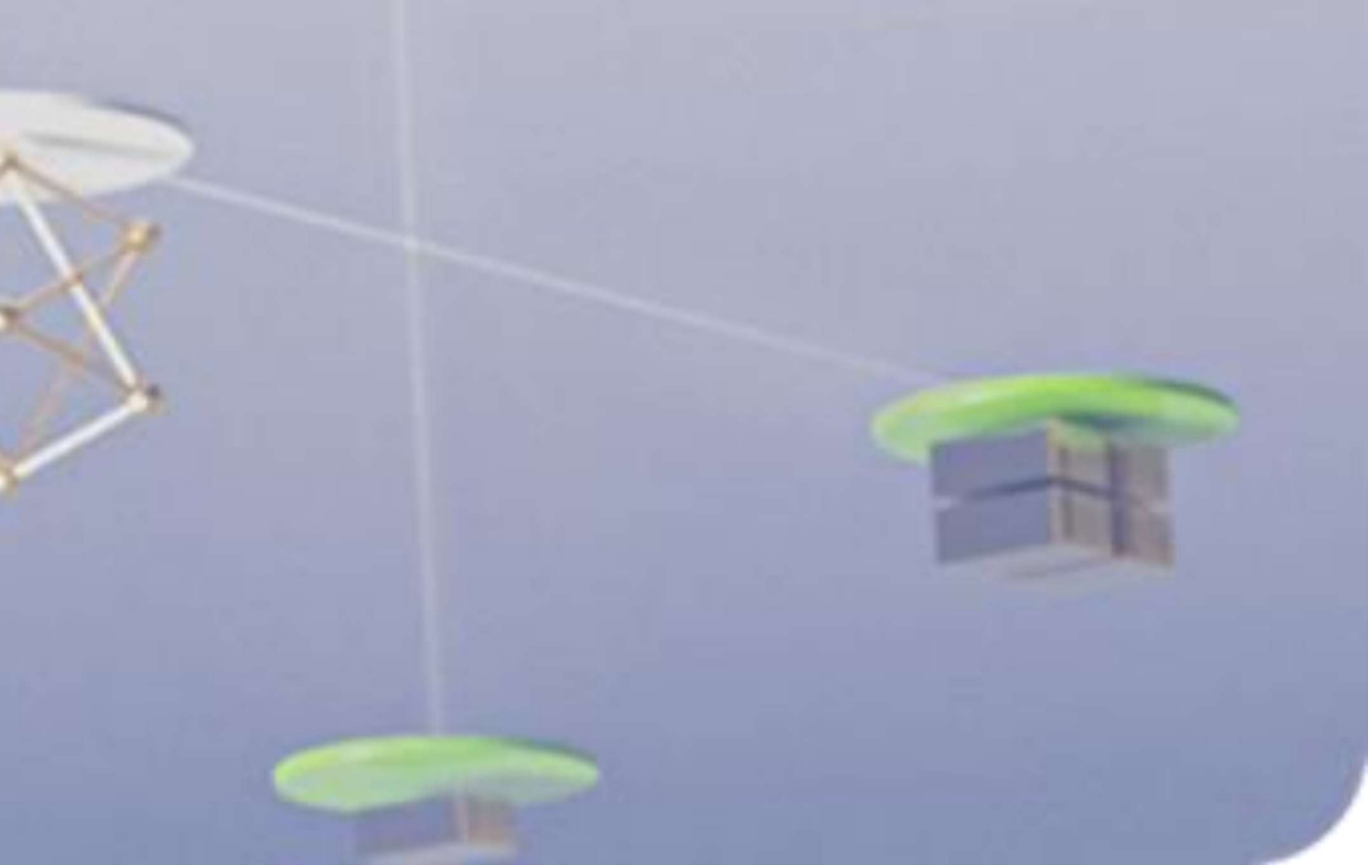
Building RAG A

Building RAG A



Retrieval Augmented Generation

Prerequisites

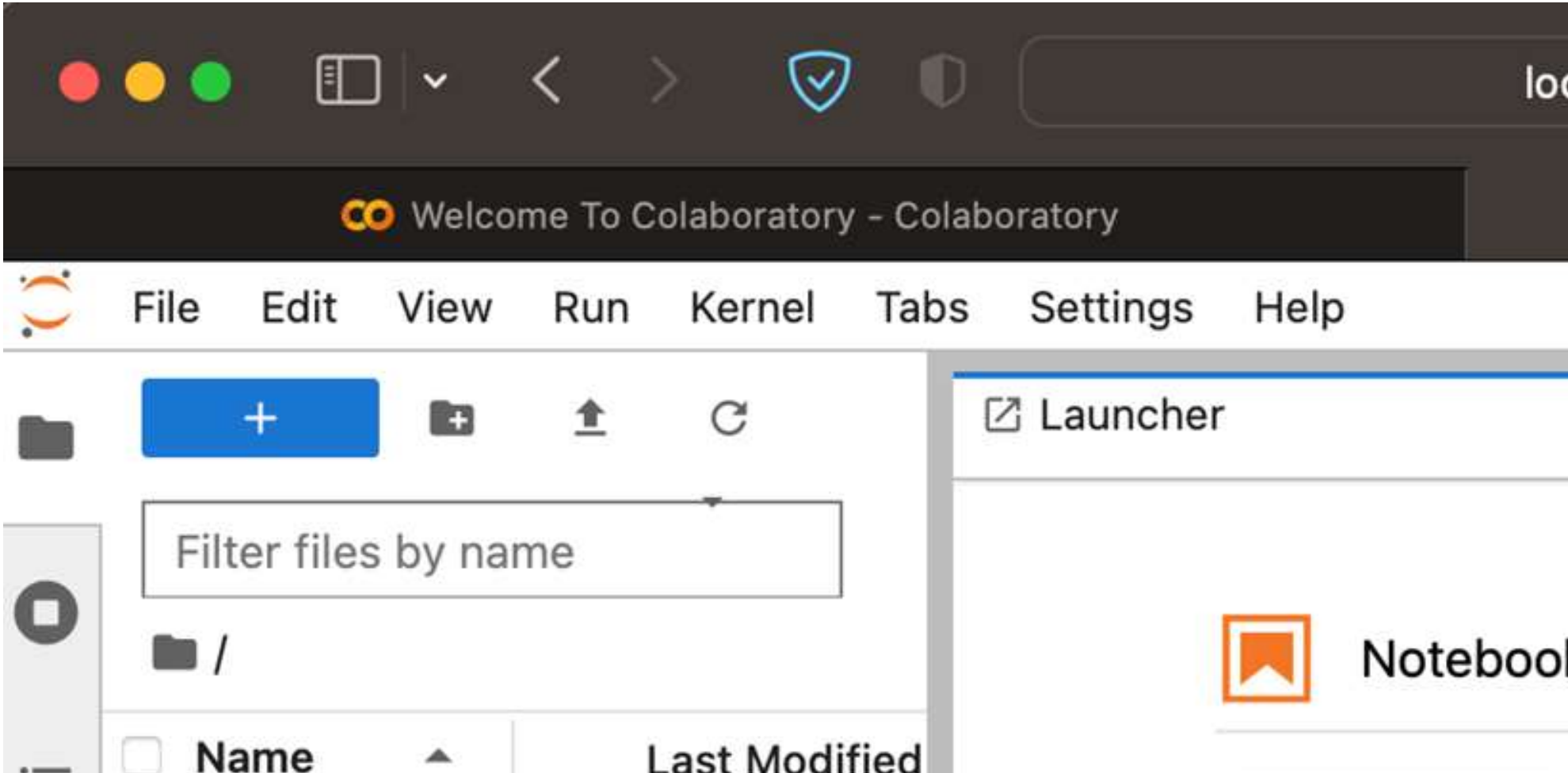
RAG Agents in Product

- Prior LLM/LangChain

Course Objecti

RAG Agents in Product

Building RAG A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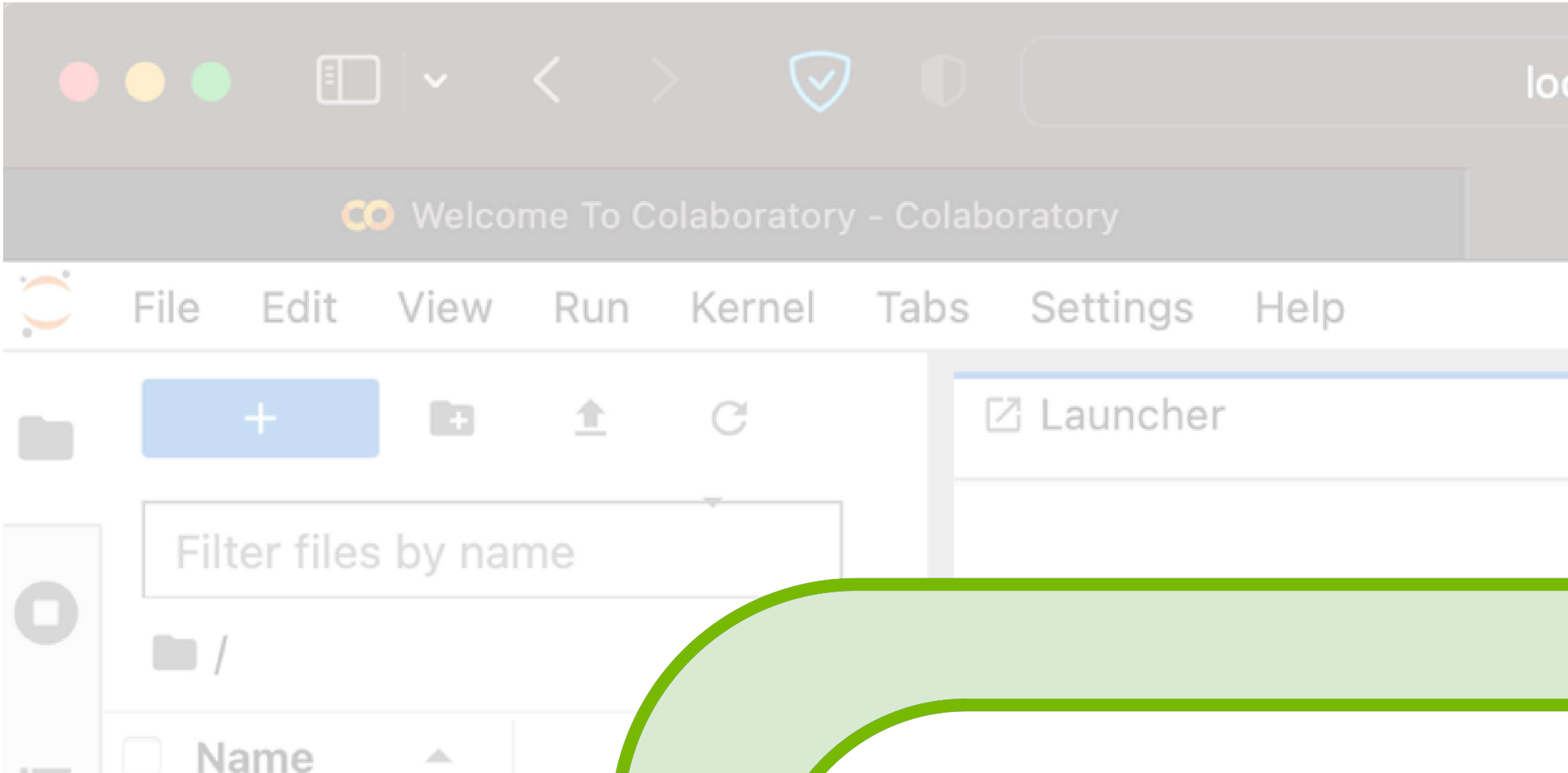
