

A6: Let's Talk with Yourself!

In this assignment, apply RAG (Retrieval-Augmented Generation) techniques in Langchain framework to augment your chatbot that specializes in answering questions related to yourself, your documents, resume and any other relevant information.

Load Libraries and define device

```
In [1]: import os
import torch

# Set GPU device for CUDA computation
# os.environ["CUDA_VISIBLE_DEVICES"] = "1"
# os.environ['http_proxy'] = 'http://192.41.170.23:3128'
# os.environ['https_proxy'] = 'http://192.41.170.23:3128'
# device = torch.device('cuda' if torch.cuda.is_available() else 'cpu')

os.environ["TOKENIZERS_PARALLELISM"] = "True"

# Use the MPS (Metal Performance Shaders) backend for PyTorch if available
device = torch.device("mps" if torch.backends.mps.is_available() else "cpu")
device
```

```
Out[1]: device(type='mps')
```

Task 1. Source Discovery - Based on code-along/01-rag-langchain.ipynb, modify as follows:

1. Find all relevant sources related to yourself, including documents, websites, or personal data. Please list down the reference documents (1 point)

Answer: For this task I have used my CV and Profile as a reference document which holds all the answers to the 10 questions that is to be answered about myself by the chat bot. The document can be downloaded from the link: [Download Document](#)

2. Design your Prompt for Chatbot to handle questions related to your personal information. Develop a model that can provide gentle and informative answers based on the designed template. (0.5 point)
3. Explore the use of other text-generation models or OPENAI models to enhance AI capabilities. (0.5 point)

Note: Groq also offers the llama3-70b model (generator model) with limited request capacity. For further exploration, refer to the following link (<https://python.langchain.com/docs/integrations/chat/groq/>)

1. Prompt

A set of instructions or input provided by a user to guide the model's response, helping it understand the context and generate relevant and coherent language-based output, such as answering questions, completing sentences, or engaging in a conversation.

```
In [2]: from langchain import PromptTemplate

prompt_template = """
    Hi! I am an AI – RAGBot assistant that answers questions about the user
    I ensure responses are accurate and cite relevant sources.
    I'll be sure to answer you to the best of my ability!!
    Context: {context}
    Question: {question}
    Answer:
    """.strip()

PROMPT = PromptTemplate.from_template(
    template = prompt_template
)

PROMPT
#using str.format
#The placeholder is defined using curly brackets: {} {}
```

```
Out[2]: PromptTemplate(input_variables=['context', 'question'], template="Hi! I am
an AI – RAGBot assistant that answers questions about the user based on the
available documents. \n    I ensure responses are accurate and cite relevant
sources.\n    I'll be sure to answer you to the best of my ability!!\n
Context: {context}\n    Question: {question}\n    Answer:")
```

```
In [3]: PROMPT.format(
    context = "A RAGBot is a type of artificial intelligence that answers qu
    question = "What is a RAGBot?"
)
```

```
Out[3]: "Hi! I am an AI – RAGBot assistant that answers questions about the user ba
sed on the available documents. \n    I ensure responses are accurate and c
ite relevant sources.\n    I'll be sure to answer you to the best of my abi
lity!!\n    Context: A RAGBot is a type of artificial intelligence that ans
wers questions by retrieving information from uploaded documents. It uses N
LP techniques to process and understand the content of these documents, all
owing it to provide accurate and contextually relevant responses to user qu
eries. By analyzing text and context, the RAGBot can extract the most perti
nent details and generate appropriate answers without the need for explicit
instructions.\n    Question: What is a RAGBot?\n    Answer:"
```

2. Retrieval

1. **Document loaders** : Load documents from many different sources (HTML, PDF, code).
2. **Document transformers** : One of the essential steps in document retrieval is breaking down a large document into smaller, relevant chunks to enhance the retrieval process.

3. **Text embedding models** : Embeddings capture the semantic meaning of the text, allowing you to quickly and efficiently find other pieces of text that are similar.
4. **Vector stores** : there has emerged a need for databases to support efficient storage and searching of these embeddings.
5. **Retrievers** : Once the data is in the database, you still need to retrieve it.

2.1 Document Loaders

Use document loaders to load data from a source as Document's. A Document is a piece of text and associated metadata. For example, there are document loaders for loading a simple .txt file, for loading the text contents of any web page, or even for loading a transcript of a YouTube video.

PDF Loader

```
In [4]: from langchain.document_loaders import PyMuPDFLoader

# nlp_docs = 'documents/CV _SachinMalego.pdf'
# loader = PyMuPDFLoader(nlp_docs)
# documents = loader.load()

# List of document paths
nlp_docs = [
    '/Users/sachinmalego/Documents/AIT Course Works/02. Second Semester/02.',
    '/Users/sachinmalego/Documents/AIT Course Works/02. Second Semester/02.'
]

# Load all documents
documents = []
for doc in nlp_docs:
    loader = PyMuPDFLoader(doc)
    documents.extend(loader.load())

# Now 'documents' contains all loaded text from the PDFs
documents = [doc for file in nlp_docs for doc in PyMuPDFLoader(file).load()]
```

```
In [5]: len(documents)
```

```
Out[5]: 9
```

```
In [6]: documents[1]
```

Out[6]: Document(page_content='SACHIN MALEGO \n \n+66-0910633538(M); e-mail: s.malego@gmail.com; st125171@ait.asia \n2 | Page \n \nOrganization/Duty Station: National Disaster Risk Reduction and Management Authority \n(NDRRMA), Government of Nepal and National Housing and Settlements Resilience Platform \n(NHSRP) Central Office, Lalitpur (Assigned districts: Kathmandu, Lalitpur, Bhaktapur, Makwanpur, \nNawalpur, Parasi, and Sindhuli) Job Responsibilities: \n• \nCoordination with Relevant IM Actors: Collaborate with pertinent Information Management (IM) \nstakeholders to ensure the upkeep of common district-level IM tools. These tools facilitate various \nfunctions such as data collection, collation, analysis, and dissemination. It involves maintaining \narchives of baseline data, key datasets, key indicators, and other essential tools necessary for \neffective information management. \n• \nManagement of IT Projects: Oversee IT projects, including software development initiatives, to \nensure they are completed within established timelines and meet project objectives. This entails \ncoordinating with developers, stakeholders, and project managers to ensure smooth project \nexecution. \n• \nComprehensive System Documentation: Conduct thorough documentation of systems and source \ncode to ensure clarity, transparency, and compliance with organizational policies and standards. \nThis documentation serves as a reference for future maintenance, troubleshooting, and \nenhancements. \n• \nDevelopment of Training Packages: Develop training and orientation packages tailored to the \nspecific needs of users of the developed information systems. These packages aim to equip users \nwith the necessary knowledge and skills to effectively utilize the systems for their intended \npurposes. \n• \nTechnical Support to NDRRMA: Provide crucial technical support to the National Disaster Risk \nReduction and Management Authority (NDRRMA) in the multi-hazard policy-making process. This \ninvolves leveraging expertise in information management to contribute to informed decision \nmaking and the development of effective disaster management strategies. \n• \nSupport for Major NDRRMA Information Systems: Offer consultancy and assistance support for \nkey NDRRMA information systems, such as the Bipad portal, Reconstruction Management \nInformation System (RMIS), Resource Management System, and Volunteer Management System \n(VMS). This includes ensuring the smooth functioning, maintenance, and optimization of these \nsystems. \n• \nGovernment Data Security: Provide feedback on government data security measures and \ncontribute to the development of a robust data management platform for multi-hazard disaster \nmanagement. This involves identifying vulnerabilities, recommending solutions, and supporting the \nimplementation of security protocols to safeguard sensitive information. \n• \nAnalysis and Reporting Support: Assist the General/Technical Coordinator in conducting analysis \nand generating reports on the quality, coverage, and gaps in operational activities. These \nanalyses and reports serve as valuable insights for decision-making and strategic planning \npurposes. \n• \nInformation Sharing Mechanisms: Contribute to the establishment and maintenance of robust \ninformation sharing, communication, and dissemination mechanisms among Partner Organizations \n(POs), local authorities, and other humanitarian actors. This facilitates efficient exchange of \ninformation and coordination of efforts in disaster response and recovery efforts. \n• \nTechnical Assistance in Information Management: Provide technical assistance in various aspects \nof information management, including data collection, verification, and analysis. This support aims \nto enhance the identification of coverage and gaps in disaster response activities and improve \noverall data quality. \n• \nPreparation and Sharing of Information Products: Prepare and disseminate localized information \nproducts, such as analysis reports, maps, and case studies, in the local language. These products \nserve to inform stakeholders and aid in strategy and decision-making processes at the

```
local level. \n', metadata={'source': '/Users/sachinmalego/Documents/AIT Course Works/02. Second Semester/02. AI-NLU/Lab Work/Github/Python-fo-Natural-Language-Processing/Assignment/NLP-A6-Lets-Talk-with-Yourself/documents/CV _SachinMalego.pdf', 'file_path': '/Users/sachinmalego/Documents/AIT Course Works/02. Second Semester/02. AI-NLU/Lab Work/Github/Python-fo-Natural-Language-Processing/Assignment/NLP-A6-Lets-Talk-with-Yourself/documents/CV _SachinMalego.pdf', 'page': 1, 'total_pages': 7, 'format': 'PDF 1.4', 'title': '', 'author': '', 'subject': '', 'keywords': '', 'creator': '', 'producer': 'macOS Version 15.1.1 (Build 24B91) Quartz PDFContext', 'creationDate': "D:20241213042847Z00'00'", 'modDate': "D:20241213042847Z00'00'", 'trapped': ''})
```

2.2 Document Transformers

This text splitter is the recommended one for generic text. It is parameterized by a list of characters. It tries to split on them in order until the chunks are small enough

```
In [7]: from langchain.text_splitter import RecursiveCharacterTextSplitter
```

```
text_splitter = RecursiveCharacterTextSplitter(
    chunk_size = 700,
    chunk_overlap = 100
)

doc = text_splitter.split_documents(documents)
```

```
In [8]: doc[1]
```

```
Out[8]: Document(page_content='offering assistance in information system design, data visualization, data security, and data \nmanagement of Reconstruction portals. \n• \nSupported the National Disaster Risk Reduction and Management Authority (NDRRMA) as a \nconsultant in the design and development of Bipad portals, along with creating training and \norientation packages. \n• \nServed as Technical Lead for Asia Shelter Forum 2020 and Co-facilitator for Asia Shelter Forum \n2021. \n \nOBJECTIVE \nTo leverage my extensive experience in Information Systems Design, Data Management, Data Science, \nAI, and Disaster Risk Reduction to contribute effectively as an Expert to the field, With a proven track', metadata={'source': '/Users/sachinmalego/Documents/AIT Course Works/02. Second Semester/02. AI-NLU/Lab Work/Github/Python-fo-Natural-Language-Processing/Assignment/NLP-A6-Lets-Talk-with-Yourself/documents/CV _SachinMalego.pdf', 'file_path': '/Users/sachinmalego/Documents/AIT Course Works/02. Second Semester/02. AI-NLU/Lab Work/Github/Python-fo-Natural-Language-Processing/Assignment/NLP-A6-Lets-Talk-with-Yourself/documents/CV _SachinMalego.pdf', 'page': 0, 'total_pages': 7, 'format': 'PDF 1.4', 'title': '', 'author': '', 'subject': '', 'keywords': '', 'creator': '', 'producer': 'macOS Version 15.1.1 (Build 24B91) Quartz PDFContext', 'creationDate': "D:20241213042847Z00'00'", 'modDate': "D:20241213042847Z00'00'", 'trapped': ''})
```

```
In [9]: len(doc)
```

```
Out[9]: 45
```

2.3 Text Embedding Models

Embeddings create a vector representation of a piece of text. This is useful because it means we can think about text in the vector space, and do things like semantic search where we look for pieces of text that are most similar in the vector space.

Note Instructor Model : [Huggingface](#) | [Paper](#)

```
In [10]: import warnings
warnings.simplefilter("ignore", FutureWarning)

import torch
from langchain_community.embeddings import HuggingFaceInstructEmbeddings

model_name = 'hkunlp/instructor-base'

embedding_model = HuggingFaceInstructEmbeddings(
    model_name = model_name,
    model_kwargs = {"device" : device}
)
```

```
load INSTRUCTOR_Transformer
max_seq_length 512
```

2.4 Vector Stores

One of the most common ways to store and search over unstructured data is to embed it and store the resulting embedding vectors, and then at query time to embed the unstructured query and retrieve the embedding vectors that are 'most similar' to the embedded query. A vector store takes care of storing embedded data and performing vector search for you.

```
In [11]: #locate vectorstore
vector_path = './vector-store'
if not os.path.exists(vector_path):
    os.makedirs(vector_path)
    print('create path done')
```

```
In [12]: #save vector locally
from langchain.vectorstores import FAISS

vectordb = FAISS.from_documents(
    documents = doc,
    embedding = embedding_model
)

db_file_name = 'nlp_db'

vectordb.save_local(
    folder_path = os.path.join(vector_path, db_file_name),
    index_name = 'nlp' #default index
)
```

2.5 retrievers

A retriever is an interface that returns documents given an unstructured query. It is more general than a vector store. A retriever does not need to be able to store documents, only to return (or retrieve) them. Vector stores can be used as the backbone of a retriever, but there are other types of retrievers as well.

```
In [13]: #calling vector from local
vector_path = './vector-store'
db_file_name = 'nlp_db'

from langchain.vectorstores import FAISS

vectordb = FAISS.load_local(
    folder_path = os.path.join(vector_path, db_file_name),
    embeddings = embedding_model,
    index_name = 'nlp' #default index
)
```

```
In [14]: #ready to use
retriever = vectordb.as_retriever()
```

```
In [15]: retriever.get_relevant_documents("How old are you?")
```

Out[15]: [Document(page_content='record in technical leadership and consultancy role s, my aim is to drive digital transformation initiatives \nand enhance organiza tional capabilities in utilizing data-driven strategies, artificial int elligence, and \nmachine learning for impactful decision-making and sustain able development. \n \nPERSONAL DETAILS \nDate of Birth: \n23rd Dec 198 8 A.D. \nGender: \nMale \nPermanent Address: \nAsan Tole, Tansen-2, Pal pa, Nepal \nCurrent Address: \nAIT Thailand \nNationality: \nNepali \nLanguage Known: \nEnglish, Nepali \n \nPROFESSIONAL WORKING EXPERIENCE \nDate: July 08, 2018 – July 15, 2024 \nJob Title: Information Management O fficer – National', metadata={'source': '/Users/sachinmalego/Documents/AIT Course Works/02. Second Semester/02. AI-NLU/Lab Work/Github/Python-fo-Natur al-Language-Processing/Assignment/NLP-A6-Lets-Talk-with-Yourself/documents/ CV _SachinMalego.pdf', 'file_path': '/Users/sachinmalego/Documents/AIT Cour se Works/02. Second Semester/02. AI-NLU/Lab Work/Github/Python-fo-Natural-L anguage-Processing/Assignment/NLP-A6-Lets-Talk-with-Yourself/documents/CV _ SachinMalego.pdf', 'page': 0, 'total_pages': 7, 'format': 'PDF 1.4', 'titl e': '', 'author': '', 'subject': '', 'keywords': '', 'creator': '', 'produc er': 'macOS Version 15.1.1 (Build 24B91) Quartz PDFContext', 'creationDat e': "D:20241213042847Z00'00'", 'modDate': "D:20241213042847Z00'00'", 'trapp ed': ''}),

