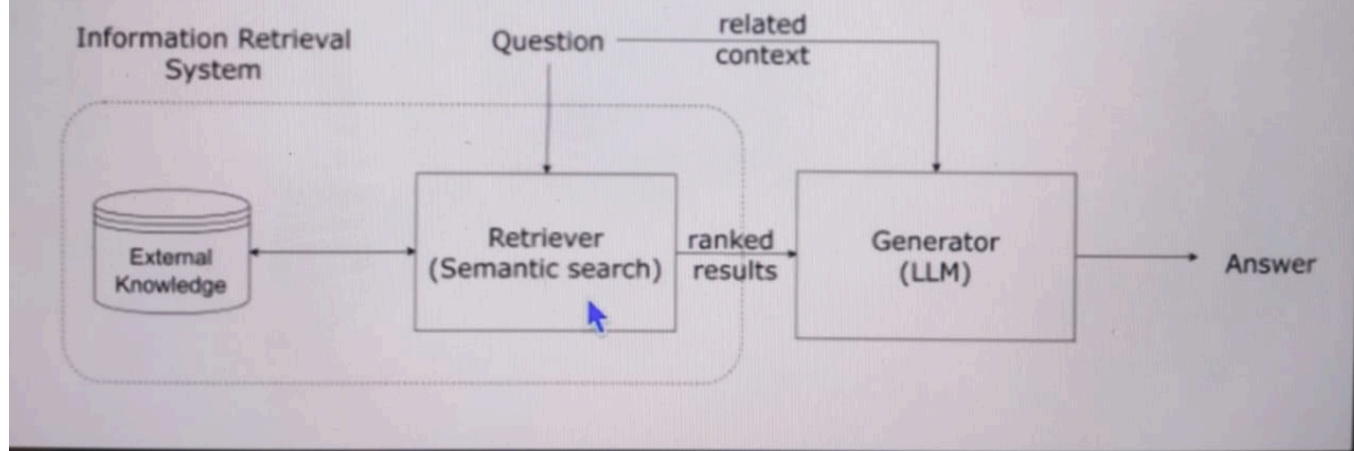


# Retrieval Augmented Generation (RAG)



## Part 1: Overall Product Specification

Problem Statement: We are given set of life insurance documents. Our purpose is to build a RAG application for efficient searching in the documents.

```
# Importing necessary libraries
!pip install llama-index
```

```
Collecting llama-index
  Downloading llama_index-0.10.34-py3-none-any.whl (6.9 kB)
Collecting llama-index-agent-openai<0.3.0,>=0.1.4 (from llama-index)
  Downloading llama_index_agent_openai-0.2.3-py3-none-any.whl (13 kB)
Collecting llama-index-cli<0.2.0,>=0.1.2 (from llama-index)
  Downloading llama_index_cli-0.1.12-py3-none-any.whl (26 kB)
Collecting llama-index-core<0.11.0,>=0.10.34 (from llama-index)
  Downloading llama_index_core-0.10.34-py3-none-any.whl (15.4 MB)
  15.4/15.4 MB 29.7 MB/s eta 0:00:00
Collecting llama-index-embeddings-openai<0.2.0,>=0.1.5 (from llama-index)
  Downloading llama_index_embeddings_openai-0.1.9-py3-none-any.whl (6.0 kB)
Collecting llama-index-indices-managed-llama-cloud<0.2.0,>=0.1.2 (from llama-index)
  Downloading llama_index_indices_managed_llama_cloud-0.1.6-py3-none-any.whl (6.7 kB)
Collecting llama-index-legacy<0.10.0,>=0.9.48 (from llama-index)
  Downloading llama_index_legacy-0.9.48-py3-none-any.whl (2.0 MB)
  2.0/2.0 MB 45.8 MB/s eta 0:00:00
Collecting llama-index-llms-openai<0.2.0,>=0.1.13 (from llama-index)
  Downloading llama_index_llms_openai-0.1.16-py3-none-any.whl (10 kB)
Collecting llama-index-multi-modal-llms-openai<0.2.0,>=0.1.3 (from llama-index)
  Downloading llama_index_multi_modal_llms_openai-0.1.5-py3-none-any.whl (5.8 kB)
Collecting llama-index-program-openai<0.2.0,>=0.1.3 (from llama-index)
  Downloading llama_index_program_openai-0.1.6-py3-none-any.whl (5.2 kB)
Collecting llama-index-question-gen-openai<0.2.0,>=0.1.2 (from llama-index)
  Downloading llama_index_question_gen_openai-0.1.3-py3-none-any.whl (2.9 kB)
Collecting llama-index-readers-file<0.2.0,>=0.1.4 (from llama-index)
  Downloading llama_index_readers_file-0.1.20-py3-none-any.whl (37 kB)
Collecting llama-index-readers-llama-parse<0.2.0,>=0.1.2 (from llama-index)
  Downloading llama_index_readers_llama_parse-0.1.4-py3-none-any.whl (2.5 kB)
Collecting openai>=1.14.0 (from llama-index-agent-openai<0.3.0,>=0.1.4->llama-index)
  Downloading openai-1.25.1-py3-none-any.whl (312 kB)
  312.9/312.9 kB 26.2 MB/s eta 0:00:00
Requirement already satisfied: PyYAML>=6.0.1 in /usr/local/lib/python3.10/dist-packages (from llama-index-core<0.11.0,>=0.10.34->llama-index)
Requirement already satisfied: SQLAlchemy[asyncio]>=1.4.49 in /usr/local/lib/python3.10/dist-packages (from llama-index-core<0.11.0,>=0.10.34->llama-index)
Requirement already satisfied: aiohttp>=4.0.0,>=3.8.6 in /usr/local/lib/python3.10/dist-packages (from llama-index-core<0.11.0,>=0.10.34->llama-index)
Collecting dataclasses-json (from llama-index-core<0.11.0,>=0.10.34->llama-index)
  Downloading dataclasses_json-0.6.5-py3-none-any.whl (28 kB)
Collecting deprecated>=1.2.9.3 (from llama-index-core<0.11.0,>=0.10.34->llama-index)
  Downloading Deprecated-1.2.14-py2.py3-none-any.whl (9.6 kB)
Collecting dirtyjson<2.0.0,>=1.0.8 (from llama-index-core<0.11.0,>=0.10.34->llama-index)
  Downloading dirtyjson-1.0.8-py3-none-any.whl (25 kB)
Requirement already satisfied: fsspec>=2023.5.0 in /usr/local/lib/python3.10/dist-packages (from llama-index-core<0.11.0,>=0.10.34->llama-index)
```

```

Collecting httpx (from llama-index-core<0.11.0,>=0.10.34->llama-index)
  Downloading httpx-0.27.0-py3-none-any.whl (75 kB)
    75.6/75.6 kB 8.2 MB/s eta 0:00:00
Collecting llamaindex-py-client<0.2.0,>=0.1.18 (from llama-index-core<0.11.0,>=0.10.34->llama-index)
  Downloading llamaindex_py_client-0.1.19-py3-none-any.whl (141 kB)
    141.9/141.9 kB 14.9 MB/s eta 0:00:00
Requirement already satisfied: nest-asyncio<2.0.0,>=1.5.8 in /usr/local/lib/python3.10/dist-packages (from llama-index-core<0.11.0,>=0.10.34->llama-index)
Requirement already satisfied: networkx<3.0 in /usr/local/lib/python3.10/dist-packages (from llama-index-core<0.11.0,>=0.10.34->llama-index)
Requirement already satisfied: nltk<4.0.0,>=3.8.1 in /usr/local/lib/python3.10/dist-packages (from llama-index-core<0.11.0,>=0.10.34->llama-index)
