken from this chunk of document
[Document(page_content="help prevent injuries. \n2. **Tai Chi:** An ancient Chinese practice that combines flowing movements and deep \nbreathing, improving flexibility, balance, and relaxation. \n3. **Yoga:** Many yoga poses involve stretching and increasing flexibility, making it a \nwell-rounded exercise choice. \n## Core Strengthening Exercises: \n1. **Planks:** Holding a plank position engages the core, back, and shoulders. It's excellent for \ndeveloping core strength. \n2. **Crunches:** Abdominal crunches target the core muscles for better posture and reduced \nback pain. \n3. **Leg Raises:** Lying leg raises strengthen lower abdominal muscles. \n## Balance and Coordination Exercises: \n1. **Balance Exercises:** Activities like standing on one leg or using a balance board can \nimprove stability and prevent falls. \n2. **Agility Drills:** Agility exercises enhance coordination, speed, and reaction time. \n3. **Tai Chi:** As previously mentioned, Tai Chi also improves balance and coordination."),
Document(page_content="emotional and mental well -being. \nCertainly! Here are some exercises that can contribute to your overall health and well -being: \n## Cardiovascular (Aerobic) Exercises: \n1. **Walking:** A simple yet effective exercise that requires no special equipment. Brisk walking \ncan improve heart health and help maintain a healthy weight. \n2. **Running:** Running is an excellent way to boost cardiovascular fitness. Start with a pace \nthat suits your fitness level and gradually increase intensity. \n3. **Cycling:** Whether on a stationary bike or outdoors, cycling is great for leg strength and \ncardiovascular health. \n4. **Swimming:** A full -body workout that's easy on the joints. Swimming enhances endurance \nand muscle strength. \n5. **Dancing:** Dancing is a fun way to stay active and improve cardiovascular fitness. There \nare various dance styles to choose from. \n6. **Jumping Rope:** A high -intensity exercise that improves coordination and heart health."),
Document(page_content="2. **Agility Drills:** Agility exercises enhance coordination, speed, and reaction time. \n3. **Tai Chi:** As previously mentioned, Tai Chi also improves balance and coordination. \n## High -Intensity Interval Training (HIIT): \n1. **HIIT Workouts:** High -Intensity Interval Training alternates between short bursts of intense \nexercise and brief rest periods. It's time -efficient and effective for burning calories and improving \nfitness. \n## Outdoor Activities: \n1. **Hiking:** Exploring nature while hiking provides both physical and mental benefits. \n2. **Outdoor

Sports:** Activities like tennis, soccer, and basketball are great ways to stay active \nwhile enjoying the outdoors. When incorporating exercise into your routine, it's essential to choose activities you enjoy to \nstay motivated. Additionally, consider your fitness level and any underlying health conditions. \nConsult a healthcare professional or fitness expert if you're unsure about the right exercises for")]
enter your query:exit