

# Text Summarization

Set `.env` variables

```
import os
from dotenv import load_dotenv
load_dotenv()
```

**LLM:**

```
from langchain_groq import ChatGroq
api_key=os.getenv("GROQ_API_KEY")

llm=ChatGroq(groq_api_key=api_key,model="gemma2-9b-it")
llm
```

**Import Libraries:**

```
from langchain_core.messages import(
    AIMessage,
    HumanMessage,SystemMessage
)
```

**Define speech:**

```
✓ speech="""
People across the country, involved in government, poli
successful. Therefore, as a Member of Parliament, it wa
ready to participate in this program, much like you.

In our country, governments have come and gone, numerou
to believe that the most critical aspect that requires
Yojana"] (Prime Minister's housing scheme), then those v
The government should reach him. Since you have assigne
out of the government benefits. Therefore, I have decid
benefits, and to ensure that the programs are reaching
Yatra"] is, in a way, my own examination. I want to hear
reached those for whom it was meant.
```

## Chat Message:

```
chat_message=[
    SystemMessage(content="You are expert with expertise in summarizing sp
eeches"),
    HumanMessage(content=f"Please provide a short and concise summary of
the following speech:\n Text:{speech}")
]
```

## Count Tokens:

```
llm.get_num_tokens(speech)
```

909

```
d:\Python_Env\LangChain\venv\lib\site-packages\huggingface_hub\file_download.py:143: UserWarning:
To support symlinks on Windows, you either need to activate Developer Mode or to run Python as an
admin. warnings.warn(message)
```

```
vocab.json: 100% ██████████ 1.04M/1.04M [00:02<00:00, 499kB/s]
merges.txt: 100% ██████████ 456k/456k [00:00<00:00, 2.79MB/s]
tokenizer.json: 100% ██████████ 1.36M/1.36M [00:01<00:00, 1.34MB/s]
config.json: 100% ██████████ 665/665 [00:00<00:00, 55.5kB/s]
```

- It **downloaded a tokenizer** (probably for **GPT-2**), using the Hugging Face Transformers library



It downloaded a 3 MB file at **C:\Users\Jeevan\.cache\huggingface\hub**

## Get Summary:

```
## getting the summary
llm(chat_message)
```

OR

```
llm.invoke(chat_message)
```

## Output:

```
AIMessage(content='**Summary:**\n\nThe speaker, a Member of Parliament, emphasizes the importance of ensuring that government schemes reach their intended beneficiaries without corruption or bureaucratic hurdles. He highlights the "Viksit Bharat Sankalp Yatra" as an initiative to assess the impact of government programs on people's lives. The speaker shares stories of beneficiaries who have benefited from schemes such as housing, healthcare, and gas connections, demonstrating the positive effects of these initiatives. He argues th
```

```
at the yatra has motivated government officials to work more diligently and with greater enthusiasm.', response_metadata={'token_usage': {'completion_tokens': 108, 'prompt_tokens': 895, 'total_tokens': 1003, 'completion_time': 0.12312992, 'prompt_time': 0.799254143, 'queue_time': None, 'total_time': 0.922384063}, 'model_name': 'Gemma-7b-It', 'system_fingerprint': 'fp_7d8efeb0b1', 'finish_reason': 'stop', 'logprobs': None}, id='run-52febd0d-a42a-4421-a7fc-b4ca2d1446e4-0', usage_metadata={'input_tokens': 895, 'output_tokens': 108, 'total_tokens': 1003})
```

## ✨ Summarize + Translate

**LLM Chain** → Combine prompt template with LLM

```
from langchain_core.prompts import PromptTemplate

generic_template = """
Write a summary of the following speech:
Speech:{speech}
Translate the precise summary to {language}
"""

prompt = PromptTemplate(
    input_variables=['speech', 'language'],
    template=generic_template
)
prompt
```

```
PromptTemplate(input_variables=['language', 'speech'], input_types={}, partial_variables={}, template='\nWrite a summary of the following speech
```

**Entire Prompt:**

```
complete_prompt=prompt.format(speech=speech,language="Hindi")
complete_prompt
```

```
'\nWrite a summary of the following speech:\nSpeech:\nPeople across the country, involved in government, political, and
```