Document(page_content='• \nUndertake any other duties assigned by the supe rvisor, demonstrating flexibility and \nadaptability to contribute to vario us tasks and initiatives as needed. \n \nDate: July 08, 2018 – March 31, 2018', metadata={'source': '/Users/sachinmalego/Documents/AIT Course Works/ 02. Second Semester/02. AI-NLU/Lab Work/Github/Python-fo-Natural-Language-P rocessing/Assignment/NLP-A6-Lets-Talk-with-Yourself/documents/CV _SachinMal ego.pdf', 'file_path': '/Users/sachinmalego/Documents/AIT Course Works/02. Second Semester/02. AI-NLU/Lab Work/Github/Python-fo-Natural-Language-Proce ssing/Assignment/NLP-A6-Lets-Talk-with-Yourself/documents/CV _SachinMalego. pdf', 'page': 2, 'total_pages': 7, 'format': 'PDF 1.4', 'title': '', 'autho r': '', 'subject': '', 'keywords': '', 'creator': '', 'producer': 'macOS Ve rsion 15.1.1 (Build 24B91) Quartz PDFContext', 'creationDate': "D:202412130 42847Z00'00'", 'modDate': "D:20241213042847Z00'00'", 'trapped': ''}),

Document(page_content='Sachin Malego is an accomplished professional speci alizing in Information Systems Design, Data \nScience, Artificial Intellige nce, and Disaster Risk Reduction. Born on December 23, 1988, he has \namass ed extensive experience in the field, combining technical expertise with le adership roles in \nnational and international projects. His career spans o ver a decade, with significant contributions \nto data-driven decision-maki ng and digital transformation initiatives. \nWith an academic foundation ro ted in technology and innovation, Sachin holds a Bachelor of \nScience in Computer Science and Information Technology (B.Sc. CSIT) from St. Xavie r's', metadata={'source': '/Users/sachinmalego/Documents/AIT Course Works/0 2. Second Semester/02. AI-NLU/Lab Work/Github/Python-fo-Natural-Language-Pr ocessing/Assignment/NLP-A6-Lets-Talk-with-Yourself/documents/Profile_Sachin Malego.pdf', 'file_path': '/Users/sachinmalego/Documents/AIT Course Works/0 2. Second Semester/02. AI-NLU/Lab Work/Github/Python-fo-Natural-Language-Pr ocessing/Assignment/NLP-A6-Lets-Talk-with-Yourself/documents/Profile_Sachin Malego.pdf', 'page': 0, 'total_pages': 2, 'format': 'PDF 1.3', 'title': '', 'author': '', 'subject': '', 'keywords': '', 'creator': '', 'producer': 'ma cOS Version 15.3.2 (Build 24D81) Quartz PDFContext', 'creationDate': "D:202 50315142840Z00'00'", 'modDate': "D:20250315142840Z00'00'", 'trapped': ''}),

Document(page_content='• \nKnowledge of Email, Internet, Social networking sites, etc. \n• \nKnowledge of hardware and software installation, trouble shooting, and bugs fixing. \n• \nKnowledge of GIS/Mapping and Google Maps API. \n• \nKnowledge of Content Management System. \n• \nKnowledge of Zoo

m Hosting and maintenance. \n \nPUBLICATION/RESEARCH WORK \n• \nReport publication on “Urban Housing Recovery – July 2020” from HRRP, worked primarily on \ncase analysis and visualization, and report publication. \n• \nReport publication on “Impact of COVID-19 on Post-Earthquake Recovery and Reconstruction \nJune 2020” from HRRP, worked primarily on data collection strategy, work division, data', metadata={'source': '/Users/sachinmalego/Documents/AIT Course Works/02. Second Semester/02. AI-NLU/Lab Work/Github/Python-fo-Natural-Language-Processing/Assignment/NLP-A6-Lets-Talk-with-Yourself/documents/CV _SachinMalego.pdf', 'file_path': '/Users/sachinmalego/Documents/AIT Course Works/02. Second Semester/02. AI-NLU/Lab Work/Github/Python-fo-Natural-Language-Processing/Assignment/NLP-A6-Lets-Talk-with-Yourself/documents/CV _SachinMalego.pdf', 'page': 5, 'total_pages': 7, 'format': 'PDF 1.4', 'title': '', 'author': '', 'subject': '', 'keywords': '', 'creator': '', 'producer': 'macOS Version 15.1.1 (Build 24B91) Quartz PDFContext', 'creationDate': "D:20241213042847Z00'00'", 'modDate': "D:20241213042847Z00'00'", 'trapped': ''}}]

In [16]: retriever.get_relevant_documents("What is your highest level of education?")

Out[16]: [Document(page_content='(Division) \nM.Sc. DSAI \nAIT \nAsian Institute of Technology, \nThailand \nCurrent \n \nB.Sc. CSIT \nT.U. \nSt. Xavier's College Maitighar, \nKathmandu \n2013 A.D. \n81.36% \n(Distinction) \n10+2 \nHSEB \nMillennium H.S.S. Tansen, \nPalpa \n2007 A.D. \n64.1% \n(Ist div.) \nS.L.C. \nHMG \nNew Horizon Eng. Bo. Sec. School \nTansen, Palpa \n2005 A.D. \n71.37% \n(Ist div.) \n \nACADEMIC PROJECTS \n• \nFinal year project entitled "ICT in SMART Energy for Sustainable Empowerment" as per the \nrequirement for the partial fulfillment of B.Sc. CSIT degree. \n• \nMini project on Database entitled "Vehicle Registration System" as per the requirement for the \npartial fulfillment of B.Sc. CSIT degree. \n•', metadata={'source': '/Users/sachinmalego/Documents/AIT Course Works/02. Second Semester/02. AI-NLU/Lab Work/Github/Python-fo-Natural-Language-Processing/Assignment/NLP-A6-Lets-Talk-with-Yourself/documents/CV _SachinMalego.pdf', 'file_path': '/Users/sachinmalego/Documents/AIT Course Works/02. Second Semester/02. AI-NLU/Lab Work/Github/Python-fo-Natural-Language-Processing/Assignment/NLP-A6-Lets-Talk-with-Yourself/documents/CV _SachinMalego.pdf', 'page': 4, 'total_pages': 7, 'format': 'PDF 1.4', 'title': '', 'author': '', 'subject': '', 'keywords': '', 'creator': '', 'producer': 'macOS Version 15.1.1 (Build 24B91) Quartz PDFContext', 'creationDate': "D:20241213042847Z00'00'", 'modDate': "D:20241213042847Z00'00'", 'trapped': ''}), Document(page_content="Science in Computer Science and Information Technology (B.Sc. CSIT) from St. Xavier's \nCollege, Maitighar, Kathmandu, where he graduated with distinction, securing 81.36%. Currently, \nhe is pursuing a Master of Science in Data Science and Artificial Intelligence at the Asian Institute \nof Technology (AIT), Thailand, further expanding his expertise in AI, predictive analytics, and \ndata-driven solutions. \nSachin's professional experience is marked by his tenure as an Information Management Officer \nat the National Disaster Risk Reduction and Management Authority (NDRRMA) under the \nGovernment of Nepal from 2018 to 2024. His role involved designing and managing critical", metadata={'source': '/Users/sachinmalego/Documents/AIT Course Works/02. Second Semester/02. AI-NLU/Lab Work/Github/Python-fo-Natural-Language-Processing/Assignment/NLP-A6-Lets-Talk-with-Yourself/documents/Profile_SachinMalego.pdf', 'file_path': '/Users/sachinmalego/Documents/AIT Course Works/02. Second Semester/02. AI-NLU/Lab Work/Github/Python-fo-Natural-Language-Processing/Assignment/NLP-A6-Lets-Talk-with-Yourself/documents/Profile_SachinMalego.pdf', 'page': 0, 'total_pages': 2, 'format': 'PDF 1.3', 'title': '', 'author': '', 'subject': '', 'keywords': '', 'creator': '', 'producer': 'macOS Version 15.3.2 (Build 24D81) Quartz PDFContext', 'creationDate': "D:20250315142840Z00'00'", 'modDate': "D:20250315142840Z00'00'", 'trapped': ''}), Document(page_content='Sachin Malego is an accomplished professional specializing in Information Systems Design, Data \nScience, Artificial Intelligence, and Disaster Risk Reduction. Born on December 23, 1988, he has \namassed extensive experience in the field, combining technical expertise with leadership roles in \nnational and international projects. His career spans over a decade, with significant contributions \nto data-driven decision-making and digital transformation initiatives. \nWith an academic foundation rooted in technology and innovation, Sachin holds a Bachelor of \nScience in Computer Science and Information Technology (B.Sc. CSIT) from St. Xavier's', metadata={'source': '/Users/sachinmalego/Documents/AIT Course Works/02. Second Semester/02. AI-NLU/Lab Work/Github/Python-fo-Natural-Language-Processing/Assignment/NLP-A6-Lets-Talk-with-Yourself/documents/Profile_SachinMalego.pdf', 'file_path': '/Users/sachinmalego/Documents/AIT Course Works/02. Second Semester/02. AI-NLU/Lab Work/Github/Python-fo-Natural-Language-Processing/Assignment/NLP-A6-Lets-Talk-with-Yourself/documents/Profile_SachinMalego.pdf', 'page': 0, 'total_pages': 2, 'format': 'PDF 1.3', 'title': ''},

```
'author': '', 'subject': '', 'keywords': '', 'creator': '', 'producer': 'macOS Version 15.3.2 (Build 24D81) Quartz PDFContext', 'creationDate': 'D:20250315142840Z00'00'', 'modDate': 'D:20250315142840Z00'00'', 'trapped': ''}),
Document(page_content='record in technical leadership and consultancy roles, my aim is to drive digital transformation initiatives \nand enhance organizational capabilities in utilizing data-driven strategies, artificial intelligence, and \nmachine learning for impactful decision-making and sustainable development. \n \nPERSONAL DETAILS \nDate of Birth: \n23rd Dec 1988 A.D. \nGender: \nMale \nPermanent Address: \nAsan Tole, Tansen-2, Palpa, Nepal \nCurrent Address: \nAIT Thailand \nNationality: \nNepali \nLanguage Known: \nEnglish, Nepali \n \nPROFESSIONAL WORKING EXPERIENCE \nDate: July 08, 2018 – July 15, 2024 \nJob Title: Information Management Officer – National', metadata={'source': '/Users/sachinmalego/Documents/AIT Course Works/02. Second Semester/02. AI-NLU/Lab Work/Github/Python-fo-Natural-Language-Processing/Assignment/NLP-A6-Lets-Talk-with-Yourself/documents/CV _SachinMalego.pdf', 'file_path': '/Users/sachinmalego/Documents/AIT Course Works/02. Second Semester/02. AI-NLU/Lab Work/Github/Python-fo-Natural-Language-Processing/Assignment/NLP-A6-Lets-Talk-with-Yourself/documents/CV _SachinMalego.pdf', 'page': 0, 'total_pages': 7, 'format': 'PDF 1.4', 'title': '', 'author': '', 'subject': '', 'keywords': '', 'creator': '', 'producer': 'macOS Version 15.1.1 (Build 24B91) Quartz PDFContext', 'creationDate': 'D:20241213042847Z00'00'', 'modDate': 'D:20241213042847Z00'00'', 'trapped': ''})]
```

3. Memory

One of the core utility classes underpinning most (if not all) memory modules is the `ChatMessageHistory` class. This is a super lightweight wrapper that provides convenience methods for saving `HumanMessages`, `AIMessages`, and then fetching them all.

You may want to use this class directly if you are managing memory outside of a chain.

```
In [17]: from langchain.memory import ChatMessageHistory
```

```
history = ChatMessageHistory()
history
```

```
Out[17]: ChatMessageHistory(messages=[])
```

```
In [18]: history.add_user_message('hi')
history.add_ai_message('Whats up?')
history.add_user_message('How are you')
history.add_ai_message('I\'m quite good. How about you?')
history.add_user_message('I\'m fine')
history.add_ai_message('That\'s good to hear')
history.add_user_message('Bye')
history.add_ai_message('Bye')
```

```
In [19]: history
```

```
Out [19]: ChatMessageHistory(messages=[HumanMessage(content='hi'), AIMessage(content='What's up?'), HumanMessage(content='How are you?'), AIMessage(content='I'm quite good. How about you?'), HumanMessage(content='I'm fine'), AIMessage(content='That's good to hear'), HumanMessage(content='Bye'), AIMessage(content='Bye')])
```

3.1 Memory types

There are many different types of memory. Each has their own parameters, their own return types, and is useful in different scenarios.

- Conversation Buffer
- Conversation Buffer Window

What variables get returned from memory?

Before going into the chain, various variables are read from memory. These have specific names which need to align with the variables the chain expects. You can see what these variables are by calling `memory.load_memory_variables({})`. Note that the empty dictionary that we pass in is just a placeholder for real variables. If the memory type you are using is dependent upon the input variables, you may need to pass some in.

In this case, you can see that `load_memory_variables` returns a single key, `history`. This means that your chain (and likely your prompt) should expect an input named `history`. You can usually control this variable through parameters on the memory class. For example, if you want the memory variables to be returned in the key `chat_history` you can do.

Conversation Buffer

This memory allows for storing messages and then extracts the messages in a variable.

```
In [20]: from langchain.memory import ConversationBufferMemory

memory = ConversationBufferMemory()
memory.save_context({'input': 'hi'}, {'output': 'What's up?'})
memory.save_context({'input': 'How are you?'}, {'output': 'I'm quite good. How about you?'})
memory.load_memory_variables({})
```

```
Out [20]: {'history': 'Human: hi\nAI: What's up?\nHuman: How are you?\nAI: I'm quite good. How about you?'}
```

```
In [21]: from langchain.memory import ConversationBufferMemory

memory = ConversationBufferMemory(return_messages = True)
memory.save_context({'input': 'hi'}, {'output': 'What's up?'})
memory.save_context({'input': 'How are you?'}, {'output': 'I'm quite good. How about you?'})
memory.load_memory_variables({})
```

```
Out[21]: {'history': [HumanMessage(content='hi'),
  AIMessage(content="What's up?"),
  HumanMessage(content='How are you?'),
  AIMessage(content="I'm quite good. How about you?")]}
```

Conversation Buffer Window

- it keeps a list of the interactions of the conversation over time.
- it only uses the last K interactions.
- it can be useful for keeping a sliding window of the most recent interactions, so the buffer does not get too large.

```
In [22]: from langchain.memory import ConversationBufferWindowMemory

memory = ConversationBufferWindowMemory(k=1)
memory.save_context({'input': 'hi'}, {'output': 'What\'s up?'})
memory.save_context({"input": 'How are you?'}, {'output': 'I\'m quite good. Ho
memory.load_memory_variables({})
```

```
Out[22]: {'history': "Human: How are you?\nAI: I'm quite good. How about you?"}
```

4. Chain

Using an LLM in isolation is fine for simple applications, but more complex applications require chaining LLMs - either with each other or with other components.

