



# Lang-Chain Travel Agent

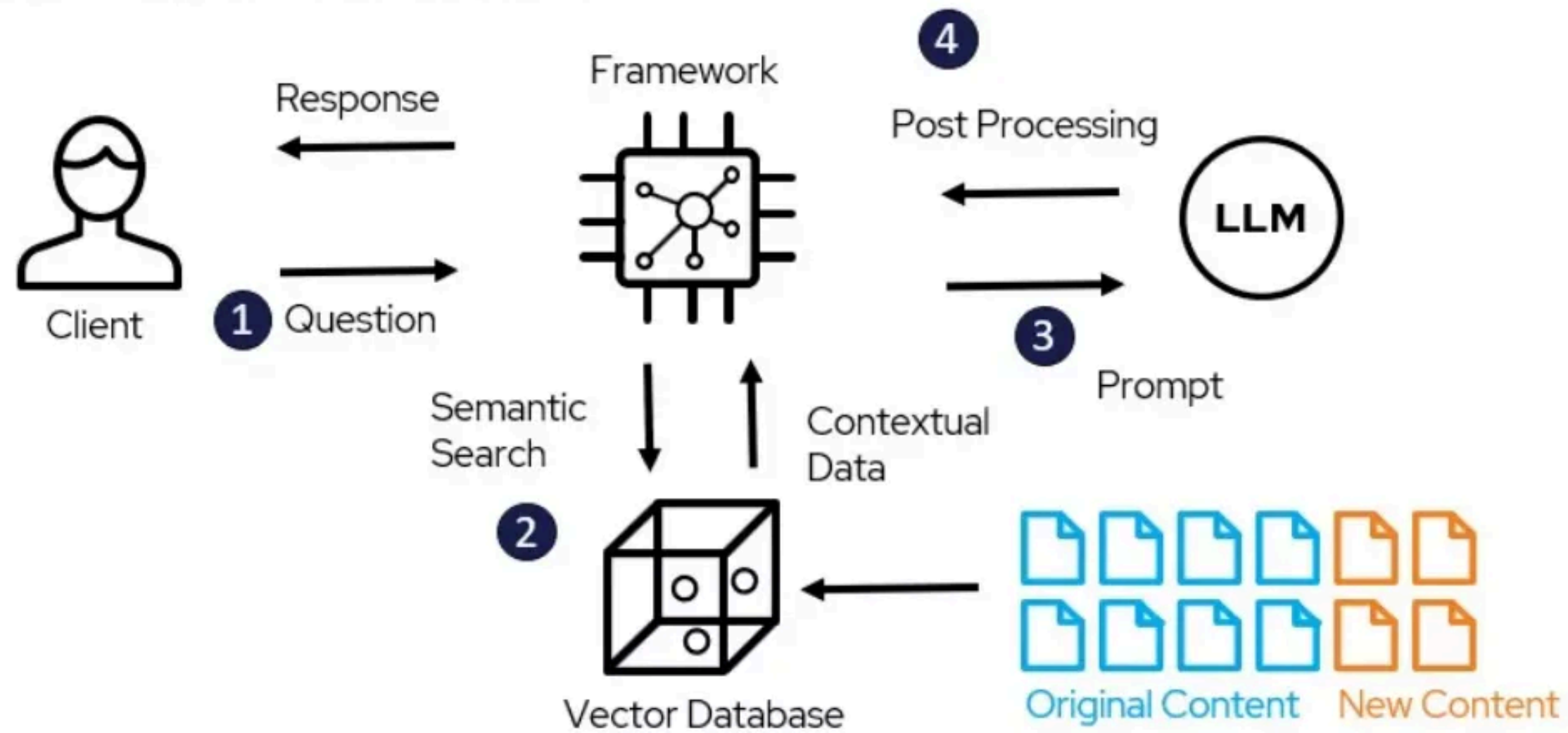
G W U C S C I - 6 3 6 5 2 4 F A

Travel Q&A Assistant Using LLM and Vector Databases

Shi Qiu



## RAG Architecture Model



# Process

- 1.The user asks a question.
- 2.The system uses an LLM to classify the query's intent (hotel-related or not).
- 3.If hotel-related, it searches a hotel CSV(2.24 GB) based on extracted filters. If non-hotel-related, it uses vector-based semantic search on a Knowledge Graph.
- 4.The system collects relevant information , then prompts the LLM to generate a cohesive, helpful answer.
- 5.The user receives a final, context-informed response. The conversation continues as the user asks follow-up questions.



