Lang Chain Model IO

Venkata Reddy AI Classes
https://www.youtube.com/@VenkataReddyAIClasses/playlists

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Document loaders

Document loaders in LangChain

- Document loaders get documents from various sources.
- LangChain offers more than 100 different document loaders.
- Integrations with other big providers like AirByte and Unstructured are included.
- LangChain can load many document types (HTML, PDF, code) from different places (private S3 buckets, public websites).

Document loaders in LangChain

- Document loaders load data from various sources into Documents, which consist of text and metadata.
- There are loaders for .txt files, web pages, and YouTube video transcripts.
- They include a "load" method for loading documents from a source.
- Optionally, they can "lazy load" data, loading it into memory as needed.

Basic Document Loader

```
!wget https://raw.githubusercontent.com/venkatareddykonasani/Datasets/master/Mobile_Phone_Review/Mobile.md

loader = TextLoader("./Mobile.md")
loaded_text= loader.load()
print(type(loaded_text))
print(loaded_text)
```

```
--2024-03-30 17:55:29--  https://raw.githubusercontent.com/venkatareddykonasani/Datasets/master/Mobile_Phone_Review/
Resolving raw.githubusercontent.com (raw.githubusercontent.com)... 185.199.108.133, 185.199.109.133, 185.199.110.133
Connecting to raw.githubusercontent.com (raw.githubusercontent.com)|185.199.108.133|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 3140 (3.1K) [text/plain]
Saving to: 'Mobile.md'

Mobile.md              100%[===================>]   3.07K  --.-KB/s    in 0s

2024-03-30 17:55:29 (44.0 MB/s) - 'Mobile.md' saved [3140/3140]

<class 'list'>
[Document(page_content="### Samsung Galaxy S22 Ultra Review \n\nSamsung's Galaxy S22 Ultra is the epitome of innovat
, metadata={'source': './Mobile.md'})]
```

Contains Document and metadata

Chain on the loaded document

```python
llm=OpenAI(temperature=0)

template="""
read the following review and extract the following information:
Name of the product
Brand of the product
Price of the product
Rating of the product

review is given here : {input_review}
"""

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

chain=LLMChain(llm=llm,
               prompt=prompt)
```

Chain on the loaded document

```python
result=chain.invoke({"input_review":loaded_text})
print(result['text'])
```

```
Name of the product: Samsung Galaxy S22 Ultra
Brand of the product: Samsung
Price of the product: Not mentioned in the review
Rating of the product: Not mentioned in the review
```

Basic Document Loader – Example2

```
!wget https://raw.githubusercontent.com/venkatareddykonasani/Datasets/ma

loader = TextLoader("./Mail.txt")
loaded_text= loader.load()
print(type(loaded_text))
print(loaded_text)
```

```
--2024-03-30 18:13:40--  https://raw.githubusercontent.com/venkatareddykonasani
Resolving raw.githubusercontent.com (raw.githubusercontent.com)... 185.199.109.
Connecting to raw.githubusercontent.com (raw.githubusercontent.com)|185.199.109
HTTP request sent, awaiting response... 200 OK
Length: 2457 (2.4K) [text/plain]
Saving to: 'Mail.txt'

Mail.txt                100%[===================>]    2.40K  --.-KB/s    in 0s

2024-03-30 18:13:40 (43.3 MB/s) - 'Mail.txt' saved [2457/2457]

<class 'list'>
[Document(page_content="Subject: Urgent Attention Required: Project Delay and C
```

Basic Document Loader – Example2

```python
llm=OpenAI(temperature=0)

template="""
read the following mail and extract the following information:
Name of the person
Main Point of the mail
Ticket-id
The mail is given here : {input_mail}
"""

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


chain=LLMChain(llm=llm,
               prompt=prompt)


result=chain.invoke({"input_mail":loaded_text})
print(result['text'])
```

Basic Document Loader – Example2

```python
result=chain.invoke({"input_mail":loaded_text})
print(result['text'])
```

```
Name of the person: John Doe
Main Point of the mail: Urgent attention required for project delay and critical issues
Ticket-id: UAT1966286RT5
```