Requirement already satisfied: numpy in /usr/local/lib/python3.10/dist-packages (from llama-index-core<0.11.0,>=0.10.34->llama-index)
Requirement already satisfied: pandas in /usr/local/lib/python3.10/dist-packages (from llama-index-core<0.11.0,>=0.10.34->llama-index)
Requirement already satisfied: pillow<9.0.0 in /usr/local/lib/python3.10/dist-packages (from llama-index-core<0.11.0,>=0.10.34->llama-index)
Requirement already satisfied: requests<2.31.0 in /usr/local/lib/python3.10/dist-packages (from llama-index-core<0.11.0,>=0.10.34->llama-index)
Requirement already satisfied: tenacity<9.0.0,>=8.2.0 in /usr/local/lib/python3.10/dist-packages (from llama-index-core<0.11.0,>=0.10.34->llama-index)
Collecting tiktoken<0.2.2 (from llama-index-core<0.11.0,>=0.10.34->llama-index)

# Document loaders for SimpleDirectoryReader
!pip install docx2txt
!pip install pypdf

# Install OpenAI
!pip install openai

Collecting docx2txt
  Downloading docx2txt-0.8.tar.gz (2.8 kB)
  Preparing metadata (setup.py) ... done
Building wheels for collected packages: docx2txt
  Building wheel for docx2txt (setup.py) ... done
  Created wheel for docx2txt: filename=docx2txt-0.8-py3-none-any.whl size=3960 sha256=d946c2c983969984f77ed9419f9dae0c7727248c5ce25fa787
  Stored in directory: /root/.cache/pip/wheels/22/58/cf/093d0a6c3ecdfc5f6ddd5524043b88e59a9a199cb02352966
Successfully built docx2txt
Installing collected packages: docx2txt
Successfully installed docx2txt-0.8
Requirement already satisfied: pypdf in /usr/local/lib/python3.10/dist-packages (4.2.0)
Requirement already satisfied: typing_extensions>=4.0 in /usr/local/lib/python3.10/dist-packages (from pypdf) (4.11.0)
Requirement already satisfied: openai in /usr/local/lib/python3.10/dist-packages (1.25.1)
Requirement already satisfied: anyio<5,>=3.5.0 in /usr/local/lib/python3.10/dist-packages (from openai) (3.7.1)
Requirement already satisfied: distro<2,>=1.7.0 in /usr/lib/python3/dist-packages (from openai) (1.7.0)
Requirement already satisfied: httpx<1,>=0.23.0 in /usr/local/lib/python3.10/dist-packages (from openai) (0.27.0)
Requirement already satisfied: pydantic<3,>=1.9.0 in /usr/local/lib/python3.10/dist-packages (from openai) (2.7.1)
Requirement already satisfied: sniffio in /usr/local/lib/python3.10/dist-packages (from openai) (1.3.1)
Requirement already satisfied: tqdm>4 in /usr/local/lib/python3.10/dist-packages (from openai) (4.66.2)
Requirement already satisfied: typing-extensions<5,>=4.7 in /usr/local/lib/python3.10/dist-packages (from openai) (4.11.0)
Requirement already satisfied: idna>=2.8 in /usr/local/lib/python3.10/dist-packages (from anyio<5,>=3.5.0->openai) (3.7)
Requirement already satisfied: exceptiongroup in /usr/local/lib/python3.10/dist-packages (from anyio<5,>=3.5.0->openai) (1.2.1)
Requirement already satisfied: certifi in /usr/local/lib/python3.10/dist-packages (from httpx<1,>=0.23.0->openai) (2024.2.2)
Requirement already satisfied: httpcore==1.* in /usr/local/lib/python3.10/dist-packages (from httpx<1,>=0.23.0->openai) (1.0.5)
Requirement already satisfied: h11<0.15,>=0.13 in /usr/local/lib/python3.10/dist-packages (from httpcore==1.*->httpx<1,>=0.23.0->openai) (0.14.0)
Requirement already satisfied: annotated-types>=0.4.0 in /usr/local/lib/python3.10/dist-packages (from pydantic<3,>=1.9.0->openai) (0.6.0)
Requirement already satisfied: pydantic-core==2.18.2 in /usr/local/lib/python3.10/dist-packages (from pydantic<3,>=1.9.0->openai) (2.18.2)

```

```

#import openAI
from llama_index.llms.openai import OpenAI
#import ChatMessage
from llama_index.core.llms import ChatMessage
#import os
import os
import openai

from google.colab import drive
drive.mount('/content/drive', force_remount=True)

Mounted at /content/drive

#Set API key
filepath="/content/drive/MyDrive/GenAI/RAG-project/"
with open(filepath + "openai_api_key.txt","r") as f:
    openai.api_key=f.readlines()

#import SimpleDirectoryReader
from llama_index.core import SimpleDirectoryReader

# Create object of SimpleDirectoryReader
reader=SimpleDirectoryReader(input_dir="/content/drive/MyDrive/GenAI/RAG-DEMO/Policy-Documents/")

```

```
documents=reader.load_data()
#lenth of documents
print(f"Loaded {len(documents)} documents/pages successfully.")
```

