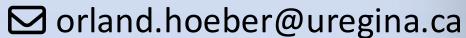
Supporting Human Intelligence -An Alternative to Retrieval Augmented Generation in Academic Digital Library Search

Orland Hoeber















Retrieval-Augmented Generation (RAG)

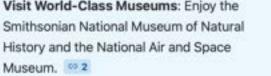
- RAG leverages LLMs and GenAI to turn search queries into clear and concise answers
- The general process is to:
 - rewrite the query in multiple different ways to address the word mismatch problem
 - combine and re-rank the search results
 - use the top-n results as the basis for generating an answer

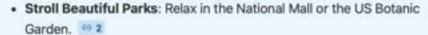




Here are some interesting things to do in Washington, D.C.:

- · Explore Hidden Attractions: Discover unique spots like the Catacombs of Washington, D.C. and Riggs Library. 91
- · Visit World-Class Museums: Enjoy the History and the National Air and Space Museum. 00 2





- Experience Local Culture: Take a self-guided street art tour or enjoy festivals throughout the year. 991
- . Tour Iconic Landmarks: Visit the White House, Lincoln Memorial, and the United States Capitol. 22 These activities offer a mix of history, culture, and fun experiences in the

Ø C ⇔ 5 Sources

capital city!

Atlas Obscura

289 Cool and Unusual Things to Do in...

TourScanner

73 Fun & Unusual Things to Do in Washington DC -...

View all



Interesting things to do in Washington D.C. include visiting iconic monuments like the Lincoln Memorial and Washington Monument, exploring free Smithsonian museums such as the National Museum of Natural History and the National Air and Space Museum, and touring significant government buildings like the

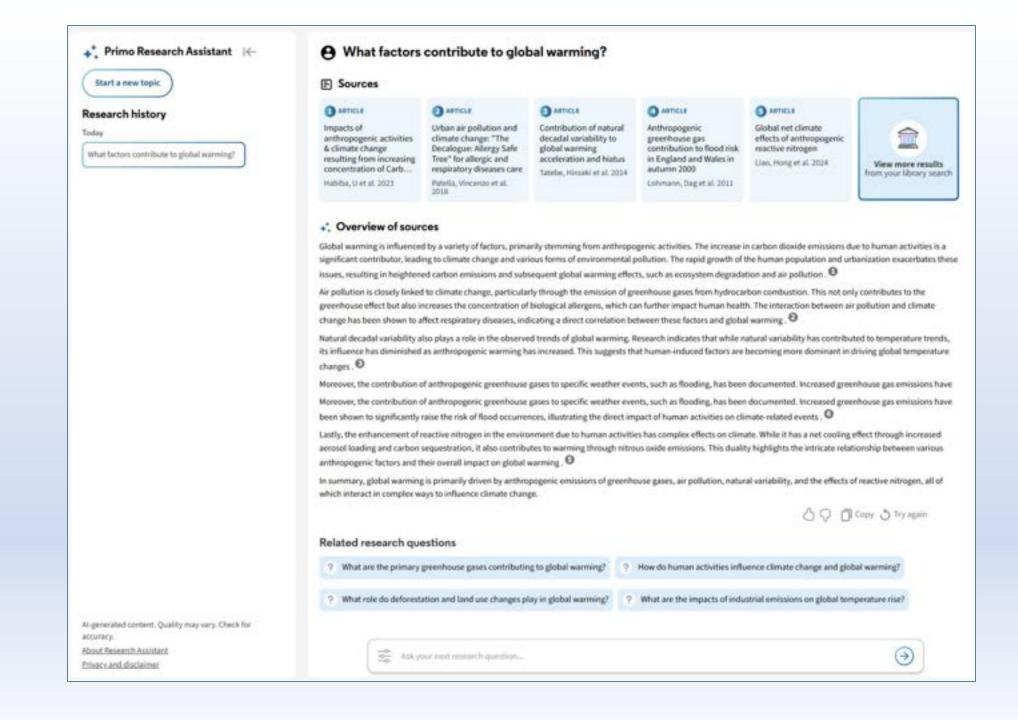
White House and the U.S. Capitol. You can also visit the National Archives Museum, the International Spy Museum, and the National Mall to see memorials like the World War II Memorial.