CSV Loader

```python
from langchain_community.document_loaders.csv_loader import CSVLoader
!wget https://raw.githubusercontent.com/venkatareddykonasani/Datasets/master/Leads.csv

loader = CSVLoader(file_path="./Leads.csv")
csv_file_data = loader.load()
print(type(csv_file_data))
print(csv_file_data)
```

```
--2024-03-30 18:46:22--  https://raw.githubusercontent.com/venkatareddykonasani/Datasets/master
Resolving raw.githubusercontent.com (raw.githubusercontent.com)... 185.199.108.133, 185.199.109
Connecting to raw.githubusercontent.com (raw.githubusercontent.com)|185.199.108.133|:443... co
HTTP request sent, awaiting response... 200 OK
Length: 1493 (1.5K) [text/plain]
Saving to: 'Leads.csv'

Leads.csv             100%[===================>]   1.46K  --.-KB/s    in 0s

2024-03-30 18:46:22 (26.1 MB/s) - 'Leads.csv' saved [1493/1493]

<class 'list'>
[Document(page_content='Week_num: 1\nLeads: 756.48\nPromotion_Budget: 51735.6', metadata={'sour
```

CSV Loader

```python
llm=OpenAI(temperature=0)

template="""
read the following data and extract the following information:

What is the average promotional budget ?
What is the average Leads?

data is given here : {input_data}
"""

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

chain=LLMChain(llm=llm,
               prompt=prompt)
```

- This works only for small datasets
- We need to use agents to work with CSV data

CSV Loader

```python
result=chain.invoke({"input_data":csv_file_data})
print(result['text'])
```

```
Average promotional budget: $60,000.08
Average leads: 890.08
```

Sending full data inside a prompt. This may not work for larger datasets

CSV Loader – Common Issues

```python
from langchain_community.document_loaders.csv_loader import CSVLoader
!wget https://raw.githubusercontent.com/venkatareddykonasani/Datasets/

loader = CSVLoader(file_path="./AB_NYC_2019.csv")
csv_file_data = loader.load()
print(type(csv_file_data))
print(csv_file_data)
```

```
--2024-04-01 02:35:12--  https://raw.githubusercontent.com/venkatareddykonasa
Resolving raw.githubusercontent.com (raw.githubusercontent.com)... 185.199.10
Connecting to raw.githubusercontent.com (raw.githubusercontent.com)|185.199.1
HTTP request sent, awaiting response... 200 OK
Length: 7077973 (6.8M) [text/plain]
Saving to: 'AB_NYC_2019.csv'

AB_NYC_2019.csv      100%[===================>]   6.75M  --.-KB/s    in 0.08s

2024-04-01 02:35:12 (84.6 MB/s) - 'AB_NYC_2019.csv' saved [7077973/7077973]
```

CSV Loader – Common Issues

```
print(csv_file_data)
```

```
IOPub data rate exceeded.
The notebook server will temporarily stop sending output
to the client in order to avoid crashing it.
To change this limit, set the config variable
`--NotebookApp.iopub_data_rate_limit`.

Current values:
NotebookApp.iopub_data_rate_limit=1000000.0 (bytes/sec)
NotebookApp.rate_limit_window=3.0 (secs)
```

Max tokens issue

CSV Loader – Common Issues

```python
llm=OpenAI(temperature=0)

template="""
read the following data and extract the following information:

What is the average price?
What are the top 5 most expensive listings?
What are the top 5 most reviewed listings?

data is given here : {input_data}
"""

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

chain=LLMChain(llm=llm,
               prompt=prompt,
               verbose=True)
```