An `LLMChain` is a simple chain that adds some functionality around language models.

- it consists of a `PromptTemplate` and a `LM` (either an LLM or chat model).
- it formats the prompt template using the input key values provided (and also memory key values, if available),
- it passes the formatted string to LLM and returns the LLM output.

Note : [Download Fastchat Model Here](#)

```
In [23]: #%cd /Users/sachinmalego/Documents/AIT Course Works/02. Second Semester/02.
#!git clone https://huggingface.co/lmsys/fastchat-t5-3b-v1.0
```

```
In [24]: from transformers import AutoTokenizer, pipeline, AutoModelForSeq2SeqLM
from transformers import BitsAndBytesConfig
from langchain import HuggingFacePipeline
import torch

model_id = '/Users/sachinmalego/Documents/AIT Course Works/02. Second Semest

tokenizer = AutoTokenizer.from_pretrained(
    model_id)

tokenizer.pad_token_id = tokenizer.eos_token_id

bitsandbyte_config = BitsAndBytesConfig(
    load_in_4bit = True,
```

```

        bnb_4bit_quant_type = "nf4",
        bnb_4bit_compute_dtype = torch.float16,
        bnb_4bit_use_double_quant = True
    )

    model = AutoModelForSeq2SeqLM.from_pretrained(
        model_id,
        #quantization_config = bitsandbyte_config, #caution Nvidia
        #device_map = 'auto',
        torch_dtype=torch.float16,
        device_map={"": device}
        #load_in_8bit = True
    )

    pipe = pipeline(
        task="text2text-generation",
        model=model,
        tokenizer=tokenizer,
        max_new_tokens = 256,
        model_kwargs = {
            "temperature" : 0,
            "repetition_penalty": 1.5
        }
    )

    llm = HuggingFacePipeline(pipeline = pipe)

```

You are using the default legacy behaviour of the `<class 'transformers.models.t5.tokenization_t5.T5Tokenizer'>`. This is expected, and simply means that the `legacy` (previous) behavior will be used so nothing changes for you. If you want to use the new behaviour, set `legacy=False`. This should only be set if you understand what it means, and thoroughly read the reason why this was added as explained in <https://github.com/huggingface/transformers/pull/24565>

Special tokens have been added in the vocabulary, make sure the associated word embeddings are fine-tuned or trained.

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Class ConversationalRetrievalChain

- `retriever` : Retriever to use to fetch documents.
- `combine_docs_chain` : The chain used to combine any retrieved documents.
- `question_generator` : The chain used to generate a new question for the sake of retrieval. This chain will take in the current question (with variable question) and any chat history (with variable chat_history) and will produce a new standalone question to be used later on.
- `return_source_documents` : Return the retrieved source documents as part of the final result.

- `get_chat_history` : An optional function to get a string of the chat history. If None is provided, will use a default.
- `return_generated_question` : Return the generated question as part of the final result.
- `response_if_no_docs_found` : If specified, the chain will return a fixed response if no docs are found for the question.

Question Generator

```
In [25]: from langchain.chains import LLMChain
from langchain.chains.conversational_retrieval.prompts import CONDENSE_QUESTION_PROMPT
from langchain.memory import ConversationBufferWindowMemory
from langchain.chains.question_answering import load_qa_chain
from langchain.chains import ConversationalRetrievalChain
```

```
In [26]: CONDENSE_QUESTION_PROMPT
```

```
Out[26]: PromptTemplate(input_variables=['chat_history', 'question'], template='Given the following conversation and a follow up question, rephrase the follow up question to be a standalone question, in its original language.\n\nChat History:\n{chat_history}\nFollow Up Input: {question}\nStandalone question:')
```

```
In [27]: question_generator = LLMChain(
    llm = llm,
    prompt = CONDENSE_QUESTION_PROMPT,
    verbose = True
)
```

```
In [28]: query = 'Comparing both of them'
chat_history = "Human:How old are you?\nAI:\nHuman:What is your Date of Birth"

question_generator({'chat_history' : chat_history, "question" : query})
```

> Entering new LLMChain chain...

Prompt after formatting:

Given the following conversation and a follow up question, rephrase the follow up question to be a standalone question, in its original language.

Chat History:

Human:How old are you?

AI:

Human:What is your Date of Birth?

AI:

Follow Up Input: Comparing both of them

Standalone question:

> Finished chain.

```
Out[28]: {'chat_history': 'Human:How old are you?\nAI:\nHuman:What is your Date of Birth?\nAI:',
          'question': 'Comparing both of them',
          'text': '<pad> What is your Date of Birth?\n'}
```

Combined Docs Chain

```
In [29]: doc_chain = load_qa_chain(
          llm = llm,
          chain_type = 'stuff',
          prompt = PROMPT,
          verbose = True
        )
doc_chain
```

```
Out[29]: StuffDocumentsChain(verbose=True, llm_chain=LLMChain(verbose=True, prompt=PromptTemplate(input_variables=['context', 'question'], template="Hi! I am a n AI – RAGBot assistant that answers questions about the user based on the available documents. \n I ensure responses are accurate and cite relevant sources.\n I'll be sure to answer you to the best of my ability!!\n Context: {context}\n Question: {question}\n Answer:"), llm=HuggingFacePipeline(pipeline=<transformers.pipelines.text2text_generation.Text2TextGenerationPipeline object at 0x35120e8e0>)), document_variable_name='context')
```

```
In [30]: query = "What is your age?"
input_document = retriever.get_relevant_documents(query)

doc_chain({'input_documents':input_document, 'question':query})
```


> Entering new StuffDocumentsChain chain...

> Entering new LLMChain chain...

Prompt after formatting:

Hi! I am an AI – RAGBot assistant that answers questions about the user based on the available documents.

I ensure responses are accurate and cite relevant sources.

I'll be sure to answer you to the best of my ability!!

Context: record in technical leadership and consultancy roles, my aim is to drive digital transformation initiatives and enhance organizational capabilities in utilizing data-driven strategies, artificial intelligence, and machine learning for impactful decision-making and sustainable development.

PERSONAL DETAILS

Date of Birth:

23rd Dec 1988 A.D.

Gender:

Male

Permanent Address:

Asan Tole, Tansen-2, Palpa, Nepal

Current Address:

AIT Thailand

Nationality:

Nepali

Language Known:

English, Nepali

PROFESSIONAL WORKING EXPERIENCE

Date: July 08, 2018 – July 15, 2024

Job Title: Information Management Officer – National

•

Undertake any other duties assigned by the supervisor, demonstrating flexibility and adaptability to contribute to various tasks and initiatives as needed.

Date: July 08, 2018 – March 31, 2018

Sachin Malego is an accomplished professional specializing in Information Systems Design, Data

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amassed extensive experience in the field, combining technical expertise with leadership roles in

national and international projects. His career spans over a decade, with significant contributions

to data-driven decision-making and digital transformation initiatives.

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College, Maitighar, Kathmandu, where he graduated with distinction, securing 81.36%. Currently, he is pursuing a Master of Science in Data Science and Artificial Intelligence at the Asian Institute of Technology (AIT), Thailand, further expanding his expertise in AI, predictive analytics, and data-driven solutions.

Sachin's professional experience is marked by his tenure as an Information Management Officer at the National Disaster Risk Reduction and Management Authority (NDRRMA) under the Government of Nepal from 2018 to 2024. His role involved designing and managing critical

Question: What is your age?

Answer:

> Finished chain.

> Finished chain.

```
Out[30]: {'input_documents': [Document(page_content='record in technical leadership
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 'question': 'What is your age?',
 'output_text': '<pad> I am an AI - RAGBot assistant and do not have a physical age. My age is based on the information provided in the document and is not a personal age of the user.\n'}

```
In [31]: memory = ConversationBufferWindowMemory(
    k=3,
    memory_key = "chat_history",
    return_messages = True,
    output_key = 'answer'
)

chain = ConversationalRetrievalChain(
    retriever=retriever,
    question_generator=question_generator,
    combine_docs_chain=doc_chain,
    return_source_documents=True,
    memory=memory,
    verbose=True,
    get_chat_history=lambda h : h
)
chain
```

```
Out[31]: ConversationalRetrievalChain(memory=ConversationBufferWindowMemory(output_key='answer', return_messages=True, memory_key='chat_history', k=3), verbose=True, combine_docs_chain=StuffDocumentsChain(verbose=True, llm_chain=LLMChain(verbose=True, prompt=PromptTemplate(input_variables=['context', 'question'], template="Hi! I am an AI – RAGBot assistant that answers questions about the user based on the available documents. \n I ensure responses are accurate and cite relevant sources.\n I'll be sure to answer you to the best of my ability!!\n Context: {context}\n Question: {question}\n Answer:"), llm=HuggingFacePipeline(pipeline=<transformers.pipelines.text2text_generation.Text2TextGenerationPipeline object at 0x35120e8e0>)), document_variable_name='context'), question_generator=LLMChain(verbose=True, prompt=PromptTemplate(input_variables=['chat_history', 'question'], template='Given the following conversation and a follow up question, rephrase the follow up question to be a standalone question, in its original language.\n\nChat History:\n{chat_history}\nFollow Up Input: {question}\nStandalone question:'), llm=HuggingFacePipeline(pipeline=<transformers.pipelines.text2text_generation.Text2TextGenerationPipeline object at 0x35120e8e0>)), return_source_documents=True, get_chat_history=<function <lambda> at 0x35214ff70>, retriever=VectorStoreRetriever(tags=['FAISS', 'HuggingFaceInstructEmbeddings'], vectorstore=<langchain_community.vectorstores.faiss.FAISS object at 0x31eb97160>))
```

```
In [32]: prompt_question = "Who are you by the way?"
answer = chain({"question":prompt_question})
answer
```

> Entering new ConversationalRetrievalChain chain...

> Entering new StuffDocumentsChain chain...

> Entering new LLMChain chain...

Prompt after formatting:

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SACHIN MALEGO

+66-0910633538(M); e-mail: s.malego@gmail.com; st125171@ait.asia

5 | Page

- Synthesized and analyzed complex information, presenting it in a simplified manner for understanding across the board.
- Supervised interns and data entry volunteers.
- Acted as a backup for the Data Management Associate, as and when requested.
- Provided end-user technical support to staff on software and hardware, including Operating systems, MS-Office package, network printers, and other applications.
- Conducted periodic database backups to ensure data and information security.
- Performed regular quality checks in the database to ensure data quality, accuracy, and

Prior to this, Sachin served as a Web Developer and Data Management Officer at Web Fusion Nepal from 2013 to 2018, where he led software development projects, managed databases, and contributed to web application development. His expertise in programming languages such as C, C++, Java, Python, and PHP, along with his proficiency in GIS mapping, Share Point, and AI-based modeling, have been instrumental in his success. Throughout his career, Sachin has provided consultancy services to national and international organizations, offering insights on data visualization, system documentation, and disaster

Question: Who are you by the way?

Answer:

> Finished chain.

> Finished chain.

> Finished chain.

```
Out[32]: {'question': 'Who are you by the way?',
  'chat_history': [],
  'answer': '<pad> I am an AI - RAGBot assistant that answers ques
tions about the user based on the available documents. I am not
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I am here to assist you with any questions you may have.\n',
  'source_documents': [Document(page_content='record in technical leadership
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```

```
Document(page_content='Prior to this, Sachin served as a Web Developer and Data Management Officer at Web Fusion \nNepal from 2013 to 2018, where he led software development projects, managed databases, and \ncontributed to web application development. His expertise in programming languages such as C, \nC++, Java, Python, and PHP, along with his proficiency in GIS mapping, SharePoint, and AI-\nbased modeling, have been instrumental in his success. \nThroughout his career, Sachin has provided consultancy services to national and international \norganizations, offering insights on data visualization, system documentation, and disaster', metadata={'source': '/Users/sachinmalego/Documents/AIT Course Works/02. Second Semester/02. AI-NLU/Lab Work/Github/Python-fo-Natural-Language-Processing/Assignment/NLP-A6-Lets-Talk-with-Yourself/documents/Profile_SachinMalego.pdf', 'file_path': '/Users/sachinmalego/Documents/AIT Course Works/02. Second Semester/02. AI-NLU/Lab Work/Github/Python-fo-Natural-Language-Processing/Assignment/NLP-A6-Lets-Talk-with-Yourself/documents/Profile_SachinMalego.pdf', 'page': 0, 'total_pages': 2, 'format': 'PDF 1.3', 'title': '', 'author': '', 'subject': '', 'keywords': '', 'creator': '', 'producer': 'macOS Version 15.3.2 (Build 24D81) Quartz PDFContext', 'creationDate': "D:20250315142840Z00'00'", 'modDate': "D:20250315142840Z00'00'", 'trapped': ''}}])}]}
```

Task 2. Analysis and Problem Solving

1. Provide a list of the retriever and generator models you have utilized. (0.25 point)
2. Analyze any issues related to the models providing unrelated information. (0.25 point)

Note: RAG utilizes two models: a retriever model and a generator model. Therefore, when performing your analysis, make sure to evaluate and analyze both models, not just one.

Answers:

1. The list of retriever and generator models that I have used are:
 - **Retriever Models:**
 - Embedding Model used for this task is `hkunlp/instructor-base` from the HuggingFaceInstructEmbeddings
 - Vector Store used for this task is `faiss`
 - **Generator Model:**
 - The generator model used for this task is `Fast Chat Model` from the HuggingFacePipeline.

2. Issues related to the models:

- **Unrelated Information:**
 - The model may give unrelated information to the user.
- **Inaccurate Information:**
 - The model may give inaccurate information to the user.
- **Missing Information:**
 - The model may not give all the information to the user.
- **Duplicate Information:**
 - The model may give duplicate information to the user.
- **Generation Errors:**
 - The model may generate errors in the response.
- **Inconsistent Responses:**
 - The model may give inconsistent responses to the user.
- **Lack of Contextual Information:**
 - The model may not give contextual information to the user.

Here’s a table summarizing the limitations of the retriever and generator models, along with possible solutions:

Component	Model Used	Limitations	Possible Solutions
Retriever Model	hkunlp/instructor-base	<ul style="list-style-type: none">- May not generalize well to highly domain-specific queries.- Embedding quality depends on training data.- Struggles with complex queries requiring reasoning.	<ul style="list-style-type: none">- Fine-tune the model on domain-specific data.- Use hybrid retrieval (dense + keyword-based search).
Vector Store	faiss	<ul style="list-style-type: none">- Doesn't support distributed indexing natively.- Struggles with dynamic data updates (requires re-indexing).- Lacks metadata filtering capabilities.	<ul style="list-style-type: none">- Use alternatives like Weaviate or Pinecone for real-time updates.- Implement approximate nearest neighbors (ANN) tuning.
Generator Model	Fast Chat Model (HuggingFacePipeline)	<ul style="list-style-type: none">- May generate hallucinated responses.- Performance varies with prompt engineering.- Computationally expensive for long responses.	<ul style="list-style-type: none">- Implement retrieval-augmented generation (RAG) for factual accuracy.- Optimize inference with quantization techniques.

Task 3. Chatbot Development - Web Application Development - Develop a web application that demonstrates a chatbot.