Multiple matches found (3994). Please refine your search criteria

"Enter additional requirements (e.g., 'parking', 'free wifi', etc.):"

```
Number of results found: 37
-----
Sample of the matched results:
      HotelName HotelRating
The Penthouse Organic & Modern in Times Square ThreeStar Distances are ca
      Visions Inn ThreeStar
      Riviera Motor Inn Brooklyn OneStar
      Villa Florencia All
      Argos Inn FourStar
-----
```

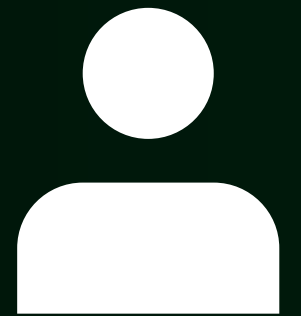


Multiple matches found (490). Please refine your search criteria

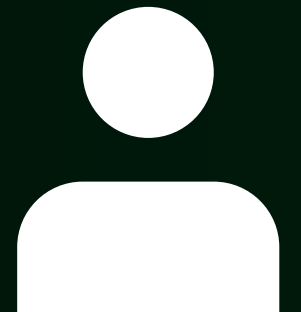
"Enter additional requirements (e.g., 'parking', 'free wifi', etc.):"

```
Number of results found: 5
-----
Sample of the matched results:
      HotelName HotelRating
      Argos Inn FourStar
New York Marriott East Side FourStar
      LaGuardia Plaza Hotel FourStar
      Boro Hotel FourStar
      Y01 Wellness Center FourStar
-----
```

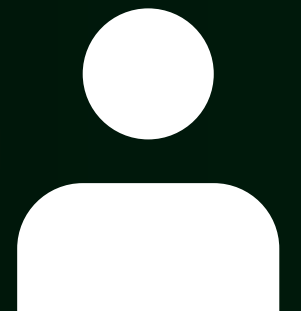
help me find a hotel in newyork



maybe a 4 star hotel



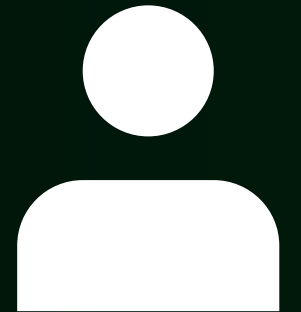
maybe fivestar instead





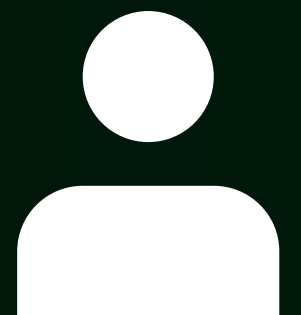
Multiple matches found (89). Please refine your search criteria.  
Enter additional requirements (e.g., 'parking', 'free wifi', etc.):

with wifi available in all areas



Multiple matches found (73). Please refine your search criteria.  
Enter additional requirements (e.g., 'parking', 'free wifi', etc.):

...(more requirements)





Congrats, we found you a hotel: Collective Governors Island, what else do you want to know?

how can i contact them



To contact Collective Governors Island, you can reach out to them via email at [hello@collectiveretreats.com](mailto:hello@collectiveretreats.com) or by phone at (970) 445-2033. You can also visit their website at <https://www.booking.com/hotel/us/collective-governors-island.html> for more information and to make reservations.

how to get there



To get to Collective Governors Island, you can take the Governors Island Ferry departing daily from Lower Manhattan and Brooklyn. The island is car-free, so it is best explored by foot or bicycle. You can also reach the island from local airports such as Newark International, LaGuardia, and JFK by taking public transportation or a taxi to the 10 South Street Ferry Terminal and then taking the Governors Island Ferry. Enjoy your stay at this peaceful oasis with endless opportunities for discovery and relaxation.