Sending full data inside a prompt. This may not work for larger datasets

CSV Loader – Common Issues

```
chain.invoke({"input_data":csv_file_data})
```

```
> Entering new LLMChain chain...
IOPub data rate exceeded.
The notebook server will temporarily stop sending output
to the client in order to avoid crashing it.
To change this limit, set the config variable
`--NotebookApp.iopub_data_rate_limit`.

Current values:
NotebookApp.iopub_data_rate_limit=1000000.0 (bytes/sec)
NotebookApp.rate_limit_window=3.0 (secs)

---------------------------------------------------------------------------
RateLimitError                            Traceback (most recent call last)
<ipython-input-23-35747fb4690a> in <cell line: 1>()
----> 1 chain.invoke({"input_data":csv_file_data})
```
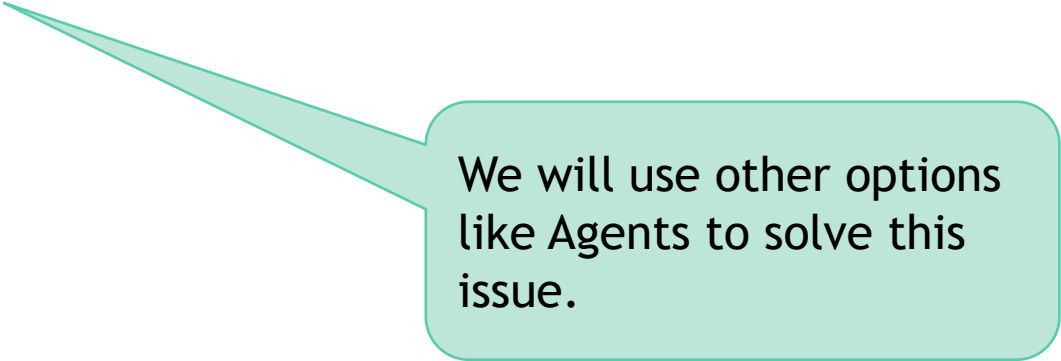
CSV Loader – Common Issues

RateLimitError: Error code: 429 - {'error': {'message': 'Request too large for gpt-3.5-turbo-instruct in organization org-LpzZ7qKTHls32x8DEx6NLota on tokens per min (TPM): Limit 90000, Requested 5662579. The input or output tokens must be reduced in order to run successfully. Visit https://platform.openai.com/account/rate-limits to learn more.', 'type': 'tokens', 'param': None, 'code': 'rate_limit_exceeded'}}

We will use other options like Agents to solve this issue.

WebBaseLoader

```python
from langchain_community.document_loaders import WebBaseLoader

loader = WebBaseLoader("https://www.amazon.in/Indigenous-Unprocessed-

web_file_data = loader.load()
print(type(web_file_data))
print(web_file_data)
print(len(web_file_data[0].page_content))
web_file_data[0].page_content=web_file_data[0].page_content[:10000]
print(len(web_file_data[0].page_content))
```

```
<class 'list'>
[Document(page_content="\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n
20694
10000
```

> Directly get the data from the webpage

> Limit it to 10000 characters. Otherwise, we may face the max tokens limit issue

WebBaseLoader

```python
llm=OpenAI(temperature=0)

template="""
read the following data summarize it into 4 bullet points
data is given here : {input_data}
"""


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


chain=LLMChain(llm=llm,
               prompt=prompt)
```

WebBaseLoader

```
result=chain.invoke({"input_data":web_file_data})
result['text']
```

'\n- The data is a collection of customer reviews for a product on Amazon.in.\n- The product is INDIGENOUS HONEY Ra
R tested and NPOP organic certified.\n- The reviews are mostly positive, with an average rating of 4.3 out of 5 sta
taste, quality, sourcing, and packaging of the honey, and recommend it as a delicious and wholesome choice.'

Youtube Loader

```
!pip install --upgrade --quiet  youtube-transcript-api
```

```python
from langchain_community.document_loaders import YoutubeLoader
loader = YoutubeLoader.from_youtube_url(
    "https://www.youtube.com/watch?v=fbQvVS_8ZNI"
)

youtube_file_data = loader.load()
print(type(youtube_file_data))
print(youtube_file_data)
```

```
<class 'list'>
[Document(page_content="[Music] all healing comes from inside ourselves
```

Video transcript

Youtube Loader

```python
llm=OpenAI(temperature=0)

template="""
read the following data summarize it into 4 bullet points
data is given here : {input_data}
"""

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

chain=LLMChain(llm=llm,
               prompt=prompt)
```

```python
result=chain.invoke({"input_data":youtube_file_data})
result['text']
```

'\n- Healing comes from within ourselves and is based on love\n- We have the power to choose and have free will, but have used it to dominate the Earth\n- The five L's - life, love, laughter, labor, and listening - are essential for understanding ourselves and the world around us\n- Meeting Gandhi at a young age sparked a lifelong connection to the power of love and recognizing others as real beings.'