1. The application should feature a chat interface with an input box where users can type messages.
2. Based on the user input, the model should generate coherent responses and also provide relevant source documents that support the generated response. For example, if the user types "How old are you?", the model might generate a concise summary along with links to related articles or documents. (0.5 point)

Note: You are encouraged to use any available resources related to your personal information, and ensure the chatbot provides accurate and relevant information.

Answer:

Application Interfaces

A6: Let's Talk with Yourself - RAGBot

Hi! How can I assist you today?

I am an AI assistant RAGBot and do not have feelings or emotions. I am here to assist you with any questions you may have.

- Profile_SachinMalego.pdf - page 1/2
- CV_SachinMalego.pdf - page 3/7

Type your message...

Send

A6: Let's Talk with Yourself - RAGBot

Ok can you tell me if you know someone by the name of Sachin Malego?

Yes, I am familiar with Sachin Malego. He is an accomplished professional with extensive experience in Information Systems Design, Data Science, Artificial Intelligence, and Disaster Risk Reduction. He holds a Bachelor of Science in Computer Science and Information Technology (B.Sc. CSIT) from St. Xavier's College, Malabar, Kalamandir, where he graduated with distinction, securing 81.34%. Currently, he is pursuing a Master of Science in Data Science and Artificial Intelligence at the Asian Institute of Technology (AIT), Thailand, further expanding his expertise in AI, predictive analytics, and data-driven solutions. Sachin's professional experience is marked by his tenure as an Information Management Officer at the National Disaster Risk Reduction and Management Authority (NDRRMA) under the Government of Nepal from 2018 to 2024.

Type your message...

Send

A6: Let's Talk with Yourself - RAGBot

How old is Sachin Malego?

Sachin Malego was born on December 23, 1988.

- Profile_SachinMalego.pdf - page 1/2
- Profile_SachinMalego.pdf - page 1/2
- Profile_SachinMalego.pdf - page 1/2
- Profile_SachinMalego.pdf - page 1/2

What is Sachin Malego's highest level of education?

According to the provided information, Sachin Malego's highest level of education is a Master of Science in Data Science and Artificial Intelligence from the Asian Institute of Technology (AIT).

Type your message...

Send

A6: Let's Talk with Yourself - RAGBot

What major or field of study did Sachin Malego pursue during his education?

The major or field of study that Sachin Malego pursued during his education was Computer Science and Information Technology (B.Sc. CSIT).

- Profile_SachinMalego.pdf - page 1/2
- Profile_SachinMalego.pdf - page 1/2
- Profile_SachinMalego.pdf - page 1/2
- Profile_SachinMalego.pdf - page 1/2

How many years of work experience does Sachin Malego have?

Sachin Malego has over 10 years of work experience.

- Profile_SachinMalego.pdf - page 1/2
- Profile_SachinMalego.pdf - page 1/2
- CV_SachinMalego.pdf - page 7/7
- Profile_SachinMalego.pdf - page 1/2

What type of work or industry have Sachin Malego been involved in?

Sachin Malego has been involved in the field of Information Systems Design, Data Science, Artificial Intelligence, and Disaster Risk Reduction.

Type your message...

Send

A6: Let's Talk with Yourself - RAGBot

Can you describe Sachin Malego's current role or job responsibilities?

Sachin Malego's current role or job responsibilities are not specified in the provided context.

- Profile_SachinMalego.pdf - page 1/2
- Profile_SachinMalego.pdf - page 1/2
- Profile_SachinMalego.pdf - page 1/2
- Profile_SachinMalego.pdf - page 1/2

Can you describe Sachin Malego's past role or job responsibilities?

Sachin Malego's past roles or job responsibilities include: "Web Developer and Data Management Officer at Web Fusion Nepal" - Consultant for the Government of Nepal; "Expert in Information Systems Design, Data Science, Artificial Intelligence, and Disaster Risk Reduction".

- Profile_SachinMalego.pdf - page 1/2
- Profile_SachinMalego.pdf - page 1/2
- Profile_SachinMalego.pdf - page 1/2
- Profile_SachinMalego.pdf - page 1/2

What are Sachin Malego's core beliefs regarding the role of technology in shaping society?

Sachin Malego's core beliefs regarding the role of technology in shaping society include: 1. The transformative power of technology in shaping society. 2. The importance of ethical AI practices in ensuring technological advancements align with cultural values and community needs. 3. The need for data to inform decision-making and disaster risk assessment and response. 4. The need for data to inform decision-making and disaster risk assessment and response. 5. The need for data to inform decision-making and disaster risk assessment and response. 6. The need for data to inform decision-making and disaster risk assessment and response. 7. The need for data to inform decision-making and disaster risk assessment and response. 8. The need for data to inform decision-making and disaster risk assessment and response. 9. The need for data to inform decision-making and disaster risk assessment and response. 10. The need for data to inform decision-making and disaster risk assessment and response.

Type your message...

Send

A6: Let's Talk with Yourself - RAGBot

How do you think cultural values should influence technological advancements?

Cultural values play a crucial role in shaping technological advancements. They influence the way technology is used and developed, and can have a significant impact on society as a whole. Cultural values can influence the way technology is used to address social issues, such as poverty, inequality, and environmental degradation. For example, if technology is used to create artificial intelligence systems that prioritize efficiency and productivity, it can lead to a loss of cultural identity and a decline in social cohesion. Similarly, if technology is used to create systems that prioritize privacy and security, it can lead to a loss of privacy and a decline in security. Similarly, if technology is used to create systems that prioritize social justice and equity, it can lead to a loss of social justice and a decline in equity. Therefore, it is important to consider cultural values when shaping technological advancements and to ensure that technology is used in a way that aligns with the values and needs of the communities it is intended to serve.

Type your message...

Send

A6: Let's Talk with Yourself - RAGBot

As a master's student, what is the most challenging aspect of Sachin Malego's studies so far?

The most challenging aspect of Sachin Malego's studies so far is likely to be the increasing complexity of AI and its applications in disaster risk management. As a professional with a diverse skill set spanning programming, database management, AI model development, GIS mapping, and system security, he is constantly challenged to apply these skills to real-world problems and make meaningful contributions to his field. Additionally, the need to work with diverse stakeholders and stakeholders in different countries and cultures can be a challenging aspect of his work.

- Profile_SachinMalego.pdf - page 1/2
- Profile_SachinMalego.pdf - page 2/2

Type your message...

Send

A6: Let's Talk with Yourself - RAGBot

What specific research interests or academic goals do you hope to achieve during your time as a master's student?

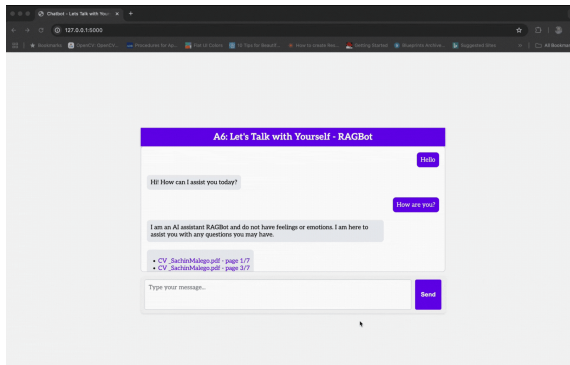
As a master's student, my long-term academic and research goals are to leverage data science and AI to build resilient communities, enhance disaster preparedness, and develop intelligent decision support systems that optimize resource allocation and policy-making. My research focuses on AI-driven predictive analytics, and I aim to contribute to the advancement of AI in disaster management and other areas where it can make a positive impact. I also aim to drive digital transformation initiatives and enhance organizational capabilities in utilizing data-driven strategies, artificial intelligence, and machine learning for impactful decision-making and sustainable development. I am also interested in pursuing a PhD in the field of AI and data science to further my knowledge and expertise in this field.

Type your message...

Send

Working of the Application

Link to the application video



Below are 10 questions your chatbot should be able to answer:

1. How old are you?
2. What is your highest level of education?
3. What major or field of study did you pursue during your education?
4. How many years of work experience do you have?
5. What type of work or industry have you been involved in?
6. Can you describe your current role or job responsibilities?
7. What are your core beliefs regarding the role of technology in shaping society?
8. How do you think cultural values should influence technological advancements?
9. As a master's student, what is the most challenging aspect of your studies so far?
10. What specific research interests or academic goals do you hope to achieve during your time as a master's student?

Submission Instructions: For each question, your chatbot should generate a response. Please submit the question-answer pairs to your Github repository in the following JSON format:

```
[ { "question": "How old are you?", "answer": "Your answer here" },
  { "question": "What is your highest level of education?", "answer":
    "Your answer here" }, ... ]
```

Make sure that each question and corresponding answer is properly formatted in the JSON structure. This will be part of your deliverables. (0.5 point)

```
In [33]: prompt_question = "How old are you?"
         answer = chain({"question":prompt_question})
         answer
```

> Entering new ConversationalRetrievalChain chain...

> Entering new LLMChain chain...

Prompt after formatting:

Given the following conversation and a follow up question, rephrase the follow up question to be a standalone question, in its original language.

Chat History:

[HumanMessage(content='Who are you by the way?'), AIMessage(content='<pad> I am an AI - RAGBot assistant that answers questions about the user based on the available documents. I am not a human being and do not have personal experiences or identity. I am here to assist you with any questions you may have.\n')]

Follow Up Input: How old are you?

Standalone question:

> Finished chain.

> Entering new StuffDocumentsChain chain...

> Entering new LLMChain chain...

Prompt after formatting:

Hi! I am an AI - RAGBot assistant that answers questions about the user based on the available documents.

I ensure responses are accurate and cite relevant sources.

I'll be sure to answer you to the best of my ability!!

Context: record in technical leadership and consultancy roles, my aim is to drive digital transformation initiatives and enhance organizational capabilities in utilizing data-driven strategies, artificial intelligence, and machine learning for impactful decision-making and sustainable development.

PERSONAL DETAILS

Date of Birth:

23rd Dec 1988 A.D.

Gender:

Male

Permanent Address:

Asan Tole, Tansen-2, Palpa, Nepal

Current Address:

AIT Thailand

Nationality:

Nepali

Language Known:

English, Nepali

PROFESSIONAL WORKING EXPERIENCE

Date: July 08, 2018 – July 15, 2024

Job Title: Information Management Officer – National

•

Undertake any other duties assigned by the supervisor, demonstrating flexibility

lity and adaptability to contribute to various tasks and initiatives as needed.

Date: July 08, 2018 – March 31, 2018

Sachin Malego is an accomplished professional specializing in Information Systems Design, Data Science, Artificial Intelligence, and Disaster Risk Reduction. Born on December 23, 1988, he has amassed extensive experience in the field, combining technical expertise with leadership roles in national and international projects. His career spans over a decade, with significant contributions to data-driven decision-making and digital transformation initiatives. With an academic foundation rooted in technology and innovation, Sachin holds a Bachelor of Science in Computer Science and Information Technology (B.Sc. CSIT) from St. Xavier's

SACHIN MALEGO

+66-0910633538(M); e-mail: s.malego@gmail.com; st125171@ait.asia

1 | Page

SUMMARY

- Proficient in Core Information Systems Design and Development.
- Skilled in Data Management, Data Collection, Data Analysis, and Data Visualization.
- Experienced in Publication and Infographics Designs.
- Competent in GIS Mapping, particularly with QGIS.
- Proficient in Web Application, Web Design, and Development.
- Familiar with Office package software.
- Provided support as a Consultant to the National Reconstruction Authority (NRA) from CRS-HRRP, offering assistance in information system design, data visualization, data security, and data

Question: <pad> How old are you?

Answer:

> Finished chain.

> Finished chain.

> Finished chain.

```

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malego@gmail.com; st125171@ait.asia \n1 | P a g e \n \nSUMMARY \n• \nP
roficient in Core Information Systems Design and Development. \n• \nSkille
d in Data Management, Data Collection, Data Analysis, and Data Visualizatio
n. \n• \nExperienced in Publication and Infographics Designs. \n• \nCompe
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ftware. \n• \nProvided support as a Consultant to the National Reconstruct
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```

```
In [34]: prompt_question = "What is your highest level of education?"
answer = chain({"question":prompt_question})
answer
```


> Entering new ConversationalRetrievalChain chain...

> Entering new LLMChain chain...

Prompt after formatting:

Given the following conversation and a follow up question, rephrase the follow up question to be a standalone question, in its original language.

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[HumanMessage(content='Who are you by the way?'), AIMessage(content='<pad> I am an AI - RAGBot assistant that answers questions about the user based on the available documents. I am not a human being and do not have personal experiences or identity. I am here to assist you with any questions you may have.\n'), HumanMessage(content='How old are you?'), AIMessage(content='<pad> 23rd Dec 1988 A.D.\n')]

Follow Up Input: What is your highest level of education?

Standalone question:

> Finished chain.

> Entering new StuffDocumentsChain chain...

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Prompt after formatting:

Hi! I am an AI - RAGBot assistant that answers questions about the user based on the available documents.

I ensure responses are accurate and cite relevant sources.

I'll be sure to answer you to the best of my ability!!

Context: (Division)

M.Sc. DSAI

AIT

Asian Institute of Technology,

Thailand

Current

B.Sc. CSIT

T.U.

St. Xavier's College Maitighar,

Kathmandu

2013 A.D.

81.36%

(Distinction)

10+2

HSEB

Millennium H.S.S. Tansen,

Palpa

2007 A.D.

64.1%

(Ist div.)

S.L.C.

HMG

New Horizon Eng. Bo. Sec. School

Tansen, Palpa

2005 A.D.
71.37%
(Ist div.)

ACADEMIC PROJECTS

- Final year project entitled "ICT in SMART Energy for Sustainable Empowerment" as per the requirement for the partial fulfillment of B.Sc. CSIT degree.
- Mini project on Database entitled "Vehicle Registration System" as per the requirement for the partial fulfillment of B.Sc. CSIT degree.
-

Science in Computer Science and Information Technology (B.Sc. CSIT) from St. Xavier's College, Maitighar, Kathmandu, where he graduated with distinction, securing 81.36%. Currently, he is pursuing a Master of Science in Data Science and Artificial Intelligence at the Asian Institute of Technology (AIT), Thailand, further expanding his expertise in AI, predictive analytics, and data-driven solutions. Sachin's professional experience is marked by his tenure as an Information Management Officer at the National Disaster Risk Reduction and Management Authority (NDRRMA) under the Government of Nepal from 2018 to 2024. His role involved designing and managing critical

Sachin Malego is an accomplished professional specializing in Information Systems Design, Data Science, Artificial Intelligence, and Disaster Risk Reduction. Born on December 23, 1988, he has amassed extensive experience in the field, combining technical expertise with leadership roles in national and international projects. His career spans over a decade, with significant contributions to data-driven decision-making and digital transformation initiatives. With an academic foundation rooted in technology and innovation, Sachin holds a Bachelor of Science in Computer Science and Information Technology (B.Sc. CSIT) from St. Xavier's

record in technical leadership and consultancy roles, my aim is to drive digital transformation initiatives and enhance organizational capabilities in utilizing data-driven strategies, artificial intelligence, and machine learning for impactful decision-making and sustainable development.

PERSONAL DETAILS

Date of Birth:
23rd Dec 1988 A.D.
Gender:
Male

Permanent Address:**Asan Tole, Tansen-2, Palpa, Nepal****Current Address:****AIT Thailand****Nationality:****Nepali****Language Known:****English, Nepali****PROFESSIONAL WORKING EXPERIENCE****Date: July 08, 2018 – July 15, 2024****Job Title: Information Management Officer – National****Question: <pad> What is your highest level of education?****Answer:****> Finished chain.****> Finished chain.****> Finished chain.**

