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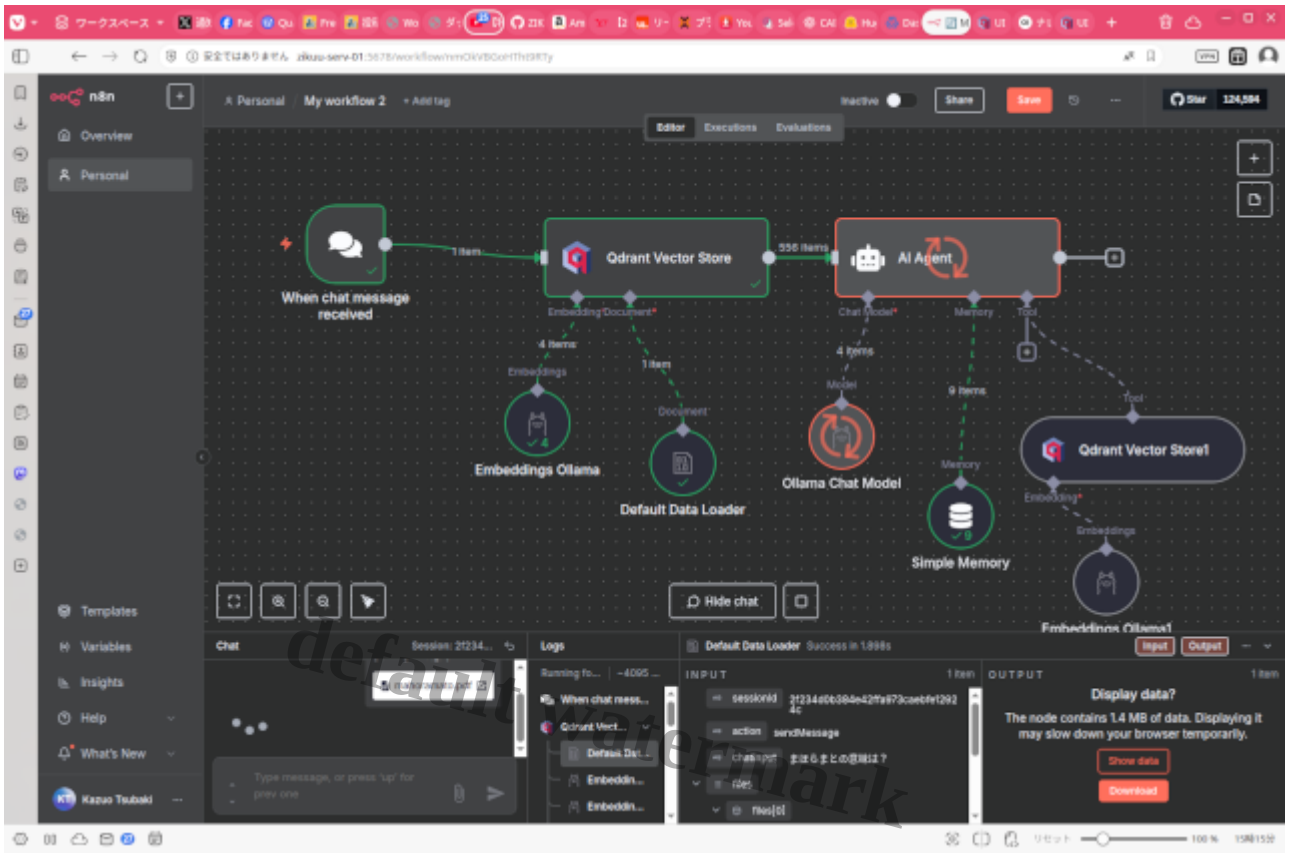

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```
import sys
import os
import base64
from langchain_community.document_loaders import UnstructuredPDFLoader
from langchain_text_splitters import RecursiveCharacterTextSplitter
from langchain_ollama import ChatOllama
from qdrant_client import QdrantClient
from langchain_core.prompts import PromptTemplate
from langchain.chains import RetrievalQA
from langchain_huggingface import HuggingFaceEmbeddings
from langchain_qdrant import QdrantVectorStore

history = []
MAX_HISTORY_SIZE = 50

class EmbeddingsManager:
    def __init__(
```

```
        self,
        model_name: str = "BAAI/bge-small-en",
        device: str = "cpu",
        encode_kwargs: dict = {"normalize_embeddings": True},
        qdrant_url: str = "http://localhost:6333",
        collection_name: str = "vector_db",
    ):
        self.model_name = model_name
        self.device = device
        self.encode_kwargs = encode_kwargs
        self.qdrant_url = qdrant_url
        self.collection_name = collection_name

        self.embeddings = HuggingFaceEmbeddings(
            model_name=self.model_name,
            model_kwargs={"device": self.device},
            encode_kwargs=self.encode_kwargs,
        )

    def create_embeddings(self, pdf_path: str):

        if not os.path.exists(pdf_path):
            raise FileNotFoundError(f"The file {pdf_path} does not exist.")