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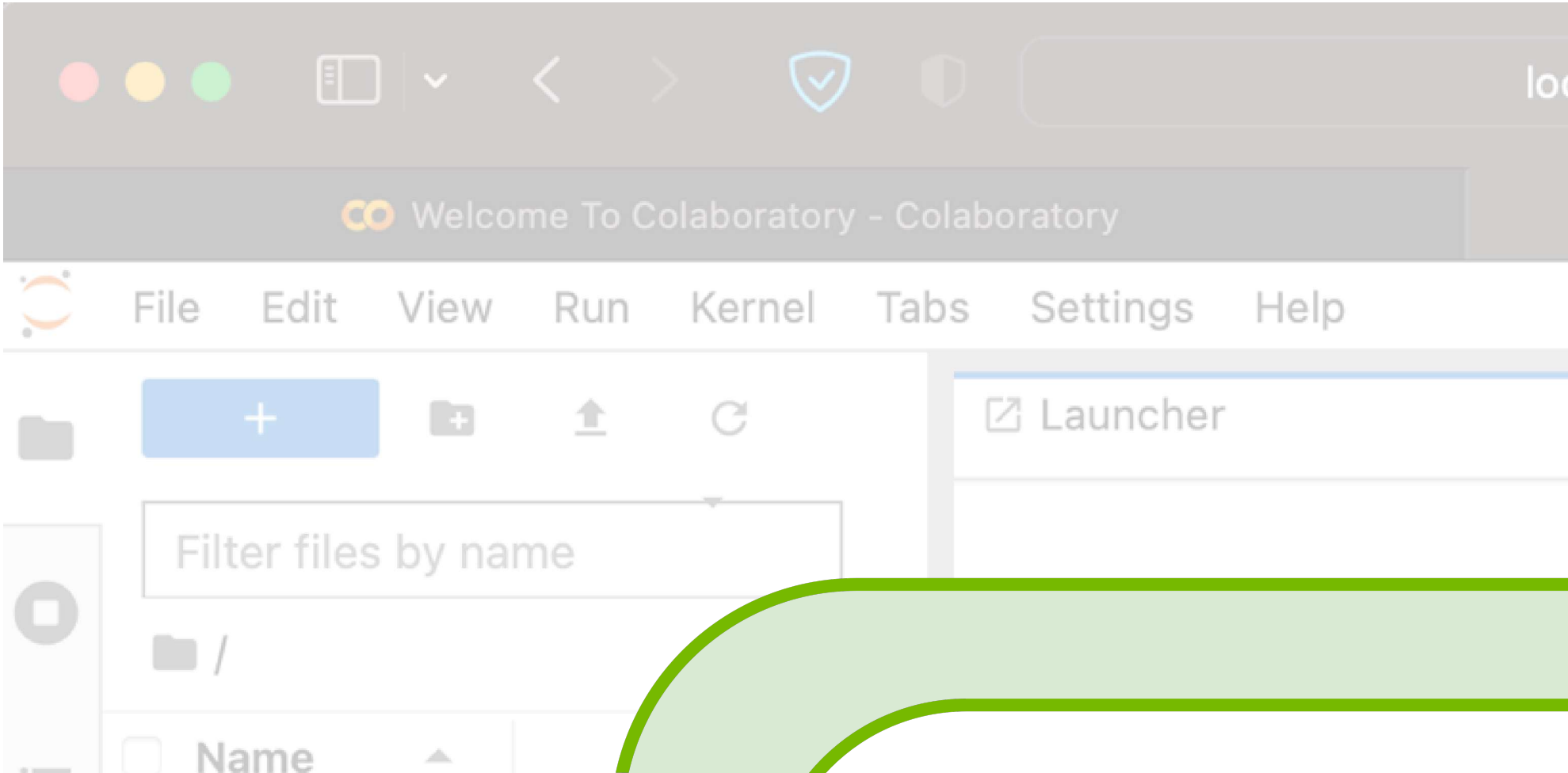
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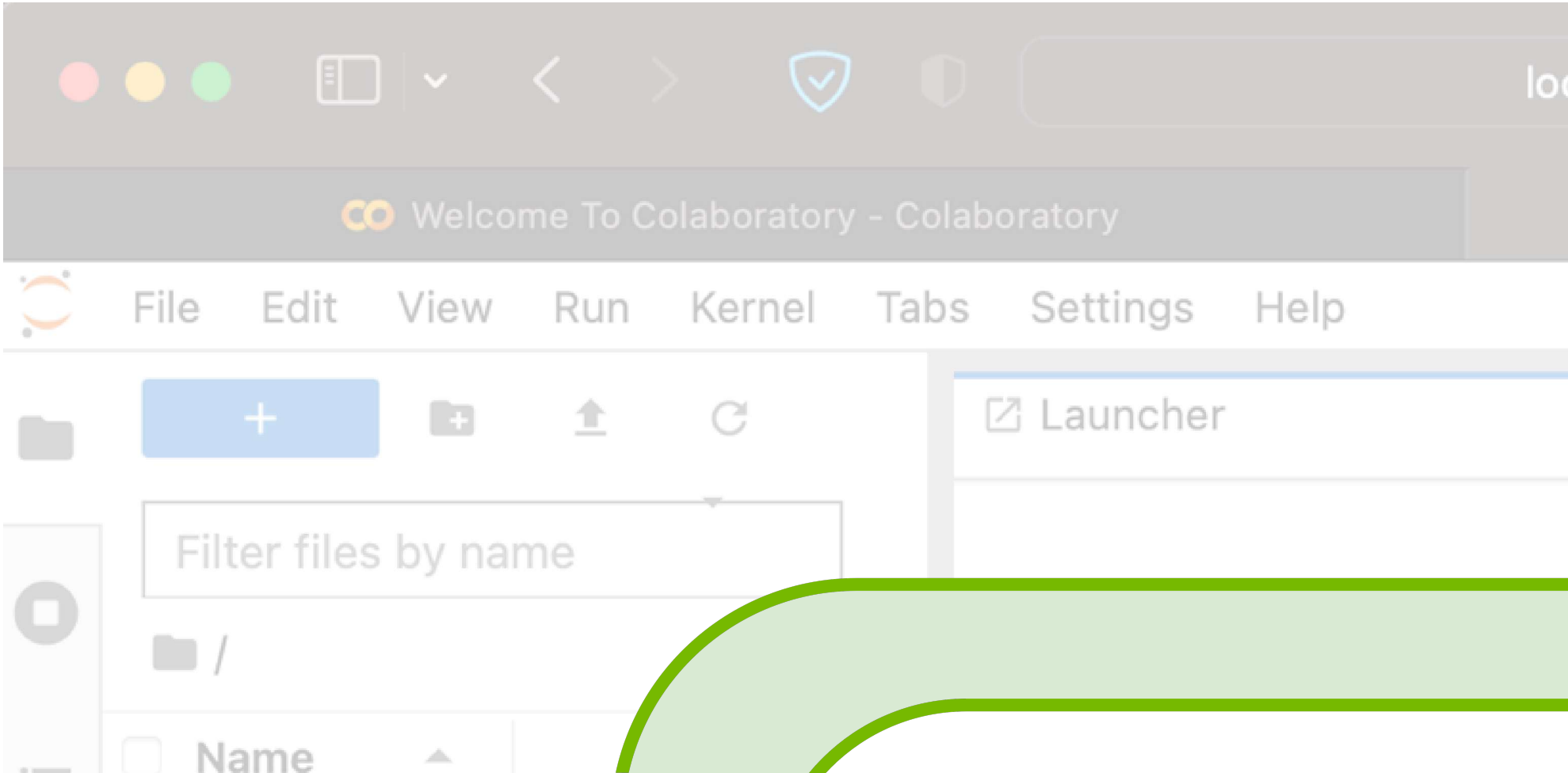
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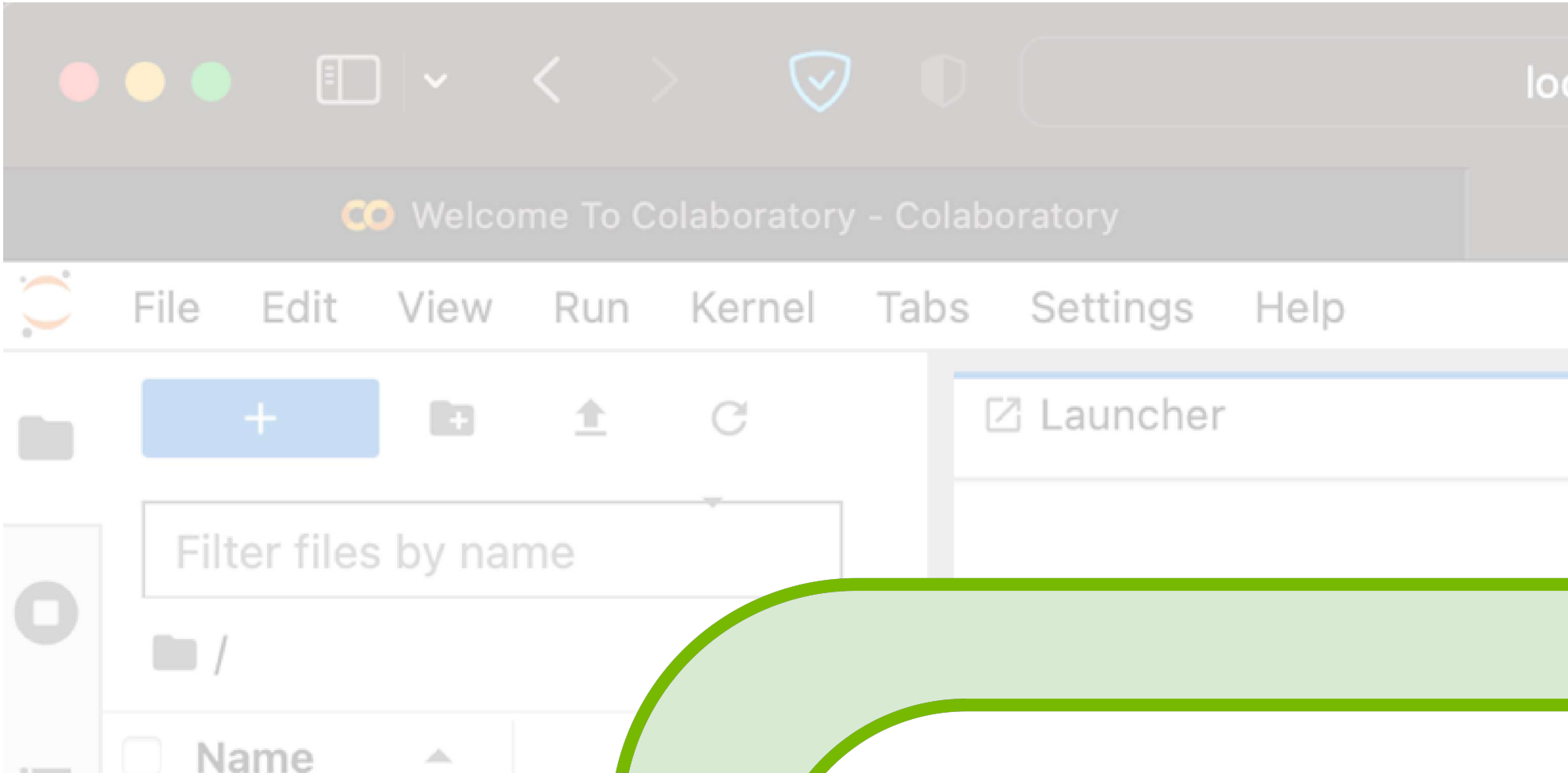
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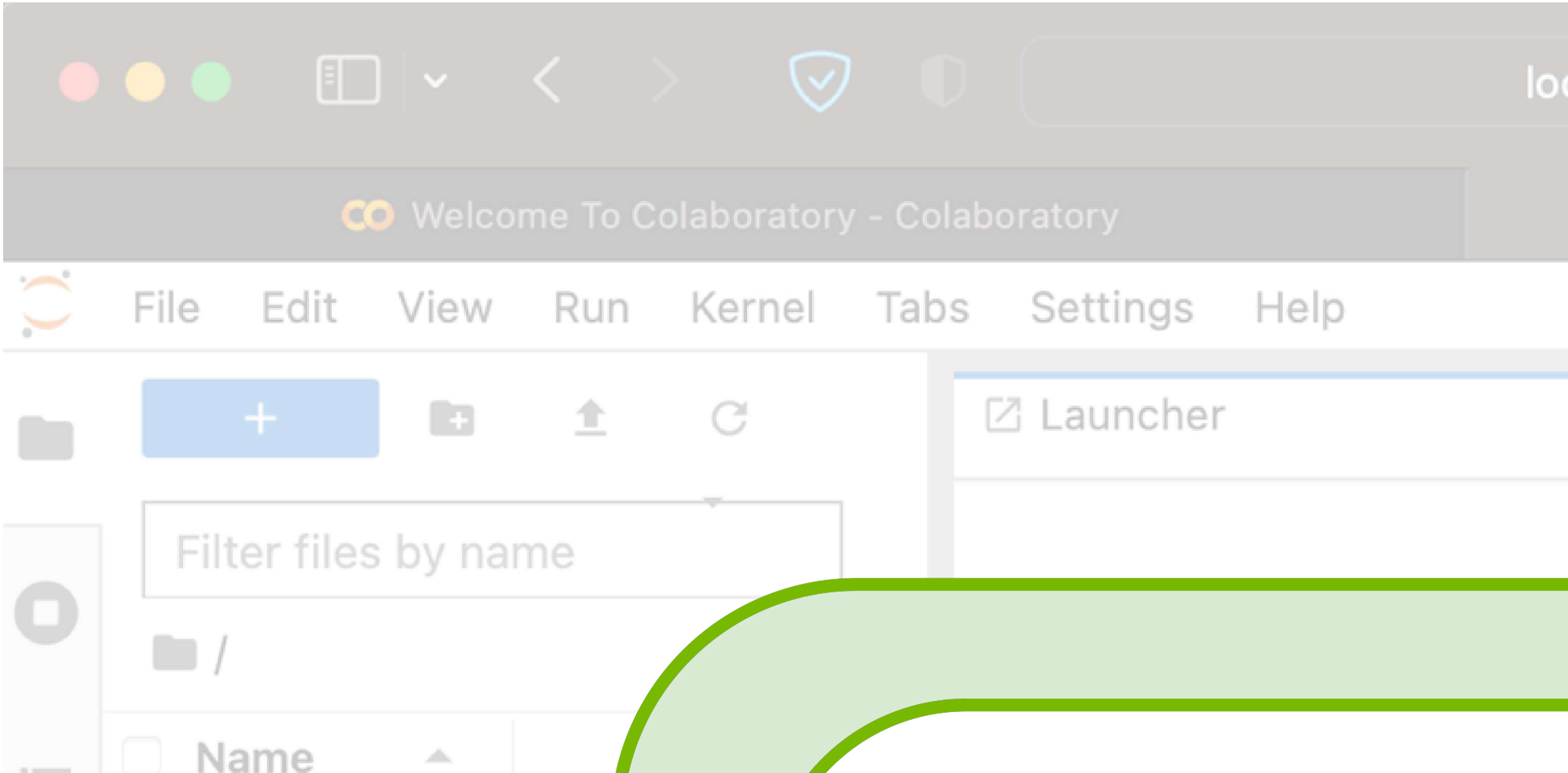
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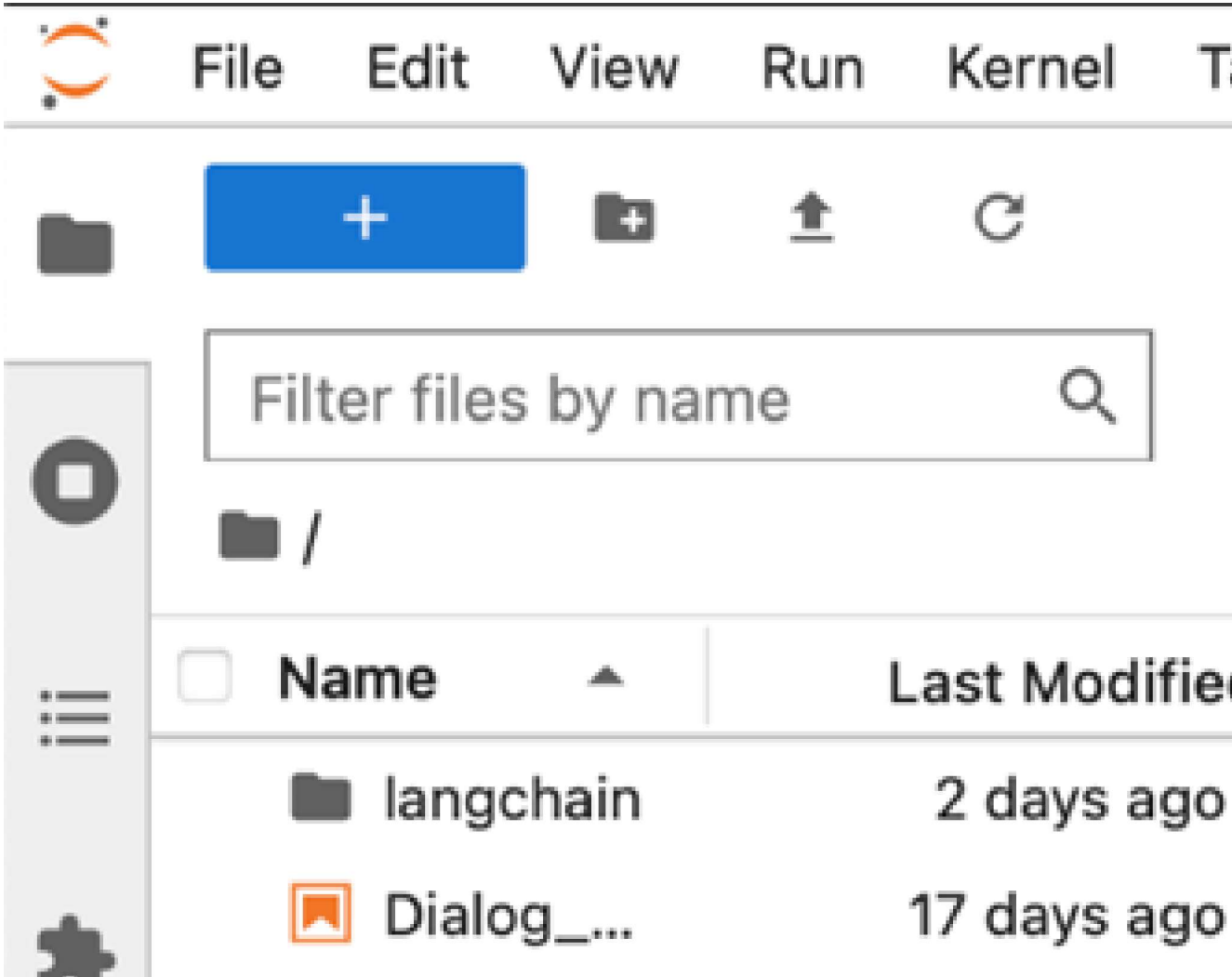