Loaded 217 documents/pages successfully.

```
documents[0]
```

```
Document(id='5787c354-ec24-42f3-9e61-e6190b49af1d', embedding=None, metadata={'page_label': '1', 'file_name': 'HDFC-Life-Easy-Health-101N110V03-Policy-Bond-Single-Pay.pdf', 'file_path': '/content/drive/MyDrive/GenAI/RAG-DEMO/Policy-Documents/HDFC-Life-Easy-Health-101N110V03-Policy-Bond-Single-Pay.pdf', 'file_type': 'application/pdf', 'file_size': 1303156, 'creation_date': '2024-03-31', 'last_modified_date': '2024-03-31'}, excluded_embed_metadata_keys=['file_name', 'file_type', 'file_size', 'creation_date', 'last_modified_date', 'last_accessed_date'], excluded_llm_metadata_keys=['file_name', 'file_type', 'file_size', 'creation_date', 'last_modified_date', 'last_accessed_date'], relationships={}, text='
Part A
<<Date>>
<<Policyholder's Name>>
<<Policyholder's Address>>
<<Policyholder's Contact Number>>
Dear <<Policyholder's Name>>,
Sub: Your Policy no. << >>
We are glad to inform you that your proposal has been accepted and the HDFC Life Easy Health ("Policy") being this document, has been issued. We have made every effort to design your Policy in a simple format. We have highlighted items of importance so that you may recognize them easily.
Policy document: As an evidence of the insurance contract between HDFC Life Insurance Company Limited and you, the Policy is enclosed herewith. Please preserve this document safely and also inform your nominees about the same. A copy of your proposal form and other relevant documents submitted by you is also enclosed for your information and record.
Cancellation in the Free-Look Period: In case you are not agreeable to any of the terms and conditions stated in the Policy, you have the option to return the Policy to us for cancellation stating the reasons thereof, within 30 days from the date of receipt of the Policy as your Policy is an electronic Policy / purchased through Distance Marketing mode. On receipt of your letter along with the original Policy (original Policy Document is not required for policies in dematerialised form), we shall arrange to refund the Premium paid by you, subject to deduction of the proportionate risk Premium for the period of cover and the expenses incurred by us for medical examination (if any) and stamp duty charges. / In case you are not agreeable to any of the terms and conditions stated in the Policy, you have the option to return the Policy to us for cancellation stating the reasons thereof, within 15 days from the date of receipt of the Policy. On receipt of your letter along with the original Policy (original Policy Document is not required for policies in dematerialised form), we shall arrange to refund the Premium paid by you, subject to deduction of the proportionate risk Premium for the period of cover and the expenses incurred by us for medical examination (if any) and stamp duty charges.
Contacting us: The address for correspondence is specified below. To enable us to serve you better, you are requested to quote your Policy number in all future correspondence. In case you are keen to know more about our products and services, we would request you to talk to our Certified Financial Consultant (Insurance Agent) who has advised you while taking this Policy. The details of your Certified Financial Consultant including contact details are listed below.
To contact us in case of any grievance, please refer to Part G. In case you are not satisfied with our response, you can also approach the Insurance Ombudsman in your region.
Thanking you for choosing HDFC Life Insurance Company Limited and looking forward to serving you in the years ahead,
Yours sincerely,
Designation of the Authorised Signatory
Branch Address:
Agency/Intermediary Code:
Agency/Intermediary Name:
Agency/Intermediary Telephone Number:
Agency/Intermediary mobile & landline number', start_char_idx=None, end_char_idx=None, text_template='{metadata_str}\n\n{content}', metadata_template='{key}: {value}', metadata_seperator='\n')
```

#### Step 4: Building the query engine

```
# import SimpleNodeParser
from llama_index.core.node_parser import SimpleNodeParser
# import VectorStoreIndex
from llama_index.core import VectorStoreIndex
# import display, HTML
from IPython.display import display, HTML
```

```
# Create parser and parse documents into nodes
parser=SimpleNodeParser.from_defaults()
nodes=parser.get_nodes_from_documents(documents)
```

```
# build index
index=VectorStoreIndex(nodes)
```

```
#construct query engine
query_engine=index.as_query_engine()
```

```
#query
```

```
response=query_engine.query("What provisions may allow for a longer reinstatement period for an approved leave of absence taken in accordance with the Uniformed Services Employment and Reemployment Rights Act of 1994 (USERRA) could include specific clauses in the policy document that outline extended reinstatement timelines or special considerations for individuals returning from military service.")
```

```
response.response
```

'The provisions that may allow for a longer reinstatement period for an approved leave of absence taken in accordance with the Uniformed Services Employment and Reemployment Rights Act of 1994 (USERRA) could include specific clauses in the policy document that outline extended reinstatement timelines or special considerations for individuals returning from military service.'

```
dir(response)
```

```
['_annotations_',
 '_class_',
```

```

'__dataclass_fields__',
'__dataclass_params__',
'__delattr__',
'__dict__',
'__dir__',
'__doc__',
'__eq__',
'__format__',
'__ge__',
'__get_validators__',
'__getattr__',
'__gt__',
'__hash__',
'__init__',
'__init_subclass__',
'__le__',
'__lt__',
'__match_args__',
'__module__',
'__ne__',
'__new__',
'__pydantic_initialised__',
'__pydantic_model__',
'__pydantic_run_validation__',
'__pydantic_validate_values__',
'__reduce__',
'__reduce_ex__',
'__repr__',
'__setattr__',
'__sizeof__',
'__str__',
'__subclasshook__',
'__validate__',
'__weakref__',
'get_formatted_sources',
'metadata',
'response',
'source_nodes']

```

response.metadata

```

{'0ceded9c-504d-4879-bc59-d0eb06b6f0d2': {'page_label': '11',
'file_name': 'HDFC-Life-Sampoorna-Jeevan-101N158V04-Policy-Document (1).pdf',
'file_path': '/content/drive/MyDrive/GenAI/RAG-DEMO/Policy-Documents/HDFC-Life-Sampoorna-Jeevan-101N158V04-Policy-Document (1).pdf',
'file_type': 'application/pdf',
'file_size': 1990500,
'creation_date': '2024-03-31',
'last_modified_date': '2024-03-31'},
'0685a662-ec44-4210-ba8e-5269dfe87c04': {'page_label': '9',
'file_name': 'HDFC-Life-Group-Poorna-Suraksha-101N137V02-Policy-Document.pdf',
'file_path': '/content/drive/MyDrive/GenAI/RAG-DEMO/Policy-Documents/HDFC-Life-Group-Poorna-Suraksha-101N137V02-Policy-Document.pdf',
'file_type': 'application/pdf',
'file_size': 1371541,
'creation_date': '2024-03-31',
'last_modified_date': '2024-03-31'}}