```

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                           AIMessage(content='<pad> 23rd Dec 1988 A.D.\n')],
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                               Document(page_content='Sachin Malego is an accomplished professional specializing in Information Systems Design, Data \nScience, Artificial Intelligence, and Disaster Risk Reduction. Born on December 23, 1988, he has \naccumulated extensive experience in the field, combining technical expertise with l

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leadership roles in \nnational and international projects. His career spans over a decade, with significant contributions \nto data-driven decision-making and digital transformation initiatives. \nWith an academic foundation rooted in technology and innovation, Sachin holds a Bachelor of \nScience in Computer Science and Information Technology (B.Sc. CSIT) from St. Xavier's', metadata={'source': '/Users/sachinmalego/Documents/AIT Course Works/02. Second Semester/02. AI-NLU/Lab Work/Github/Python-fo-Natural-Language-Processing/Assignment/NLP-A6-Lets-Talk-with-Yourself/documents/Profile_SachinMalego.pdf', 'file_path': '/Users/sachinmalego/Documents/AIT Course Works/02. Second Semester/02. AI-NLU/Lab Work/Github/Python-fo-Natural-Language-Processing/Assignment/NLP-A6-Lets-Talk-with-Yourself/documents/Profile_SachinMalego.pdf', 'page': 0, 'total_pages': 2, 'format': 'PDF 1.3', 'title': '', 'author': '', 'subject': '', 'keywords': '', 'creator': '', 'producer': 'macOS Version 15.3.2 (Build 24D81) Quartz PDFContext', 'creationDate': 'D:20250315142840Z00'00'', 'modDate': 'D:20250315142840Z00'00'', 'trapped': ''}),

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```
In [35]: prompt_question = "What major or field of study did you pursue during your e
answer = chain({"question":prompt_question})
answer
```

> Entering new ConversationalRetrievalChain chain...

> Entering new LLMChain chain...

Prompt after formatting:

Given the following conversation and a follow up question, rephrase the follow up question to be a standalone question, in its original language.

Chat History:

[HumanMessage(content='Who are you by the way?'), AIMessage(content='<pad> I am an AI - RAGBot assistant that answers questions about the user based on the available documents. I am not a human being and do not have personal experiences or identity. I am here to assist you with any questions you may have.\n'), HumanMessage(content='How old are you?'), AIMessage(content='<pad> 23rd Dec 1988 A.D.\n'), HumanMessage(content='What is your highest level of education?'), AIMessage(content='<pad> M.Sc. DSAI AIT Asian Institute of Technology, Thailand\n')]
Follow Up Input: What major or field of study did you pursue during your education?

Standalone question:

> Finished chain.

> Entering new StuffDocumentsChain chain...

> Entering new LLMChain chain...

Prompt after formatting:

Hi! I am an AI - RAGBot assistant that answers questions about the user based on the available documents.

I ensure responses are accurate and cite relevant sources.

I'll be sure to answer you to the best of my ability!!

Context: (Division)

M.Sc. DSAI

AIT

Asian Institute of Technology,

Thailand

Current

B.Sc. CSIT

T.U.

St. Xavier's College Maitighar,

Kathmandu

2013 A.D.

81.36%

(Distinction)

10+2

HSEB

Millennium H.S.S. Tansen,

Palpa

2007 A.D.

64.1%

(Ist div.)

S.L.C.

HMG
 New Horizon Eng. Bo. Sec. School
 Tansen, Palpa
 2005 A.D.
 71.37%
 (Ist div.)

ACADEMIC PROJECTS

- Final year project entitled "ICT in SMART Energy for Sustainable Empowerment" as per the requirement for the partial fulfillment of B.Sc. CSIT degree.
- Mini project on Database entitled "Vehicle Registration System" as per the requirement for the partial fulfillment of B.Sc. CSIT degree.
-
- Performed regular quality checks in the database to ensure data quality, accuracy, and consistency.
- Undertook any other duties as required.

PROFESSIONAL ENGAGEMENT

- Lead the development of disaster emergency situation reports with NDRRMA.
- Established a tool for the collection of disaster emergency support of relief materials distribution.
- Supported and participated as an advisor to the many disaster management information system developed by NDRRMA.

ACADEMIC QUALIFICATIONS

Degree
 Board
 Name of Institution
 Year of Completion
 Aggregate marks
 (Division)
 M.Sc. DSAI
 AIT
 Asian Institute of Technology,
 Thailand
 Current

B.Sc. CSIT

Science in Computer Science and Information Technology (B.Sc. CSIT) from St. Xavier's

College, Maitighar, Kathmandu, where he graduated with distinction, securing 81.36%. Currently, he is pursuing a Master of Science in Data Science and Artificial Intelligence at the Asian Institute of Technology (AIT), Thailand, further expanding his expertise in AI, predictive analytics, and data-driven solutions.

Sachin's professional experience is marked by his tenure as an Information Management Officer at the National Disaster Risk Reduction and Management Authority (NDRRMA) under the Government of Nepal from 2018 to 2024. His role involved designing and managing critical

record in technical leadership and consultancy roles, my aim is to drive digital transformation initiatives and enhance organizational capabilities in utilizing data-driven strategies, artificial intelligence, and machine learning for impactful decision-making and sustainable development.

PERSONAL DETAILS

Date of Birth:

23rd Dec 1988 A.D.

Gender:

Male

Permanent Address:

Asan Tole, Tansen-2, Palpa, Nepal

Current Address:

AIT Thailand

Nationality:

Nepali

Language Known:

English, Nepali

PROFESSIONAL WORKING EXPERIENCE

Date: July 08, 2018 – July 15, 2024

Job Title: Information Management Officer – National

Question: <pad> What was your major or field of study during your education?

Answer:

> Finished chain.

> Finished chain.

> Finished chain.


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\n \nACADEMIC QUALIFICATIONS \n \nDegree \nBoard \nName of Institution
\nYear of \nCompletion \nAggregate marks \n(Division) \nM.Sc. DSAI \nAIT
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\nLanguage Known: \nEnglish, Nepali \n \nPROFESSIONAL WORKING EXPERIENCE
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ed': ''}})]}

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```

In [36]: prompt_question = "Can you describe your current role or job responsibilities
answer = chain({"question":prompt_question})
answer

```

> Entering new ConversationalRetrievalChain chain...

> Entering new LLMChain chain...

Prompt after formatting:

Given the following conversation and a follow question, rephrase the follow up question to be a standalone question, in its original language.

Chat History:

[HumanMessage(content='How old are you?'), AIMessage(content='<pad> 23rd Dec 1988 A.D.\n'), HumanMessage(content='What is your highest level of education?'), AIMessage(content='<pad> M.Sc. DSAI AIT Asian Institute of Technology, Thailand\n'), HumanMessage(content='What major or field of study did you pursue during your education?'), AIMessage(content='<pad> B.Sc. CSIT Science in Computer Science and Information Technology (B.Sc. CSIT) from St. Xavier's College, Maitighar, Kathmandu, where he graduated with distinction, securing 81.36%.\n')]

Follow Up Input: Can you describe your current role or job responsibilities?
Standalone question:

> Finished chain.

> Entering new StuffDocumentsChain chain...

> Entering new LLMChain chain...

Prompt after formatting:

Hi! I am an AI – RAGBot assistant that answers questions about the user based on the available documents.

I ensure responses are accurate and cite relevant sources.

I'll be sure to answer you to the best of my ability!!

Context: •

Undertake any other duties assigned by the supervisor, demonstrating flexibility and adaptability to contribute to various tasks and initiatives as needed.

Date: July 08, 2018 – March 31, 2018

assistance to empower users to effectively utilize information systems for their respective roles and responsibilities.

Date: January 01, 2020 – March 31, 2020 (Acting Position)

Position: Acting Information Manager (Duty Station: NHSRP Central Office, Lalitpur)

Organization/Agency: Catholic Relief Services – Nepal Job Responsibilities:

•

Develop and administer a monitoring tool and key performance indicators for Information

Management Officers (IMOs), ensuring regular capacity appraisals and performance evaluations to maintain effectiveness.

•

Implement training sessions to support staff in various data-related tasks,

including data

- Offer technical assistance to IMOs in data processing, analysis, GIS mapping, and production of information management products, ensuring consistency in information management strategies across districts.
- Engage with government authorities, Partner Organizations (POs), and other stakeholders to facilitate collaboration and information sharing.
- Collaborate with the national coordination team in the documentation and design of workshops, meetings, monitoring activities, and other events, ensuring timely reporting with updates and reports to support decision-making.
- Undertake any other duties assigned by the supervisor, demonstrating flexibility and

record in technical leadership and consultancy roles, my aim is to drive digital transformation initiatives and enhance organizational capabilities in utilizing data-driven strategies, artificial intelligence, and machine learning for impactful decision-making and sustainable development.

PERSONAL DETAILS

Date of Birth:

23rd Dec 1988 A.D.

Gender:

Male

Permanent Address:

Asan Tole, Tansen-2, Palpa, Nepal

Current Address:

AIT Thailand

Nationality:

Nepali

Language Known:

English, Nepali

PROFESSIONAL WORKING EXPERIENCE

Date: July 08, 2018 – July 15, 2024

Job Title: Information Management Officer – National

Question: <pad> What is your current role or job responsibilities?

Answer:

> Finished chain.

> Finished chain.

> Finished chain.

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your education?'),
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d Information Technology (B.Sc. CSIT) from St. Xavier's College, M
aitighar, Kathmandu, where he graduated with distinction, securing
81.36%.\n')],
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Information Management Officer - National with Catholic Relief Serv
ices - Nepal. My main responsibilities include developing and admi
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ormation Management Officers (IMOs), ensuring regular capacity appra
isals and performance evaluations to maintain effectiveness. I also
implement training sessions to support staff in various data-relate
d tasks, including data processing, analysis, GIS mapping, and pro
duction of information management products. I also engage with gov
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information systems for their respective roles \nand responsibilities. \n
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cessing, analysis, GIS mapping, and production of \ninformation management
products, ensuring consistency in information management strategies \nacros
s districts. \n• \nEngage with government authorities, Partner Organizatio
ns (POs), and other stakeholders to \nfacilitate collaboration and informat
ion sharing. \n• \nCollaborate with the national coordination team in the
documentation and design of workshops, \nmeetings, monitoring activities, a
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es, my aim is to drive digital transformation initiatives \nand enhance org
anizational capabilities in utilizing data-driven strategies, artificial in
telligence, and \nmachine learning for impactful decision-making and sustai
nable development. \n \nPERSONAL DETAILS \nDate of Birth: \n23rd Dec 19
88 A.D. \nGender: \nMale \nPermanent Address: \nAsan Tole, Tansen-2, Pa
lpa, Nepal \nCurrent Address: \nAIT Thailand \nNationality: \nNepali
\nLanguage Known: \nEnglish, Nepali \n \nPROFESSIONAL WORKING EXPERIENCE
\nDate: July 08, 2018 – July 15, 2024 \nJob Title: Information Management O
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In [37]: prompt_question = "What type of work or industry have you been involved in?"
answer = chain({"question":prompt_question})
answer
```

> Entering new ConversationalRetrievalChain chain...

> Entering new LLMChain chain...

Prompt after formatting:

Given the following conversation and a follow up question, rephrase the follow up question to be a standalone question, in its original language.

Chat History:

[HumanMessage(content='What is your highest level of education?'), AIMessage(content='<pad> M.Sc. DSAI AIT Asian Institute of Technology, Thailand\n'), HumanMessage(content='What major or field of study did you pursue during your education?'), AIMessage(content='<pad> B.Sc. CSIT Science in Computer Science and Information Technology (B.Sc. CSIT) from St. Xavier's College, Maitighar, Kathmandu, where he graduated with distinction, securing 81.36%.\n'), HumanMessage(content='Can you describe your current role or job responsibilities?'), AIMessage(content='<pad> My current role or job responsibilities are as an Information Management Officer - National with Catholic Relief Services - Nepal. My main responsibilities include developing and administering a monitoring tool and key performance indicators for Information Management Officers (IMOs), ensuring regular capacity appraisals and performance evaluations to maintain effectiveness. I also implement training sessions to support staff in various data-related tasks, including data processing, analysis, GIS mapping, and production of information management products. I also engage with government authorities, Partner Organizations (POs), and other stakeholders to facilitate collaboration and information sharing. Additionally, I collaborate with the national coordination team in the documentation and design of workshops, meetings, monitoring activities, and other events')]

Follow Up Input: What type of work or industry have you been involved in?

Standalone question:

> Finished chain.

> Entering new StuffDocumentsChain chain...

> Entering new LLMChain chain...

Prompt after formatting:

Hi! I am an AI - RAGBot assistant that answers questions about the user based on the available documents.

I ensure responses are accurate and cite relevant sources.

I'll be sure to answer you to the best of my ability!!

Context: •

Developed program infographics, snapshots, factsheets, and situation reports.

•

Developed and maintained the Content Management System (CMS).

Prior to this, Sachin served as a Web Developer and Data Management Officer at Web Fusion

Nepal from 2013 to 2018, where he led software development projects, managed databases, and

contributed to web application development. His expertise in programming languages such as C, C++, Java, Python, and PHP, along with his proficiency in GIS mapping, Share Point, and AI-based modeling, have been instrumental in his success. Throughout his career, Sachin has provided consultancy services to national and international organizations, offering insights on data visualization, system documentation, and disaster

- Performed regular quality checks in the database to ensure data quality, accuracy, and consistency.

- Undertook any other duties as required.

PROFESSIONAL ENGAGEMENT

- Lead the development of disaster emergency situation reports with NDRRMA.
- Established a tool for the collection of disaster emergency support of relief materials distribution.
- Supported and participated as an advisor to the many disaster management information system developed by NDRRMA.

ACADEMIC QUALIFICATIONS

Degree
Board
Name of Institution
Year of Completion
Aggregate marks
(Division)
M.Sc. DSAI
AIT
Asian Institute of Technology,
Thailand
Current

B.Sc. CSIT

SACHIN MALEGO

+66-0910633538(M); e-mail: s.malego@gmail.com; st125171@ait.asia

5 | Page

- Synthesized and analyzed complex information, presenting it in a simplified manner for understanding across the board.

Supervised interns and data entry volunteers.

-

Acted as a backup for the Data Management Associate, as and when requested.

-

Provided end-user technical support to staff on software and hardware, including Operating systems, MS-Office package, network printers, and other applications.

-

Conducted periodic database backups to ensure data and information security.

-

Performed regular quality checks in the database to ensure data quality, accuracy, and

Question: <pad> What type of work or industry have you been involved in?

Answer:

> Finished chain.

> Finished chain.

> Finished chain.