Historic and government sites

The White House: See the official residence and workplace of the President of the

Show more V





RAG: Turns all searching into question-answering

- RAG automates two human elements of searching:
 - query formulation
 - search result evaluation
- This works well when the task is unambiguous and has clear answers
- What if the search task is related to academic work, where the goal is to learn?



The Academic Digital Library Context

- Academic digital libraries provide access to reliable and curated collections of resources
- Purpose: to enable learning and research within an academic community (students, researchers, and lecturers/professors)
- Sometimes providing an answer (via RAG) is misaligned with the search goal



Exploratory Search

- Exploratory browsing
 - discovery
 - learning
 - investigation
- Focused searching
 - query reformulation
 - result examination
 - information extraction
- Fluctuating uncertainty
- Difficult to complete in a single session



Dilex Search – Supporting Human Intelligence

GenAl Risk

 If we direct all searches to AI-generated answers, we offload the cognitive aspect of searching to the AI, limiting the ability for people to learn as they search

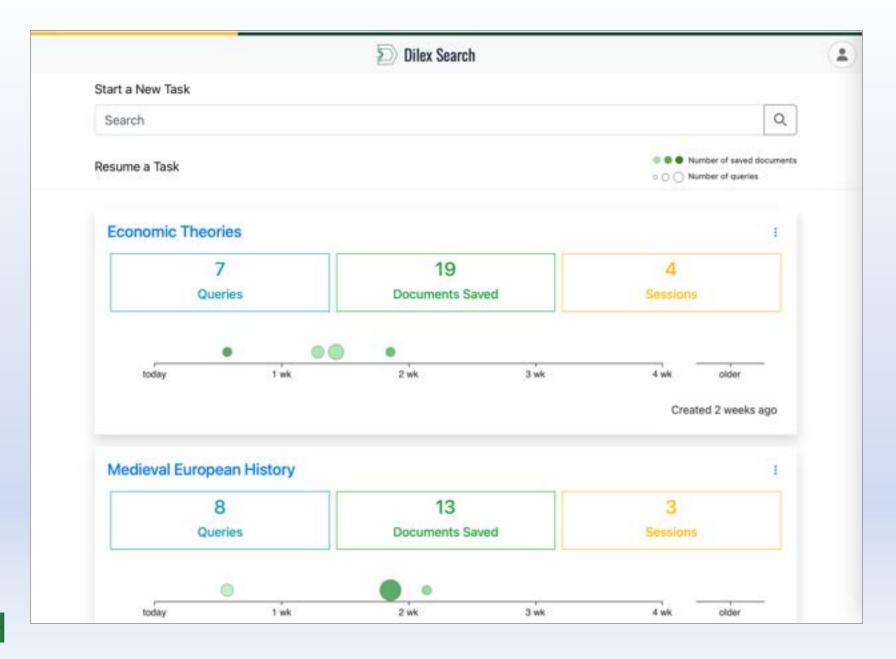
Human-Centred Approach

- Provide user interface support to enable and enhance human intelligence while searching
 - remember past search activities
 - support interactive exploration
 - encourage learning while searching

Dilex Search – Foundational Principles

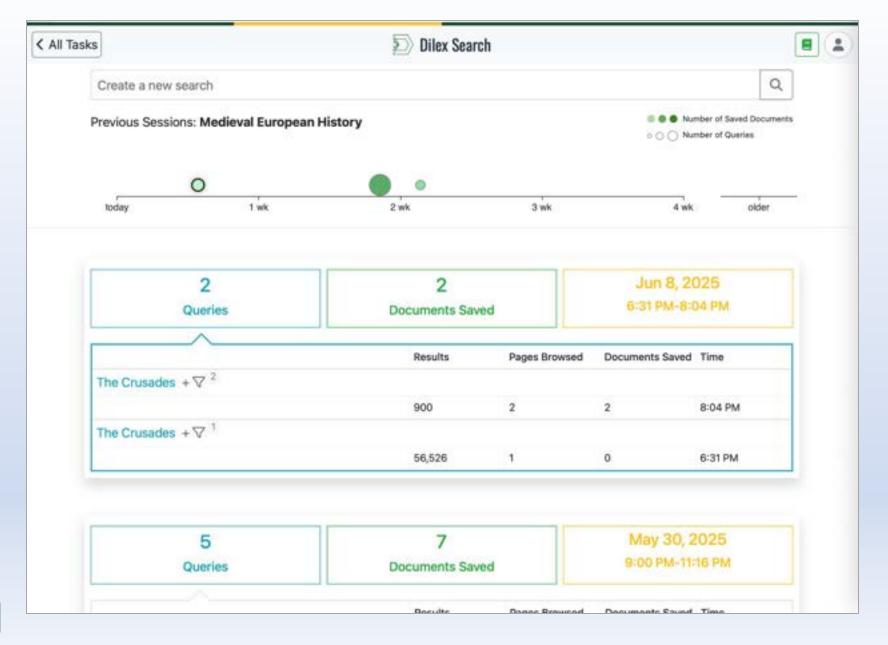
- Low barrier to use and adoption through lightweight additions to the common search interface design pattern
- Clear and intuitive visualizations to allow searchers to see information without having to read it
- Interactivity to support searcher needs beyond issuing queries and evaluating search results
- Deep integration within academic digital library ecosystems (e.g., Ex Libris Primo)