- This will show you the entire prompt

## Invoke prompt:

```
llm_chain = prompt | llm
```

```
llm_chain.invoke({'speech':speech,'language':'hindi'})
```

## Output:



```
AIMessage(content="यह भाषण विकासशील भारत संकल्प यात्रा के बारे में है। वक्ता, एक सांसद के रूप में, यह सुनिश्चित करने के लिए देश भर में यात्रा कर रहे हैं कि सरकारी योजनाएँ उनके लक्षित लाभार्थियों तक पहुँचें। \n\nवह कहता है कि कई योजनाएं पहले ही मौजूद हैं, लेकिन उन्हें प्रभावी ढंग से लागू करने की जरूरत है। उन्होंने 'प्रधानमंत्री आवास योजना' के उदाहरण के साथ यह बताया कि जहाँ लाखों घर प्रदान किए गए हैं, लेकिन कुछ लोग अभी भी लाभ से वंचित हैं। \n\nवक्ता यह सुनिश्चित करने के लिए लोगों से सीधे जुड़ना चाहते हैं कि योजनाएँ सही लोगों तक पहुँच रही हैं और भ्रष्टाचार से मुक्त हैं। \n\nवह 'विकासशील भारत संकल्प यात्रा' को अपनी खुद की जाँच मानते हैं। \n\nउनके अनुसार, यह यात्रा न केवल लोगों को लाभ पहुँचाने में मदद कर रही है, बल्कि सरकारी अधिकारियों को भी प्रेरित कर रही है। \n\nवक्ता विभिन्न योजनाओं के लाभों के बारे में लोगों की कहानियों को साझा करते हैं, जैसे कि आयुष्मान कार्ड के माध्यम से स्वास्थ्य सेवा और जीवन ज्योति योजना के तहत वित्तीय सहायता। \n\nवह इस यात्रा के माध्यम से गरीबी रेखा के बीच के अंतर को कम करने में मदद करने का दावा करते हैं। \n\n\n", additional_kwargs={}, response_metadata={'token_usage': {'completion_tokens': 335, 'prompt_tokens': 880, 'total_tokens': 1215, 'completion_time': 0.609090909, 'prompt_time': 0.038018099, 'queue_time': 0.24873952200000002, 'total_time': 0.647109008}, 'model_name': 'gemma2-9b-it', 'system_fingerprint': 'fp_10c08bf97d', 'finish_reason': 'stop', 'logprobs': None}, id='run--0713e729-
```

```
7521-40a6-beb4-e5ea37d269b4-0', usage_metadata={'input_tokens': 880, 'output_tokens': 335, 'total_tokens': 1215})
```

```
response = llm_chain.invoke({'speech': speech, 'language': 'marathi'})  
response.content
```