At Collective Governors Island, you can enjoy a variety of activities such as morning yoga, spa offerings, live music, cocktail hour on the sunset terrace, chef-driven farm-to-table dining, and exploring historic Governor's Island by bike. The gourmet dining experience offers a contemporary American menu with a focus on wood flame grilling. Additionally, guests can relax in the peaceful oasis and take advantage of the expansive outdoor setting. To get to Collective Governors Island, you can take the Governors Island Ferry departing daily from Lower Manhattan and Brooklyn. Enjoy your stay!

what can i do there

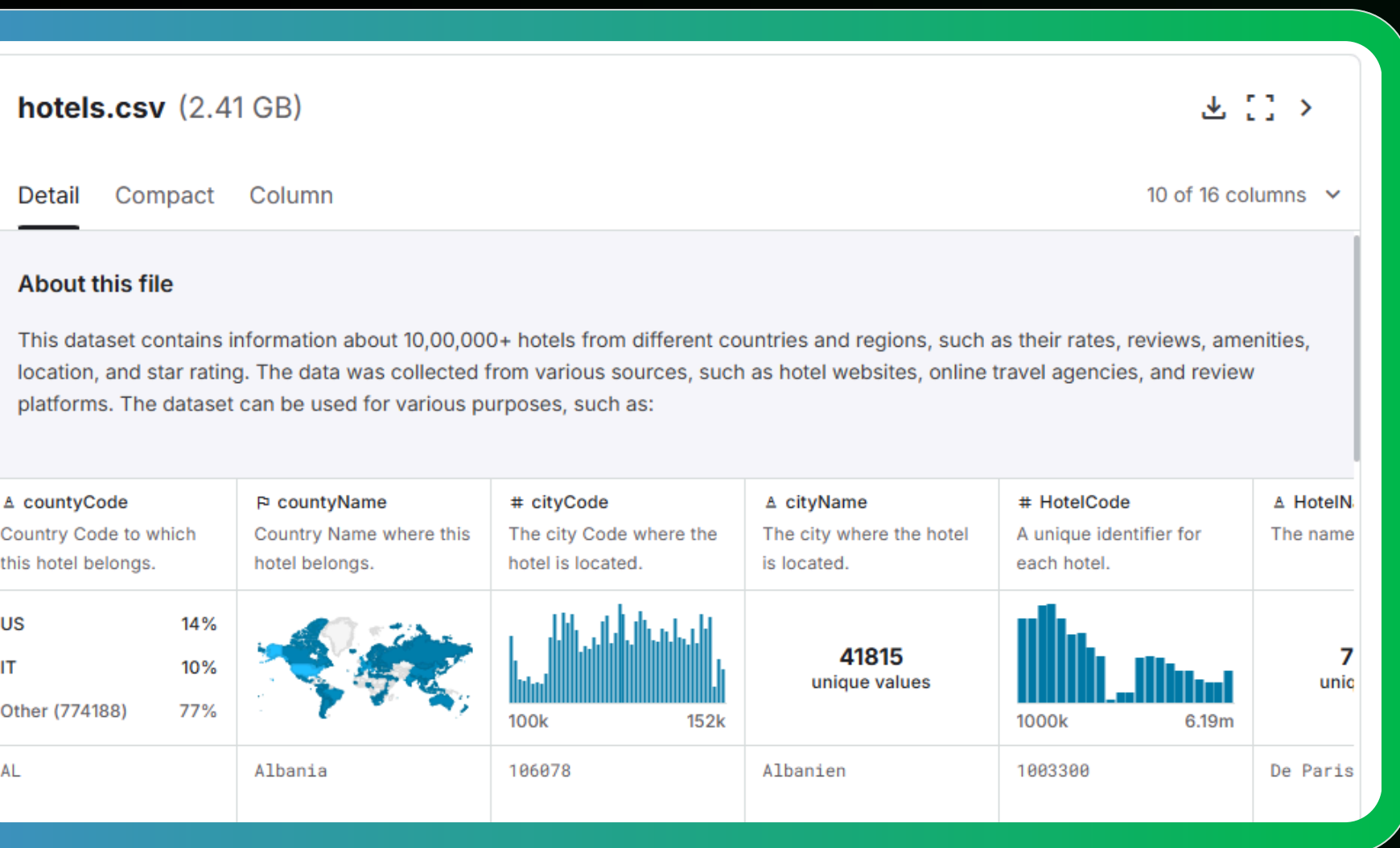


Thank you for your interest in Collective Governors Island. If you have any further questions or need assistance with booking, feel free to reach out to us at [hello@collectiveretreats.com](mailto:hello@collectiveretreats.com) or call (970) 445-2033. Have a great day!