Workspace Overview



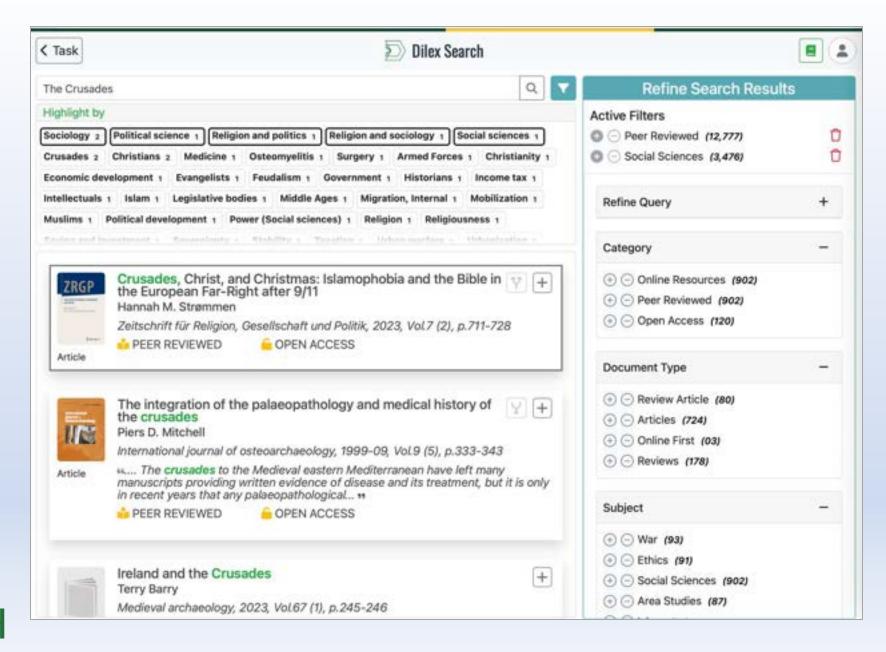


Workspace Detail



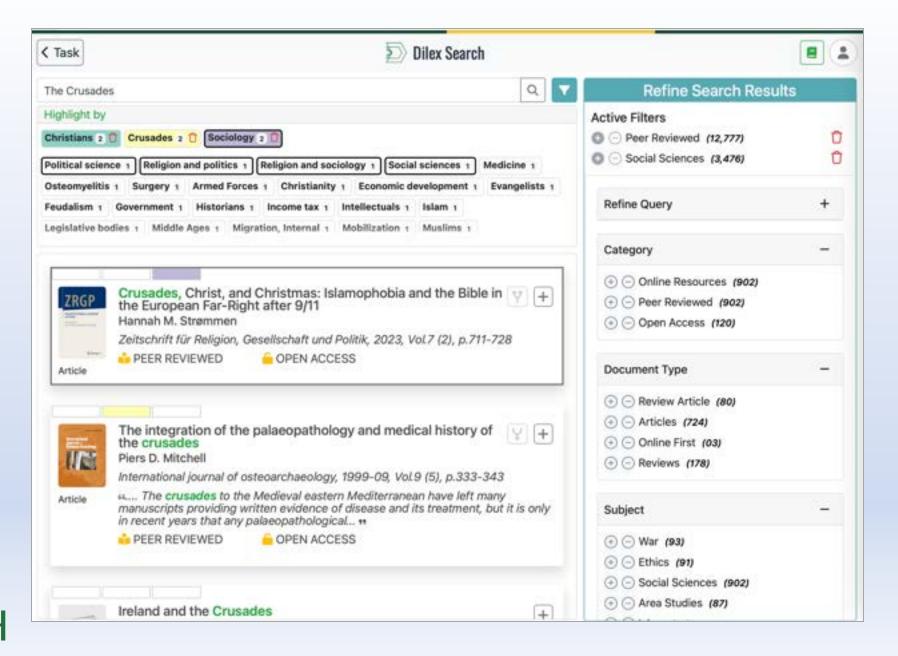


Task Resumption



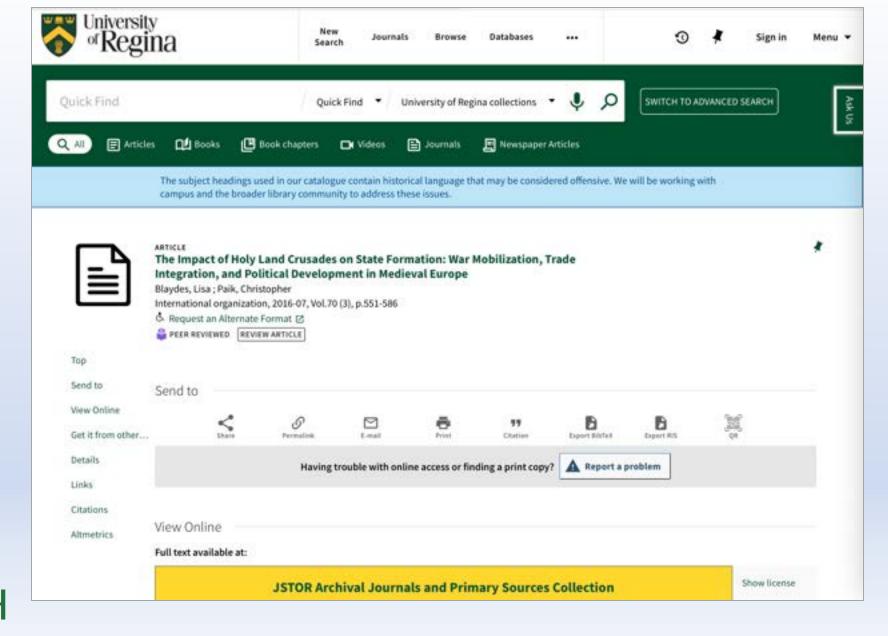


Results Exploration