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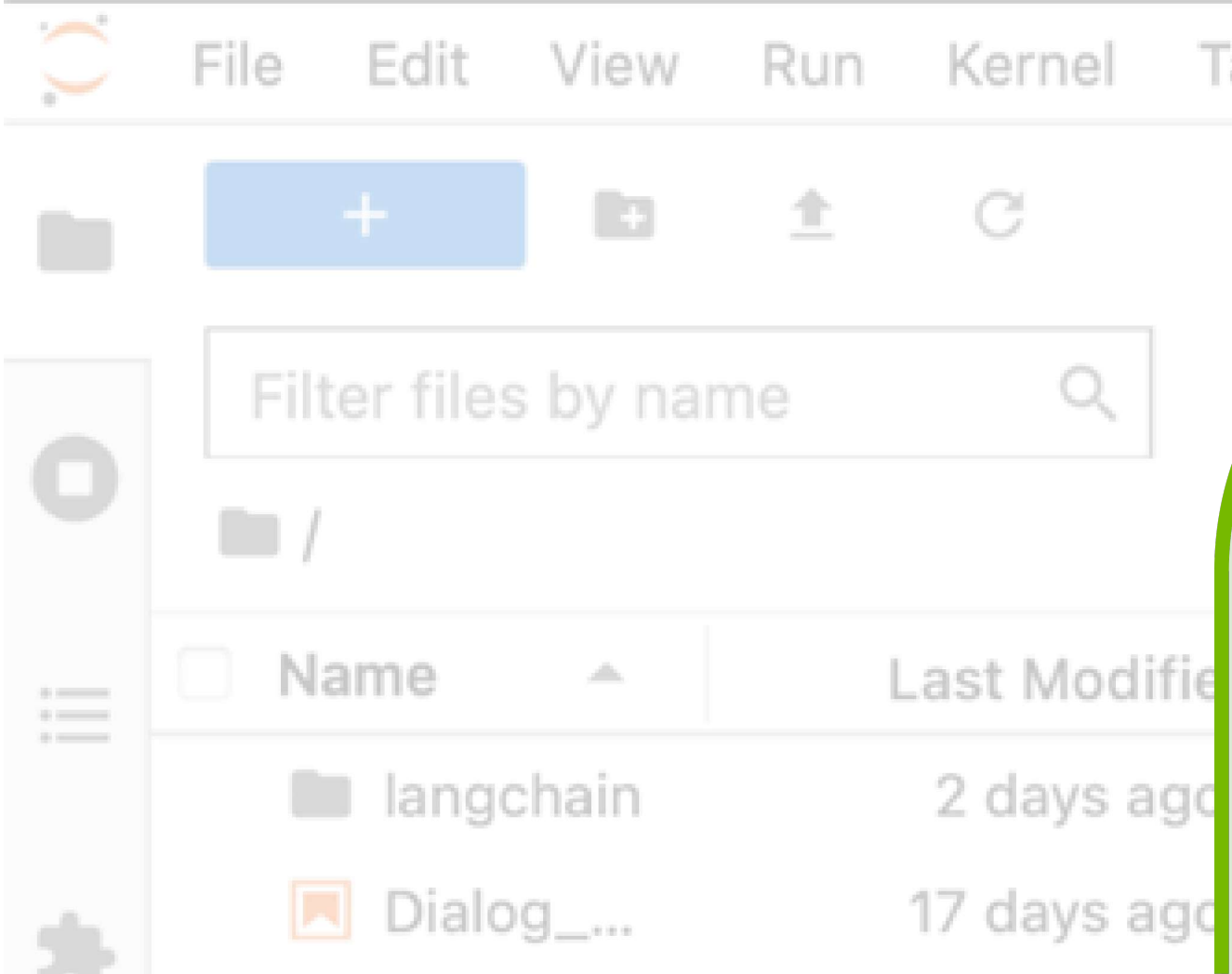
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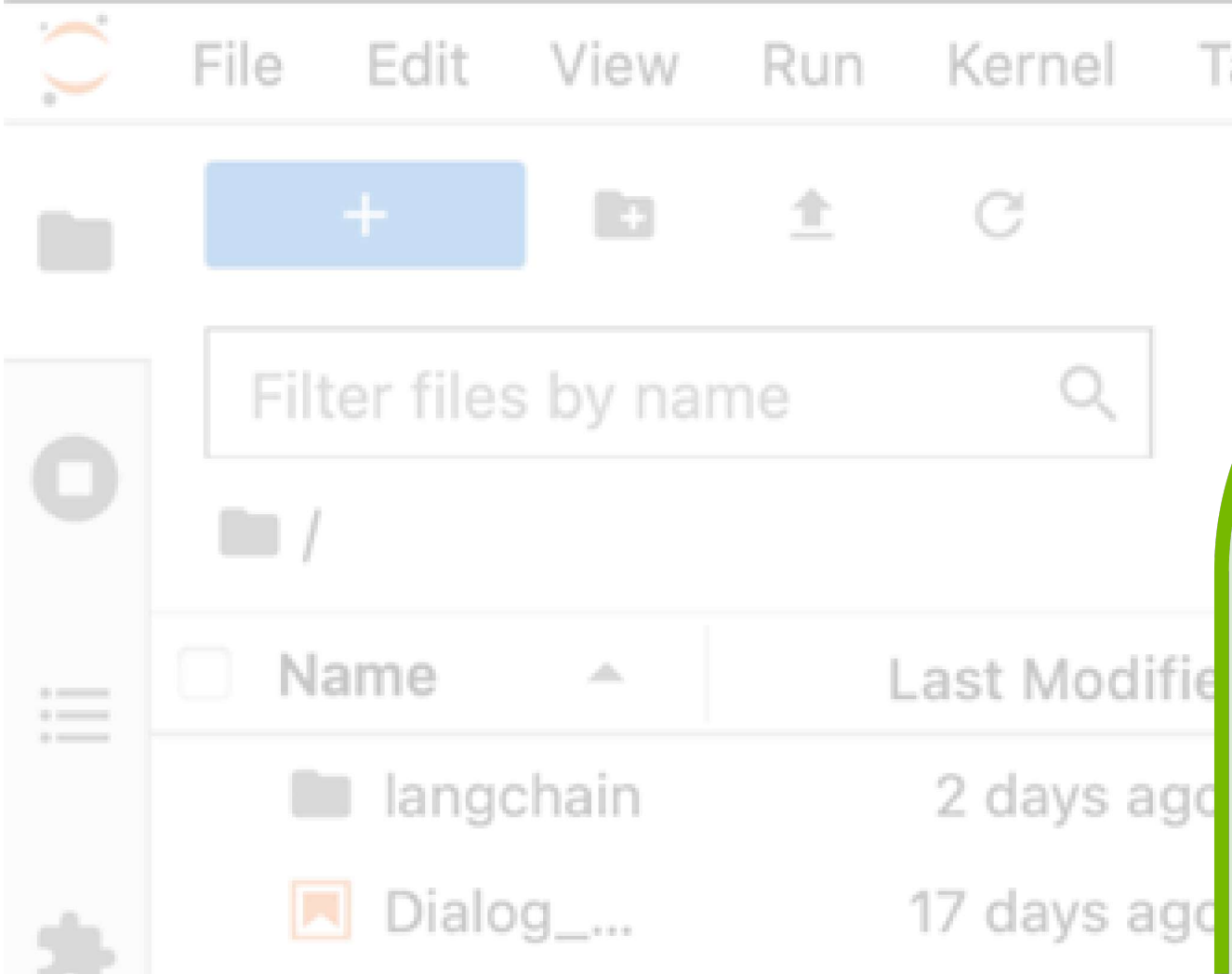
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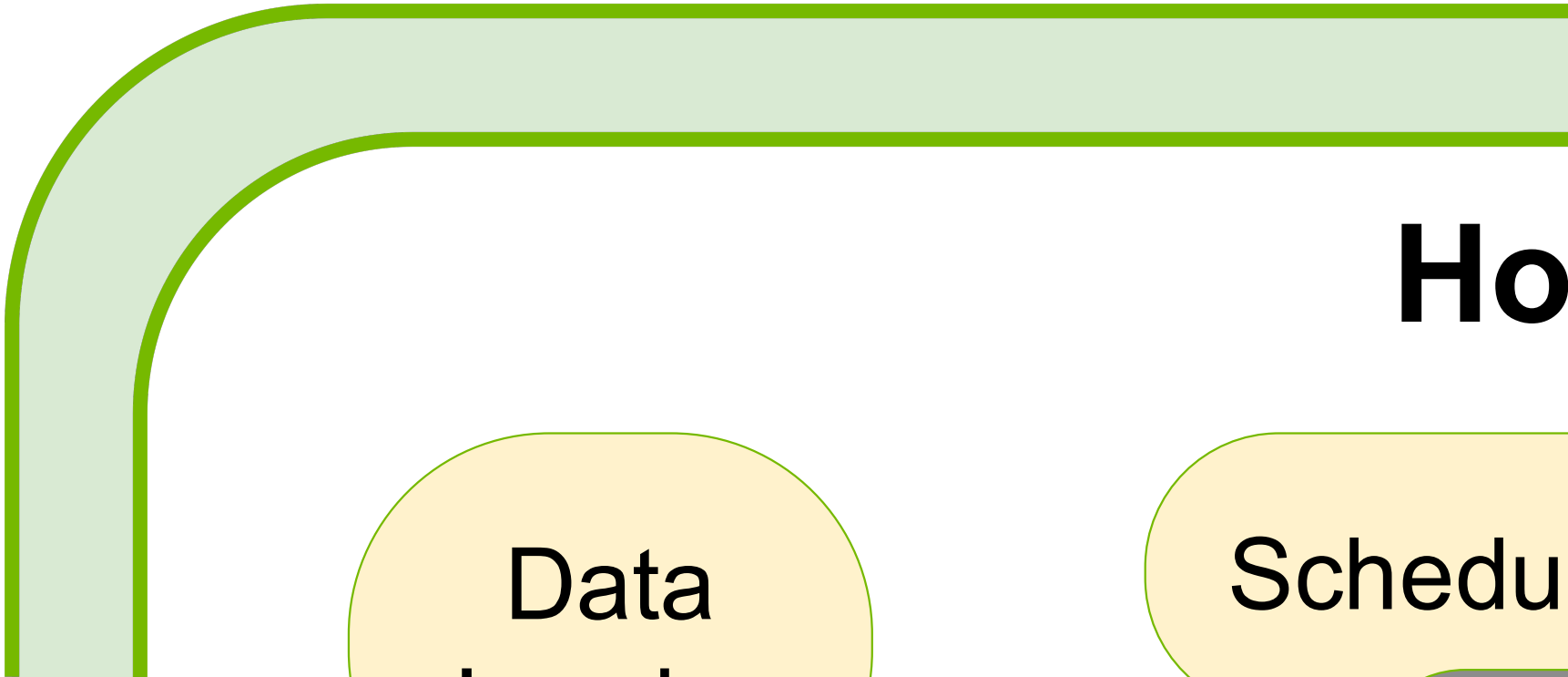
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1. Allocate Resources
2. Define Services