Thank you for using the Travel Assistant. Goodbye!

thankyou, exit





# Hotel Data

- Source: A structured CSV file containing information about various hotels.
- Purpose: Enables fast filtering and retrieval of hotel-related information based on user queries.

Learn More



<https://www.kaggle.com/datasets/raj713335/tbo-hotels-dataset>





A	B	C	D	E	F	G	H	I	J	K
countyCode	countyName	cityCode	cityName	HotelCode	HotelName	HotelRating	Address	Attractions	Description	FaxNumber
IT	Italy	135955	San Lorenzo al Mare	1360997	Hotel Riviera	FourStar	Via Aurelia	Distances to nearby attractions	<p>Headline : In the heart of the town	39-0183-8
AT	Austria	148811	Zillertal	1158375	Sport und	FourStar	Kleinboder	Distances to nearby attractions	<p>Headline : In the heart of the town	43-528-8
IT	Italy	128165	Mazara del Vallo	1500047	Sud 12 Villa	OneStar	Via Formia	Distances to nearby attractions	<p>Headline : In the heart of the town	011-39-3
GB	United Kingdom	124857	Leith	5330986	Home By L	ThreeStar	Maritime S	Distances to nearby attractions	<p>Headline : In the heart of the town	
BR	Brazil	111263	Bombinhas	5681939	Cobertura	All	1860 Avenida Aroeira	Distances to nearby attractions	<p>Headline : In the heart of the town	
IT	Italy	137719	Senigallia	1372370	Hotel Le Q	ThreeStar	Via Umber	Distances to nearby attractions	<p>Headline : In the heart of the town	39-071-7
CA	Canada	141448	Vancouver, British Columbia	1214567	The Burrar	ThreeStar	1100 Burrar	Distances to nearby attractions	<p>Headline : In the heart of the town	1-604-68
LK	Sri Lanka	115185	Dambulla	1626908	Lakmini Lo	OneStar	126 Sigiriya	Distances to nearby attractions	<p>Headline : In the heart of the town	
IL	Israel	139939	Tel Aviv	1415534	Momos Ho	TwoStar	28 Ben Yeh	Distances to nearby attractions	<p>Headline : In the heart of the town	972-3-52
IT	Italy	112558	Brescia	1572150	Albergo Ri	ThreeStar	Viale Pinet	Distances to nearby attractions	<p>Headline : In the heart of the town	39-0364-
PA	Panama	112455	Boquete	1675050	Bambuda	All	El Castillo, Calle Princip	Distances to nearby attractions	<p>Headline : In the heart of the town	
IT	Italy	103138	San Giuseppe Comacchio	6104551	Appartam	All	VIALE DEI	Distances to nearby attractions	<p>Headline : In the heart of the town	
ES	Spain	114006	Castello D'Empuries	5894688	Basic Com	All	Passeig Carles Fages	Distances to nearby attractions	<p>Headline : In the heart of the town	
GB	United Kingdom	109098	Ambleside	1792948	High Wray	FourStar	Ambleside Cumbria L	Distances to nearby attractions	<p>Headline : In the heart of the town	
KH	Cambodia	123974	Koh Kong	1656356	Kampot Vi	FourStar	National Road 3 Thvi	Distances to nearby attractions	<p>Headline : In the heart of the town	855-97-3
US	United States	146942	Oakland, Maryland	5235668	Boxer Over	ThreeStar	131 Offsho	Distances to nearby attractions	<p>Headline : In the heart of the town	

# Key Columns in the Dataset

- HotelName: Name of the hotel.
- HotelRating: Rating of the hotel (e.g., stars).
- CityName: Location of the hotel.
- HotelFacilities: Facilities offered (e.g., parking, free WiFi).
- Attractions: Nearby attractions.
- Description: Brief description of the hotel.
- PhoneNumber: Contact information.
- HotelWebsiteUrl: Official website of the hotel

<https://www.kaggle.com/datasets/raj713335/tbo-hotels-dataset>

# Some Key Stats:



## Key Statistics

- Records: 1,009,103 entries
- Unique Cities: 41,796 unique city names
- Hotel Ratings Distribution:
  - ThreeStar: 352,451 hotels
  - TwoStar: 159,708 hotels
  - FiveStar: 22,369 hotels