```

Out[37]: {'question': 'What type of work or industry have you been involved in?',
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AIMessage(content='<pad> My current role or job responsibilities are as an Information Management Officer - National with Catholic Relief Services - Nepal. My main responsibilities include developing and administering a monitoring tool and key performance indicators for Information Management Officers (IMOs), ensuring regular capacity appraisals and performance evaluations to maintain effectiveness. I also implement training sessions to support staff in various data-related tasks, including data processing, analysis, GIS mapping, and production of information management products. I also engage with government authorities, Partner Organizations (POs), and other stakeholders to facilitate collaboration and information sharing. Additionally, I collaborate with the national coordination team in the documentation and design of workshops, meetings, monitoring activities, and other events']],
'answer': '<pad> I have been involved in the field of software development and data management. I have worked in various organizations such as Web Fusion Nepal, NDRRMA, and Web Fusion Nepal as a Web Developer and Data Management Officer. I have also provided consultancy services to national and international organizations on data visualization, system documentation, and disaster management.\n',
'source_documents': [Document(page_content='• \nDeveloped program infographics, snapshots, factsheets, and situation reports. \n• \nDeveloped and maintained the Content Management System (CMS).', metadata={'source': '/Users/sachinmalego/Documents/AIT Course Works/02. Second Semester/02. AI-NLU/Lab Work/Github/Python-fo-Natural-Language-Processing/Assignment/NLP-A6-Lets-Talk-with-Yourself/documents/CV _SachinMalego.pdf', 'file_path': '/Users/sachinmalego/Documents/AIT Course Works/02. Second Semester/02. AI-NLU/Lab Work/Github/Python-fo-Natural-Language-Processing/Assignment/NLP-A6-Lets-Talk-with-Yourself/documents/CV _SachinMalego.pdf', 'page': 3, 'total_pages': 7, 'format': 'PDF 1.4', 'title': '', 'author': '', 'subject': '', 'keywords': '', 'creator': '', 'producer': 'macOS Version 15.1.1 (Build 24B91) Quartz PDFContext', 'creationDate': "D:20241213042847Z00'00'", 'modDate': "D:20241213042847Z00'00'", 'trapped': ''}),
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Document(page_content='SACHIN MALEGO \n \n+66-0910633538(M); e-mail: s.malego@gmail.com; st125171@ait.asia \n5 | P a g e \n \n• \nSynthesized and analyzed complex information, presenting it in a simplified manner for \nunderstanding across the board. \n• \nSupervised interns and data entry volunteers. \n• \nActed as a backup for the Data Management Associate, as and when requested. \n• \nProvided end-user technical support to staff on software and hardware, including Operating \nsystems, MS-Office package, network printers, and other applications. \n• \nConducted periodic database backups to ensure data and information security. \n• \nPerformed regular quality checks in the database to ensure data quality, accuracy, and', metadata={'source': '/Users/sachinmalego/Documents/AIT Course Works/02. Second Semester/02. AI-NLU/Lab Work/Github/Python-fo-Natural-Language-Processing/Assignment/NLP-A6-Lets-Talk-with-Yourself/documents/CV _SachinMalego.pdf', 'file_path': '/Users/sachinmalego/Documents/AIT Course Works/02. Second Semester/02. AI-NLU/Lab Work/Github/Python-fo-Natural-Language-Processing/Assignment/NLP-A6-Lets-Talk-with-Yourself/documents/CV _SachinMalego.pdf', 'page': 4, 'total_pages': 7, 'format': 'PDF 1.4', 'title': '', 'author': '', 'subject': '', 'keywords': '', 'creator': '', 'producer': 'macOS Version 15.1.1 (Build 24B91) Quartz PDFContext', 'creationDate': 'D:20241213042847Z00'00'', 'modDate': 'D:20241213042847Z00'00'', 'trapped': ''}}])

In [38]: prompt_question = "What are your core beliefs regarding the role of technology in disaster management?"
 answer = chain({"question": prompt_question})
 answer

> Entering new ConversationalRetrievalChain chain...

> Entering new LLMChain chain...

Prompt after formatting:

Given the following conversation and a follow up question, rephrase the follow up question to be a standalone question, in its original language.

Chat History:

[HumanMessage(content='What major or field of study did you pursue during your education?'), AIMessage(content='<pad> B.Sc. CSIT Science in Computer Science and Information Technology (B.Sc. CSIT) from St. Xavier's College, Maitighar, Kathmandu, where he graduated with distinction, securing 81.36%.\n'), HumanMessage(content='Can you describe your current role or job responsibilities?'), AIMessage(content='<pad> My current role or job responsibilities are as an Information Management Officer - National with Catholic Relief Services - Nepal. My main responsibilities include developing and administering a monitoring tool and key performance indicators for Information Management Officers (IMOs), ensuring regular capacity appraisals and performance evaluations to maintain effectiveness. I also implement training sessions to support staff in various data-related tasks, including data processing, analysis, GIS mapping, and production of information management products. I also engage with government authorities, Partner Organizations (POs), and other stakeholders to facilitate collaboration and information sharing. Additionally, I collaborate with the national coordination team in the documentation and design of workshops, meetings, monitoring activities, and other events'), HumanMessage(content='What type of work or industry have you been involved in?'), AIMessage(content='<pad> I have been involved in the field of software development and data management. I have worked in various organizations such as Web Fusion Nepal, NDRRMA, and Web Fusion Nepal as a Web Developer and Data Management Officer. I have also provided consultancy services to national and international organizations on data visualization, system documentation, and disaster management.\n')]

Follow Up Input: What are your core beliefs regarding the role of technology in shaping society?

Standalone question:

> Finished chain.

> Entering new StuffDocumentsChain chain...

> Entering new LLMChain chain...

Prompt after formatting:

Hi! I am an AI - RAGBot assistant that answers questions about the user based on the available documents.

I ensure responses are accurate and cite relevant sources.

I'll be sure to answer you to the best of my ability!!

Context: organizations, offering insights on data visualization, system documentation, and disaster management strategies. His technical leadership in major national platforms, including his role as

a Technical Lead for Asia Shelter Forum 2020 and Co-facilitator for Asia Shelter Forum 2021, underscores his ability to drive impactful initiatives. Sachin believes in the transformative power of technology in shaping society. He advocates for ethical AI practices, ensuring technological advancements align with cultural values and community needs. His vision is to leverage data science and AI to build resilient communities,

development, GIS mapping, and system security, Sachin continues to drive technological advancements in his field. His ambition is to develop intelligent systems that enhance disaster risk assessment and response, ultimately contributing to sustainable development and community resilience.

- Offer technical assistance to IMOs in data processing, analysis, GIS mapping, and production of information management products, ensuring consistency in information management strategies across districts.

- Engage with government authorities, Partner Organizations (POs), and other stakeholders to facilitate collaboration and information sharing.

- Collaborate with the national coordination team in the documentation and design of workshops, meetings, monitoring activities, and other events, ensuring timely reporting with updates and reports to support decision-making.

- Undertake any other duties assigned by the supervisor, demonstrating flexibility and

functions such as data collection, collation, analysis, and dissemination. It involves maintaining archives of baseline data, key datasets, key indicators, and other essential tools necessary for effective information management.

- Management of IT Projects: Oversee IT projects, including software development initiatives, to ensure they are completed within established timelines and meet project objectives. This entails coordinating with developers, stakeholders, and project managers to ensure smooth project execution.

- Comprehensive System Documentation: Conduct thorough documentation of systems and source

Question: <pad> What are your core beliefs regarding the role of technology in shaping society?

Answer:

- > **Finished chain.**
- > **Finished chain.**
- > **Finished chain.**

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          'answer': '<pad> Sachin believes in the transformative power of technology in shaping society. He advocates for ethical AI practices, ensuring technological advancements align with cultural values and community needs. He believes that technology can be used to build resilient communities, develop intelligent systems that enhance disaster risk assessment and response, and contribute to sustainable development and community resilience. He believes that technology can be used to enhance disaster risk assessment and response, and contribute to sustainable development and community resilience. He also believes that technology can be used to enhance disaster risk assessment and response, and contribute to sustainable development and community resilience.\n',
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```

```
In [39]: prompt_question = "How do you think cultural values should influence technol
answer = chain({"question":prompt_question})
answer
```

> Entering new ConversationalRetrievalChain chain...

> Entering new LLMChain chain...

Prompt after formatting:

Given the following conversation and a follow question, rephrase the follow up question to be a standalone question, in its original language.

Chat History:

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[HumanMessage(content='Can you describe your current role or job responsibilities?'), AIMessage(content='<pad> My current role or job responsibilities are as an Information Management Officer – National with Catholic Relief Services – Nepal. My main responsibilities include developing and administering a monitoring tool and key performance indicators for Information Management Officers (IMOs), ensuring regular capacity appraisals and performance evaluations to maintain effectiveness. I also implement training sessions to support staff in various data-related tasks, including data processing, analysis, GIS mapping, and production of information management products. I also engage with government authorities, Partner Organizations (POs), and other stakeholders to facilitate collaboration and information sharing. Additionally, I collaborate with the national coordination team in the documentation and design of workshops, meetings, monitoring activities, and other events'), HumanMessage(content='What type of work or industry have you been involved in?'), AIMessage(content='<pad> I have been involved in the field of software development and data management. I have worked in various organizations such as Web Fusion Nepal, NDRRMA, and Web Fusion Nepal as a Web Developer and Data Management Officer. I have also provided consultancy services to national and international organizations on data visualization, system documentation, and disaster management.\n'), HumanMessage(content='What are your core beliefs regarding the role of technology in shaping society?'), AIMessage(content='<pad> Sachin believes in the transformative power of technology in shaping society. He advocates for ethical AI practices, ensuring technological advancements align with cultural values and community needs. He believes that technology can be used to build resilient communities, develop intelligent systems that enhance disaster risk assessment and response, and contribute to sustainable development and community resilience. He believes that technology can be used to enhance disaster risk assessment and response, and contribute to sustainable development and community resilience.\n')]
```

Follow Up Input: How do you think cultural values should influence technological advancements?

Standalone question:

> Finished chain.

> Entering new StuffDocumentsChain chain...

> Entering new LLMChain chain...

Prompt after formatting:

Hi! I am an AI – RAGBot assistant that answers questions about the user based on the available documents.

I ensure responses are accurate and cite relevant sources.

I'll be sure to answer you to the best of my ability!!

Context: organizations, offering insights on data visualization, system documentation, and disaster management strategies. His technical leadership in major national platforms, including his role as a Technical Lead for Asia Shelter Forum 2020 and Co-facilitator for Asia Shelter Forum 2021, underscores his ability to drive impactful initiatives. Sachin believes in the transformative power of technology in shaping society. He advocates for ethical AI practices, ensuring technological advancements align with cultural values and community needs. His vision is to leverage data science and AI to build resilient communities,

development, GIS mapping, and system security, Sachin continues to drive technological advancements in his field. His ambition is to develop intelligent systems that enhance disaster risk assessment and response, ultimately contributing to sustainable development and community resilience.

products, such as analysis reports, maps, and case studies, in the local language. These products serve to inform stakeholders and aid in strategy and decision-making processes at the local level.

program requirements to visually communicate key information and insights. These visual aids enhance understanding and facilitate effective communication of complex data and concepts.

- Continuous Improvement of Information Systems: Drive continuous improvement efforts to enhance the functionality, efficiency, and sustainability of information systems. This includes gathering user feedback, identifying areas for enhancement, and implementing solutions to optimize system performance.

- Capacity Building Support: Provide inputs and support for the capacity building of end users of information systems. This involves conducting training sessions, workshops, and providing technical

Question: <pad> What are your thoughts on the importance of cultural values in shaping technological advancements?

Answer:

> Finished chain.

> **Finished chain.**

> **Finished chain.**