```

response.source\_nodes

```

[NodeWithScore(node=TextNode(id='0ceded9c-504d-4879-bc59-d0eb06b6f0d2', embedding=None, metadata={'page_label': '11', 'file_name':
'HDFC-Life-Sampoorna-Jeevan-101N158V04-Policy-Document (1).pdf', 'file_path': '/content/drive/MyDrive/GenAI/RAG-DEMO/Policy-
Documents/HDFC-Life-Sampoorna-Jeevan-101N158V04-Policy-Document (1).pdf', 'file_type': 'application/pdf', 'file_size': 1990500,
'creation_date': '2024-03-31', 'last_modified_date': '2024-03-31'}, excluded_embed_metadata_keys=['file_name', 'file_type',
'file_size', 'creation_date', 'last_modified_date', 'last_accessed_date'], excluded_llm_metadata_keys=['file_name', 'file_type',
'file_size', 'creation_date', 'last_modified_date', 'last_accessed_date'], relationships={<NodeRelationship.SOURCE: '1'>:
RelatedNodeInfo(node_id='c58796a5-51a4-4640-a415-c87538acb693', node_type=<ObjectType.DOCUMENT: '4'>, metadata={'page_label': '11',
'file_name': 'HDFC-Life-Sampoorna-Jeevan-101N158V04-Policy-Document (1).pdf', 'file_path': '/content/drive/MyDrive/GenAI/RAG-
DEMO/Policy-Documents/HDFC-Life-Sampoorna-Jeevan-101N158V04-Policy-Document (1).pdf', 'file_type': 'application/pdf', 'file_size':
1990500, 'creation_date': '2024-03-31', 'last_modified_date': '2024-03-31'},
hash='ba37b4e89a59994884d91e2c286f3fc935302ec3d1a8487bd36c0fa248a6df16'), <NodeRelationship.PREVIOUS: '2'>:
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'file_name': 'HDFC-Life-Sampoorna-Jeevan-101N158V04-Policy-Document (1).pdf', 'file_path': '/content/drive/MyDrive/GenAI/RAG-
DEMO/Policy-Documents/HDFC-Life-Sampoorna-Jeevan-101N158V04-Policy-Document (1).pdf', 'file_type': 'application/pdf', 'file_size':
1990500, 'creation_date': '2024-03-31', 'last_modified_date': '2024-03-31'},
hash='64e566f4b08c76a2bb6d6f4345464c5cbb3cf76dd5008a98a3852ca6421c497b')), text='D.2.2. Notwithstanding anything to the contrary
contained elsewhere in this Policy, the Company reserves the right to revive \nthe lapsed Policy either on its original terms and
conditions or on such other or modified terms and conditions as the \nCompany may specify or to reject the Revival . If needed the
Company may refer it to its medical examiner in decid ing \non Revival of lapse d Policy. Subject to the provisions of Clauses D.2.1
above, the Revival shall come into effect on the \ndate when the Company specifically communicates it in writing to the Policyholder.
\n \nD.2.3 If the Policy is not revived for full Benefits before the Policy Maturity Date but within five years from the due date for
\npayment of the first unpaid Premium and if the Policy has not acquired Guaranteed Surrender Value, then the Policy \nwill terminate.
\n \nD.3. Non-Forfeiture options : PART D \nPolicy Servicing Related Aspects', start_char_idx=3529, end_char_idx=4449,
text_template='{metadata_str}\n\n{content}', metadata_template='{key}: {value}', metadata_seperator='\n'), score=0.7711361909629276),

```

```

NodeWithScore(node=TextNode(id='0685a662-ec44-4210-ba8e-5269dfe87c04', embedding=None, metadata={'page_label': '9', 'file_name': 'HDFC-Life-Group-Poorna-Suraksha-101N137V02-Policy-Document.pdf', 'file_path': '/content/drive/MyDrive/GenAI/RAG-DEMO/Policy-Documents/HDFC-Life-Group-Poorna-Suraksha-101N137V02-Policy-Document.pdf', 'file_type': 'application/pdf', 'file_size': 1371541, 'creation_date': '2024-03-31', 'last_modified_date': '2024-03-31'}, excluded_embed_metadata_keys=['file_name', 'file_type', 'file_size', 'creation_date', 'last_modified_date', 'last_accessed_date'], excluded_llm_metadata_keys=['file_name', 'file_type', 'file_size', 'creation_date', 'last_modified_date', 'last_accessed_date'], relationships={<NodeRelationship.SOURCE: '1'}>: RelatedNodeInfo(node_id='9d424dc8-6e10-4081-abb3-5407654f1dca', node_type=ObjectType.DOCUMENT: '4', metadata={'page_label': '9', 'file_name': 'HDFC-Life-Group-Poorna-Suraksha-101N137V02-Policy-Document.pdf', 'file_path': '/content/drive/MyDrive/GenAI/RAG-DEMO/Policy-Documents/HDFC-Life-Group-Poorna-Suraksha-101N137V02-Policy-Document.pdf', 'file_type': 'application/pdf', 'file_size': 1371541, 'creation_date': '2024-03-31', 'last_modified_date': '2024-03-31'}, hash='b2b82b53fd8fa191435a8a8c52dd3a89a13fcdec44bf61e26791c7c4d53f808')), text='Page 9 of 31 \n In case if the Scheme Member surrenders the Certificate of Insurance anytime during the Coverage Term, \nsurrender value will be calculated as given below: \n \n \nWhere, \nTerm Definition \nM Elapsed months since coverage inception, any part of month shall be counted as full. \nN Number of months for which premiums are payable \nP Policy Term in months \nT Number of months for which premiums are paid \nTotal Premiums Paid Total premiums paid means total of all premiums received, excluding any extra premium, \nany rider premium and taxes. \nOriginal Sum \nAssured The Sum Assured specified for the Member at inception. \nCurrent Sum \nAssured The Sum Assured applicable in the policy month of surrender as per the repayment schedule \nset at inception. This will be equal to the Original Sum Assured for level term assurance \ncoverage. \nUpon payment of surrender benefit the cover for that Scheme Member (Single Life or Joint Life) terminates \nand no further benefits are payable. \n \nIn case of surrender of the Master Policy / Scheme Member leaving the group, the Scheme Members will be \ngiven an option to continue the policy as an individual policy till the expiry of member coverage term. \n \nRegular Pay \nNo surrender benefit is payable. \n \n(4) Benefits on Paid-Up \nRegular Pay \nIf premiums are discontinued at any time before the premium payment term, the policy shall acquire a paid-\nup status on expiry of the grace period for the last unpaid premium and the cover shall continue for the paid-\nup Sum Assured as defined below: \n \nWhere T & N are as defined above. \nRegular Pay \nIf payment of Premium on behalf of a Scheme Member is discontinued at any time before the completion of \nthe Premium Payment Term the Insurance cover shall cease and no benefits shall be paid. \n \nSingle Pay \nNot Applicable \n \n(5) Grace Period \nThere will be a grace period of 30 days for non-monthly premium paying mode and 15 days for monthly \nmode under Regular and Limited pay policies. \nThe policy is considered to be in-force with the risk cover during the grace period without any interruption. \nIf a premium is not paid within the grace period, then all benefits will lapse. \nThe Insurer shall be responsible to honour any valid claims brought under this policy in instances wherein \nthe Master Policyholder has collected/ deducted the Premium but has failed to pay the same to the Insurer \nwithin the Grace Period due to administrative reasons.', start_char_idx=2, end_char_idx=2456, text_template='{metadata_str}\n\n{content}', metadata_template='{key}: {value}', metadata_seperator='\n'), score=0.7682377651274183]]

len(response.source_nodes)

2

print(response.source_nodes[0].node.metadata['file_name'])
print(response.source_nodes[0].node.metadata['page_label'])

HDFC-Life-Sampoorna-Jeevan-101N158V04-Policy-Document (1).pdf
11

print(response.source_nodes[0].node.metadata['file_name'] + " Page No " + response.source_nodes[0].node.metadata['page_label'])

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# Extract the score
print(response.source_nodes[0].score)

0.7711361909629276

# Response Node Text
response.source_nodes[0].node.text

'D.2.2. Notwithstanding anything to the contrary contained elsewhere in this Policy, the Company reserves the right to revive \nthe lapsed Policy either on its original terms and conditions or on such other or modified terms and conditions as the \nCompany may specify or to reject the Revival . If needed the Company may refer it to its medical examiner in decid ing \non Revival of lapse d Policy. Sub ject to the provisions of Clauses D.2.1 above, the Revival shall come into effect on the \ndate when the Company specifically communic ates it in writing to the Policyholder. \n \nD.2.3 If the Policy is not revived for full Benefits before the Policy Maturity Date bu t within five years from the due date for \npayment of the first unpaid Premium and if the Policy has not acquired Guaranteed Surrender Value, then the Policy \nwill terminate. \n \nD.3. Non-Forfeiture options : PART D \nPolicy Servicing Related Aspects'
```