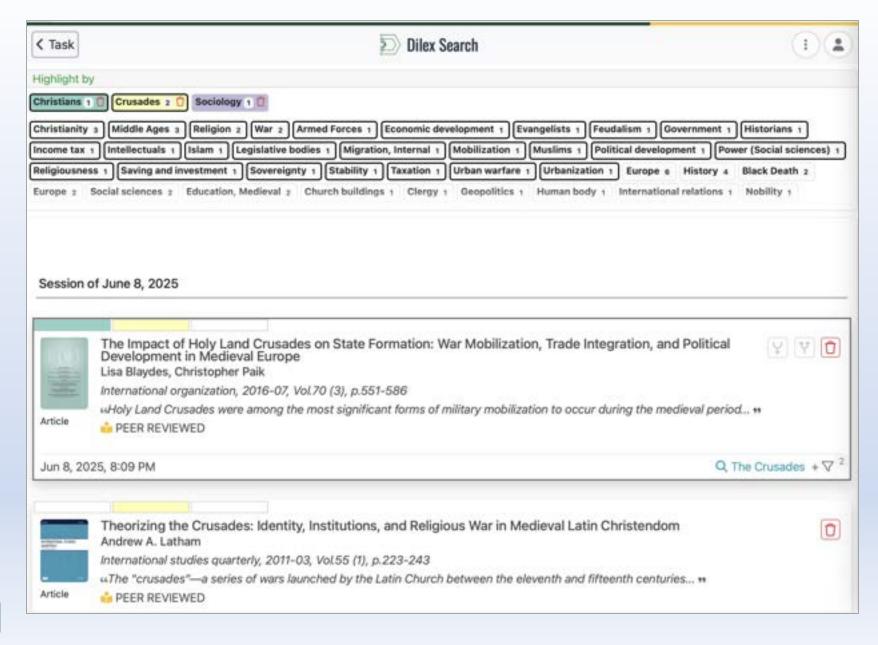


Resource Details Integrated with Primo



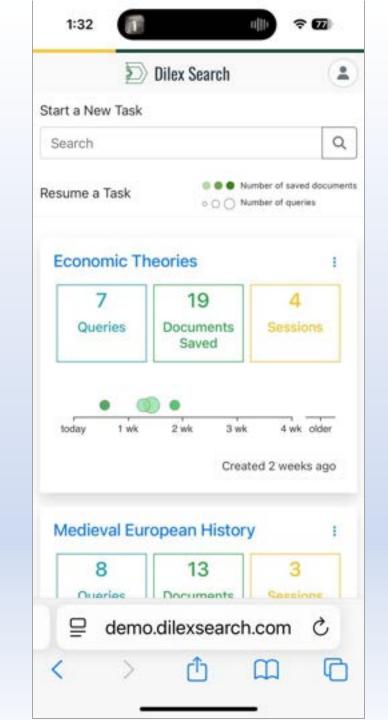


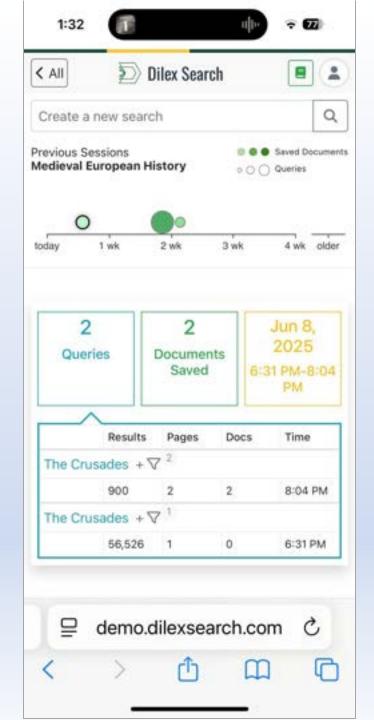
Workspace Exploration





Mobile Search







Mobile Search