## Popular Cities

- London: 5,941 hotels
- Orlando, Florida: 5,522 hotels
- Bali: 3,153 hotels

columns		null_values	data types
0	countyCode	912	object
1	countyName	0	object
2	cityCode	0	int64
3	cityName	0	object
4	HotelCode	0	int64
5	HotelName	0	object
6	HotelRating	0	object
7	Address	102	object
8	Attractions	525092	object
9	Description	47005	object
10	FaxNumber	560347	object
11	HotelFacilities	50378	object
12	Map	930	object
13	PhoneNumber	327137	object
14	PinCode	30979	object
15	HotelWebsiteUrl	250118	object

<https://www.kaggle.com/datasets/raj713335/tbo-hotels-dataset>



# One Shot

```
def parse_user_input(user_input, column_names):
    """
    Uses LLM to extract filtering criteria and return fields.
    """

    one_shot_example = """
    Example User Input: "I want to find a hotel in London, with 3 star and wifi"
    Example Output: {
      "filters": {"cityName": "London", "HotelRating": "ThreeStar", "HotelFacilities": "Wifi"}
    }
    """

    prompt_text = f"""
    The dataset has the following columns: {column_names}
    Based on this, analyze the user's input and determine:
    1. The filtering criteria (e.g., "cityName": "New York").

    Provide your answer in JSON format like this:
    {{
      "filters": {{ "column_name": "value", "another_column": "value" }}
    }}

    {one_shot_example}

    User Input: "{user_input}"
    """
    response = llm.invoke(prompt_text)
    response_content = response.content.strip()

    if "Output:" in response_content:
        response_content = response_content.split("Output:", 1)[1].strip()

    try:
        parsed_request = json.loads(response_content)
        return parsed_request
    except json.JSONDecodeError:
        print("-----")
        print("Error parsing LLM response as JSON.")
        print("Please try rephrasing your query.")
        print("-----")
        raise ValueError("LLM returned an invalid JSON response.")
```

```
one_shot_example = """
```

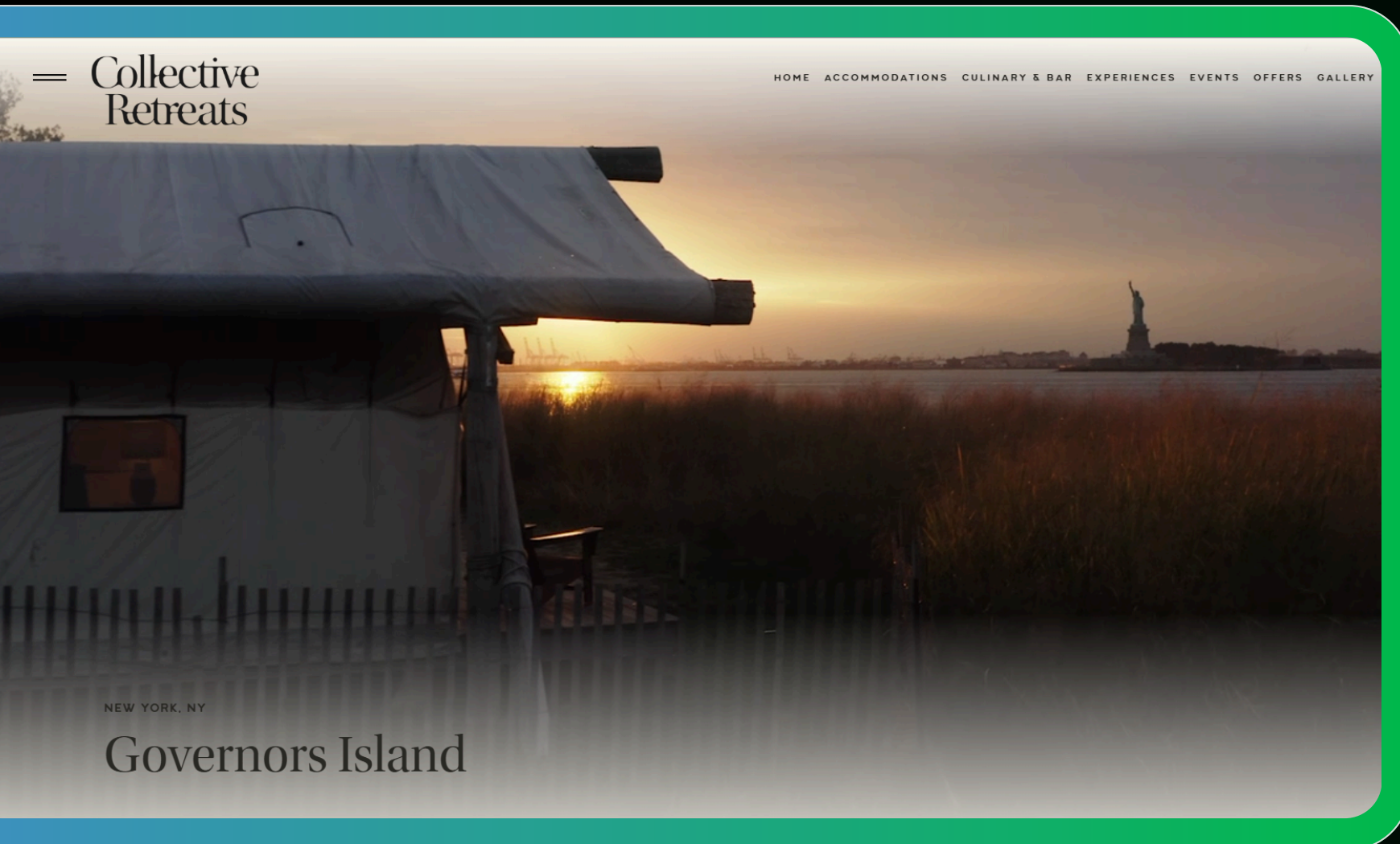
```
Example User Input: "I want to find a hotel in London, with 3 star and wifi"
```

```
Example Output: {
```

```
  "filters": {"cityName": "London", "HotelRating": "ThreeStar", "HotelFacilities": "Wifi"}
```

```
}
```

```
"""
```