## Step 6: Creating response pipeline

```

# Query response function
def query_response(user_input):
    response=query_engine.query(user_input)
    file_name=response.source_nodes[0].node.metadata['file_name'] + " Page No " + response.source_nodes[0].node.metadata['page_label']
    final_response=response.response + "\nCheck further at " + file_name
    return final_response
```

```
def initialize_conv():
    print("Feel free to ask questions related to insurance policies. Enter exit once you are done!")
    while True:
        user_input=input()
        if user_input.lower() == "exit":
            print("Exiting the program. Bye!!!")
            break
        else:
            response=query_response(user_input)
            display(HTML(f'<p style="font-size:20px">{response}</p>'))
```

```
initialize_conv()
```

Feel free to ask questions related to insurance policies. Enter exit once you are done!  
What provisions may allow for a longer reinstatement period for an approved leave of abs

The provisions that may allow for a longer reinstatement period for an approved leave of absence taken in accordance with the Uniformed Services Employment and Reemployment Rights Act of 1994 (USERRA) could include clauses that specify the right of the company to revive a lapsed policy on modified terms and conditions, or to reject the revival altogether. Additionally, the reinstatement may come into effect on the date when the company communicates it in writing to the policyholder. Check

### Step 7: Building a test pipeline

```
questions=["What provisions may allow for a longer reinstatement period for an approved leave of absence taken in accordance with the Unifor
"How is the peroid of time during which a reinstated Member's insurance was not in force treated for the purpose of determining t
"What are the requirements for placing in force any Scheduled benefit that would have been subject to Proof of Good Health has th
```

```
import pandas as pd
```

```
def testing_pipeline(questions):
    test_feedback=[]
    for i in questions:
        print(i)
        print(query_response(i))
        print("\nPlease provide your feedback on the response provided by bot")
        user_input=input()
        page=query_response(i).split()[-1]
        test_feedback.append((i,query_response(i),page,user_input))

    feedback_df=pd.DataFrame(test_feedback,columns=["Question", "Response", "Page", "Good/Bad"])
    return feedback_df
```

```
testing_pipeline(questions)
```

What provisions may allow for a longer reinstatement period for an approved leave of absence taken in accordance with the Uniformed Serv Provisions related to the revival of a lapsed policy may allow for a longer reinstatement period for an approved leave of absence taken Check further at HDFC-Life-Sampoorna-Jeevan-101N158V04-Policy-Documents (1).pdf Page No 11

Please provide your feedback on the response provided by bot  
Yes

How is the peroid of time during which a reinstated Member's insurance was not in force treated for the purpose of determining the lengt The period of time during which a reinstated Member's insurance was not in force is typically not considered when determining the length Check further at HDFC-Life-Group-Term-Life-Policy.pdf Page No 15

Please provide your feedback on the response provided by bot  
Good

What are the requirements for placing in force any Scheduled benefit that would have been subject to Proof of Good Health has the member The requirements for placing in force any Scheduled benefit that would have been subject to Proof of Good Health if the member remained Check further at HDFC-Life-Group-Term-Life-Policy.pdf Page No 15

Please provide your feedback on the response provided by bot  
Bad

	Question	Response	Page	Good/Bad
0	What provisions may allow for a longer reinsta...	The provisions that may allow for a longer rei...	11	Yes
1	How is the peroid of time during which a reins...	The period of time during which a reinstated M...	15	Good
2	What are the requirements for placing in force...	The requirements for placing in force any Sche...	15	Bad

Part 3: Next steps

3.1 Building a custom prompt template

response=query\_engine.query("What provisions may allow for a longer reinstatement period for an approved leave of absence taken in accordanc

response.response

'The provisions that may allow for a longer reinstatement period for an approved leave of absence taken in accordance with the Uniformed Services Employment and Reemployment Rights Act of 1994 (USERRA) could include clauses that specify the Company's right to r evive a lapsed Policy on modified terms and conditions. subject to certain conditions b