Wikipedia

```
!pip install wikipedia

from langchain.document_loaders import WikipediaLoader

loader=WikipediaLoader(query="Sundar Pichai", load_max_docs=1)
wiki_file_data=loader.load()
print(type(wiki_file_data))
print(wiki_file_data)
```

Limit it to a couple of documents to avoid max tokens error

PyPDFLoader

```
!pip install pypdf
from langchain.document_loaders import PyPDFLoader
loader=PyPDFLoader(file_path="Regulatory_Rules_in_Credit_Risk_Models.pdf")
```

BSHTMLLoader

```
!pip install beautifulsoup4
from langchain.document_loaders import BSHTMLLoader
loader=BSHTMLLoader(file_path="South_Asia_Global_Debt_Summary.html")
```

Many more Integrations

Activeloop Deep Lake	Chroma	Epsilla	Javelin AI Gateway	Nuclia	Roam	TigerGraph
AI21 Labs	Clarifai	EverNote	Jina	NVIDIA	Robocorp	Tigris
Aim	ClearML	Exa Search	Johnsnowlabs	Obsidian	Rockset	Together AI
AINetwork	ClickHouse	Facebook - Meta	KDB.AI	Oracle Cloud Infrastructure (OCI)	Runhouse	2Markdown
Airbyte	Cloudflare	Fiddler	Kinetica	Ollama	RWKV-4	Trello
Airtable	CnosDB	Figma	Konko	Ontotext GraphDB	Salute Devices	Trubrics
Aleph Alpha	Cohere	Fireworks	Label Studio	OpenLLM	SearchApi	TruLens
Alibaba Cloud	College Confidential	Flyte	LanceDB	OpenSearch	SearxNG Search API	Twitter
AnalyticDB	Comet	ForefrontAI	LangChain Decorators ✨	OpenWeatherMap	SemaDB	Typesense
Annoy	Confident AI	Git	Lantern	Outline	SerpAPI	Unstructured
Anyscale	Confluence	GitBook	Llama.cpp	Petals	Shale Protocol	Upstash Redis
Apache Doris	Context	Golden	LLMonitor	Postgres Embedding	SingleStoreDB	USearch
Apify	C Transformers	Serper - Google Search API	Log10	PGVector	scikit-learn	VDMS
ArangoDB	CTranslate2	GooseAI	Marqo	Pinecone	Slack	Vearch
Arcee	DashVector	GPT4All	MediaWikiDump	PipelineAI	spaCy	Vectara
Argilla	Databricks	Gradient	Meilisearch	Portkey	SparkLLM	Vespa
Arthur	Datadog Tracing	Graphsignal	Metal	Predibase	Spreedly	VoyageAI
Arxiv	Datadog Logs	Grobid	Milvus	Prediction Guard	SQLite	WandB Tracing
Astra DB	DataForSEO	Groq	Minimax	PremAI	Stack Exchange	Weights & Biases
Atlas	DeepInfra	Gutenberg	MistralAI	PromptLayer	StarRocks	Weather
AwaDB	DeepSparse	Hacker News	MLflow Deployments for LLMs	PubMed	StochasticAI	Weaviate
AZLyrics	Diffbot	Hazy Research	MLflow AI Gateway	PygmalionAI	Streamlit	WhatsApp
BagelDB	DingoDB	Helicone	MLflow	Qdrant	Stripe	WhyLabs
Baichuan	Discord	Hologres	Modal	RAGatouille	Supabase (Postgres)	Wikipedia
Baidu	DocArray	HTML to text	ModelScope	Ray Serve	Nebula	Wolfram Alpha
Banana	Doctran	IBM	Modern Treasury	Rebuff	Tair	Writer
Baseten	Docugami	iFixit	Momento	Reddit	Telegram	Xata
Beam	DSPy	IMSDb	MongoDB Atlas	Redis	Tencent	Xorbits Inference (Xinference)
Beautiful Soup	DuckDB	Infinispan VS	Motherduck	Remembrall	TensorFlow Datasets	Yandex
BiliBili	Eden AI	Infinity	Motörhead	Replicate	TiDB	Yeager.ai
Bittensor	Elasticsearch	Infino	MyScale	Chaindesk	Cassandra	YouTube
Blackboard	ElevenLabs	Intel	Neo4j	Nomic	Notion DB	Zep
Brave Search	CerebriumAI	Jaguar	NLPCloud			Zilliz

Output Parsers

Output parsers

- Output parsers transform the output of language models (LLMs) into a more structured and suitable format

- LangChain OutputParsers feature a large collection of parsers for different types of structured outputs.

- Output parsers are essential for converting the textual output of language models into more structured information.