# Hotel detail

- New York Looks Different From Here
- Immediately accessible yet a world away. Take an 8-minute ferry ride and set foot onto the island's 173 acres of peaceful, sprawling green space. Unspoiled skyline and landmark views are enjoyed from our unique indoor/outdoor accommodations, sprinkled from the shoreline to the retreat's great lawn.
- Reset and get totally removed from city life while exploring all our island retreat has to offer. Morning yoga, slow bike rides, culinary explorations, sunset cocktails, and once-in-a-lifetime views await.

<https://collectiveretreats.com/governors-island/>



Run Feedback Metadata

Input

HUMAN

You are a travel assistant. Based on the user's question and the following information, provide a helpful answer.

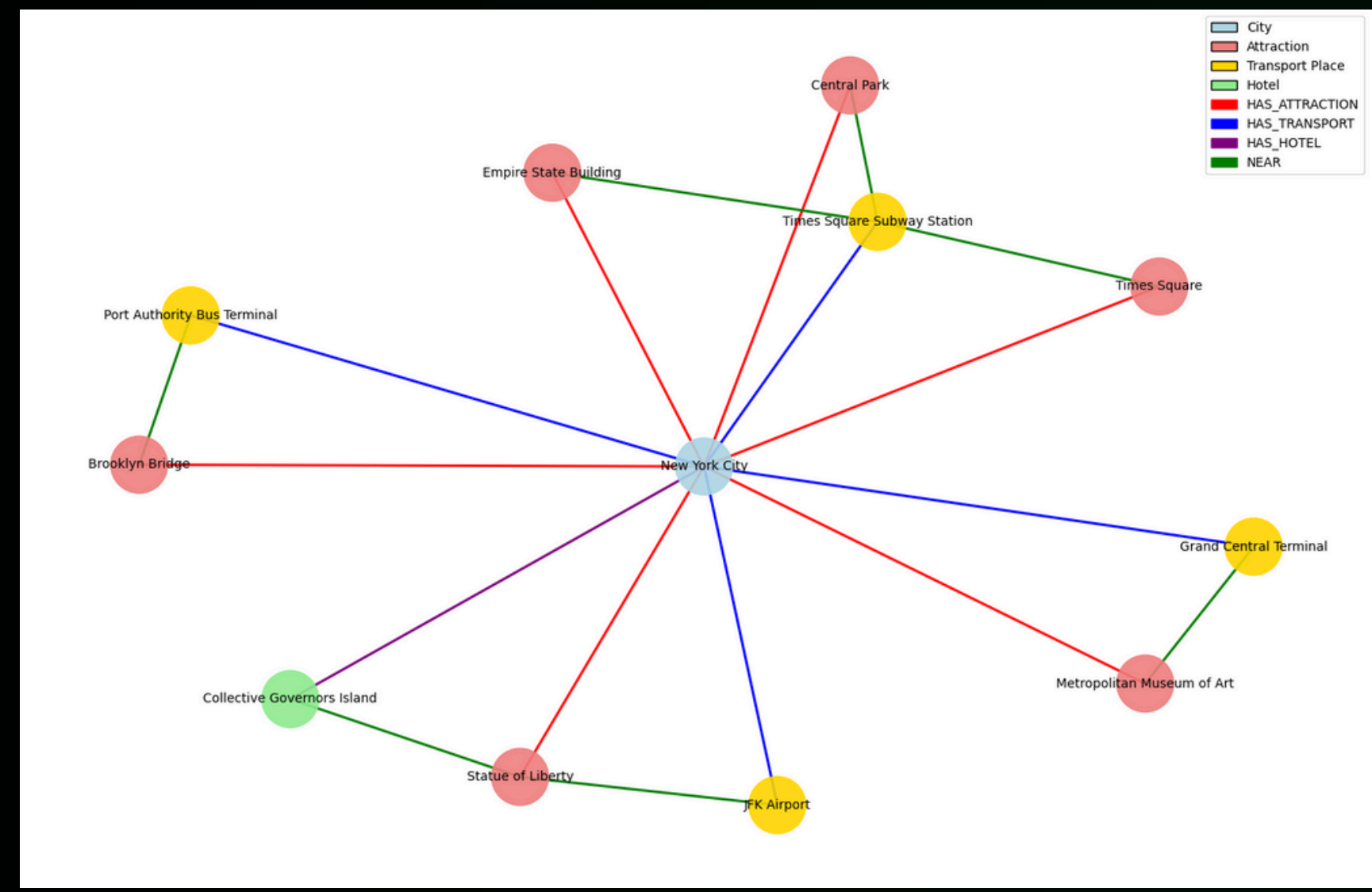
User Question: "What transportation options do I have if I want to reach Central Park?"  
Retrieved Information:  
Transport options to Times Square: Times Square Subway Station.  
Attractions in New York City: Central Park, Times Square, Statue of Liberty, Empire State Building, Metropolitan Museum of Art, Brooklyn Bridge.  
I'm sorry, I couldn't understand your query. Please try rephrasing.

Answer:

Rendered Output

AI

To reach Central Park, you can take the subway to Times Square Subway Station and then transfer to another subway line or take a bus to reach Central Park. Central Park is a popular attraction in New York City and is easily accessible by public transportation.



20241209\_Lang\_Travel\_V2

RunsThreadsMonitorSetup

≡ 1 filter

Last 7 days

Root Runs

LLM Calls

All Runs

Columns

<input type="checkbox"/>	>	✓	Name	Input	Output	Error	Start Time	Latency	Dataset	Annotation Queue	Tokens	Cost
<input type="checkbox"/>		✓	ChatOpenAI	human: you are a trav...	ai: Thank you for ...		2024/12/11 02:44:43	🕒 0.85s	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	2,737	\$0.0014225
<input type="checkbox"/>		✓	ChatOpenAI	human: Please deter...	ai: No		2024/12/11 02:44:43	🕒 0.33s	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	47	\$0.0000245