1. Allocate Resources
2. Define Services

1. Allocate Resources
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1. Allocate Resources
2. Define Services

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Chatbot

Hello World!!

You typed: Hello World!!

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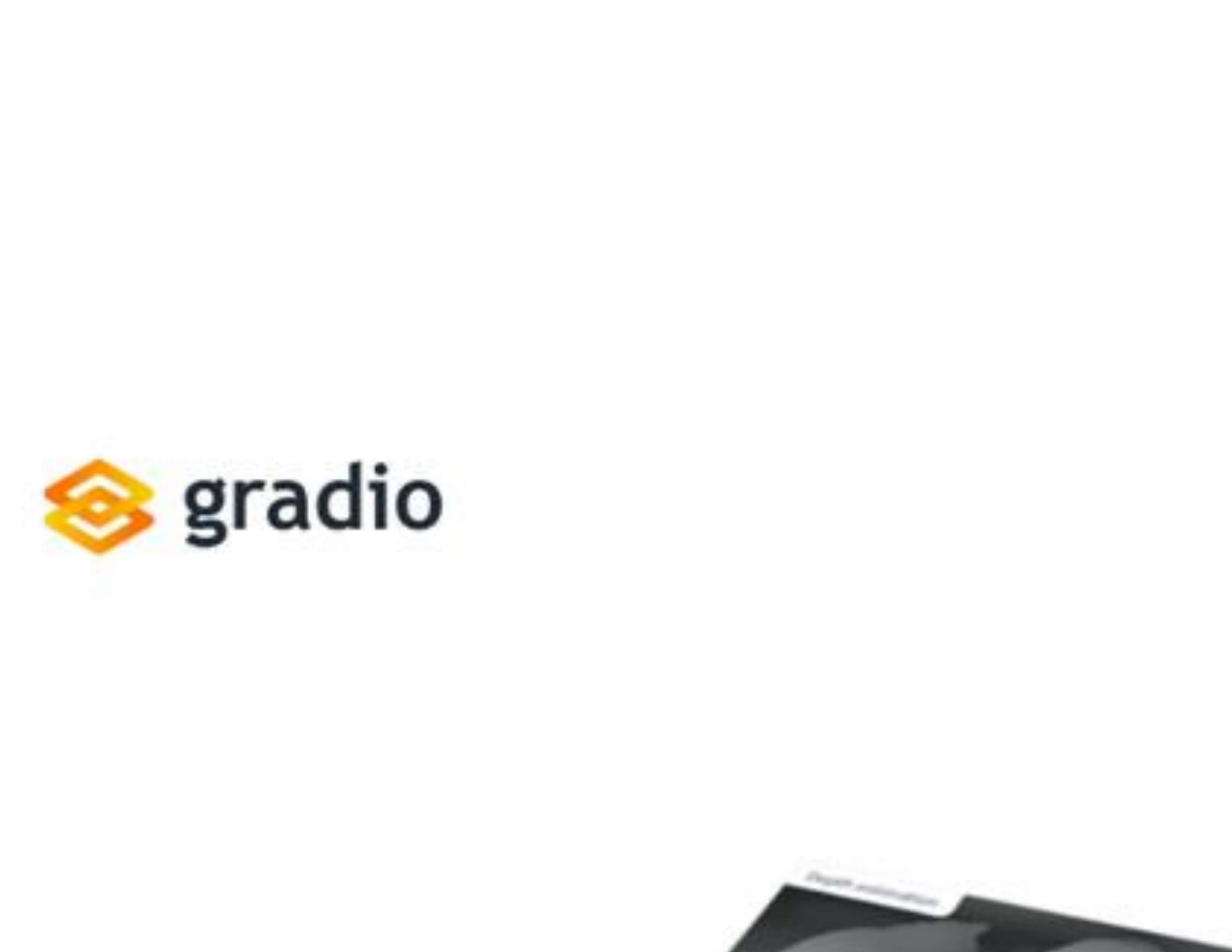
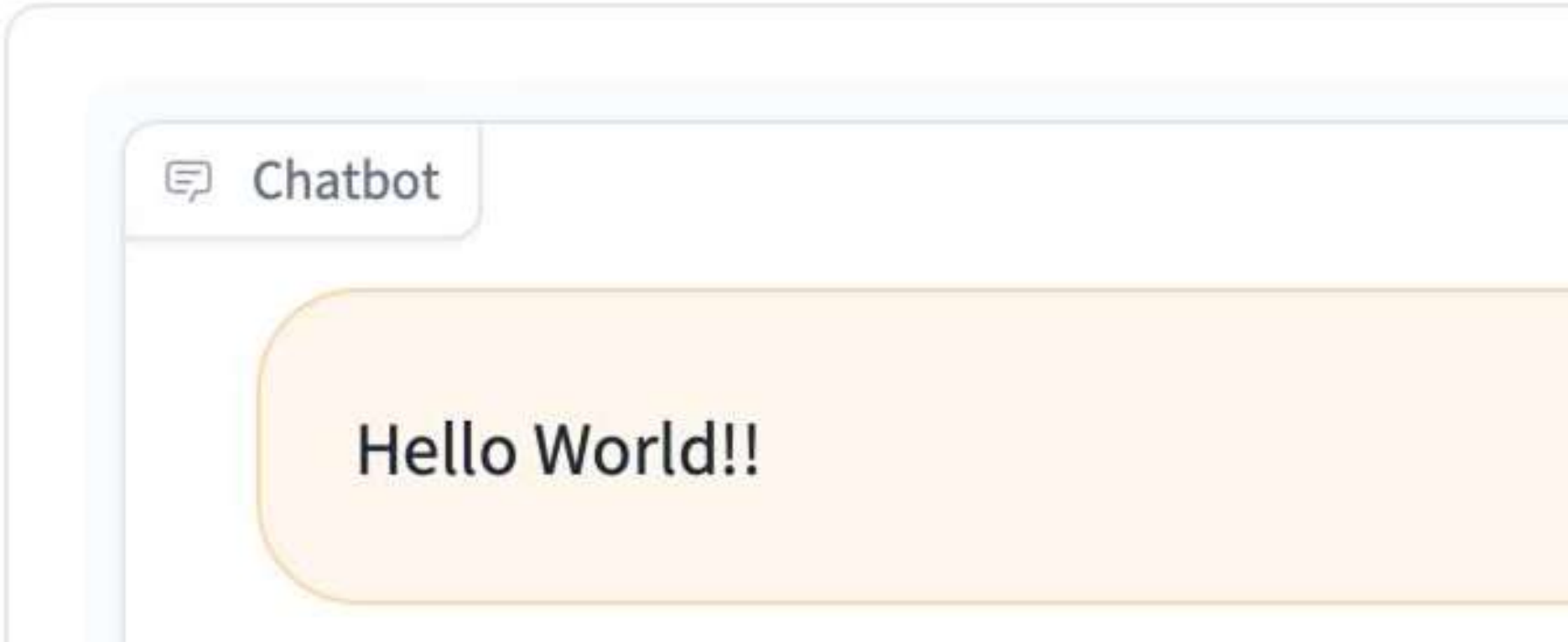
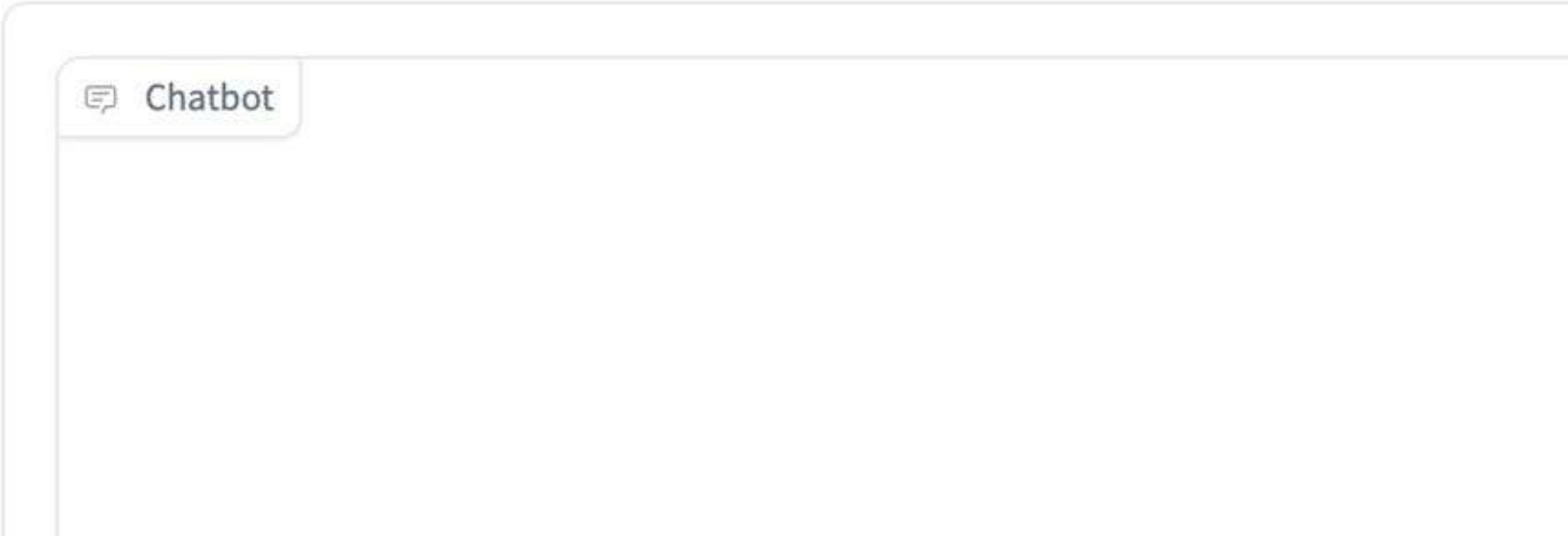



Chatbot
Hello World!!

Hello World Airbnb Map Chatbot Streaming Diffu


Chatbot

Chatbot

Hello World!!

You typed: Hello World!!

Building RAG A

Chatbot

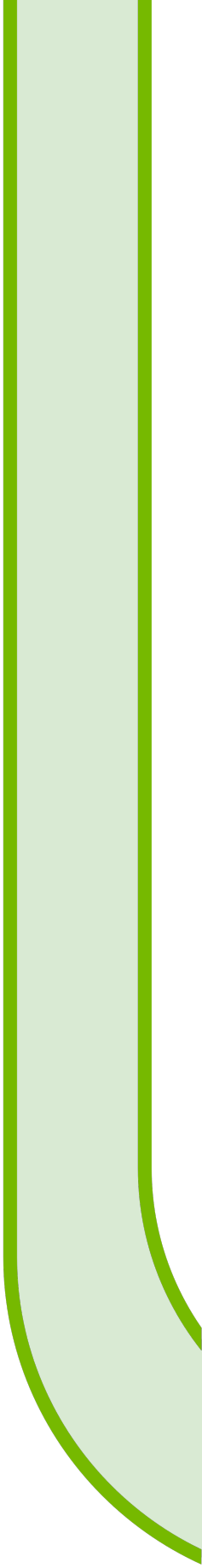
Hello World!!

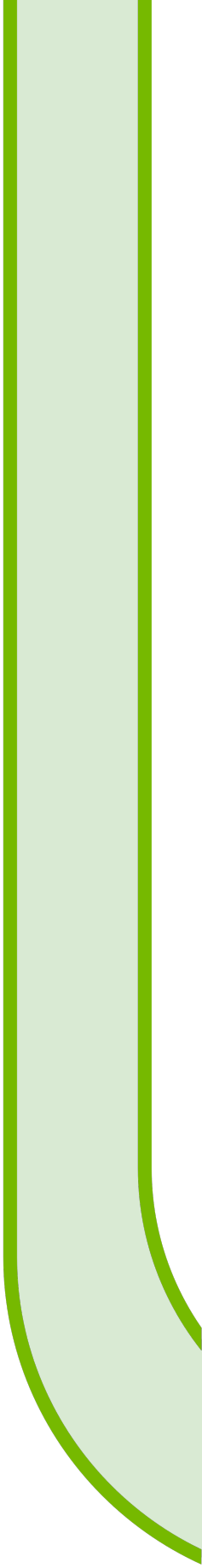
You typed: Hello World!!

Jupyter Notebook

Jupyter Notebook

Jupyter Notebook





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"messages": [{
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OpenAI G

OpenAI G

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"messages": [{
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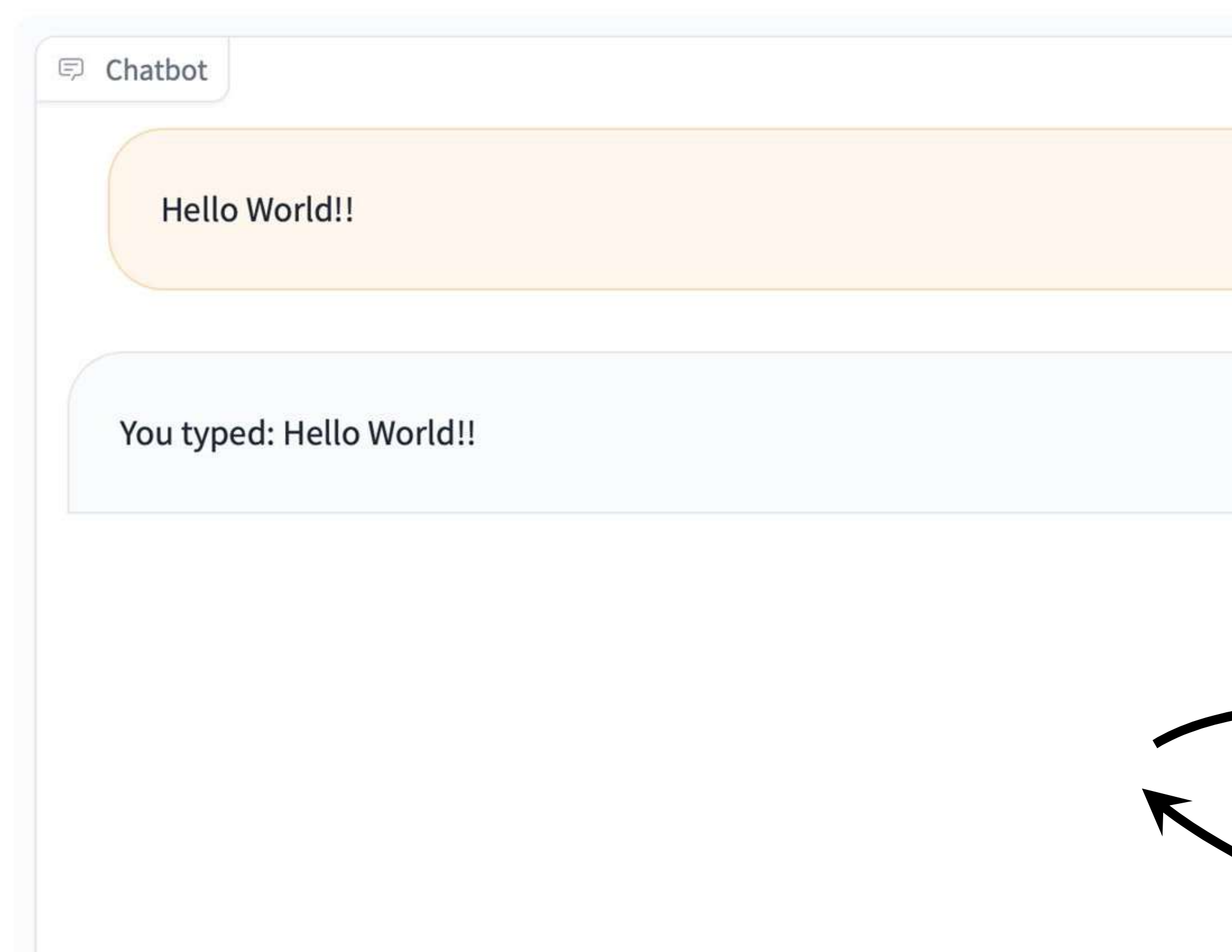
Millions of Apps |

Application Layer


Chatbot
Hello World!!
You typed: Hello World!!

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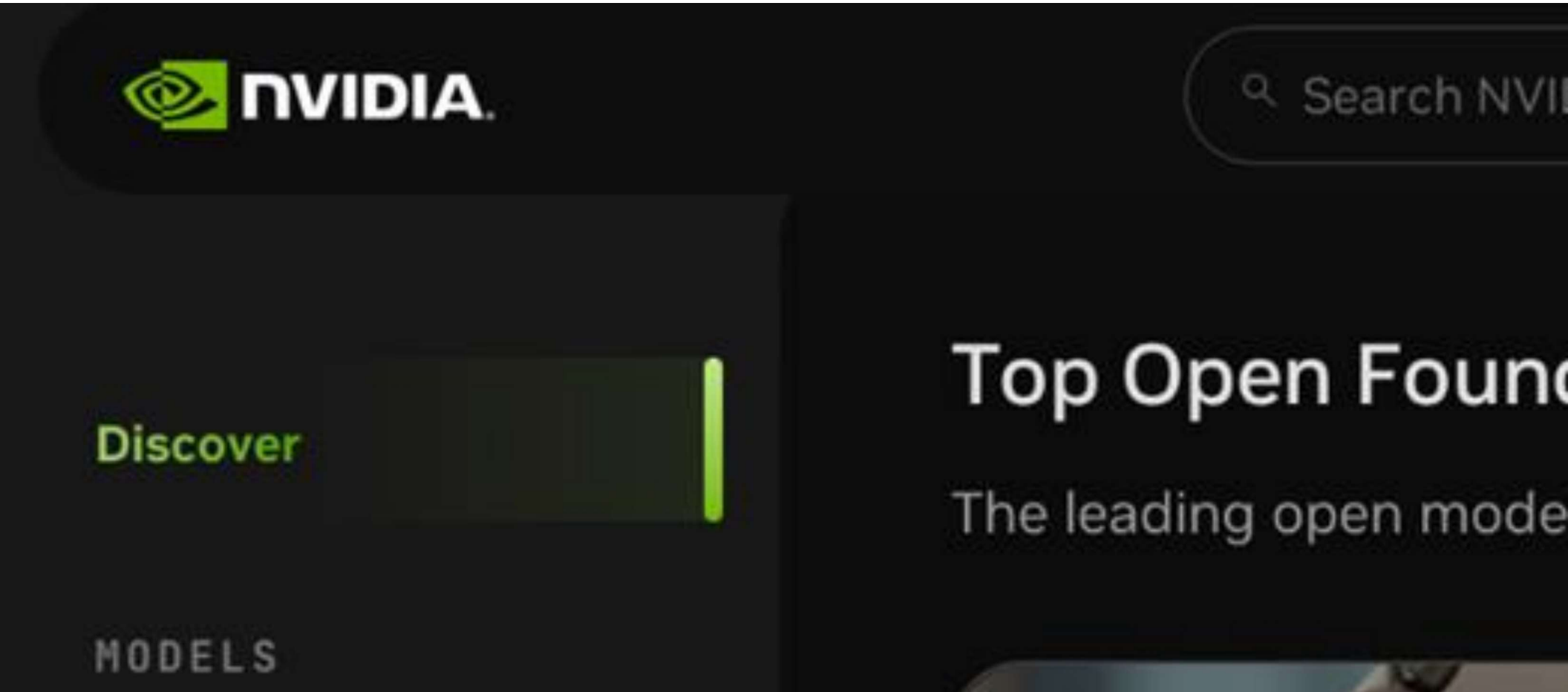
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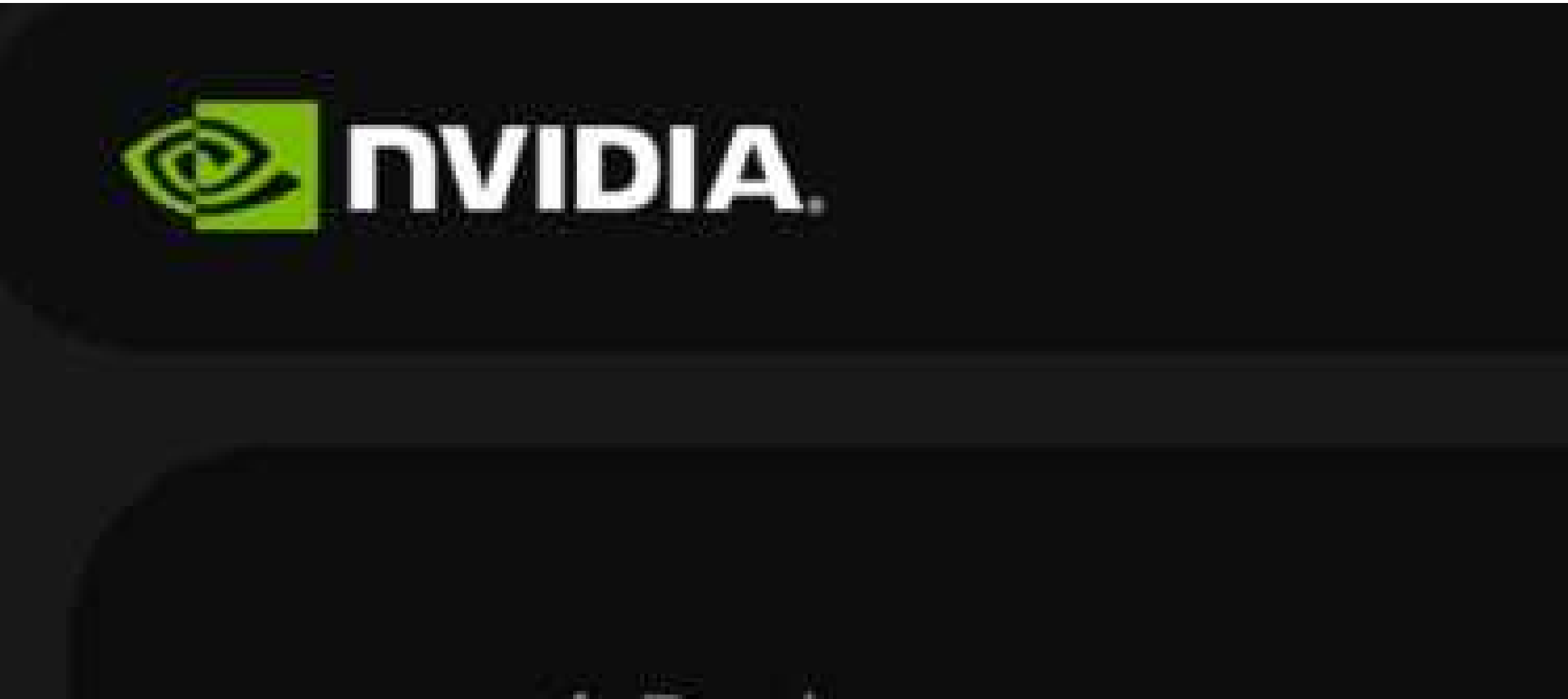