Next Steps: Augmenting Human Search with GenAl

Augmenting Human Search

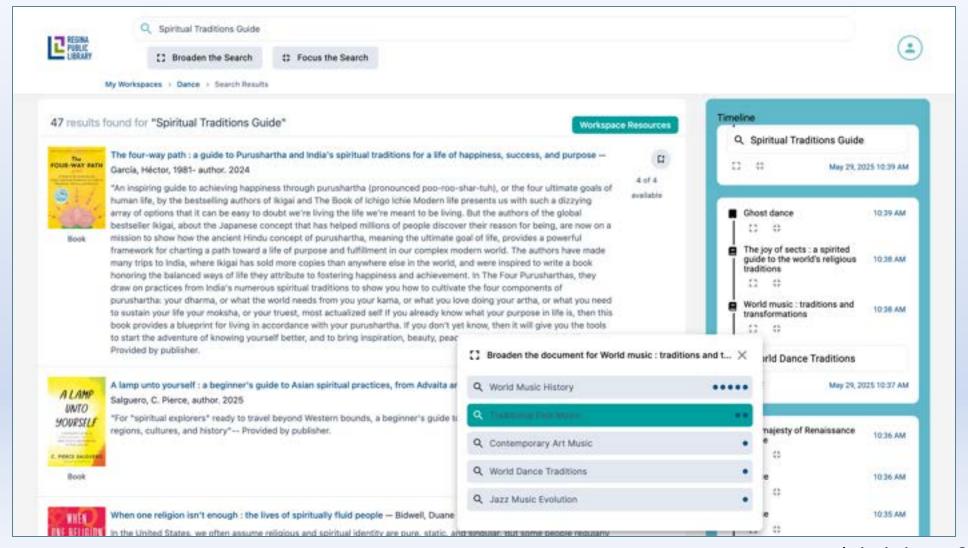
 Leverage LLMs and GenAI to support the journey of searching, rather than jumping to the destination