<input type="checkbox"/>		✓	ChatOpenAI	human: Please deter...	ai: No		2024/12/11 02:44:42	🕒 0.32s	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	47	\$0.0000245
<input type="checkbox"/>		✓	ChatOpenAI	human: you are a trav...	ai: At Collective G...		2024/12/11 02:44:25	🕒 1.29s	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	2,376	\$0.001296
<input type="checkbox"/>		✓	ChatOpenAI	human: Please deter...	ai: No		2024/12/11 02:44:25	🕒 0.34s	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	48	\$0.000025
<input type="checkbox"/>		✓	ChatOpenAI	human: Please deter...	ai: No		2024/12/11 02:44:24	🕒 0.32s	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	48	\$0.000025
<input type="checkbox"/>		✓	ChatOpenAI	human: you are a trav...	ai: To get to Colle...		2024/12/11 02:44:14	🕒 1.43s	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	1,845	\$0.0010185
<input type="checkbox"/>		✓	ChatOpenAI	human: Please deter...	ai: No		2024/12/11 02:44:13	🕒 0.30s	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	47	\$0.0000245
<input type="checkbox"/>		✓	ChatOpenAI	human: Please deter...	ai: No		2024/12/11 02:44:13	🕒 0.45s	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	47	
<input type="checkbox"/>		✓	ChatOpenAI	human: you are a trav...	ai: To contact Col...		2024/12/11 02:43:50	🕒 0.87s	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	1,296	
<input type="checkbox"/>		✓	ChatOpenAI	human: Please deter...	ai: No		2024/12/11 02:43:49	🕒 0.33s	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	48	
<input type="checkbox"/>		✓	ChatOpenAI	human: Please deter...	ai: No		2024/12/11 02:43:49	🕒 0.37s	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	48	
<input type="checkbox"/>		✓	ChatOpenAI	human: The dataset h...	ai: { "filters": {"H...		2024/12/11 02:43:36	🕒 0.48s	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	227	
<input type="checkbox"/>		✓	ChatOpenAI	human: The dataset h...	ai: { "filters": {"H...		2024/12/11 02:43:21	🕒 0.59s	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	228	