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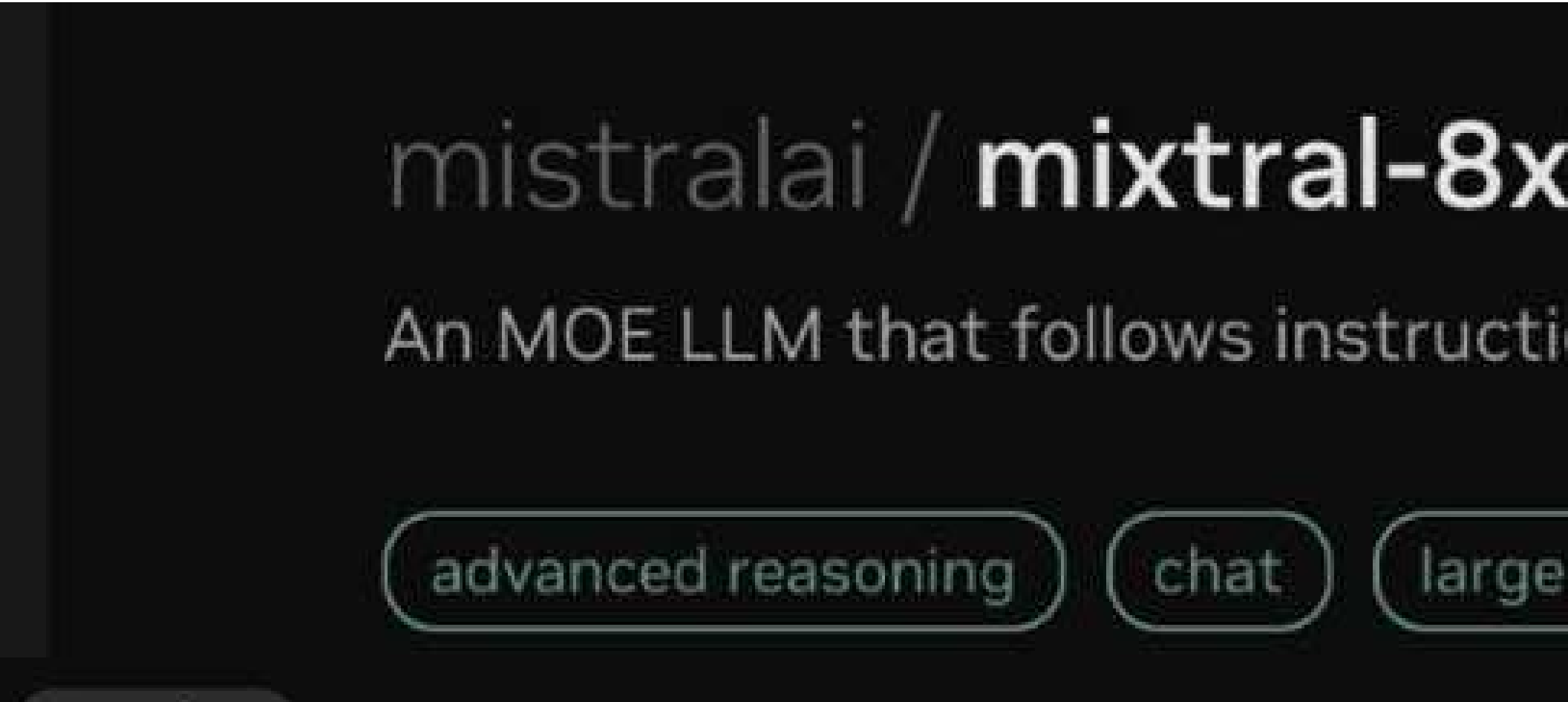
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An MOE LLM that follows instructi
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Output Parsers

Models

Prompts

Example Selectors

Output Parsers

Models

Prompts

Example Selectors

ChatNVIDIA

Building RAG A

Input

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Input

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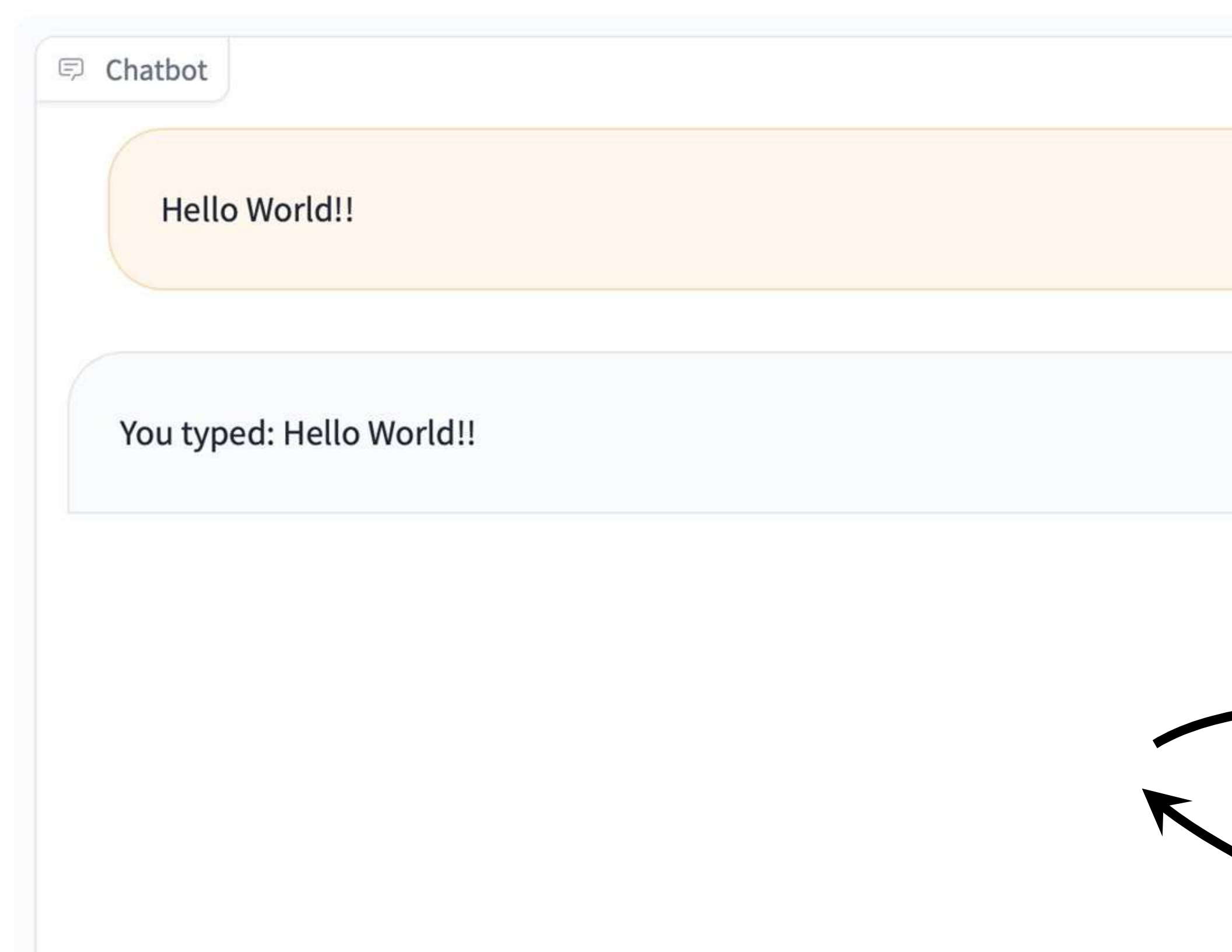
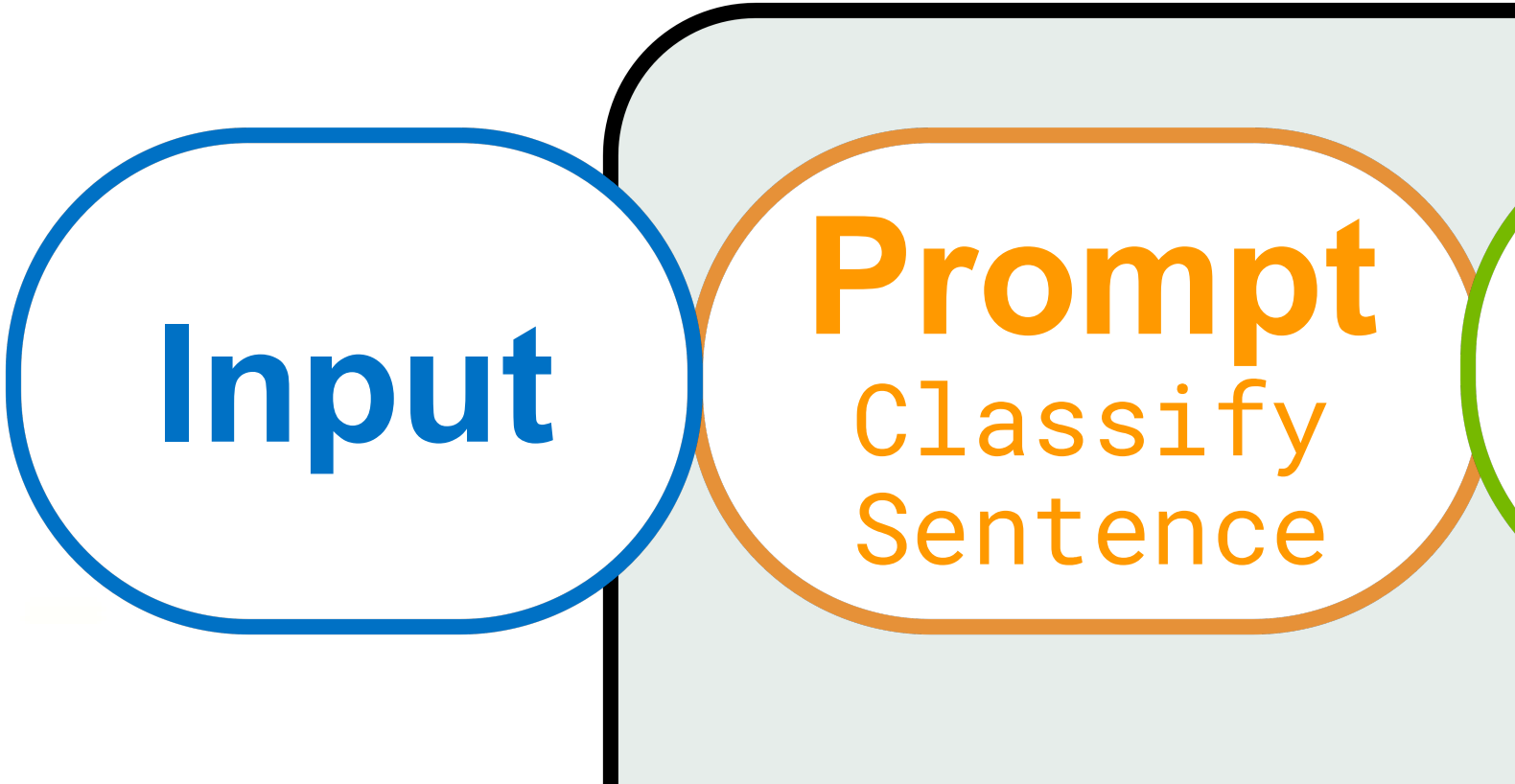
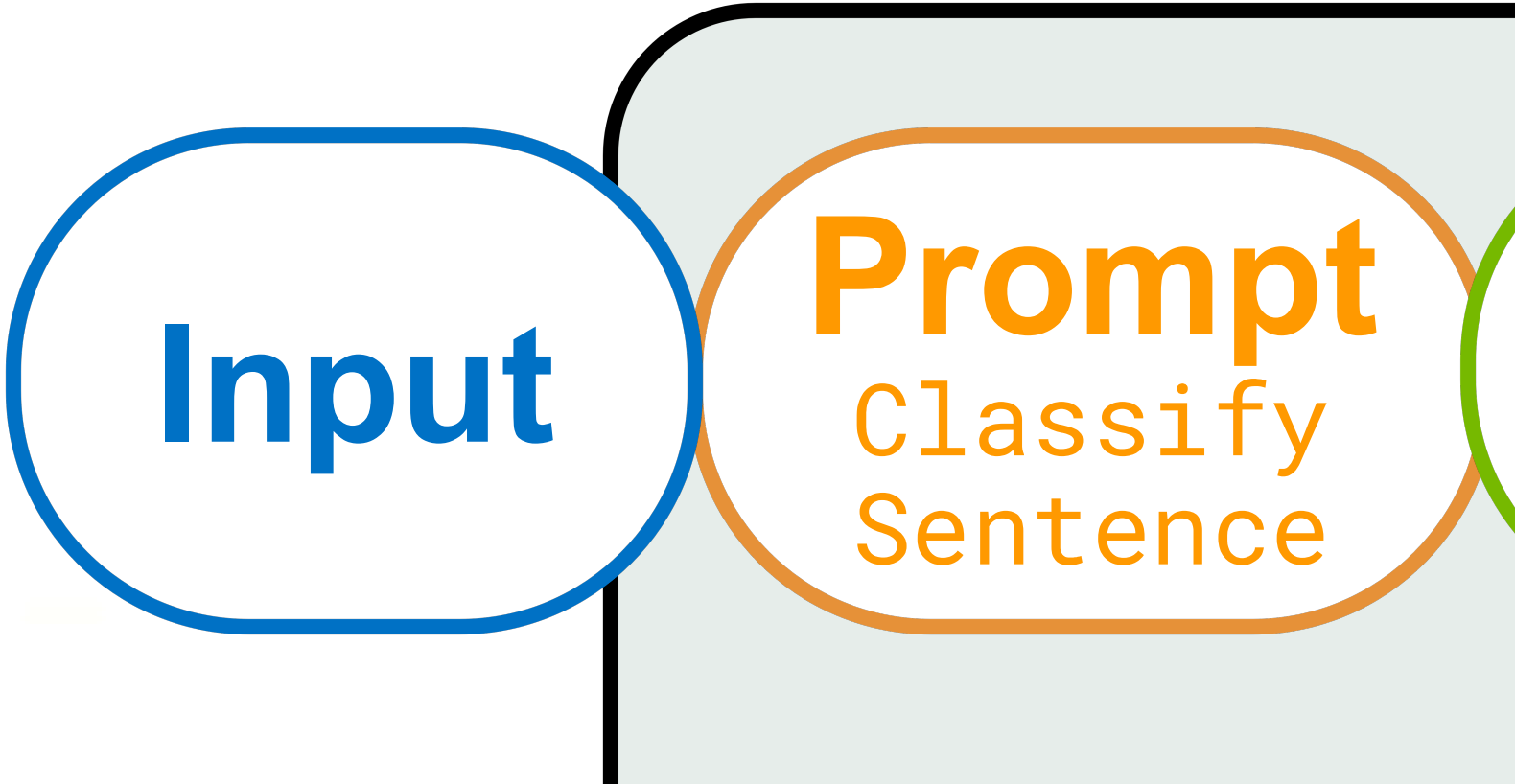

Chatbot
Hello World!!
You typed: Hello World!!