        loader = UnstructuredPDFLoader(pdf_path)
        docs = loader.load()
        if not docs:
            raise ValueError("No documents were loaded from the PDF.")

        text_splitter = RecursiveCharacterTextSplitter(
            chunk_size=1000, chunk_overlap=250
        )
        splits = text_splitter.split_documents(docs)
        if not splits:
            raise ValueError("No text chunks were created from the documents."

        try:
            qdrant = QdrantVectorStore.from_documents(
                splits,
                self.embeddings,
                url=self.qdrant_url,
                prefer_grpc=False,
                collection_name=self.collection_name,
            )
        except Exception as e:
            raise ConnectionError(f"Failed to connect to Qdrant: {e}")
            return False

        return True

class ChatbotManager:
    def __init__(
        self,
        model_name: str = "BAAI/bge-small-en",
        device: str = "cpu",
        encode_kwargs: dict = {"normalize_embeddings": True},
```

```
        llm_model: str = "gemma3:1b",
        llm_temperature: float = 0.1,
        qdrant_url: str = "http://localhost:6333",
        collection_name: str = "vector_db",
    ):
        self.model_name = model_name
        self.device = device
        self.encode_kwargs = encode_kwargs
        self.llm_model = llm_model
        self.llm_temperature = llm_temperature
        self.qdrant_url = qdrant_url
        self.collection_name = collection_name

        self.embeddings = HuggingFaceEmbeddings(
            model_name=self.model_name,
            model_kwargs={"device": self.device},
            encode_kwargs=self.encode_kwargs,
        )

        self.llm = ChatOllama(
            model=self.llm_model,
            temperature=self.llm_temperature,
        )

        self.prompt_template = """Use the following pieces of information to a
If you don't know the answer, just say that you don't know, don't try to make

Context: {context}
Question: {question}

Only return the helpful answer. Answer must be detailed and well explained in
Helpful answer:
"""

        self.client = QdrantClient(
            url=self.qdrant_url, prefer_grpc=False
        )

        self.db = QdrantVectorStore(
            client=self.client,
            collection_name=self.collection_name,
            embedding=self.embeddings
        )

        self.prompt = PromptTemplate(
            template=self.prompt_template,
            input_variables=['context', 'question']
        )

        self.retriever = self.db.as_retriever(search_kwargs={"k": 1})

        self.chain_type_kwargs = {"prompt": self.prompt}

        self.qa = RetrievalQA.from_chain_type(
            llm=self.llm,
            chain_type="stuff",
```

```
            retriever=self.retriever,
            return_source_documents=False,
            chain_type_kwargs=self.chain_type_kwargs,
            verbose=False
        )

    def get_response(self, query: str) -> str:
        try:
            response = self.qa.invoke(query)
            return response  # 'response' is now a string containing only the
        except Exception as e:
            st.error(f"An error occurred while processing your request: {e}")
            return "Sorry, I couldn't process your request at the moment."


def load_pdf(filename):
    embedding_manager = EmbeddingsManager()

    print("Retrieving PDF and creating embeddings...")
    result = embedding_manager.create_embeddings(filename)

    if result:
        print("PDF document saved in vector store.")
    return result

def print_help():
    print("Help:")
    print("")
    print("--help          Show this help message")
    print("--pdf=filename  Retrieve PDF document for inference")
    print("")
    print("Example:")
    print("")
    print("    Retrieve PDF document and start chat")
    print("    python3 rag_chatbot.py --pdf=filename.pdf")
    print("")

    print("    Show help")
    print("    python3 rag_chatbot.py --help")

def main():
    args = sys.argv

    showHelp = False
    pdfFile = None

    if len(args) == 1:
        showHelp = True

    for m in args:
        if m == "--help":
            showHelp = True
        elif "--pdf=" in m:
            pdfFile = m[len("--pdf="):]

    if showHelp:
```

```
        print_help()
        exit(0)
    else:
        if pdfFile:
            if load_pdf(pdfFile) == False:
                exit(1)

    chatbot_manager = ChatbotManager()

    while True:
        prompt = input("ã??ã?ã?³ã??ã??ã??å?¥å??\n")
        if prompt == "":
            break;

        history.append({"role": "user", "content": prompt})

        response = chatbot_manager.get_response(prompt)
        answer = response["result"]
        print("")
        print(answer)
        print("")
        history.append({"role": "assistant", "content": answer})
        while len(history) > MAX_HISTORY_SIZE:
            history.pop(1)

if __name__ == "__main__":
    main()
```


Category

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Tags

1. AI
2. Docker
3. LLM
4. n8n
5. Ollama
6. Qdrant
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Date Created
2025å¹´7æ??29æ?¥
Author
kazuo-tsubaki