TRACE

Collapse

Stats

Filter

Show All

ChatOpenAI

gpt-3.5-turbo

🕒 0.85s

🗨 2,737

ChatOpenAI

PlaygroundAdd to

RunFeedbackMetadata

Run IDTrace ID

Input

HUMAN

you are a travel agent,Based on the user's question and the following information, provide a helpful answer.

User Question: "thankyou, exit"

Retrieved Information:

Hotel Name: Collective Governors Island

Rating: FiveStar

Attractions Nearby: nan

Description: With Barclays Center reachable in 5.1 km, Collective Governors Island features accommodation, a restaurant, a garden, a shared lounge and a terrace. Complimentary WiFi is offered throughout the property. There is a private bathroom with shower in some units, along with free toiletries, a hairdryer and slippers. National September 11 Memorial & Museum is 6.3 km from the camping, while One World Trade Center is 6.5 km from the property. The nearest airport is John F. Kennedy International Airport, 21 km from Collective Governors Island. Guests are required to show a photo identification and credit card upon check-in. Please note that all Special Requests are subject to availability and additional charges may apply. Please inform Collective Governors Island in advance of your expected arrival time. You can use the Special Requests box when booking, or contact the property directly with the contact details provided in your confirmation. In response to Coronavirus (COVID-19), additional safety and sanitation measures are in effect at this property.

START TIME

12/11/2024, 02:44:43 AM

END TIME

12/11/2024, 02:44:44 AM

TIME TO FIRST TOKEN

N/A

STATUS

Success

TOTAL TOKENS

2,737 tokens / \$0.0014225

LATENCY

🕒 0.85s

TYPE

LLM

Rendered Output

AI

Thank you for your interest in Collective Governors Island. If you have any further questions or need assistance with booking, feel free to reach out to us at hello@collectiveretreats.com or call (970) 445-2033. Have a great day!

- System Performance Report
- Key Metrics
- Last 7 Days Statistics:
- Run Count: 231
- Total Tokens Used: 72,634 (\$1.01)
- Median Tokens per Run: 219
- Error Rate: 3%
- Streaming Usage: 0%
- Latency Analysis
- P50 Latency: 0.80 seconds
- P99 Latency: 10.14 seconds

# Ref:

## References

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<https://medium.com/@bijit211987/advanced-rag-for-llms-slms-5bcc6fbba411>

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<https://python.langchain.com/docs/tutorials/rag/>

LangChain Smith. (n.d.). LangChain Smith. <https://smith.langchain.com/>

Smith, J., & Doe, A. (2023). Tourist attractions prediction with enhanced location knowledge graph. In 2023 IEEE Conference on Artificial Intelligence (pp. 123–130). IEEE. <https://ieeexplore.ieee.org/document/10466836>

TravelRAG: A tourist attraction retrieval framework based on multi-layer knowledge graph. (2023). ISPRS International Journal of Geo-Information, 13(11), 414. <https://www.mdpi.com/2220-9964/13/11/414#>

(2023, March 10). [Video]. Bilibili. <https://www.bilibili.com/video/BV1FtytYeEQM>

(Year). 6b6277a4f30b41aeb7a56bd5524dbe49.  
<http://bos.itdks.com/6b6277a4f30b41aeb7a56bd5524dbe49.pdf>

# Thank You

FOR YOUR ATTENTION