Building RAG A


Input
Prompt
Classify
Sentence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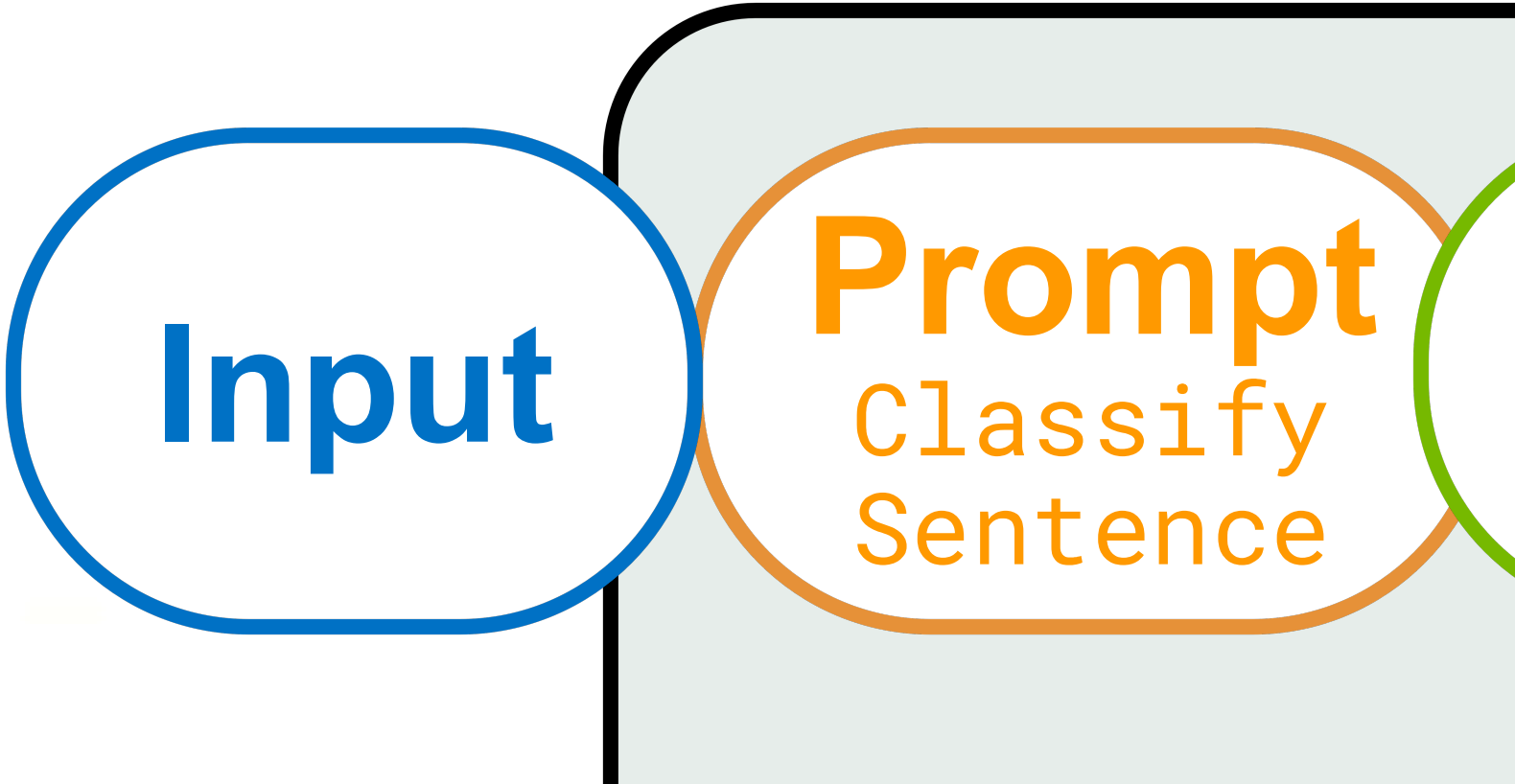
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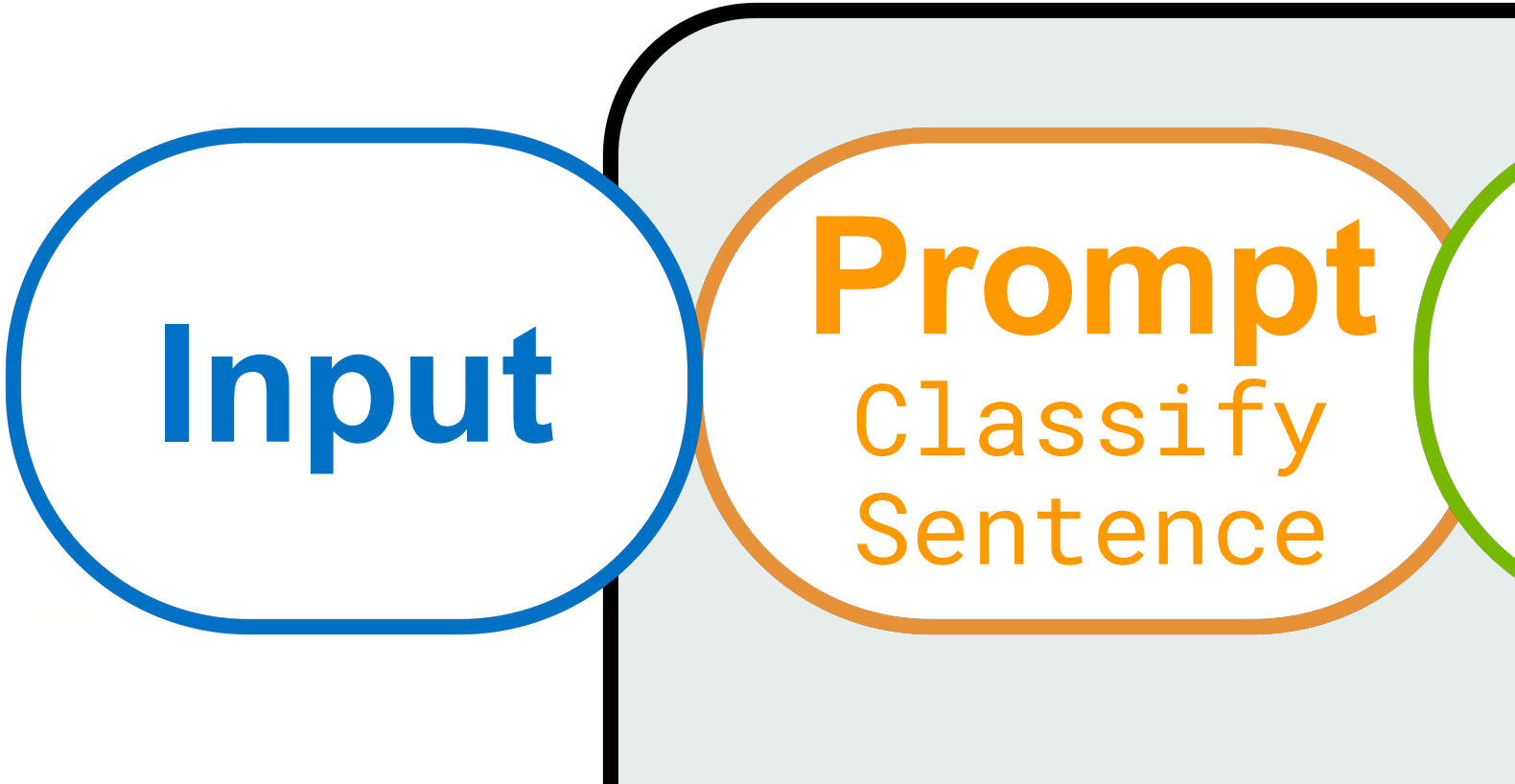
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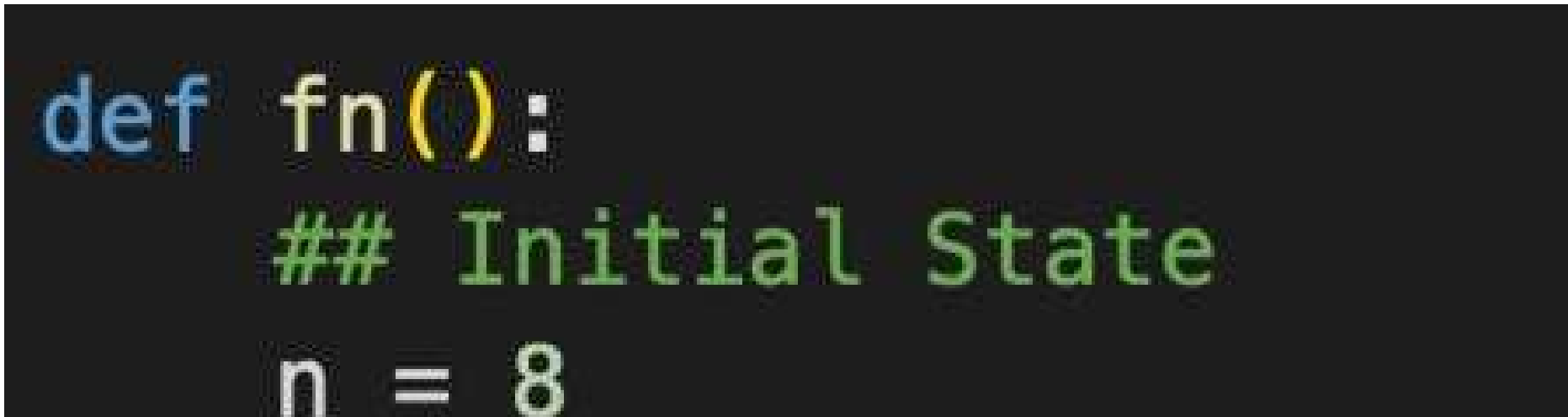
def fn():
Initial State
n = 8

F

```
def get_initial_state():
    n = 8
    fib = [0,1]
    return locals()
```

E

```
running_state = {'n': 8,
running_state['n'] = 7
running_state['fib'] +=
running_
```

F

```
from langchain_core.runnables

def next_fib_fn(d):
    return d['fib'] + [d['fib
```

F

```
from langchain_core.runnables

def next_fib_fn(d):
    return d['fib'] + [d['fib
```