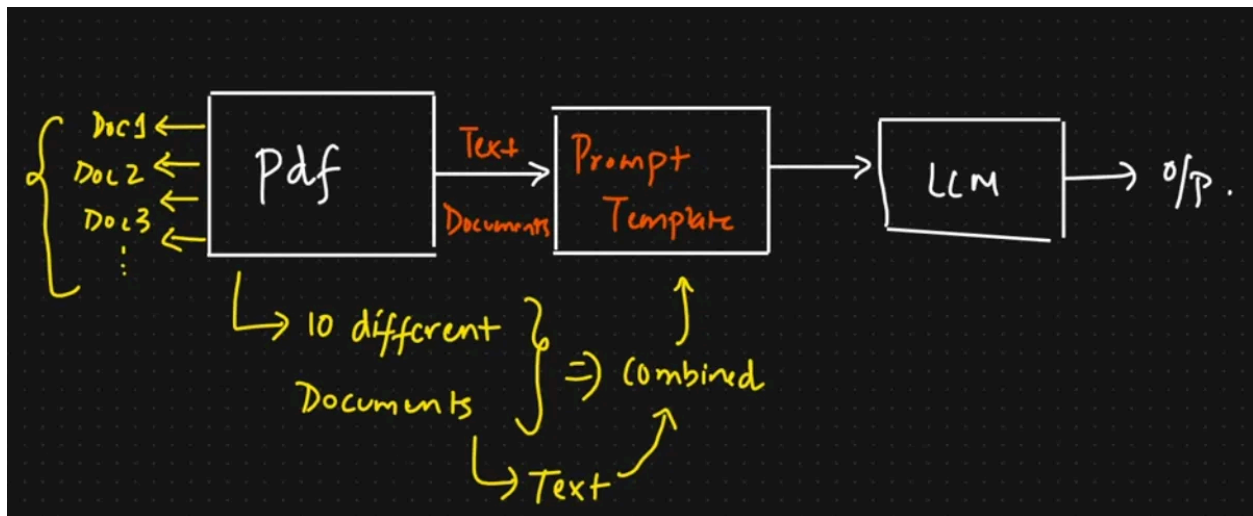
"या भाषणात, भाषक 'विकसित भारत संकल्प यात्रा' या कार्यक्रमाच्या यशस्वी होण्यासाठी देशभरातील लोकांना, विशेषतः सरकारी, राजकीय आणि सामाजिक क्षेत्रातील लोकांना त्यांना मदत करण्याचे आवाहन करतात. भाषक म्हणून त्यांचे कर्तव्य म्हणून ते या कार्यक्रमात सहभागी होण्यासाठी येत आहेत.\n\nत्यांना वाटते की सरकारच्या योजनांचे अंमलबजावणीत आणखी सुधारणा करावी लागते आणि योजनांचे फायदे प्रत्यक्ष लाभार्थ्यांपर्यंत पोहोचावेत. ते 'प्रधान मंत्री आवास योजना' यासारख्या योजनांच्या अंमलबजावणीत आलेल्या आव्हानांचा उल्लेख करतात आणि त्यांनी प्रत्यक्षात कुठे अडचण आले आहे ते समजून घेण्यासाठी 'विकसित भारत संकल्प यात्रा' सुरू केली आहे.\n\nया यात्रेतील उद्दीष्ट म्हणजे त्यांच्या कार्याचे मूल्यांकन करणे आणि लोकांना त्यांच्या अनुभवांबद्दल ऐकणे, ज्याद्वारे ते तपासू शकतात की योजनांचे फायदे प्रत्यक्षात कोणत्या प्रमाणात लाभार्थ्यांना पोहोचत आहेत. भाषकाने अनेक उदाहरणे द्यावून दाखवले आहेत, जसे की आयुष्मान कार्डच्या मदतीने अनेक लोकांना त्यांच्या आरोग्यासाठी मदत मिळाली आहे आणि आपत्कालीन मदतीच्या योजनेद्वारे गरीब वधूंना आर्थिक मदत मिळाली आहे.\n\nया यात्रेने सरकारी अधिकाऱ्यांनाही प्रेरणा दिली आहे, कारण त्यांना त्यांच्या कार्याचा प्रत्यक्ष परिणाम पाहण्याची संधी मिळाली आहे. भाषकाने सांगितले आहे की अनेक अधिकारी त्यांना सांगतात की त्यांच्या योजनांचा प्रत्यक्षात लोकांना फायदा झाला आहे आणि त्यांना त्यांच्या कार्याबद्दल गर्व आहे.\n\n"

## Text summarization

-  **StuffDocumentsChain** → **Deprecated**
  - Replaced by → `create_stuff_documents_chain`
-  **MapReduceChain** → **Deprecated (Used for larger files)**
  - Replaced by → `MapReduceDocumentsChain`

```
from langchain.chains.combine_documents import create_stuff_documents_c
hain
```

- Most basic type
- We provide the entire document at once



```
from langchain.chains.combine_documents import create_stuff_documents_c
hain
```