Two main methods

There are two main methods(functions) in an output parser

Get format instructions

- Gives you steps on how to arrange language model outputs.

Parse

- Changes a language model's text response into a structured form.

Parse with prompt (optional)

- This also turns a language model's response into a structured form but uses the original question for help.
- The original question can help fix or retry shaping the answer if needed.
- This method is optional and helps when more context is needed to structure the response.

CSV Parser

```python
from langchain.output_parsers import CommaSeparatedListOutputParser

output_parser = CommaSeparatedListOutputParser()
format_instructions = output_parser.get_format_instructions()
print(format_instructions)
```

Your response should be a list of comma separated values, eg: `foo, bar, baz`

Simple prompt generated in system

CSV Parser

```python
template="""
List down the top 10 concepts to learn from the following Topic
Topic name is: {topic_name}
{format_instructions}
"""

prompt=PromptTemplate(template=template,
                      input_variables=["topic_name", "format_instructions"])

llm=OpenAI(temperature=0)
chain=LLMChain(llm=llm,
               prompt=prompt)

result=chain.invoke({"topic_name":"Machine Learning",
          "format_instructions":format_instructions })
print(result["text"])
```

CSV Parser

```python
result=chain.invoke({"topic_name":"Machine Learning",
                     "format_instructions":format_instructions })
print(result["text"])
```

```
1. Supervised Learning
2. Unsupervised Learning
3. Reinforcement Learning
4. Deep Learning
5. Neural Networks
6. Decision Trees
7. Support Vector Machines
8. Clustering
9. Dimensionality Reduction
10. Model Evaluation and Selection
```

Datetime Parser

```python
from langchain.output_parsers import DatetimeOutputParser
output_parser = DatetimeOutputParser()
format_instructions=output_parser.get_format_instructions()
print(format_instructions)
```

Write a datetime string that matches the following pattern: '%Y-%m-%dT%H:%M:%S.%fZ'.

Examples: 1727-03-07T01:08:50.024216Z, 1753-06-25T10:03:48.396187Z, 1447-05-19T18:18:11.329552Z

Return ONLY this string, no other words!

Format instructions

Datetime Parser

```
Server_Logs =[
    "[2024-04-01 13:48:11] ERROR: Failed to connect to database. Retrying in 60 seconds.",
    "[2023-08-04 12:01:00 AM - Warning: The system is running low on disk space.",
    "[04-01-2024 13:55:39] CRITICAL: System temperature exceeds safe threshold. Initiating shutdown"
    "[Monday, April 01, 2024 01:55:39 PM] DEBUG: User query executed in 0.45 seconds.",
    "[13:55:39 on 2024-04-01] ERROR: Unable to send email notification. SMTP server not responding."
]
```

Server log messages

Datetime Parser

```python
template="""
Read the server log text and extract the date and time
log text is: {log_text}
{format_instructions}
"""

prompt=PromptTemplate(template=template,
                      input_variables=["log_text", "format_instructions"])


llm=OpenAI(temperature=0)
chain=LLMChain(prompt=prompt,
               llm=llm)
```

Datetime Parser

```python
for log_message in Server_Logs:
    result=chain.invoke({"log_text":log_message,
                         "format_instructions":format_instructions })
    print(result["text"],";", log_message )
```

2024-04-01T13:48:11.000000Z ; [2024-04-01 13:48:11] ERROR: Failed to connect to database. Retrying in 60 seconds.

2023-08-04T00:01:00.000000Z ; [2023-08-04 12:01:00 AM - Warning: The system is running low on disk space.

2024-04-01T13:55:39.000000Z ; [04-01-2024 13:55:39] CRITICAL: System temperature exceeds safe threshold. Initiating shutdown

2024-04-01T13:55:39.000000Z ; [Monday, April 01, 2024 01:55:39 PM] DEBUG: User query executed in 0.45 seconds.

2024-04-01T13:55:39.000000Z ; [13:55:39 on 2024-04-01] ERROR: Unable to send email notification. SMTP server not responding.

Custom Parser – Using Pydantic

- You can specify any Pydantic Model and query LLMs for outputs that are structured in a particular format

- You need to have some basic idea on the Pydantic data validation package that is widely used in building applications using frameworks like flask

- With Pydantic, you tell your program what kind of data it should accept (like numbers, text, or dates) using simple rules.