F

```
from langchain_core.runnables

def next_fib_fn(d):
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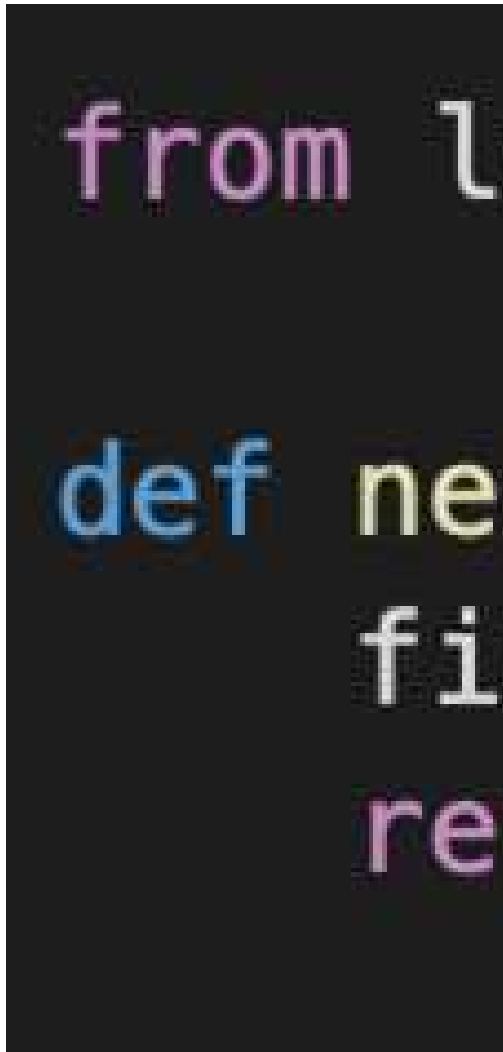
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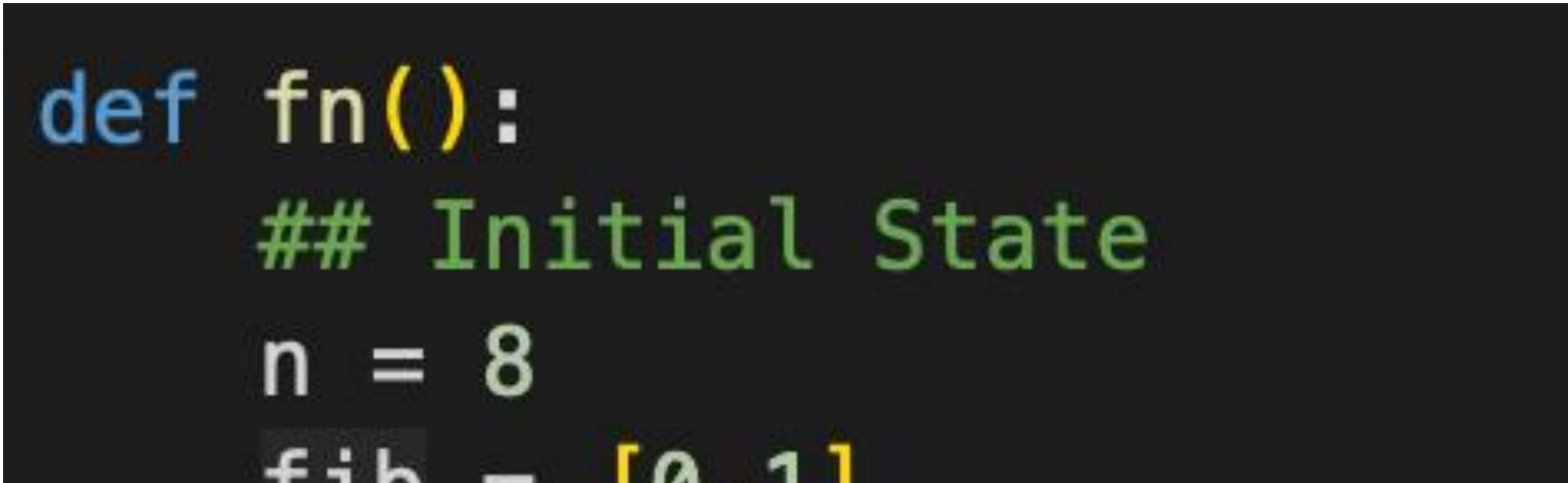
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n = 8
fib = [0,1]

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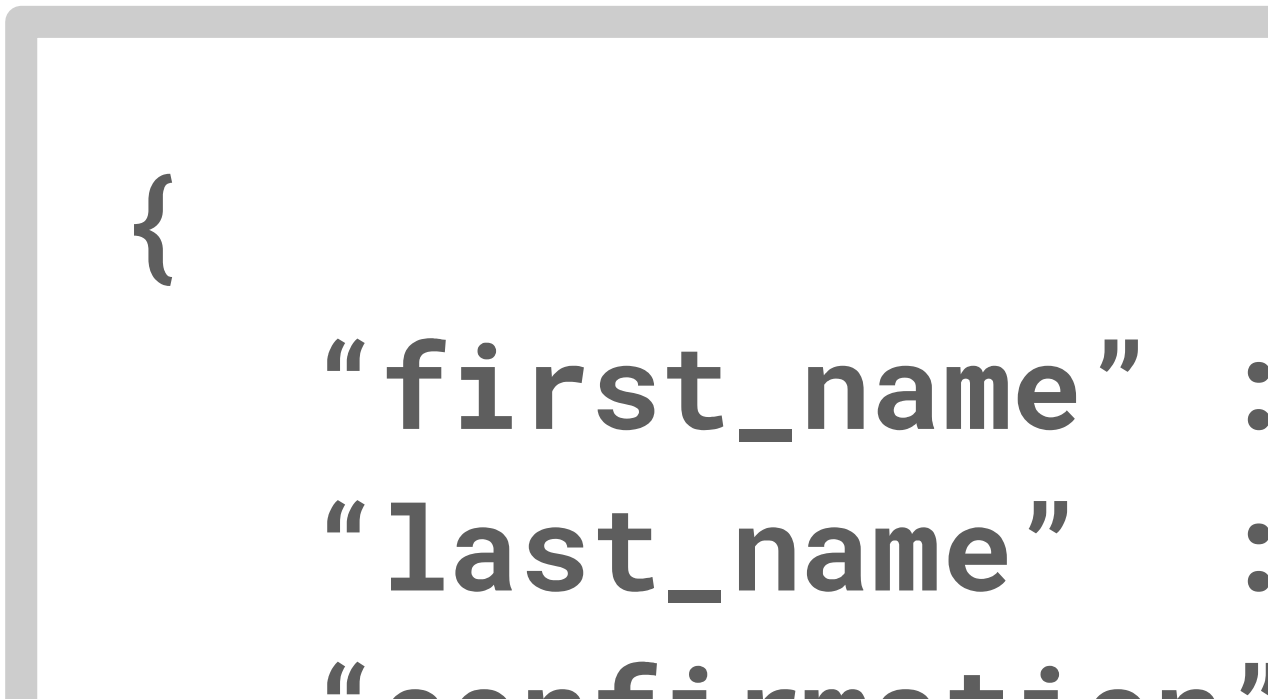
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"last_name" :
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Building RAG A

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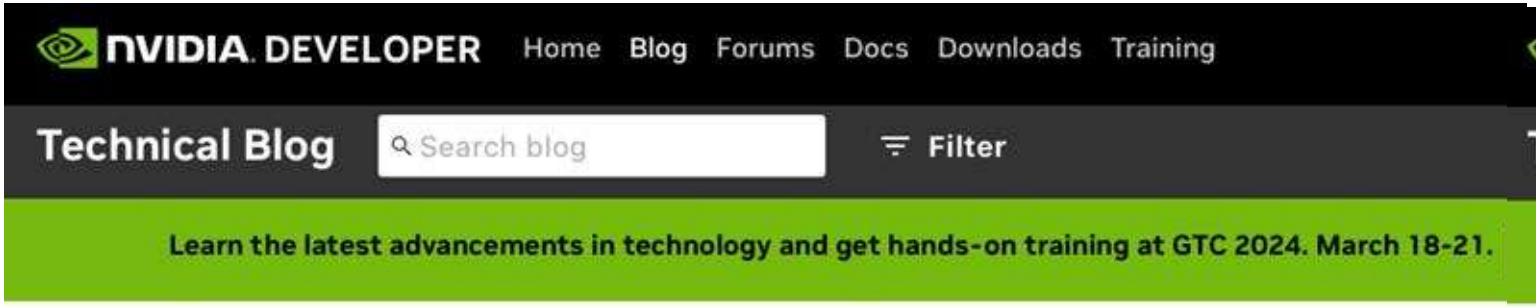

Generative AI / LLMs

RAG 101: Retrieval-Augmented

Generative AI / LLMs

Deploying R


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Database


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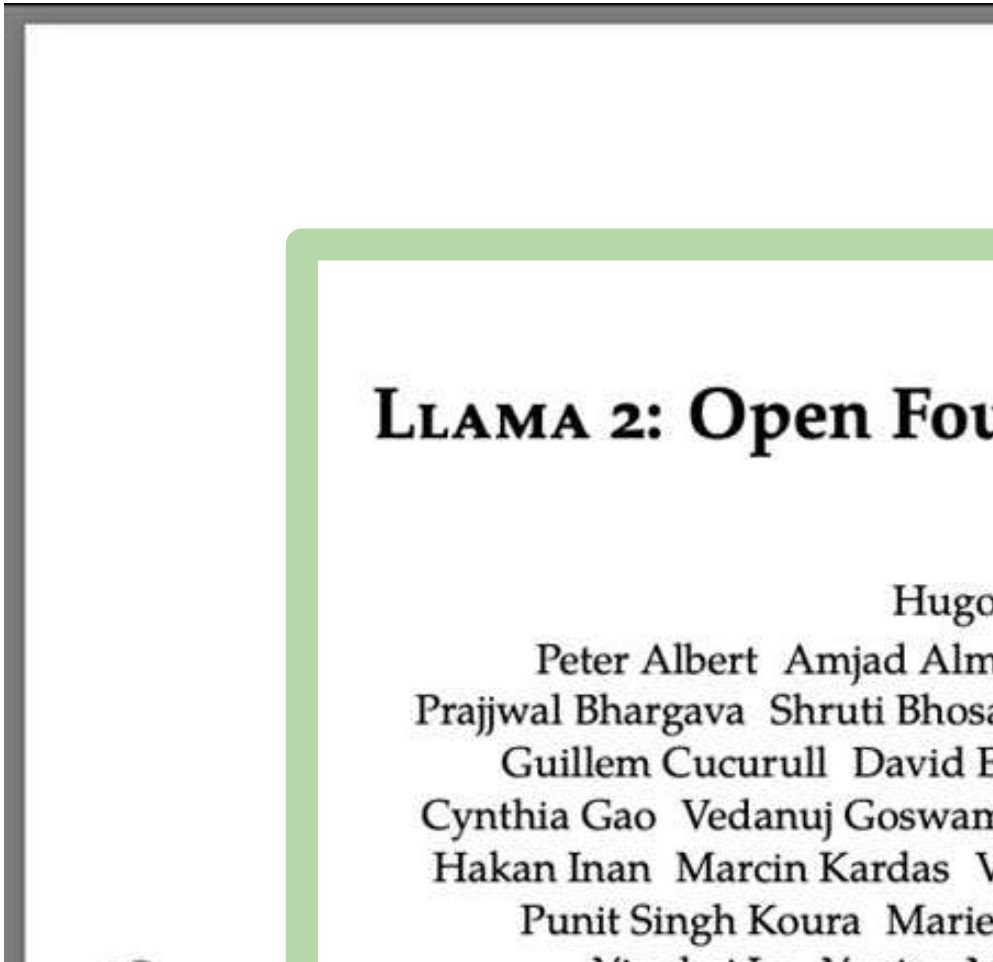
Database


Company
Database


Llama 2: Open Fou
Hugo
Peter Albert Amjad Alm
Prajjwal Bhargava Shruti Bhosa
Guillem Cucurull David E
Cynthia Gao Vedanuj Goswam
Hakan Inan Marcin Kardas
Punit Singh Koura Marie

Llama 2: Open Foundation and Fine-Tune

Hugo Touvron* Louis Martin† Kevin Stone†
Peter Albert Amjad Almahairi Yasmine Babaei Nikolay Bashlyko
Prajjwal Bhargava Shruti Bhosale Dan Bikel Lukas Blecher Cristian Ca
Guillem Cucurull David Esiobu Jude Fernandes Jeremy Fu Wenyi
Cynthia Gao Vedanuj Goswami Naman Goyal Anthony Hartshorn Sa
Hakan Inan Marcin Kardas Viktor Kerkez Madian Khabsa Isabel Klou
Punit Singh Koura Marie-Anne Lachaux Thibaut Lavril Jenya Lee
Yinghai Lu Yuning Mao Xavier Martinet Todor Mihaylov Pus

Llama 2: Open Foundation and Fine-Tuned

Hugo Touvron* Louis Martin† Kevin Stone†
Peter Albert Amjad Almahairi Yasmine Babaei Nikolay Bashlykov
Prajjwal Bhargava Shruti Bhosale Dan Bikel Lukas Blecher Cristian Canton
Guillem Cucurull David Esiobu Jude Fernandes Jeremy Fu Wenyin F
Cynthia Gao Vedanuj Goswami Naman Goyal Anthony Hartshorn Sagha
Hakan Inan Marcin Kardas Viktor Kerkez Madian Khabsa Isabel Klouma
Punit Singh Koura Marie-Anne Lachaux Thibaut Lavril Jenya Lee D
Yinghai Lu Yuning Mao Xavier Martinet Todor Mihaylov Pushk
Igor Molybog Yixin Nie Andrew Poulton Jeremy Reizenstein Rashi Rung
Alan Schelten Ruan Silva Eric Michael Smith Ranjan Subramanian Xiaoqing

How does Flying work according t

RunnableLamb