```

Out[39]: {'question': 'How do you think cultural values should influence technologic
al advancements?',
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or job responsibilities?'),
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e as an Information Management Officer – National with Catholic R
elief Services – Nepal. My main responsibilities include developing
and administering a monitoring tool and key performance indicators
for Information Management Officers (IMOs), ensuring regular capacit
y appraisals and performance evaluations to maintain effectiveness.
I also implement training sessions to support staff in various da
ta-related tasks, including data processing, analysis, GIS mapping,
and production of information management products. I also engage w
ith government authorities, Partner Organizations (POs), and other
stakeholders to facilitate collaboration and information sharing. Ad
ditionally, I collaborate with the national coordination team in t
he documentation and design of workshops, meetings, monitoring acti
vities, and other events'),
  HumanMessage(content='What type of work or industry have you been involve
d in?'),
  AIMessage(content='<pad> I have been involved in the field of so
ftware development and data management. I have worked in various
organizations such as Web Fusion Nepal, NDRRMA, and Web Fusion Ne
pal as a Web Developer and Data Management Officer. I have also
provided consultancy services to national and international organiza
tions on data visualization, system documentation, and disaster man
agement.\n'),
  HumanMessage(content='What are your core beliefs regarding the role of te
chnology in shaping society?'),
  AIMessage(content='<pad> Sachin believes in the transformative power
of technology in shaping society. He advocates for ethical AI pra
ctices, ensuring technological advancements align with cultural valu
es and community needs. He believes that technology can be used
to build resilient communities, develop intelligent systems that en
hance disaster risk assessment and response, and contribute to sus
tainable development and community resilience. He believes that tec
hnology can be used to enhance disaster risk assessment and respo
nse, and contribute to sustainable development and community resili
ence. He also believes that technology can be used to enhance di
saster risk assessment and response, and contribute to sustainable
development and community resilience.\n')],
'answer': '<pad> Cultural values play a crucial role in shaping te
chnological advancements. As a technologist and advocate for ethica
l AI practices, I believe that it is essential to consider cultu
ral values when designing and implementing technological solutions.
This involves ensuring that technological advancements align with t
he values and beliefs of the communities they serve, and that th
ey are designed to be inclusive and respectful of diverse perspec
tives and experiences.\n Cultural values can be expressed through v
arious forms, such as values related to social justice, environmen
tal sustainability, and community empowerment. By incorporating the
se values into technological advancements, we can ensure that they
are not only effective but also align with the needs and aspirat
ions of the communities they serve.\n Additionally',
'source_documents': [Document(page_content='organizations, offering insigh
ts on data visualization, system documentation, and disaster \nmanagement s

```

strategies. His technical leadership in major national platforms, including his role as \na Technical Lead for Asia Shelter Forum 2020 and Co-facilitat or for Asia Shelter Forum 2021, \nunderscores his ability to drive impactfu l initiatives. \nSachin believes in the transformative power of technology in shaping society. He advocates for \nethical AI practices, ensuring techn ological advancements align with cultural values and \ncommunity needs. His vision is to leverage data science and AI to build resilient communities.', metadata={'source': '/Users/sachinmalego/Documents/AIT Course Works/02. Sec ond Semester/02. AI-NLU/Lab Work/Github/Python-fo-Natural-Language-Processi ng/Assignment/NLP-A6-Lets-Talk-with-Yourself/documents/Profile_SachinMaleg o.pdf', 'file_path': '/Users/sachinmalego/Documents/AIT Course Works/02. Se cond Semester/02. AI-NLU/Lab Work/Github/Python-fo-Natural-Language-Process ing/Assignment/NLP-A6-Lets-Talk-with-Yourself/documents/Profile_SachinMaleg o.pdf', 'page': 0, 'total_pages': 2, 'format': 'PDF 1.3', 'title': '', 'aut hor': '', 'subject': '', 'keywords': '', 'creator': '', 'producer': 'macOS Version 15.3.2 (Build 24D81) Quartz PDFContext', 'creationDate': "D:2025031 5142840Z00'00'", 'modDate': "D:20250315142840Z00'00'", 'trapped': ''}),

Document(page_content='development, GIS mapping, and system security, Sac hin continues to drive technological \nadvancements in his field. His ambit ion is to develop intelligent systems that enhance disaster risk \nassessme nt and response, ultimately contributing to sustainable development and com munity \nresilience.', metadata={'source': '/Users/sachinmalego/Documents/A IT Course Works/02. Second Semester/02. AI-NLU/Lab Work/Github/Python-fo-Na tural-Language-Processing/Assignment/NLP-A6-Lets-Talk-with-Yourself/documen ts/Profile_SachinMalego.pdf', 'file_path': '/Users/sachinmalego/Documents/A IT Course Works/02. Second Semester/02. AI-NLU/Lab Work/Github/Python-fo-Na tural-Language-Processing/Assignment/NLP-A6-Lets-Talk-with-Yourself/documen ts/Profile_SachinMalego.pdf', 'page': 1, 'total_pages': 2, 'format': 'PDF 1.3', 'title': '', 'author': '', 'subject': '', 'keywords': '', 'creator': '', 'producer': 'macOS Version 15.3.2 (Build 24D81) Quartz PDFContext', 'cr eationDate': "D:20250315142840Z00'00'", 'modDate': "D:20250315142840Z00'0 0'", 'trapped': ''}),

Document(page_content='products, such as analysis reports, maps, and case studies, in the local language. These products \nserve to inform stakeholde rs and aid in strategy and decision-making processes at the local level.', metadata={'source': '/Users/sachinmalego/Documents/AIT Course Works/02. Sec ond Semester/02. AI-NLU/Lab Work/Github/Python-fo-Natural-Language-Processi ng/Assignment/NLP-A6-Lets-Talk-with-Yourself/documents/CV _SachinMalego.pd f', 'file_path': '/Users/sachinmalego/Documents/AIT Course Works/02. Second Semester/02. AI-NLU/Lab Work/Github/Python-fo-Natural-Language-Processing/A ssignment/NLP-A6-Lets-Talk-with-Yourself/documents/CV _SachinMalego.pdf', 'page': 1, 'total_pages': 7, 'format': 'PDF 1.4', 'title': '', 'author': '', 'subject': '', 'keywords': '', 'creator': '', 'producer': 'macOS Versio n 15.1.1 (Build 24B91) Quartz PDFContext', 'creationDate': "D:2024121304284 7Z00'00'", 'modDate': "D:20241213042847Z00'00'", 'trapped': ''}),

Document(page_content='program requirements to visually communicate key i nformation and insights. These visual aids \nenhance understanding and faci litate effective communication of complex data and concepts. \n• \nContinu ous Improvement of Information Systems: Drive continuous improvement effort s to enhance \nthe functionality, efficiency, and sustainability of informa tion systems. This includes gathering user \nfeedback, identifying areas fo r enhancement, and implementing solutions to optimize system \nperformance. \n• \nCapacity Building Support: Provide inputs and support for the capacit y building of end users of \ninformation systems. This involves conducting training sessions, workshops, and providing technical', metadata={'source': '/Users/sachinmalego/Documents/AIT Course Works/02. Second Semester/02. AI-

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Lab Work/Github/Python-fo-Natural-Language-Processing/Assignment/NLP-A6-Let
s-Talk-with-Yourself/documents/CV _SachinMalego.pdf', 'page': 2, 'total_pag
es': 7, 'format': 'PDF 1.4', 'title': '', 'author': '', 'subject': '', 'key
words': '', 'creator': '', 'producer': 'macOS Version 15.1.1 (Build 24B91)
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"D:20241213042847Z00'00'", 'trapped': ''}}}]}
```

```
In [40]: prompt_question = "As a master's student, what is the most challenging aspect
answer = chain({"question":prompt_question})
answer
```

> Entering new ConversationalRetrievalChain chain...

> Entering new LLMChain chain...

Prompt after formatting:

Given the following conversation and a follow question, rephrase the follow up question to be a standalone question, in its original language.

Chat History:

[HumanMessage(content='What type of work or industry have you been involved in?'), AIMessage(content='<pad> I have been involved in the field of software development and data management. I have worked in various organizations such as Web Fusion Nepal, NDRRMA, and Web Fusion Nepal as a Web Developer and Data Management Officer. I have also provided consultancy services to national and international organizations on data visualization, system documentation, and disaster management.\n'), HumanMessage(content='What are your core beliefs regarding the role of technology in shaping society?'), AIMessage(content='<pad> Sachin believes in the transformative power of technology in shaping society. He advocates for ethical AI practices, ensuring technological advancements align with cultural values and community needs. He believes that technology can be used to build resilient communities, develop intelligent systems that enhance disaster risk assessment and response, and contribute to sustainable development and community resilience. He believes that technology can be used to enhance disaster risk assessment and response, and contribute to sustainable development and community resilience. He also believes that technology can be used to enhance disaster risk assessment and response, and contribute to sustainable development and community resilience.\n'), HumanMessage(content='How do you think cultural values should influence technological advancements?'), AIMessage(content='<pad> Cultural values play a crucial role in shaping technological advancements. As a technologist and advocate for ethical AI practices, I believe that it is essential to consider cultural values when designing and implementing technological solutions. This involves ensuring that technological advancements align with the values and beliefs of the communities they serve, and that they are designed to be inclusive and respectful of diverse perspectives and experiences.\n Cultural values can be expressed through various forms, such as values related to social justice, environmental sustainability, and community empowerment. By incorporating these values into technological advancements, we can ensure that they are not only effective but also align with the needs and aspirations of the communities they serve.\n Additionally')]

Follow Up Input: As a master's student, what is the most challenging aspect of your studies so far?

Standalone question:

> Finished chain.

> Entering new StuffDocumentsChain chain...

> Entering new LLMChain chain...

Prompt after formatting:

Hi! I am an AI – RAGBot assistant that answers questions about the user based on the available documents.

I ensure responses are accurate and cite relevant sources.

I'll be sure to answer you to the best of my ability!!

Context: (Division)

M.Sc. DSAI

AIT

Asian Institute of Technology,

Thailand

Current

B.Sc. CSIT

T.U.

St. Xavier's College Maitighar,

Kathmandu

2013 A.D.

81.36%

(Distinction)

10+2

HSEB

Millennium H.S.S. Tansen,

Palpa

2007 A.D.

64.1%

(Ist div.)

S.L.C.

HMG

New Horizon Eng. Bo. Sec. School

Tansen, Palpa

2005 A.D.

71.37%

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ACADEMIC PROJECTS

-

Final year project entitled "ICT in SMART Energy for Sustainable Empowerment" as per the requirement for the partial fulfillment of B.Sc. CSIT degree.

-

Mini project on Database entitled "Vehicle Registration System" as per the requirement for the partial fulfillment of B.Sc. CSIT degree.

-

community needs. His vision is to leverage data science and AI to build resilient communities, enhance disaster preparedness, and develop intelligent decision-support systems that optimize resource allocation and policy-making.

As a master's student, one of the most challenging aspects of his studies has been balancing academic research with practical implementation. Navigating complex AI model training, dealing with real-world data inconsistencies, and integrating AI-driven solutions in disaster management require continuous learning and adaptation. His research focuses on AI-driven

n predictive analytics,

-

Undertake any other duties assigned by the supervisor, demonstrating flexibility and adaptability to contribute to various tasks and initiatives as needed.

Date: July 08, 2018 – March 31, 2018

Sachin's contributions to academia and research include multiple published reports and case studies, such as the 'Urban Housing Recovery – July 2020' and 'Impact of COVID-19 on Post-Earthquake Recovery and Reconstruction – June 2020,' where he played a crucial role in data collection, analysis, and publication. His research interests revolve around AI applications in disaster risk management, real-time data monitoring, and predictive modeling for crisis response. Equipped with a diverse skill set spanning programming, database management, AI model development, GIS mapping, and system security, Sachin continues to drive technological

Question: <pad> What has been the most challenging aspect of your studies so far?

Answer:

> Finished chain.

> Finished chain.

> Finished chain.

```

Out[40]: {'question': 'As a master's student, what is the most challenging aspect of
your studies so far?',
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you been involved in?'),
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organizations such as Web Fusion Nepal, NDRRMA, and Web Fusion Nepal as a Web Developer and Data Management Officer. I have also
provided consultancy services to national and international organizations on data visualization, system documentation, and disaster management.\n'),
HumanMessage(content='What are your core beliefs regarding the role of technology in shaping society?'),
AIMessage(content='<pad> Sachin believes in the transformative power of technology in shaping society. He advocates for ethical AI practices, ensuring technological advancements align with cultural values and community needs. He believes that technology can be used
to build resilient communities, develop intelligent systems that enhance disaster risk assessment and response, and contribute to sustainable development and community resilience. He believes that technology can be used to enhance disaster risk assessment and response, and contribute to sustainable development and community resilience.\n'),
HumanMessage(content='How do you think cultural values should influence technological advancements?'),
AIMessage(content='<pad> Cultural values play a crucial role in shaping technological advancements. As a technologist and advocate for ethical AI practices, I believe that it is essential to consider cultural values when designing and implementing technological solutions. This involves ensuring that technological advancements align with the values and beliefs of the communities they serve, and that they are designed to be inclusive and respectful of diverse perspectives and experiences.\n Cultural values can be expressed through various forms, such as values related to social justice, environmental sustainability, and community empowerment. By incorporating these values into technological advancements, we can ensure that they are not only effective but also align with the needs and aspirations of the communities they serve.\n Additionally']],
'answer': '<pad> Balancing academic research with practical implementation.\n',
'source_documents': [Document(page_content='(Division) \nM.Sc. DSAI \nAIT \nAsian Institute of Technology, \nThailand \nCurrent \n \nB.Sc. CSIT \nT. U. \nSt. Xavier's College Maitighar, \nKathmandu \n2013 A.D. \n81.36% \n(Distinction) \n10+2 \nHSEB \nMillennium H.S.S. Tansen, \nPalpa \n2007 A.D. \n64.1% \n(Ist div.) \nS.L.C. \nHMG \nNew Horizon Eng. Bo. Sec. School \nTansen, Palpa \n2005 A.D. \n71.37% \n(Ist div.) \n \nACADEMIC PROJECTS \n• \nFinal year project entitled "ICT in SMART Energy for Sustainable Empowerment" as per the \nrequirement for the partial fulfillment of B.Sc. CSIT degree. \n• \nMini project on Database entitled "Vehicle Registration System" as per the requirement for the \npartial fulfillment of B.S c. CSIT degree. \n• ', metadata={'source': '/Users/sachinmalego/Documents/AIT Course Works/02. Second Semester/02. AI-NLU/Lab Work/Github/Python-fo-Natural-Language-Processing/Assignment/NLP-A6-Lets-Talk-with-Yourself/documents/CV _SachinMalego.pdf', 'file_path': '/Users/sachinmalego/Documents/AIT C

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course Works/02. Second Semester/02. AI-NLU/Lab Work/Github/Python-fo-Natural-Language-Processing/Assignment/NLP-A6-Lets-Talk-with-Yourself/documents/CV _SachinMalego.pdf', 'page': 4, 'total_pages': 7, 'format': 'PDF 1.4', 'title': '', 'author': '', 'subject': '', 'keywords': '', 'creator': '', 'producer': 'macOS Version 15.1.1 (Build 24B91) Quartz PDFContext', 'creationDate': "D:20241213042847Z00'00'", 'modDate': "D:20241213042847Z00'00'", 'trapped': ''}},

Document(page_content="community needs. His vision is to leverage data science and AI to build resilient communities, \nenhance disaster preparedness, and develop intelligent decision-support systems that optimize \nresource allocation and policy-making. \nAs a master's student, one of the most challenging aspects of his studies has been balancing \nacademic research with practical implementation. Navigating complex AI model training, dealing \nwith real-world data inconsistencies, and integrating AI-driven solutions in disaster management \nrequire continuous learning and adaptation. His research focuses on AI-driven predictive analytics,", metadata={'source': '/Users/sachinmalego/Documents/AIT Course Works/02. Second Semester/02. AI-NLU/Lab Work/Github/Python-fo-Natural-Language-Processing/Assignment/NLP-A6-Lets-Talk-with-Yourself/documents/Profile_SachinMalego.pdf', 'file_path': '/Users/sachinmalego/Documents/AIT Course Works/02. Second Semester/02. AI-NLU/Lab Work/Github/Python-fo-Natural-Language-Processing/Assignment/NLP-A6-Lets-Talk-with-Yourself/documents/Profile_SachinMalego.pdf', 'page': 0, 'total_pages': 2, 'format': 'PDF 1.3', 'title': '', 'author': '', 'subject': '', 'keywords': '', 'creator': '', 'producer': 'macOS Version 15.3.2 (Build 24D81) Quartz PDFContext', 'creationDate': "D:20250315142840Z00'00'", 'modDate': "D:20250315142840Z00'00'", 'trapped': ''}},

Document(page_content='• \nUndertake any other duties assigned by the supervisor, demonstrating flexibility and \nadaptability to contribute to various tasks and initiatives as needed. \n \nDate: July 08, 2018 – March 31, 2018', metadata={'source': '/Users/sachinmalego/Documents/AIT Course Works/02. Second Semester/02. AI-NLU/Lab Work/Github/Python-fo-Natural-Language-Processing/Assignment/NLP-A6-Lets-Talk-with-Yourself/documents/CV _SachinMalego.pdf', 'file_path': '/Users/sachinmalego/Documents/AIT Course Works/02. Second Semester/02. AI-NLU/Lab Work/Github/Python-fo-Natural-Language-Processing/Assignment/NLP-A6-Lets-Talk-with-Yourself/documents/CV _SachinMalego.pdf', 'page': 2, 'total_pages': 7, 'format': 'PDF 1.4', 'title': '', 'author': '', 'subject': '', 'keywords': '', 'creator': '', 'producer': 'macOS Version 15.1.1 (Build 24B91) Quartz PDFContext', 'creationDate': "D:20241213042847Z00'00'", 'modDate': "D:20241213042847Z00'00'", 'trapped': ''}},

Document(page_content="Sachin's contributions to academia and research include multiple published reports and case \nstudies, such as the 'Urban Housing Recovery – July 2020' and 'Impact of COVID-19 on Post-\nEarthquake Recovery and Reconstruction – June 2020,' where he played a crucial role in data \ncollection, analysis, and publication. His research interests revolve around AI applications in \ndisaster risk management, real-time data monitoring, and predictive modeling for crisis response. \nEquipped with a diverse skill set spanning programming, database management, AI model \ndevelopment, GIS mapping, and system security, Sachin continues to drive technological", metadata={'source': '/Users/sachinmalego/Documents/AIT Course Works/02. Second Semester/02. AI-NLU/Lab Work/Github/Python-fo-Natural-Language-Processing/Assignment/NLP-A6-Lets-Talk-with-Yourself/documents/Profile_SachinMalego.pdf', 'file_path': '/Users/sachinmalego/Documents/AIT Course Works/02. Second Semester/02. AI-NLU/Lab Work/Github/Python-fo-Natural-Language-Processing/Assignment/NLP-A6-Lets-Talk-with-Yourself/documents/Profile_SachinMalego.pdf', 'page': 1, 'total_pages': 2, 'format': 'PDF 1.3', 'title': '', 'author': '', 'subject': '', 'keywords': '', 'creator': '', 'producer': 'ma

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'')]]}
```

```
In [41]: prompt_question = "What specific research interests or academic goals do you  
answer = chain({"question":prompt_question})  
answer
```

> Entering new ConversationalRetrievalChain chain...