# response source nodes

response.source\_nodes

[NodeWithScore(node=TextNode(id='0ceded9c-504d-4879-bc59-d0eb06b6f0d2', embedding=None, metadata={'page\_label': '11', 'file\_name': 'HDFC-Life-Sampoorna-Jeevan-101N158V04-Policy-Documents (1).pdf', 'file\_path': '/content/drive/MyDrive/GenAI/RAG-DEMO/Policy-Documents/HDFC-Life-Sampoorna-Jeevan-101N158V04-Policy-Documents (1).pdf', 'file\_type': 'application/pdf', 'file\_size': 1990500, 'creation\_date': '2024-03-31', 'last\_modified\_date': '2024-03-31', 'excluded\_embed\_metadata\_keys=['file\_name', 'file\_type', 'file\_size', 'creation\_date', 'last\_modified\_date', 'last\_accessed\_date'], excluded\_llm\_metadata\_keys=['file\_name', 'file\_type', 'file\_size', 'creation\_date', 'last\_modified\_date', 'last\_accessed\_date'], relationships={<NodeRelationship.SOURCE: '1':>: RelatedNodeInfo(node\_id='c58796a5-51a4-4640-a415-c87538acb693', node\_type=<ObjectType.DOCUMENT: '4'>, metadata={'page\_label': '11', 'file\_name': 'HDFC-Life-Sampoorna-Jeevan-101N158V04-Policy-Documents (1).pdf', 'file\_path': '/content/drive/MyDrive/GenAI/RAG-DEMO/Policy-Documents/HDFC-Life-Sampoorna-Jeevan-101N158V04-Policy-Documents (1).pdf', 'file\_type': 'application/pdf', 'file\_size': 1990500, 'creation\_date': '2024-03-31', 'last\_modified\_date': '2024-03-31'}, hash='ba37b4e89a59994884d91e2c286f3fc935302ec3d1a8487bd36c0fa248a6df16'), <NodeRelationship.PREVIOUS: '2':>: RelatedNodeInfo(node\_id='68e4835f-4630-44ab-be92-0c83df10325e', node\_type=<ObjectType.TEXT: '1'>, metadata={'page\_label': '11', 'file\_name': 'HDFC-Life-Sampoorna-Jeevan-101N158V04-Policy-Documents (1).pdf', 'file\_path': '/content/drive/MyDrive/GenAI/RAG-DEMO/Policy-Documents/HDFC-Life-Sampoorna-Jeevan-101N158V04-Policy-Documents (1).pdf', 'file\_type': 'application/pdf', 'file\_size': 1990500, 'creation\_date': '2024-03-31', 'last\_modified\_date': '2024-03-31'}, hash='64e566f4b08c76a2bb6d6f4345464c5cbb3cf76dd5008a98a3852ca6421c497b')), text='D.2.2. Notwithstanding anything to the contrary contained elsewhere in this Policy, the Company reserves the right to revive \nthe lapsed Policy either on its original terms and conditions or on such other or modified terms and conditions as the \nCompany may specify or to reject the Revival . If needed the Company may refer it to its medical examiner in decid ing \non Revival of lapse d Policy. Subject to the provisions of Clauses D.2.1 above, the Revival shall come into effect on the \ndate when the Company specifically communicates it in writing to the Policyholder. \n \nD.2.3 If the Policy is not revived for full Benefits before the Policy Maturity Date but within five years from the due date for \npayment of the first unpaid Premium and if the Policy has not acquired Guaranteed Surrender Value, then the Policy \nwill terminate. \n \nD.3. Non-Forfeiture options : PART D \nPolicy Servicing Related Aspects', start\_char\_idx=3529, end\_char\_idx=4449, text\_template='{metadata\_str}\n\n{content}', metadata\_template='{key}: {value}', metadata\_seperator='\n'), NodeWithScore(node=TextNode(id='0685a662-ec44-4210-ba8e-5269dfe87c04', embedding=None, metadata={'page\_label': '9', 'file\_name': 'HDFC-Life-Group-Poorna-Suraksha-101N137V02-Policy-Documents.pdf', 'file\_path': '/content/drive/MyDrive/GenAI/RAG-DEMO/Policy-Documents/HDFC-Life-Group-Poorna-Suraksha-101N137V02-Policy-Documents.pdf', 'file\_type': 'application/pdf', 'file\_size': 1371541, 'creation\_date': '2024-03-31', 'last\_modified\_date': '2024-03-31', 'excluded\_embed\_metadata\_keys=['file\_name', 'file\_type', 'file\_size', 'creation\_date', 'last\_modified\_date', 'last\_accessed\_date'], excluded\_llm\_metadata\_keys=['file\_name', 'file\_type', 'file\_size', 'creation\_date', 'last\_modified\_date', 'last\_accessed\_date'], relationships={<NodeRelationship.SOURCE: '1':>: RelatedNodeInfo(node\_id='9d424dc8-6e10-4081-abb3-5407654f1dca', node\_type=<ObjectType.DOCUMENT: '4'>, metadata={'page\_label': '9', 'file\_name': 'HDFC-Life-Group-Poorna-Suraksha-101N137V02-Policy-Documents.pdf', 'file\_path': '/content/drive/MyDrive/GenAI/RAG-DEMO/Policy-Documents/HDFC-Life-Group-Poorna-Suraksha-101N137V02-Policy-Documents.pdf', 'file\_type': 'application/pdf', 'file\_size': 1371541, 'creation\_date': '2024-03-31', 'last\_modified\_date': '2024-03-31'}, hash='b2b82b53fd8fa191435a8a8c52dd3a89a13fcdec44b6f1e26791c7c4d53f808')), text='Page 9 of 31 \n In case if the Scheme Member surrenders the Certificate of Insurance anytime during the Coverage Term, \nsurrender value will be calculated as given below: \n \n

\nWhere, \nTerm Definition \nM Elapsed months since coverage inception, any part of month shall be counted as full. \nN Number of months for which premiums are payable \nP Policy Term in months \nT Number of months for which premiums are paid \nTotal Premiums Paid Total premiums paid means total of all premiums received, excluding any extra premium, \nany rider premium and taxes. \nOriginal Sum \nAssured The Sum Assured specified for the Member at inception. \nCurrent Sum \nAssured The Sum Assured applicable in the policy month of surrender as per the repayment schedule \nset at inception. This will be equal to the Original Sum Assured for level term assurance \ncoverage. \nUpon payment of surrender benefit the cover for that Scheme Member (Single Life or Joint Life) terminates \nand no further benefits are payable. \n \nIn case of surrender of the Master Policy / Scheme Member leaving the group, the Scheme Members will be \ngiven an option to continue the policy as an individual policy till the expiry of member coverage term. \n \n\uf0b7 Regular Pay \nNo surrender benefit is payable. \n \n(4) Benefits on Paid-Up \n\uf0b7 Limited Pay \nIf premiums are discontinued at any time before the premium payment term, the policy shall acquire a paid-\nup status on expiry of the grace period for the last unpaid premium and the cover shall continue for the paid-\nup Sum Assured as defined below: \n \nWhere T & N are as defined above. \n\uf0b7 Regular Pay \nIf payment of Premium on behalf of a Scheme Member is discontinued at any time before the completion of \nth the Premium Payment Term the Insurance cover shall cease and no benefits shall be paid. \n \n\uf0b7 Single Pay \nNot Applicable \n \n(5) Grace Period \nThere will be a grace period of 30 days for non-monthly premium paying mode and 15 days for monthly \nmode under Regular and Limited pay policies. \nThe policy is considered to be in-force with the risk cover during the grace period without any interruption. \nIf a premium is not paid within the grace period, then all benefits will lapse. \nThe Insurer shall be responsible to honour any valid claims brought under this policy in instances wherein \nth the Master Policyholder has collected/ deducted the Premium but has failed to pay the same to the Insurer \nwithin the Grace Period due to administrative reasons.', start\_char\_idx=2, end\_char\_idx=2456, text\_template='{metadata\_str}\n\n{content}', metadata\_template='{key}: {value}', metadata\_seperator='\n'), score=0.7682377651274183)]

response.source\_nodes[0]