```
from langchain_openai import ChatOpe
from langchain_core.messages import H
from langgraph.graph import END, Mes
```

RunnableLamb

Building RAG A

How does Flying work according t

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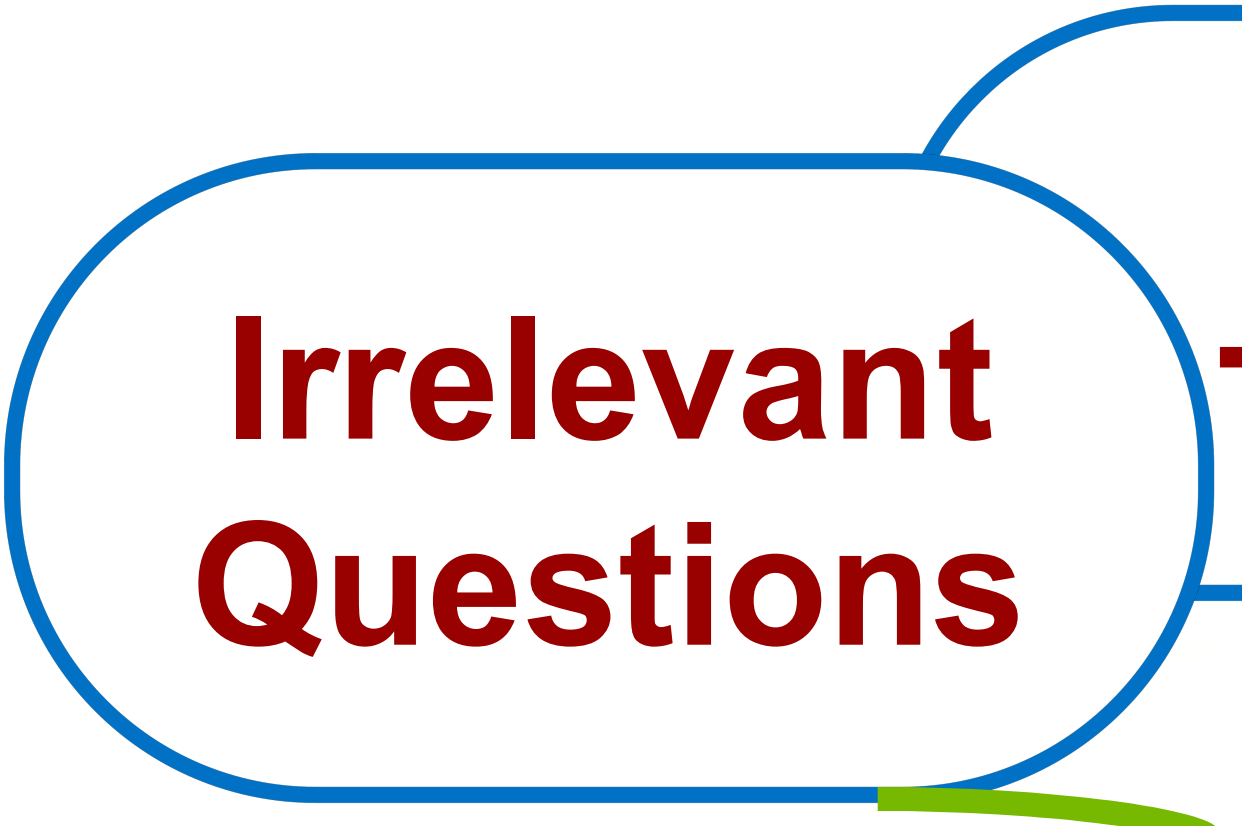
Building RAG A


Irrelevant
Questions

Illegal Topics

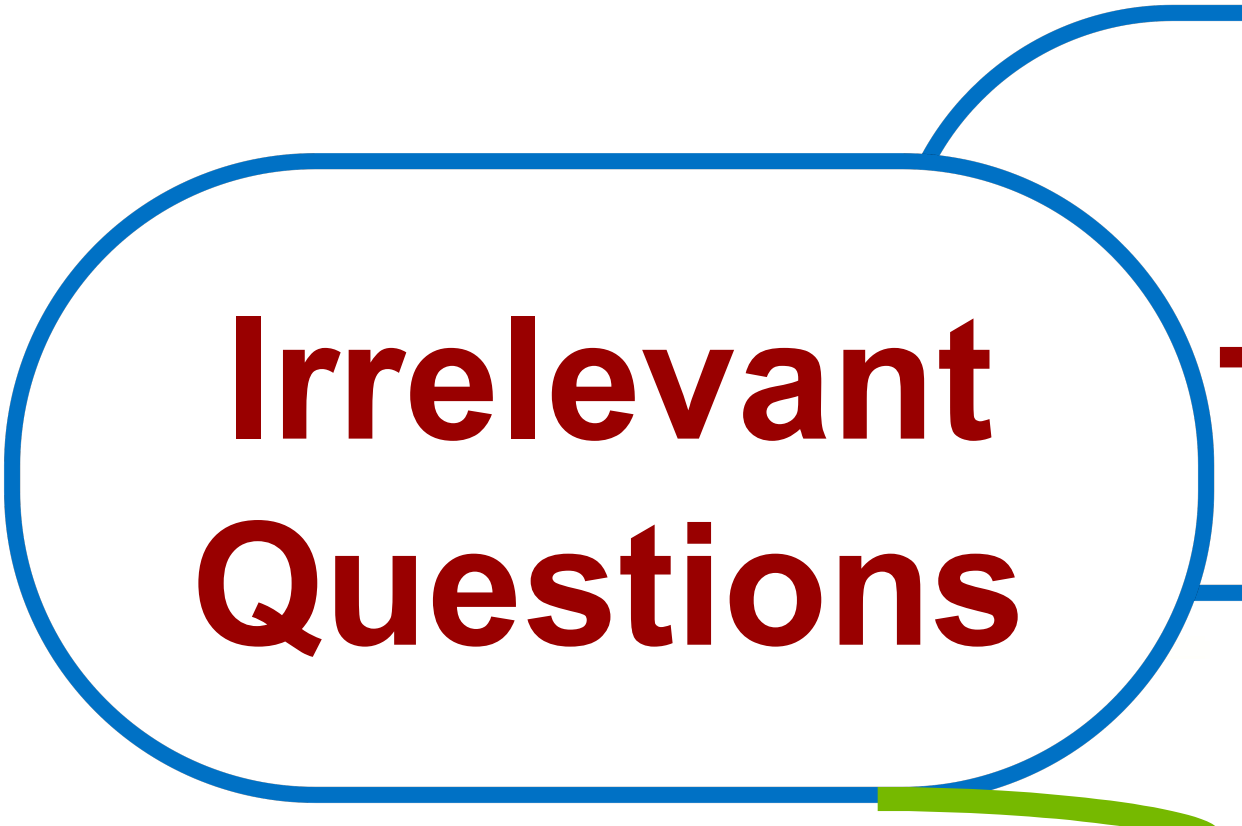
Irrelevant

Illegal Topics

Irrelevant

Illegal Topics

Irrelevant


Irrelevant
Questions

Building RAG A

Who is the


NVIDIA


Vector Stores

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from langchain_nvidia_ai
from langchain.vectorsto


embedder = NVIDIAEmbeddi
```

```
from langchain_nvidia_ai
from langchain.vectorsto


embedder = NVIDIAEmbeddi
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from langchain.vectorsto


embedder = NVIDIAEmbeddi
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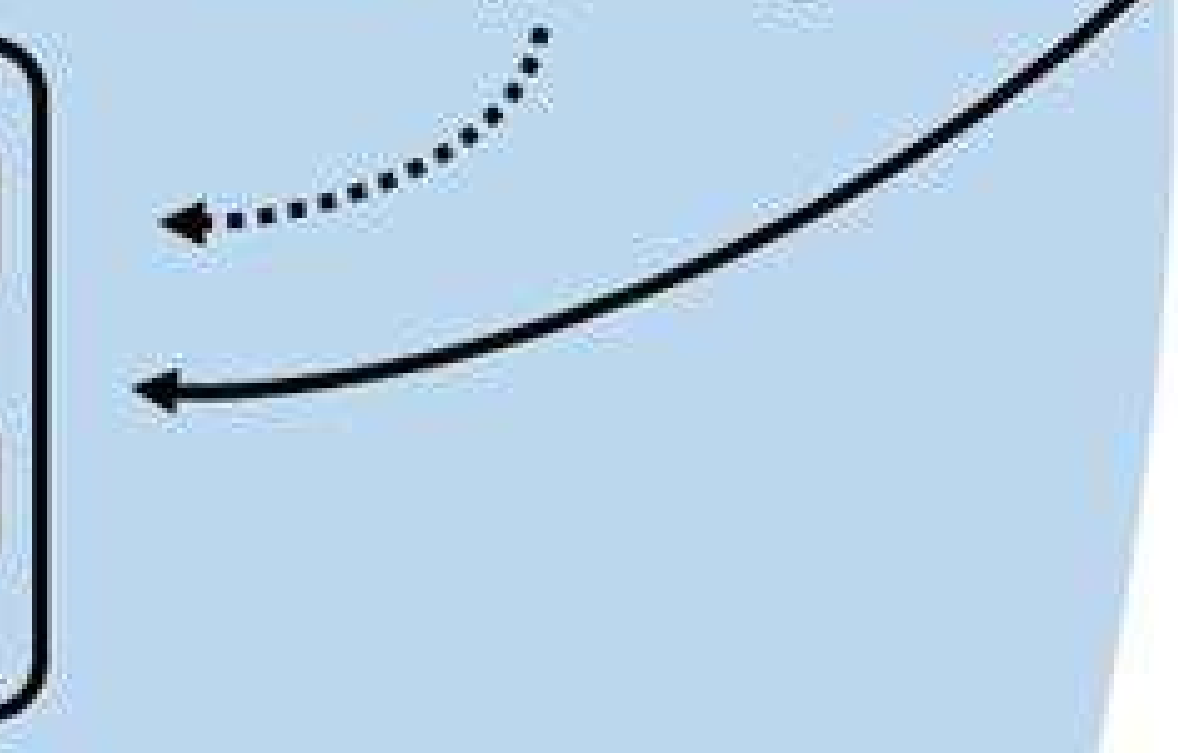
Pron

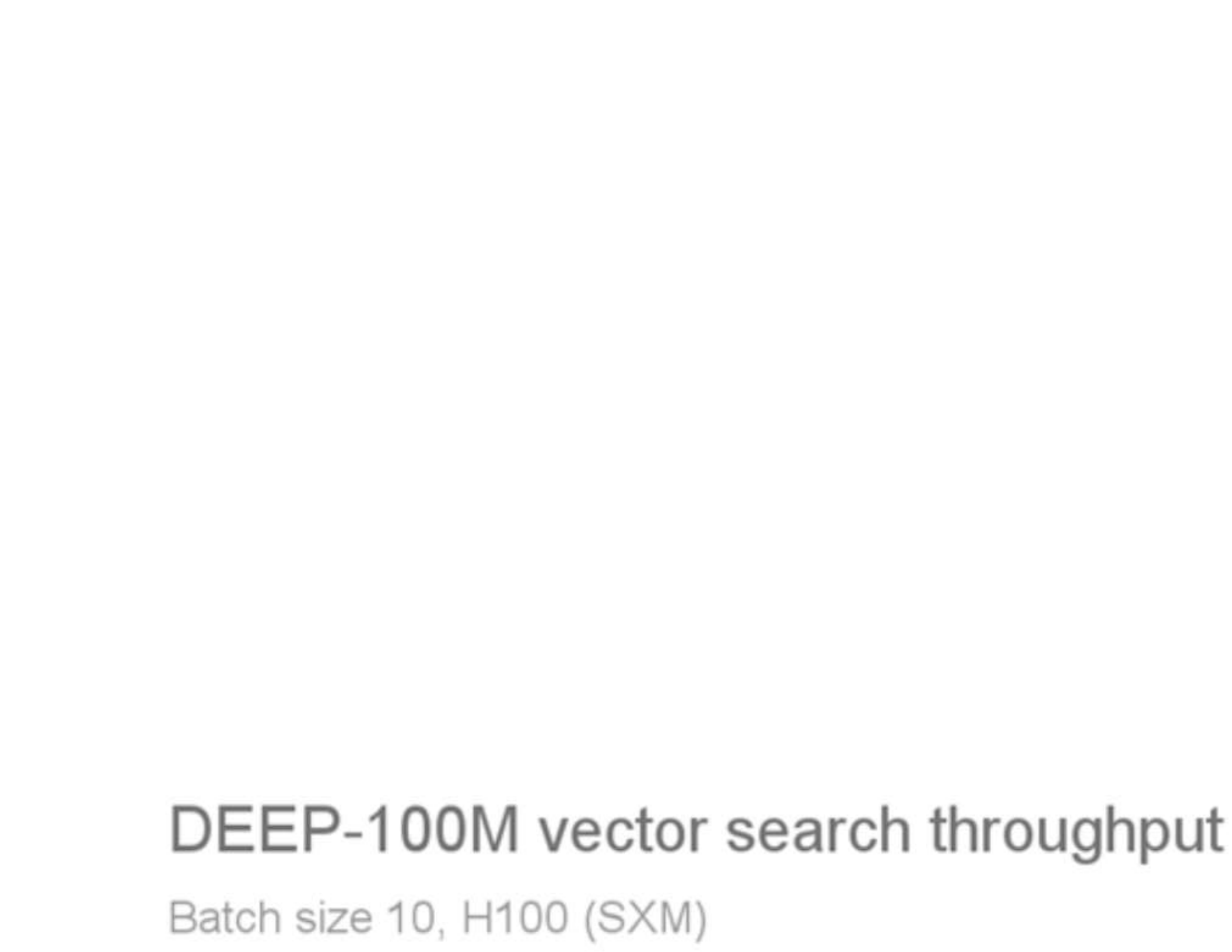
Pron



Loca

Local Host

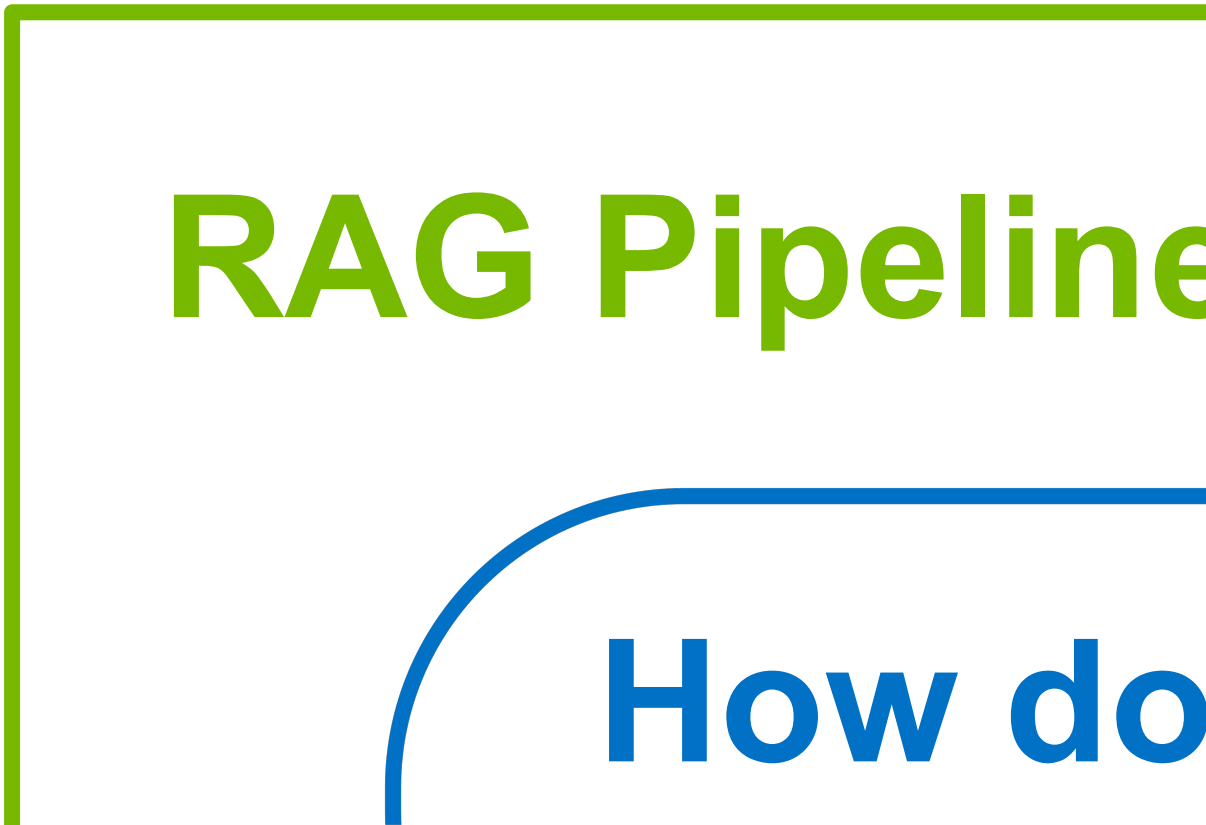
Milvus

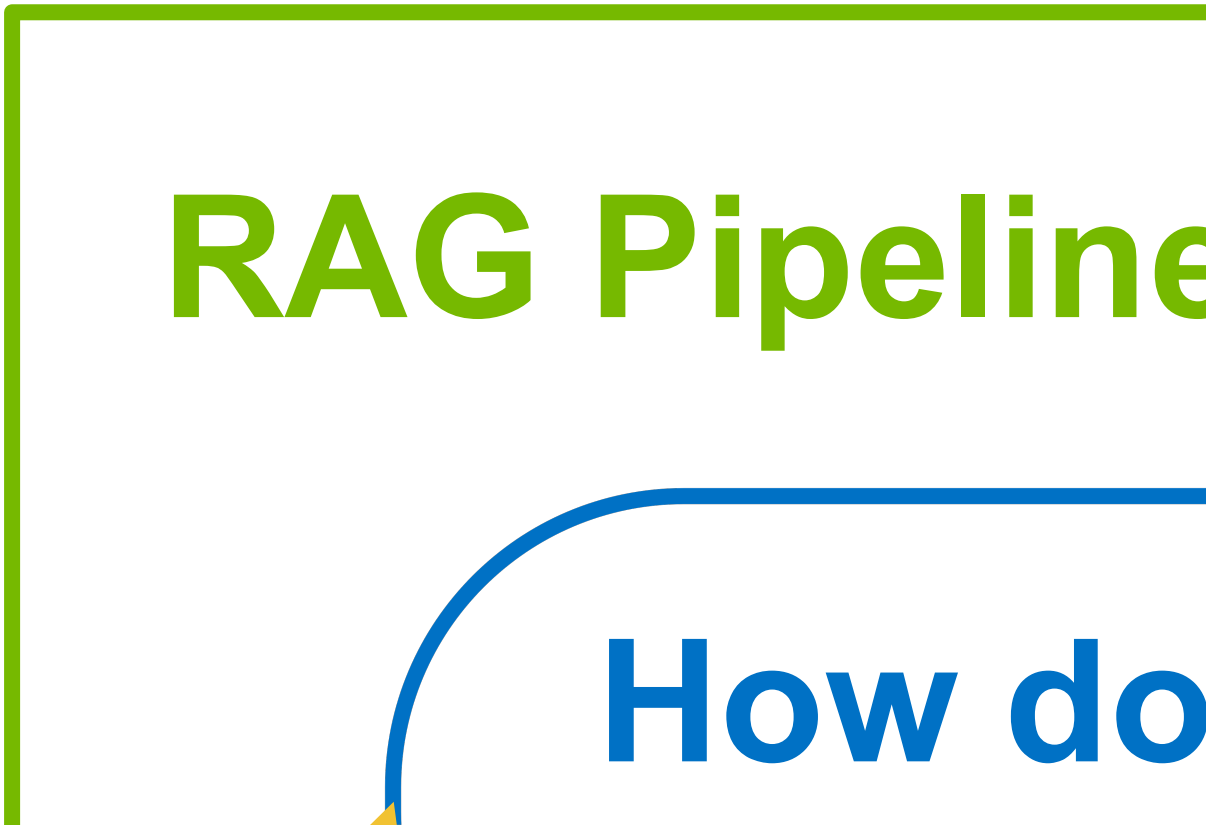

DEEP-100M vector search throughput
Batch size 10, H100 (SXM)


Hello! My name is Jane
Hello Jane! How are you?

How does RAG work?

Building RAG A


RAG Pipeline
How do


RAG Pipeline
How do

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VDB

VDB

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VDB

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56      Na
57
58    Con
59    Joh
```

Prompt

Ask some questions

LLM

VDB

Remot

Congratulation