> Entering new LLMChain chain...

Prompt after formatting:

Given the following conversation and a follow up question, rephrase the follow up question to be a standalone question, in its original language.

Chat History:

[HumanMessage(content='What are your core beliefs regarding the role of technology in shaping society?'), AIMessage(content='<pad> Sachin believes in the transformative power of technology in shaping society. He advocates for ethical AI practices, ensuring technological advancements align with cultural values and community needs. He believes that technology can be used to build resilient communities, develop intelligent systems that enhance disaster risk assessment and response, and contribute to sustainable development and community resilience. He believes that technology can be used to enhance disaster risk assessment and response, and contribute to sustainable development and community resilience. He also believes that technology can be used to enhance disaster risk assessment and response, and contribute to sustainable development and community resilience.\n'), HumanMessage(content='How do you think cultural values should influence technological advancements?'), AIMessage(content='<pad> Cultural values play a crucial role in shaping technological advancements. As a technologist and an advocate for ethical AI practices, I believe that it is essential to consider cultural values when designing and implementing technological solutions. This involves ensuring that technological advancements align with the values and beliefs of the communities they serve, and that they are designed to be inclusive and respectful of diverse perspectives and experiences.\n Cultural values can be expressed through various forms, such as values related to social justice, environmental sustainability, and community empowerment. By incorporating these values into technological advancements, we can ensure that they are not only effective but also align with the needs and aspirations of the communities they serve.\n Additionally'), HumanMessage(content='As a master's student, what is the most challenging aspect of your studies so far?'), AIMessage(content='<pad> Balancing academic research with practical implementation.\n')]

Follow Up Input: What specific research interests or academic goals do you hope to achieve during your time as a master's student?

Standalone question:

> Finished chain.

> Entering new StuffDocumentsChain chain...

> Entering new LLMChain chain...

Prompt after formatting:

Hi! I am an AI – RAGBot assistant that answers questions about the user based on the available documents.

I ensure responses are accurate and cite relevant sources.

I'll be sure to answer you to the best of my ability!!

Context: community needs. His vision is to leverage data science and AI to build resilient communities, enhance disaster preparedness, and develop intelligent decision-support systems that optimize resource allocation and policy-making. As a master's student, one of the most challenging aspects of his studies has been balancing academic research with practical implementation. Navigating complex AI model training, dealing with real-world data inconsistencies, and integrating AI-driven solutions in disaster management require continuous learning and adaptation. His research focuses on AI-driven predictive analytics,

(Division)

M.Sc. DSAI

AIT

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Current

B.Sc. CSIT

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S.L.C.

HMG

New Horizon Eng. Bo. Sec. School

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(Ist div.)

ACADEMIC PROJECTS

-

Final year project entitled "ICT in SMART Energy for Sustainable Empowerment" as per the requirement for the partial fulfillment of B.Sc. CSIT degree.

-

Mini project on Database entitled "Vehicle Registration System" as per the requirement for the partial fulfillment of B.Sc. CSIT degree.

-

-

Undertake any other duties assigned by the supervisor, demonstrating flexibility

lity and
adaptability to contribute to various tasks and initiatives as needed.

Date: July 08, 2018 – March 31, 2018

record in technical leadership and consultancy roles, my aim is to drive digital transformation initiatives
and enhance organizational capabilities in utilizing data-driven strategies, artificial intelligence, and
machine learning for impactful decision-making and sustainable development.

PERSONAL DETAILS

Date of Birth:

23rd Dec 1988 A.D.

Gender:

Male

Permanent Address:

Asan Tole, Tansen-2, Palpa, Nepal

Current Address:

AIT Thailand

Nationality:

Nepali

Language Known:

English, Nepali

PROFESSIONAL WORKING EXPERIENCE

Date: July 08, 2018 – July 15, 2024

Job Title: Information Management Officer – National

Question: <pad> What are your long-term academic and research goals as a master's student?

Answer:

> Finished chain.

> Finished chain.

> Finished chain.


```

Out[41]: {'question': 'What specific research interests or academic goals do you hope to achieve during your time as a master's student?',
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HumanMessage(content='As a master's student, what is the most challenging aspect of your studies so far?'),
AIMessage(content='<pad> Balancing academic research with practical implementation.\n')],
'answer': "<pad> As a master's student, my long-term academic and research goals as a data science and AI student are to leverage data science and AI to build resilient communities, enhance disaster preparedness, and develop intelligent decision-support systems that optimize resource allocation and policy-making. My research focuses on AI-driven predictive analytics, and I aim to use my skills and knowledge to develop innovative solutions that address real-world challenges and improve the lives of individuals and communities. I also aim to contribute to the advancement of the field by collaborating with industry experts and promoting the use of data science and AI in decision-making and resource allocation. I am also committed to promoting ethical and responsible use",
'source_documents': [Document(page_content="community needs. His vision is to leverage data science and AI to build resilient communities, \nenhance disaster preparedness, and develop intelligent decision-support systems that optimize \nresource allocation and policy-making. \nAs a master's student, one of the most challenging aspects of his studies has been balancing \nacademic research with practical implementation. Navigating complex AI model training, dealing \nwith real-world data inconsistencies, and integrating AI-driven solutions in disaster management \nrequire continuous learning and adaptation. His research focuses on AI-driven predictive analytics,"], metadata

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Document(page_content='(Division) \nM.Sc. DSAI \nAIT \nAsian Institute of Technology, \nThailand \nCurrent \n \nB.Sc. CSIT \nT.U. \nSt. Xavier's College Maitighar, \nKathmandu \n2013 A.D. \n81.36% \n(Distinction) \n10+2 \nHSEB \nMillennium H.S.S. Tansen, \nPalpa \n2007 A.D. \n64.1% \n(Ist div.) \nS.L.C. \nHMG \nNew Horizon Eng. Bo. Sec. School \nTansen, Palpa \n2005 A.D. \n71.37% \n(Ist div.) \n \nACADEMIC PROJECTS \n• \nFinal year project entitled "ICT in SMART Energy for Sustainable Empowerment" as per the \nrequirement for the partial fulfillment of B.Sc. CSIT degree. \n• \nMini project on Database entitled "Vehicle Registration System" as per the requirement for the \npartial fulfillment of B.Sc. CSIT degree.

\n•', metadata={'source': '/Users/sachinmalego/Documents/AIT Course Works/02. Second Semester/02. AI-NLU/Lab Work/Github/Python-fo-Natural-Language-Processing/Assignment/NLP-A6-Lets-Talk-with-Yourself/documents/CV _SachinMalego.pdf', 'file_path': '/Users/sachinmalego/Documents/AIT Course Works/02. Second Semester/02. AI-NLU/Lab Work/Github/Python-fo-Natural-Language-Processing/Assignment/NLP-A6-Lets-Talk-with-Yourself/documents/CV _SachinMalego.pdf', 'page': 4, 'total_pages': 7, 'format': 'PDF 1.4', 'title': '', 'author': '', 'subject': '', 'keywords': '', 'creator': '', 'producer': 'macOS Version 15.1.1 (Build 24B91) Quartz PDFContext', 'creationDate': "D:20241213042847Z00'00'", 'modDate': "D:20241213042847Z00'00'", 'trapped': ''},

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Document(page_content='record in technical leadership and consultancy roles, my aim is to drive digital transformation initiatives \nand enhance organizational capabilities in utilizing data-driven strategies, artificial intelligence, and \nmachine learning for impactful decision-making and sustainable development. \n \nPERSONAL DETAILS \nDate of Birth: \n23rd Dec 1988 A.D. \nGender: \nMale \nPermanent Address: \nAsan Tole, Tansen-2, Palpa, Nepal \nCurrent Address: \nAIT Thailand \nNationality: \nNepali \nLanguage Known: \nEnglish, Nepali \n \nPROFESSIONAL WORKING EXPERIENCE \nDate: July 08, 2018 – July 15, 2024 \nJob Title: Information Management Officer – National', metadata={'source': '/Users/sachinmalego/Documents/AIT Course Works/02. Second Semester/02. AI-NLU/Lab Work/Github/Python-fo-Natural-Language-Processing/Assignment/NLP-A6-Lets-Talk-with-Yourself/documents/CV _SachinMalego.pdf', 'file_path': '/Users/sachinmalego/Documents/AIT Cour

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ed': ''}}]]}
```

```
In [44]: from langchain.chains import RetrievalQA

# Create RAG pipeline
qa_chain = RetrievalQA.from_chain_type(
    llm = llm,
    chain_type = "stuff",
    retriever = retriever,
    return_source_documents = True,
    chain_type_kwargs={"prompt": PROMPT}
)

# Function to clean the response
def clean_text(text):
    return text.replace("<pad>", "").replace("\n", " ").strip()

# Function to ask a question and clean the answer
def ask_question(question):
    response = qa_chain.invoke({"query": question}) # Use invoke instead of
    cleaned_answer = clean_text(response["result"]) # Clean the answer
    return cleaned_answer

# Example usage
questions = [
    "How old is Sachin Malego?",
    "What is Sachin Malego's highest level of education?",
    "What major or field of study did Sachin Malego pursue during his educat
    "How many years of work experience does Sachin Malego have?",
    "What type of work or industry have Sachin Malego been involved in?",
    "Can you describe Sachin Malego's current role or job responsibilities?",
    "Can you describe Sachin Malego's past role or job responsibilities?",
    "What are Sachin Malego's core beliefs regarding the role of technology
    "How do you think cultural values should influence technological advance
    "As a master's student, what is the most challenging aspect of Sachin Ma
    "What specific research interests or academic goals do you hope to achie
]

# Get answers and clean them
answers = [{"question": q, "answer": ask_question(q)} for q in questions]

# Save responses as JSON
import json

with open("chatbot_responses.json", "w") as f:
    json.dump(answers, f, indent=4)

print("Chatbot responses saved.")
```

Chatbot responses saved.

JSON Responses

In [45]:

```
answers
```

```

Out[45]: [{'question': 'How old is Sachin Malego?',
  'answer': 'Sachin Malego is 30 years old.'},
  {'question': "What is Sachin Malego's highest level of education?",
  'answer': "Sachin Malego's highest level of education is a Master of Science in Data Science and Artificial Intelligence from the Asian Institute of Technology (AIT), Thailand."},
  {'question': 'What major or field of study did Sachin Malego pursue during his education?',
  'answer': 'Sachin Malego pursued a Bachelor of Science in Computer Science and Information Technology (B.Sc. CSIT) during his education.'},
  {'question': 'How many years of work experience does Sachin Malego have?',
  'answer': 'Based on the information provided in the resume, Sachin Malego has over 10 years of work experience.'},
  {'question': 'What type of work or industry have Sachin Malego been involved in?',
  'answer': 'Sachin Malego has been involved in the field of Information Systems Design, Data Science, Artificial Intelligence, and Disaster Risk Reduction. He has been involved in various roles such as Web Developer, Data Management Officer, and Consultant. He has also provided consultancy services to national and international organizations and has contributed to academic and research with published reports and case studies. He has a diverse skill set spanning programming, database management, AI model development, GIS mapping, and system security. He has been involved in major national platforms such as Asia Shelter Forum 2020 and 2021.'},
  {'question': "Can you describe Sachin Malego's current role or job responsibilities?",
  'answer': "I'm sorry, but I do not have access to the current role or job responsibilities of Sachin Malego. The information provided in the context does not mention his current role or job responsibilities. Can you please provide more context or details about his current role or job responsibilities?"},
  {'question': "Can you describe Sachin Malego's past role or job responsibilities?",
  'answer': "Sachin Malego's past role or job responsibilities include: * Web Developer and Data Management Officer at Web Fusion Nepal from 2013 to 2018, where he led software development projects, managed databases, and contributed to web application development. * Consultant for the Government of Nepal from 2018 to 2024, designing and managing critical information systems for disaster risk reduction, including the Bipad portal, Reconstruction Management Information System (RMIS), Resource Management System, and Volunteer Management System (VMS). * Co-ordinator with stakeholders, overseeing IT projects, developing training programs, ensuring data security, and supporting policy-making initiatives through data analysis and visualization."},
  {'question': "What are Sachin Malego's core beliefs regarding the role of technology in shaping society?",
  'answer': "Sachin Malego's core beliefs regarding the role of technology in shaping society are: 1. The transformative power of technology in shaping society. 2. The importance of ethical AI practices in ensuring technological advancements align with cultural values and community needs. 3. The need to leverage data science and AI to build resilient communities. 4. The need to develop intelligent systems that enhance disaster risk assessment and response."}]

```

e, ultimately contributing to sustainable development and community resilience."},

{'question': 'How do you think cultural values should influence technological advancements?',

'answer': 'Cultural values should influence technological advancements in several ways: 1. Ethical considerations: Cultural values should be taken into account when designing and implementing technological systems to ensure that they align with ethical principles and respect for human rights and privacy. 2. Community needs: Cultural values should be taken into account when designing and implementing technological systems to ensure that they are accessible and inclusive for all communities. 3. Sustainability: Cultural values should be taken into account when designing and implementing technological systems to ensure that they are sustainable and environmentally friendly. 4. Accessibility: Cultural values should be taken into account when designing and implementing technological systems to ensure that they are accessible and inclusive for all users. 5. Ethical',

{'question': 'As a master's student, what is the most challenging aspect of Sachin Malego's studies so far?',

'answer': 'As a master's student, the most challenging aspect of Sachin Malego's studies so far may be the integration of advanced AI and data science techniques into his research and professional work. This may involve balancing the need to develop and implement AI models with the need to manage and analyze large amounts of data, as well as the need to integrate these models into real-world applications. Additionally, the need to balance the need to develop and implement AI models with the need to maintain and update them over time may be a challenge. Additionally, the need to balance the need to develop and implement AI models with the need to maintain and update them over time may be'},

{'question': 'What specific research interests or academic goals do you hope to achieve during your time as a master's student?',

'answer': 'Sachin's research interests and academic goals as a master's student include leveraging data science and AI to build resilient communities, enhance disaster preparedness, and develop intelligent decision-support systems that optimize resource allocation and policy-making. He aims to develop and implement AI-driven solutions in disaster management, leveraging his expertise in AI, predictive analytics, and data-driven solutions. He also hopes to contribute to the development of AI-driven solutions in disaster management by leveraging his knowledge and skills in data science and AI. Additionally, he aims to develop and implement AI-driven solutions in disaster management by leveraging his expertise in data science and AI."}]