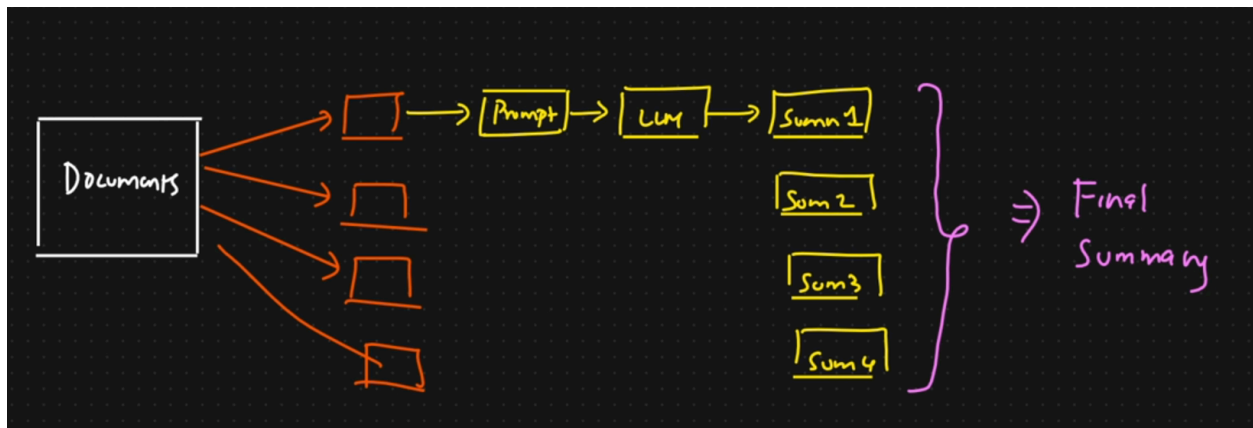
```
chain = create_stuff_documents_chain(
    llm,
    prompt="Answer using these docs: {context}\nQuestion: {input}"
)
chain.invoke({
    "input": "What are transformers?",
    "context": [Document(page_content="Transformers are neural network
s...")]
})
```

**Con:**

- Token Limit
- To solve this issue → Use **Map reduce**

## Map Reduce:

- Splits the doc in chunks and Summarises each chunk
- Combine all the summaries and get final summary

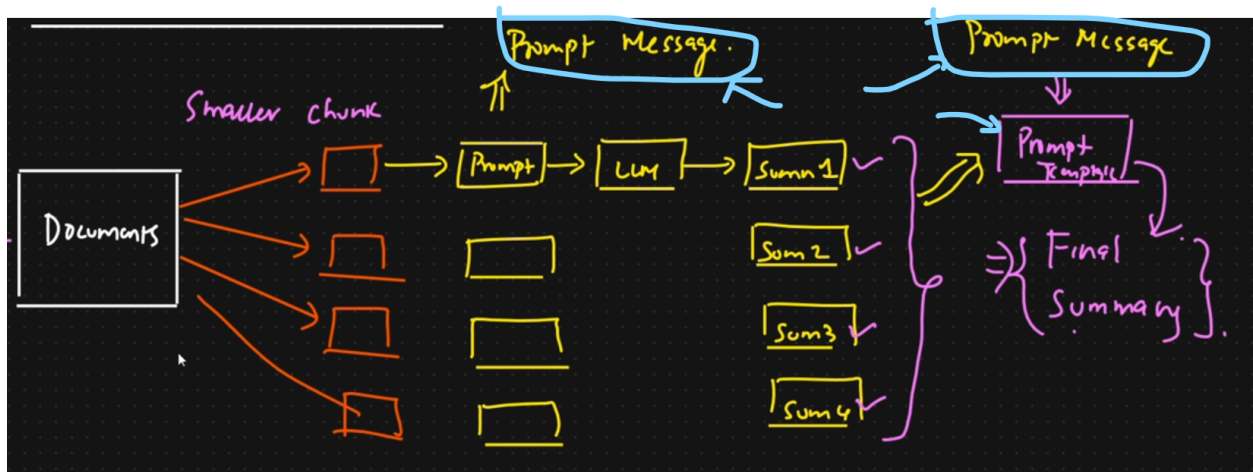


There's option of:

1. Single prompt template
2. Multiple prompts template

### Multiple prompts template:





- You can get additional information with the help of the 2nd prompt

```
from langchain_community.document_loaders import PyPDFLoader
```

```
loader = PyPDFLoader("apjspeech.pdf")
docs = loader.load_and_split()
docs
```