Support critical assessment and learning

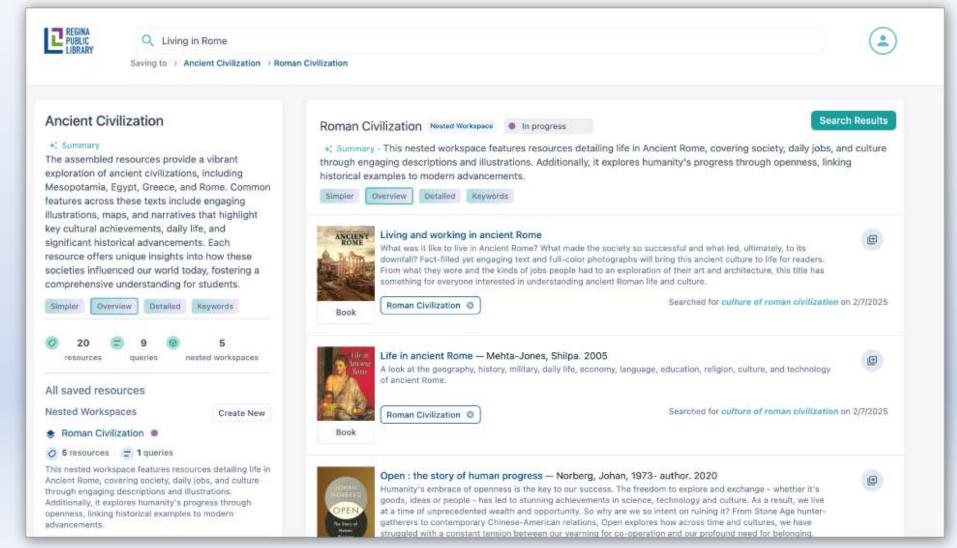
- Consider carefully:
 - where the human intelligence should be enabled
 - where the AI can take over
 - how to manage the human-AI interaction to augment rather than replace human intelligence



Query Refinement

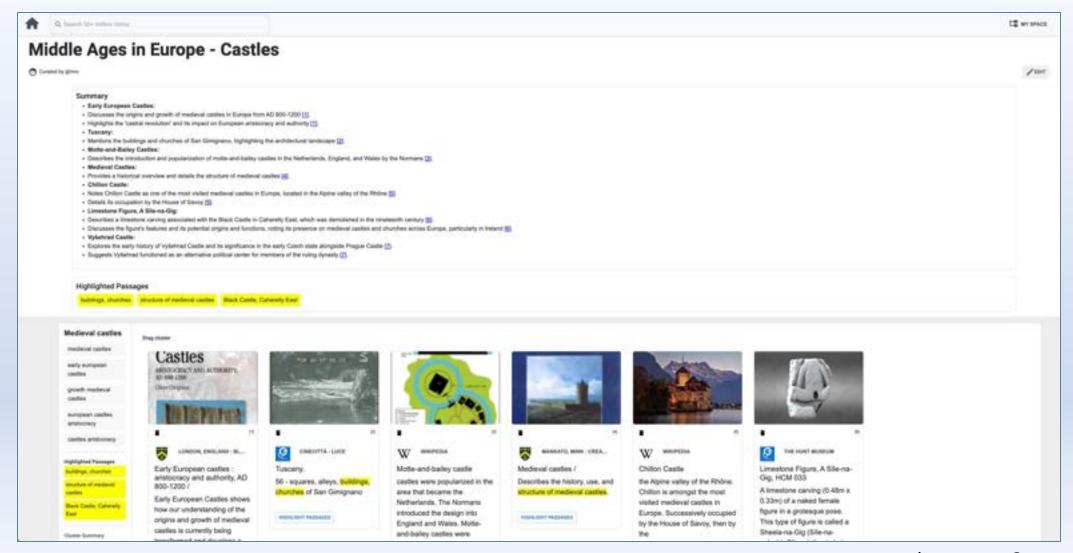


Cross-session Search



20

Cross-session Search



(Momeni & Hoeber, 2025)

Workspace Augmented Generation (WAG)

- The last two interfaces are example of WAG
 - leverage human intelligence in saving relevant resources to the workspace
 - leverage GenAI to produce summaries of found information
- The purpose of the generated output:
 - RAG answers to questions
 - WAG summaries of what was found



Acknowledgements

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- Regina Public Library and the Saskatchewan Information Library Services Consortium











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