Pydantic Package

- Pydantic ensures that the data you receive matches your specifications. If the data is incorrect or in an unexpected format, Pydantic will raise an error, highlighting exactly what went wrong.

- If the data matches the rules, your program works smoothly. If not, Pydantic helps by pointing out the problem, making it easier to keep your program safe and error-free.

```python
from pydantic import BaseModel

class User(BaseModel):
    name: str
    age: int

# Correct data
user = User(name="Alice", age=30)
print(user)

# Incorrect data raises an error
User(name="Bob", age="thirty")
```

Pydantic

```
User(name="Bob", age="thirty")
```

Failed data validation

```
name='Alice' age=30
---------------------------------------------------------------
ValidationError                        Traceback (most recent call last)
<ipython-input-7-ed292bcafae2> in <cell line: 12>()
     10
     11 # Incorrect data raises an error
---> 12 User(name="Bob", age="thirty")

/usr/local/lib/python3.10/dist-packages/pydantic/main.py in __init__(self, **data)
    169          # `__tracebackhide__` tells pytest and some other tools to omit this function from
tracebacks
    170          __tracebackhide__ = True
--> 171          self.__pydantic_validator__.validate_python(data, self_instance=self)
    172
    173      # The following line sets a flag that we use to determine when `__init__` gets overridden
by the user

ValidationError: 1 validation error for User
age
  Input should be a valid integer, unable to parse string as an integer [type=int_parsing,
input_value='thirty', input_type=str]
    For further information visit https://errors.pydantic.dev/2.6/v/int_parsing
```

Pydantic

```python
from langchain.output_parsers import PydanticOutputParser
from pydantic import BaseModel, Field


class Scientist(BaseModel):
  name: str= Field(description= "Name of the Scientist")
  dob: str= Field(description= "Date of Birth of the Scientist")
  bio: str= Field(description= "Biography of the Scientist")
```

Pydantic

```
custom_output_parser= PydanticOutputParser(pydantic_object=Scientist)
print(custom_output_parser.get_format_instructions())
```

```
The output should be formatted as a JSON instance that conforms to the JSON schema below.

As an example, for the schema {"properties": {"foo": {"title": "Foo", "description": "a list of strings", "t;
the object {"foo": ["bar", "baz"]} is a well-formatted instance of the schema. The object {"properties": {"f
```

```
Here is the output schema:
```
{"properties": {"name": {"description": "Name of the Scientist", "title": "Name", "type": "string"}, "dob":
```
```

Pydantic

```python
template="""
Take the name of the scientist is {name} and try to fill the rest of the details
{format_instructions}
"""

prompt=PromptTemplate(template=template,
                      input_variables=["name", "format_instructions"])


llm=OpenAI(temperature=0)
chain=LLMChain(prompt=prompt,
               llm=llm)


result=chain.invoke({"name":"Ramanujan",
                     "format_instructions":custom_output_parser.get_format_instructions() })
print(result["text"])
```

```
Here is the output instance:
```
{"name": "Ramanujan", "dob": "22 December 1887", "bio": "Srinivasa Ramanujan was an Indian mathematicia
```

# App: Email Response App

# Email Response App

1. **Collect Customer Communication**: Obtain customer's email or message.[Written in any language]

2. **Language Identification**: Detect the language of the message.

3. **Translate to English**: Translate message to English.

4. **Summarize Key Points**: Document critical points from the email.

5. **Craft Preliminary Response**: Draft a concise, empathetic initial reply.

```python
email_location="https://raw.githubusercontent.com/venkatareddykonasani/Datasets/master/
Customer_Emails/Mail"+str(rand.randint(1,5))+".txt"
print(email_location)

loader = WebBaseLoader(email_location)
loaded_text= loader.load()
print(type(loaded_text))
final_mail=loaded_text[0].page_content
print(final_mail)
```
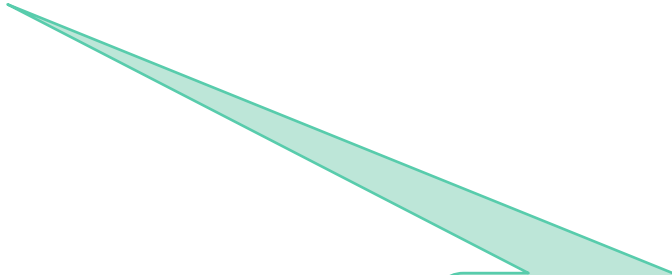
Randomly takes a language

Тема: Проблемы с последним заказом

Уважаемая служба поддержки,

Здравствуйте,

Я обращаюсь к вам с проблемами, с которыми столкнулась после оформления последнего заказ

Пожалуйста, предоставьте мне информацию о том, как я могу вернуть неподходящий товар и г

Спасибо за вашу помощь и ожидаю вашего скорого ответа.

С уважением,
Ольга Петрова