**create\_stuff\_documents\_chain**

## Load speech:

```
from langchain_community.document_loaders import PyPDFLoader
```

```
loader = PyPDFLoader("apjspeech.pdf")
docs = loader.load_and_split()
docs
```

```
[Document(metadata={'producer': 'GPL Ghostscript 8.15', 'creator': 'PScript5.dll Version 5.2', 'creationdate': 'D:20070730160943', 'moddate': 'D:20070730160943'}, content='...'),
Document(metadata={'producer': 'GPL Ghostscript 8.15', 'creator': 'PScript5.dll Version 5.2', 'creationdate': 'D:20070730160943', 'moddate': 'D:20070730160943'}, content='...'),
Document(metadata={'producer': 'GPL Ghostscript 8.15', 'creator': 'PScript5.dll Version 5.2', 'creationdate': 'D:20070730160943', 'moddate': 'D:20070730160943'}, content='...'),
Document(metadata={'producer': 'GPL Ghostscript 8.15', 'creator': 'PScript5.dll Version 5.2', 'creationdate': 'D:20070730160943', 'moddate': 'D:20070730160943'}, content='...'),
Document(metadata={'producer': 'GPL Ghostscript 8.15', 'creator': 'PScript5.dll Version 5.2', 'creationdate': 'D:20070730160943', 'moddate': 'D:20070730160943'}, content='...'),
Document(metadata={'producer': 'GPL Ghostscript 8.15', 'creator': 'PScript5.dll Version 5.2', 'creationdate': 'D:20070730160943', 'moddate': 'D:20070730160943'}, content='...')]
```

`load_and_split()` :

- Loads the PDF file.
- Splits it (usually by page).
- Returns a list of `Document` objects with metadata like `page` , `source` , etc.

## Alternative Split Option

If you want more control over how splitting is done (e.g., by sentence, token, or paragraph), you can use:

```
from langchain.text_splitter import RecursiveCharacterTextSplitter

# After loading with `load()` , use a splitter
docs = loader.load()
splitter = RecursiveCharacterTextSplitter(chunk_size=1000, chunk_overlap
=200)
split_docs = splitter.split_documents(docs)
```

```
len(docs)
7
```

## Prompt Template:

```
template=""" Write a concise and short summary of the following speech,
Speech :{text}
```

```
"""
```

```
prompt=PromptTemplate(input_variables=['text'],
                        template=template)
```

## Summarize:

```
from langchain.chains.summarize import load_summarize_chain
```

- It's ideal when you want to **summarize a collection of documents** (like PDFs, web pages, etc.) using a common summarization pattern, without manually wiring together all the components.

### What Does It Do?

It builds a summarization chain using one of the following three strategies:

1. **"stuff"** – Combines all documents and summarizes them in a single prompt.
2. **"map\_reduce"** – Summarizes each document individually (map), then summarizes those summaries (reduce).
3. **"refine"** – Summarizes the first document, then refines the summary with each additional document.

Chain Type	Description	Best For
"stuff"	Concatenates all docs into one prompt.	Small docs (fits in context window)
"map_reduce"	Summarizes each doc, then combines summaries.	Large sets of documents
"refine"	Refines summary by incorporating docs one by one.	Progressive, thoughtful summaries

```
chain=load_summarize_chain(llm,chain_type='stuff',prompt=prompt,verbose=True)
```

```
output_summary=chain.invoke(docs)
```