NodeWithScore(node=TextNode(id\_='0ceded9c-504d-4879-bc59-d0eb06b6f0d2', embedding=None, metadata={'page\_label': '11', 'file\_name': 'HDFC-Life-Sampoorna-Jeevan-101N158V04-Policy-Documents (1).pdf', 'file\_path': '/content/drive/MyDrive/GenAI/RAG-DEMO/Policy-Documents/HDFC-Life-Sampoorna-Jeevan-101N158V04-Policy-Documents (1).pdf', 'file\_type': 'application/pdf', 'file\_size': 1990500, 'creation\_date': '2024-03-31', 'last\_modified\_date': '2024-03-31'}, excluded\_embed\_metadata\_keys=['file\_name', 'file\_type', 'file\_size', 'creation\_date', 'last\_modified\_date', 'last\_accessed\_date'], excluded\_llm\_metadata\_keys=['file\_name', 'file\_type', 'file\_size', 'creation\_date', 'last\_modified\_date', 'last\_accessed\_date'], relationships={<NodeRelationship.SOURCE: '1':>: RelatedNodeInfo(node\_id='c58796a5-51a4-4640-a415-c87538acb693', node\_type=<ObjectType.DOCUMENT: '4'>, metadata={'page\_label': '11', 'file\_name': 'HDFC-Life-Sampoorna-Jeevan-101N158V04-Policy-Documents (1).pdf', 'file\_path': '/content/drive/MyDrive/GenAI/RAG-DEMO/Policy-Documents/HDFC-Life-Sampoorna-Jeevan-101N158V04-Policy-Documents (1).pdf', 'file\_type': 'application/pdf', 'file\_size': 1990500, 'creation\_date': '2024-03-31', 'last\_modified\_date': '2024-03-31'}, hash='ba37b4e89a59994884d91e2c286f3fc935302ec3d1a8487bd36c0fa248a6df16'), <NodeRelationship.PREVIOUS: '2':>: RelatedNodeInfo(node\_id='68e4835f-4630-44ab-be92-0c83df10325e', node\_type=<ObjectType.TEXT: '1'>, metadata={'page\_label': '11', 'file\_name': 'HDFC-Life-Sampoorna-Jeevan-101N158V04-Policy-Documents (1).pdf', 'file\_path': '/content/drive/MyDrive/GenAI/RAG-DEMO/Policy-Documents/HDFC-Life-Sampoorna-Jeevan-101N158V04-Policy-Documents (1).pdf', 'file\_type': 'application/pdf', 'file\_size': 1990500, 'creation\_date': '2024-03-31', 'last\_modified\_date': '2024-03-31'}, hash='64e566f4b08c76a2bb6d6f4345464c5cbb3cf76dd5008a98a3852ca6421c497b')), text='D.2.2. Notwithstanding anything to the contrary contained elsewhere in this Policy, the Company reserves the right to revive \nth the lapsed Policy either on its original terms and conditions or on such other or modified terms and conditions as the \nCompany may specify or to reject the Revival . If needed the Company may refer it to its medical examiner in decid ing \non Revival of lapse d Policy. Subject to the provisions of Clauses D.2.1 above, the Revival shall come into effect on the \ndate when the Company specifically communicates it in writing to the Policyholder. \n \nD.2.3 If the Policy is not revived for full Benefits before the Policy Maturity Date but within five years from the due date for \npayment of the first unpaid Premium and if the Policy has not acquired Guaranteed Surrender Value, then the Policy \nwill terminate. \n \nD.3. Non-Forfeiture options : PART D \nPolicy Servicing Related Aspects', start\_char\_idx=3529, end\_char\_idx=4449, text\_template='{metadata\_str}\n\n{content}', metadata\_template='{key}: {value}', metadata\_seperator='\n'), score=0.7711361909629276)

response.source\_nodes[1].node.text

'Page 9 of 31 \n In case if the Scheme Member surrenders the Certificate of Insurance a nytime during the Coverage Term, \nsurrender value will be calculated as given below: \n \n \nWhere, \nTerm Definition \nM Elapsed months since coverage inception, any part of month shall be counted as full. \nN Number of months for which premiums are payable \nP Policy Term in months \nT Number of months for which premiums are paid \nTotal Prem iums Paid Total premiums paid means total of all premiums received, excluding any extr a premium, \nany rider premium and taxes. \nOriginal Sum \nAssured The Sum Assured spec ified for the Member at inception. \nCurrent Sum \nAssured The Sum Assured applicabl e i

reference\_0 = " Check further at " + response.source\_nodes[0].node.metadata['file\_name'] + " Page No " + response.source\_nodes[0].node.metad  
reference\_1 = " Check further at " + response.source\_nodes[1].node.metadata['file\_name'] + " Page No " + response.source\_nodes[1].node.metad  
retrieved = response.source\_nodes[0].node.text + reference\_0 + response.source\_nodes[1].node.text + reference\_1  
retrieved