```python
from langchain.output_parsers import PydanticOutputParser
from pydantic import BaseModel, Field

class EmailResponse(BaseModel):
    Email_Language: str= Field(description= "The Original Language of the Email")
    Customer_ID: str= Field(description= "The Customer ID mentioned in the mail")
    English_email: str= Field(description= "The email after translating to English")
    Summary: str= Field(description= "A 4 bullets point summary of the email")
    Reply: str= Field(description= "A polite 2 line reply to the email")

custom_output_parser= PydanticOutputParser(pydantic_object=EmailResponse)
print(custom_output_parser.get_format_instructions())
```

```
The output should be formatted as a JSON instance that conforms to the JSON schema be

As an example, for the schema {"properties": {"foo": {"title": "Foo", "description": 
the object {"foo": ["bar", "baz"]} is a well-formatted instance of the schema. The ob

Here is the output schema:
```
{"properties": {"Email_Language": {"description": "The Original Language of the Email"
```
```

```python
template="""
Take the email as input. Email text is {email}
{format_instructions}
"""

prompt=PromptTemplate(template=template,
                      input_variables=["email","format_instructions"])

llm=OpenAI(temperature=0)

chain=LLMChain(prompt=prompt,
               llm=llm)

result=chain.invoke({"email":final_mail,
                     "format_instructions":custom_output_parser.get_format_instructions()})
print(result["text"])
```

```json
 {
   "Email_Language": "Russian",
   "Customer_ID": "67890ABC",
   "English_email": "Subject: Issues with my last order\n\nDear customer support,\n\nI am writing
   "Summary": "- Product received does not match description\n- One item missing from order\n- Rec
   "Reply": "Dear Olga Petrova,\n\nThank you for bringing this to our attention. We apologize for
```

Wiki Company Profile App

Wiki Company Profile App

- Take the company name as input.

- Extract the Company Details from Wikipedia:

  - The founder of the company.

  - When it was founded.

  - The current market capital of the company.

  - How many employees are working in it.

- Provide a brief 4-line summary of the company.

```python
from langchain.document_loaders import WikipediaLoader
loader=WikipediaLoader(query="Bharti Airtel",  load_max_docs=1)
company_documents=loader.load()
print(company_documents)


from langchain.output_parsers import PydanticOutputParser
from pydantic import BaseModel, Field

class CompanyProfile(BaseModel):
  Company_Name: str= Field(description= "The Name of the Company")
  Founder: str= Field(description= "The Founder of the Company")
  Start_Date: str= Field(description= "The date or the founding year of the compnay")
  Revenue: int= Field(description= "The Revenue of the company")
  Employees: str= Field(description= "How many employees are working in it")
  Summary: str= Field(description= "Provide a brief 4-line summary of the company")

custom_output_parser= PydanticOutputParser(pydantic_object=CompanyProfile)
print(custom_output_parser.get_format_instructions())
```

```python
template="""
Take the company wiki page information as input
Company Details from Wikipedia:{wiki_page_info}
{format_instructions}
"""

prompt=PromptTemplate(template=template,
                      input_variables=["wiki_page_info","format_instructions"])


llm=OpenAI(temperature=0)


chain=LLMChain(prompt=prompt,
               llm=llm)


result=chain.invoke({"wiki_page_info":company_documents,
             "format_instructions":custom_output_parser.get_format_instructions()})
print(result["text"])
```

'{"Company_Name": "Bharti Airtel", "Founder": "Sunil Mittal", "Start_Date": "1984", "Revenue": 191.5, "Employees": "21,299", "Summary": "Bharti Airtel is an Indian multinational telecommunications services company founded by Sunil Mittal in 1984. It operates in 18 countries across South Asia and Africa, and is the second largest mobile network operator in India and the world."}'

Thank you