## output\_summary

```
> Entering new StuffDocumentsChain chain...

> Entering new LLMChain chain...
Prompt after formatting:
Write a concise summary of the following:

"A P J Abdul Kalam Departing speech

Friends, I am delighted to address you all, in the country and those living abroad, after working with you and completing five beautiful and eventful years in Rashtrapati Bhavan. Today, it is indeed a thanks giving occasion. I would like to narrate, how I enjoyed every minute of my tenure enriched by the wonderful association from each one of you, hailing from different walks of life, be it politics, science and technology, academics, arts, literature, business, judiciary, administration, local bodies, farming, home makers, special children, media and above all from the youth and student community who are the future wealth of our country. During my interaction at Rashtrapati Bhavan in Delhi and at every state and union territory as well as through my online interactions, I have many unique experiences to share with you, which signify the following important messages:

...

> Finished chain.

> Finished chain.
Output is truncated. View as a scrollable element or open in a text editor. Adjust cell output settings--

{'input_documents': [Document(metadata={'producer': 'GPL Ghostscript 8.15', 'creator': 'PScript5.dll Version 5.2', 'creationdate': 'D:20070730160943', 'moddate': 'D:20070730160943', 'title': 'Microsoft Word Document'}, text='A P J Abdul Kalam Departing speech'), Document(metadata={'producer': 'GPL Ghostscript 8.15', 'creator': 'PScript5.dll Version 5.2', 'creationdate': 'D:20070730160943', 'moddate': 'D:20070730160943', 'title': 'Microsoft Word Document'}, text='Friends, I am delighted to address you all, in the country and those living abroad, after working with you and completing five beautiful and eventful years in Rashtrapati Bhavan. Today, it is indeed a thanks giving occasion. I would like to narrate, how I enjoyed every minute of my tenure enriched by the wonderful association from each one of you, hailing from different walks of life, be it politics, science and technology, academics, arts, literature, business, judiciary, administration, local bodies, farming, home makers, special children, media and above all from the youth and student community who are the future wealth of our country. During my interaction at Rashtrapati Bhavan in Delhi and at every state and union territory as well as through my online interactions, I have many unique experiences to share with you, which signify the following important messages:'), Document(metadata={'producer': 'GPL Ghostscript 8.15', 'creator': 'PScript5.dll Version 5.2', 'creationdate': 'D:20070730160943', 'moddate': 'D:20070730160943', 'title': 'Microsoft Word Document'}, text='...'), Document(metadata={'producer': 'GPL Ghostscript 8.15', 'creator': 'PScript5.dll Version 5.2', 'creationdate': 'D:20070730160943', 'moddate': 'D:20070730160943', 'title': 'Microsoft Word Document'}, text='> Finished chain.'), Document(metadata={'producer': 'GPL Ghostscript 8.15', 'creator': 'PScript5.dll Version 5.2', 'creationdate': 'D:20070730160943', 'moddate': 'D:20070730160943', 'title': 'Microsoft Word Document'}, text='> Finished chain.')], 'output_text': 'In his farewell address, President A.P.J. Abdul Kalam reflects on his five years in office, highlighting key experiences and messages he received from people across India.'}
```

output\_text': 'In his farewell address, President A.P.J. Abdul Kalam reflects on his five years in office, highlighting key experiences and messages he received from people across India. \n\nHe emphasizes the importance of:\n\n\* \*\*Accelerating development\*\* and realizing the aspirations of India's youth to build a developed nation by 2020.\n\* \*\*Empowering villages\*\* and connecting them through infrastructure and opportunity.\n\* \*\*Harnessing rural talent\*\* and utilizing it for national growth.\n\* \*\*Strengthening agriculture\*\* through the "Seed to Food" approach.\n\* \*\*Overcoming challenges\*\* through courage and determination.\n\* \*\*Fostering connectivity\*\* through technology, education, and healthcare.\n\* \*\*Defending the nation\*\* and honoring the sacrifices of the armed forces.\n\* \*\*Empowering youth\*\* through value-based education and leadership programs.\n\nHe envisions a future India characterized by reduced rural-urban divide, equitable access to resources, a thriving economy, quality education for all, a strong healthcare system, transparent governance, eradication of poverty and illiteracy, and a secure and happy society. \n\nKalam concl

udes by reiterating his commitment to connecting hearts and minds of Indians and inspiring self-confidence in the nation's ability to achieve its goals. \n\n}



There's no need to give **prompt** but still you can give a custom prompt.