'D.2.2. Notwithstanding anything to the contrary contained elsewhere in this Policy, t he Company reserves the right to revive \nth the lapsed Policy either on its original ter ms and conditions or on such other or modified terms and conditions as the \nCompany ma y specify or to reject the Revival . If needed the Company may refer it to its medical examiner in decid ing \non Revival of lapse d Policy. Subject to the provisions of Cla uses D.2.1 above, the Revival shall come into effect on the \ndate when the Company sp ecifically communicates it in writing to the Policyholder. \n \nD.2.3 If the Policy i s not revived for full Benefits before the Policv Maturity Date but within five years



```

messages=[
    {
        "role":"system",
        "content":"You are AI assistant to user."
    },
    {
        "role":"user",
        "content": f""What provisions may allow for a longer reinstatement period for an approved leave of absence taken
in accordance with the Uniformed Services Employment and Reemployment Rights Act of 1994 (USERRA)? Check in '{retrieved}'
""
    }
]
messages

[{'role': 'system', 'content': 'You are AI assistant to user.'},
 {'role': 'user',
  'content': "What provisions may allow for a longer reinstatement period for an approved leave of absence taken\n
in accordance with the Uniformed Services Employment and Reemployment Rights Act of 1994 (USERRA)? Check in 'D.2.2. Notwithstanding
anything to the contrary contained elsewhere in this Policy, the Company reserves the right to revive \nthe lapsed Policy either on
its original terms and conditions or on such other or modified terms and conditions as the \nCompany may specify or to reject the
Revival . If needed the Company may refer it to its medical examiner in decid ing \non Revival of lapse d Policy. Subject to the
provisions of Clauses D.2.1 above, the Revival shall come into effect on the \ndate when the Company specifically communicates it in
writing to the Policyholder. \n \nD.2.3 If the Policy is not revived for full Benefits before the Policy Maturity Date but within
five years from the due date for \npayment of the first unpaid Premium and if the Policy has not acquired Guaranteed Surrender Value,
then the Policy \nwill terminate. \n \nD.3. Non-Forfeiture options : PART D \nPolicy Servicing Related Aspects Check further at
HDFC-Life-Sampoorna-Jeevan-101N158V04-Policy-Docum (1).pdf Page No 11D.1. Free Look Provisions: The Policyholder shall have a
period of 15 days from the date of receipt of the Policy \nDocument to review the terms and conditions of this Policy and if the
Policyholder disagrees with any of the terms and \nconditions, the Policyholder shall have the option to return the Policy to the
Company for cancellation, stating the \nreasons for His object ions.U pon such Free -Look cancellation, the Company shall return the
Premium paid subject to \ndeduction of a proportionate risk Premium for the period of insurance cover in addition to the expenses
incurred on \nmedical examination (if any) and the stamp duty charges. All Benefits and rights under this Policy shall immediately
\nstand terminated on the cancellation of the Policy. \n \nThe Policyholder shall have a period of 30 days if the Policy is sourced
through Distance Marketing# from the date of \nreceipt of the Policy document to review the terms and conditions of this Policy and if
the Policyholder disagrees with \nthe said terms and conditions, the Policyholder shall have the option to return the Policy to the
Company for \ncancellat ion, stating the reasons for His objections. Upon such Free -Look cancellation , the Company shall return the
\nPremium paid subject to deduction of a proportionate risk Premium for the period of insurance cover and medical \nexamination fees
(if any) in additio n to the stamp duty charges. All Benefits and rights under this Policy shall \nimmediately stand terminated on the
cancellation of the Policy. \n \n# Distance Marketing includes every activity of solicitation (including lead generation) and sale of
insurance pro ducts \nthrough the following modes: (i) voice mode, which includes telephone -calling (ii) short messaging service (SMS)
(iii) \nelectronic mode which includes e -mail, internet and interactive television (DTH) (iv) physical mode which includes direct
\npostal ma il and newspaper and magazine inserts and (v) solicitation through any means of communication other than \nin person. \n
\nD.2. Revival of the Policy: \n \nD.2.1. Subject to the approval of the Company and the prevailing board approved underwriting
Policy, this Policy, if lapsed, \nmay be revived for full Benefit s within five years from the due date for payment of the first
unpaid Premium provided \nthat; \n \nD.2.1.1. This Policy has not been surrendered for cash; \n D.2.1.2. No claim has arisen under
this Policy. \nD.2.1.3. Where required by the Company, a written application for Revival is received from thePolicyholder by the
\nCompany, together with evidence of insurability and health of the Life Assured, to the satisfaction of the Company; and \nD.2.1.4.
All amounts necessary to revive this Policy including all arrears Premiums with interest/Revival charge is set as \nper the formula
below and is subject to IRDAI's approval: \nThe current rate of interest is 9.50% p.a. Any change in the revival interest rates will
be in accordance with the \nfollowing formula: Average Annualised 10 -year benchmark G -Sec Yield (over last 6 months & rounded upto
the nearest \n50 bps) + 2%.During revival campaigns, the company may offer reduced interest rates subject to the rules of the \nspecial
revival campaign. The rebates offered during the revival campaign may vary from year to year. The maximum \ninterest rate rebate may be
set up to the prevailing revival interest rate. Any change on basis of determination of \ninterest rate for revivals ca n be done only
after prior approval of the Authority. \n \nD.2.2. Notwithstanding anything to the contrary contained elsewhere in this Policy, the
Company reserves the right to revive \nthe lapsed Policy either on its original terms and conditions or on such other or modified
terms and conditions as the \nCompany may specify or to reject the Revival . If needed the Company may refer it to its medical examiner
in decid ing \non Revival of lapse d Policy. Subject to the provisions of Clauses D.2.1 above, the Revival shall come into effect on
the \ndate when the Company specifically communicates it in writing to the Policyholder. \n \nD.2.3 If the Policy is not revived for
full Benefits before the Policy Maturity Date but within five years from the due date for \npayment of the first unpaid Premium and if
the Policy has not acquired Guaranteed Surrender Value, then the Policy \nwill terminate. Check further at HDFC-Life-Sampoorna-Jeevan-
101N158V04-Policy-Docum (1).pdf Page No 11'\n
    "}]

response2=openai.chat.completions.create(
    model="gpt-3.5-turbo",
    messages=messages
)
response2.choices[0].message.content

```

'The provisions that may allow for a longer reinstatement period for an approved leave of absence taken in accordance with the Uniformed Services Employment and Reemployment Rights Act of 1994 (USERRA) include the following:\n\n- The policy may be revived for full benefits within five years from the due date for payment of the first unpaid premium, subject to approval from the company and meeting certain criteria.\n- A written application for revival must be received from the policyholder, along with evidence of insurability and health of the life assured to the satisfaction of the company.\n- All amounts necessary to revive the policy, including all arrears premiums with interest/revival charge, must be paid as per the stipulated formula.\n- The revival of the policy may be on its original terms and conditions or on modified terms as specified by the company.\n- The company reserves the right to reject the revival of a lapsed policy and may refer it to a medical examiner for a decision.\n- The revival of the policy comes into effect

### 3.2 Recommendations on How to improve further

- Based on testing pipeline's feedback, develop a strategy how to improve it further
- This can be done thorough building a better/cleaner dataset or utilizing better data pre-processing techniques

#### Suggestion 1: Using customized nodes and LLMs

This can be used if responses are not accurate or is not being summarized very well

```
#import OpenAIEmbedding
from llama_index.embeddings.openai import OpenAIEmbedding
#import SentenceSplitter
from llama_index.core.node_parser import SentenceSplitter
#import OpenAI
from llama_index.llms.openai import OpenAI
#import Settings
from llama_index.core import Settings

#Initialize the openAI model
Settings.llm=OpenAI(model="gpt-3.5-turbo", temperature=0, max_tokens=256)

#Initialize the embedding model
Settings.embed_model=OpenAIEmbedding()

#Initialize the node_parser with custom node settings
Settings.node_parser=SentenceSplitter(chunk_size=512, chunk_overlap=20)

# Initialize the num_output and context window
Settings.num_output=512
Settings.context_window=3900

#Create a VectorStoreIndex from a list of documents using the service context
index=VectorStoreIndex.from_documents(documents)
```