## Map Reduce Summary

### Split the already splitted docs:

```
from langchain.text_splitter import RecursiveCharacterTextSplitter
```

```
final_documents=RecursiveCharacterTextSplitter(chunk_size=2000,chunk_overlap=100).split_documents(docs)
```

```
final_documents
```

```
[Document(metadata={'producer': 'GPL Ghostscript 8.15', 'creator': 'PScript5.dll Version 5.2', 'creationdate': 'D:20070730160943', 'moddate': 'D:20070730160943', 'creationdate': 'D:20070730160943', 'moddate': 'D:20070730160943'}, content='...'), Document(metadata={'producer': 'GPL Ghostscript 8.15', 'creator': 'PScript5.dll Version 5.2', 'creationdate': 'D:20070730160943', 'moddate': 'D:20070730160943'}, content='...'), Document(metadata={'producer': 'GPL Ghostscript 8.15', 'creator': 'PScript5.dll Version 5.2', 'creationdate': 'D:20070730160943', 'moddate': 'D:20070730160943'}, content='...'), Document(metadata={'producer': 'GPL Ghostscript 8.15', 'creator': 'PScript5.dll Version 5.2', 'creationdate': 'D:20070730160943', 'moddate': 'D:20070730160943'}, content='...'), Document(metadata={'producer': 'GPL Ghostscript 8.15', 'creator': 'PScript5.dll Version 5.2', 'creationdate': 'D:20070730160943', 'moddate': 'D:20070730160943'}, content='...'), Document(metadata={'producer': 'GPL Ghostscript 8.15', 'creator': 'PScript5.dll Version 5.2', 'creationdate': 'D:20070730160943', 'moddate': 'D:20070730160943'}, content='...'), Document(metadata={'producer': 'GPL Ghostscript 8.15', 'creator': 'PScript5.dll Version 5.2', 'creationdate': 'D:20070730160943', 'moddate': 'D:20070730160943'}, content='...'), Document(metadata={'producer': 'GPL Ghostscript 8.15', 'creator': 'PScript5.dll Version 5.2', 'creationdate': 'D:20070730160943', 'moddate': 'D:20070730160943'}, content='...'), Document(metadata={'producer': 'GPL Ghostscript 8.15', 'creator': 'PScript5.dll Version 5.2', 'creationdate': 'D:20070730160943', 'moddate': 'D:20070730160943'}, content='...'), Document(metadata={'producer': 'GPL Ghostscript 8.15', 'creator': 'PScript5.dll Version 5.2', 'creationdate': 'D:20070730160943', 'moddate': 'D:20070730160943'}, content='...')]
```

```
len(final_documents)
```

```
13
```

- Length of **docs** was 7

## Create Prompt Template

### Map Prompt:

```
chunks_prompt="""
Please summarize the below speech:
Speech: `{text}`
Summary:
"""

map_prompt_template=PromptTemplate(input_variables=['text'],
                                   template=chunks_prompt)
```

### Final Prompt:

```
final_prompt="""
Provide the final summary of the entire speech with these important points.
Add a Motivation Title,Start the precise summary with an introduction and provide the summary in number points for the speech.
Speech:{text}

"""

final_prompt_template=PromptTemplate(input_variables=['text'],template=final_prompt)
final_prompt_template
```

### Create a Sumamry:

```
summary_chain=load_summarize_chain(
    llm=llm,
    chain_type="map_reduce",
    map_prompt=map_prompt_template,
    combine_prompt=final_prompt_template,
```

```
        verbose=True
    )
```

```
output=summary_chain.invoke(final_documents)
output
```

```
> Entering new MapReduceDocumentsChain chain...
```

```
> Entering new LLMChain chain...
Prompt after formatting:

Please summarize the below speech:
Speech:`A P J Abdul Kalam Departing speech

Friends, I am delighted to address you all, in the country and those living abroad, after working with you and completing five beautiful and eventful years in Rashtrapati Bhavan. Today, it is indeed a thanks giving occasion. I would like to narrate, how I enjoyed every minute of my tenure enriched by the wonderful association from each one of you, hailing from different walks of life, be it politics, science and technology, academics, arts, literature, business, judiciary, administration, local bodies, farming, home makers, special children, media and above all from the youth and student community who are the future wealth of our country. During my interaction at Rashtrapati Bhavan in Delhi and at every state and union territory as well as through my online interactions, I have many unique experiences to share with you, which signify the following important messages:

1. Accelerate development : Aspiration of the youth,
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\n\n1. **Youth-Driven Development:** Kalam emphasizes the urgency of achieving a developed India by 2020, driven by the aspirations of the nation's youthful population.\n2. **Empowering Villages:** Rural development is crucial, leveraging resources and fostering self-reliance through initiatives like Periyar PURA.\n3. **Sustainable Growth:** Agriculture must be bolstered to ensure food security while adopting sustainable practices.\n4. **Collaboration and Resilience:** Overcoming challenges requires national unity, partnership, and the courage to face adversity.\n5. **Technological Connectivity:** Bridging the rural-urban divide through physical, electronic, and knowledge connectivity is essential for progress.\n6. **National Defense:** Strengthening national security is crucial for a proud and secure India.\n7. **Inspiring Stories:** Kalam shares tales of resilience and triumph, from individuals overcoming disabilities to communities rebuilding after disaster, highlighting the indomitable spirit of the Indian people.\n8. **Global Reach:** India's commitment to Africa through initiatives like the Pan African e-Network demonstrates its role as a global leader in technology and development.\n9. **Value-Based Education:** Empowering youth through values-based education and leadership development (e.g., Lead India 2020 Foundation) is essential for a bright future.\n10. **Unity in Diversity:** Preserving India's rich cultural heritage while embracing its diversity is vital for national identity and progress.\n\n\nUltimately, Kalam's speech paints a vibrant picture of India's future, fueled by the aspirations of its youth, empowered by technology and collaboration, and driven by a shared vision of a developed and prosperous nation for all. \n"}

## Refine Chain For Summarization

### What it does?

Reads the **first document**, drafts a summary → reads next document, **refines** the summary → and so on.

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yar PURA initiative, which connects 65 villages with urban amenities like health care, education, and vocational training, creating economic opportunities and entrepreneurship. This model has shown success in Thanjavur district, where villagers have developed internationally competitive prototypes for 55 lifestyle products with the support of JETRO and local engineering college. Kalam also emphasizes the importance of agriculture, sharing his experiences meeting with thousands of farmers and agricultural scientists. He advocates for a "Seed to Food" approach to increase agricultural production while improving the economic conditions of farmers.

3. **Utilize rural skills for competitiveness.** This message is exemplified by the Periyar PURA initiative, which enables villagers to leverage their skills and resources for economic growth.

4. **Prioritize agricultural growth (seed to food).**

5. **Overcome challenges through determination and success.** Kalam illustrates this point with the story of Vidwan Coimbatore SR Krishna Murthy, a man who, despite being born without arms or legs, maintains a positive outlook and encourages others to face challenges with courage. He also shares the story of a talented musician who overcame his physical disabilities to share his gift with the world, showcasing the power of perseverance and support.

6. **Foster partnerships to solve problems.** Kalam highlights the collaborative efforts of the Army, Air Force, and state government in providing relief and support to the people of Urusa village after the devastating earthquake in 2005, emphasizing the importance of collective action in overcoming adversity. This is further exemplified by his encounter with the people of Car Nicobar Islands following the 2004 Tsunami. He was moved by their resilience and unity, composing a poem about their courage in the face of adversity.

7. **Show courage in facing calamities.**

8. **Leverage connectivity for societal transformation.** Kalam's speech to the Pan African Parliament in 2004 demonstrates his belief in the power of global connections to drive positive change. He proposed the concept of Pan African e-Network, aiming to connect 53 African countries through a seamless network of satellite, fiber optics, and wireless technology. This project would facilitate tele-education and tele-medicine, connecting universities, hospitals, and educational centers across the continent. The context further clarifies this point by mentioning the successful implementation of the Pan African network, enabling live tele-consultations between doctors in India and Ethiopia.

9. **Defend the nation with pride.** Kalam's personal experiences with the Indian Army, Navy, and Air Force during his tenure solidify this message. He expresses his

s profound admiration for the dedication and sacrifice of the armed forces, who stand guard 24/7 to protect the nation. He emphasizes the vital role they play in ensuring the safety and security of the country. \n10. **Mobilize youth for a developed India by 2020.** Kalam's meeting with the Lead India 2020 Foundation exemplifies his belief in empowering the youth to contribute to the nation's development. He cites the Lead India Foundation, which trains students in various districts of Andhra Pradesh, highlighting its positive impact on students' self-discipline, respect for elders, and sense of national duty. He sees the potential in India's young population and emphasizes the need to empower them through value-based education and leadership.\n\n\n\n Kalam concludes by emphasizing the importance of national unity, cultural preservation, and a collective effort to build a developed India by 2020, envisioning a nation where:\n\n\* **Healthcare is accessible to all.**\n\* **Governance is responsive, transparent, and free from corruption.**\n\* **Poverty, illiteracy, and crime against women and children are eradicated.**\n\* **All citizens feel valued and included.**\n\* **India is prosperous, healthy, secure, peaceful, and happy, with sustainable growth.** He also envisions a nation where people are proud of their leadership. \n\n\nHe reiterates his mission to connect the hearts and minds of Indians and instill confidence in their ability to achieve greatness. He concludes with a wish for God's blessings and a patriotic "Jai Hind." \n\n\n\n\n\n}