

2024 Ashby Hackathon in Computational Science

Center for Artificial Intelligence, NCSA

Agents/LLMs – How to?

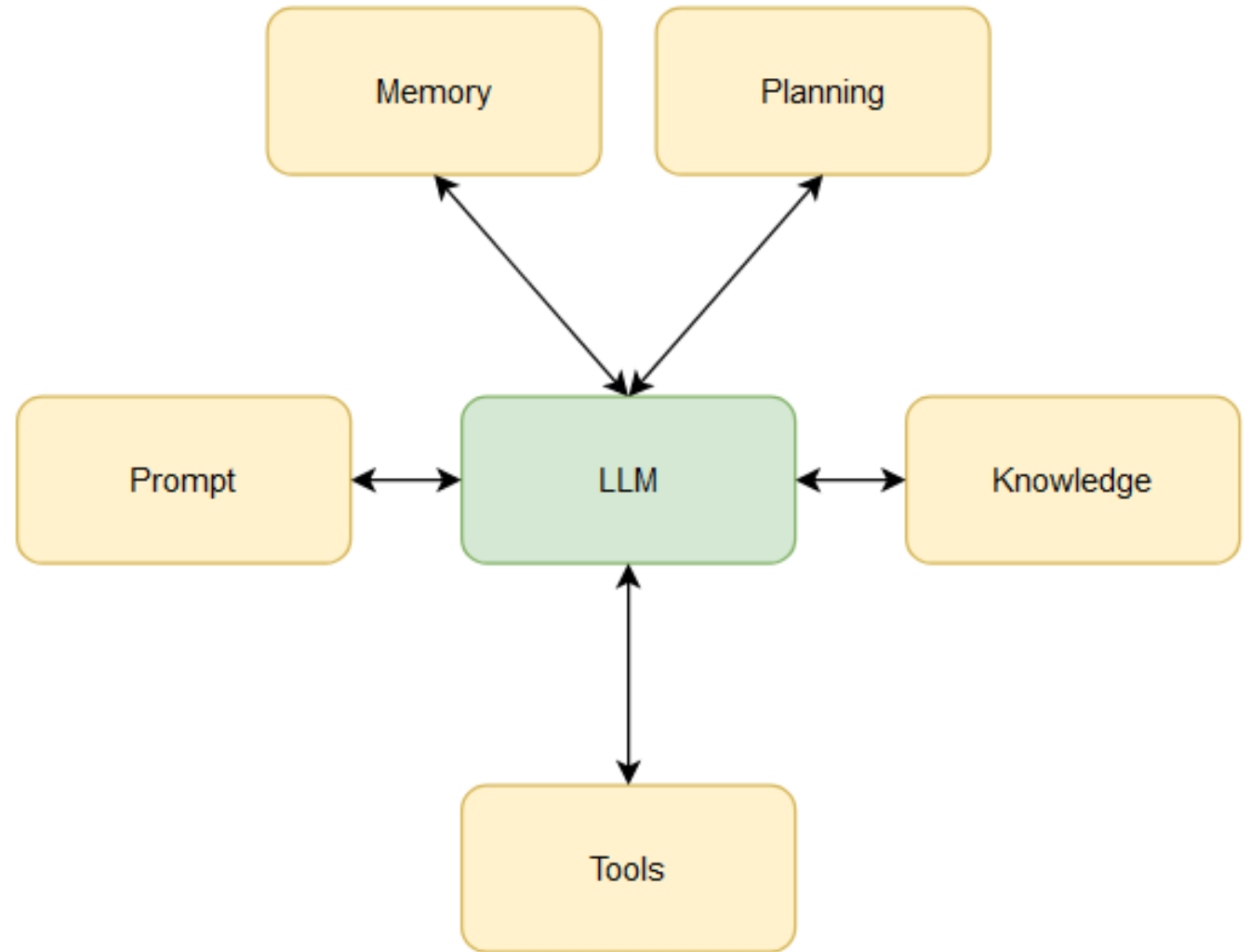
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Research Software Engineer
NCSA



NCSA

Agents

- **Planning**
 - LLM
- **RAG**
 - Documentation
 - Examples
 - Publications
- **Tools**
 - Code Execution
 - Browser
 - External REST API calls
- **Memory**
 - Agent progress
 - Intermediate steps



Open Source LLMs

- NCSA's LLM server - <https://ncsa.ai>
- Documentation - <https://docs.ncsa.ai>
- [Supported models](#)
- Drop-in replacement for OpenAI calls with custom base URL

```
# instant access from the command line 🙄🙄  
curl https://api.ncsa.ai/llm/v1/chat/completions \  
-H "Content-Type: application/json" \  
-d '{  
  "model": "NousResearch/Nous-Hermes-2-Mixtral-8x7B-DPO",  
  "messages": [{ "role": "user", "content": "Say this is a test!" }],  
  "temperature": 0.5,  
  "stream": false  
'
```



A word cloud of various Open Source LLM models. The models listed include: OPT, Jais, Qwen2, MoE, Baichuan, DeciLM, Orion, Mistral, LLaMA, BLOOM, Phi, Llama, InternLM2, Qwen2, ChatGLM, Gemma, Falcon, InternLM, Mixtral, GPT-J, StarCoder, Command-R, Qwen, DBRX, GPT-2, Phi, GPT-NeoX, Aquila, StableLM, and MPT. The words are in various colors and sizes, with Mistral and Gemma being the largest.

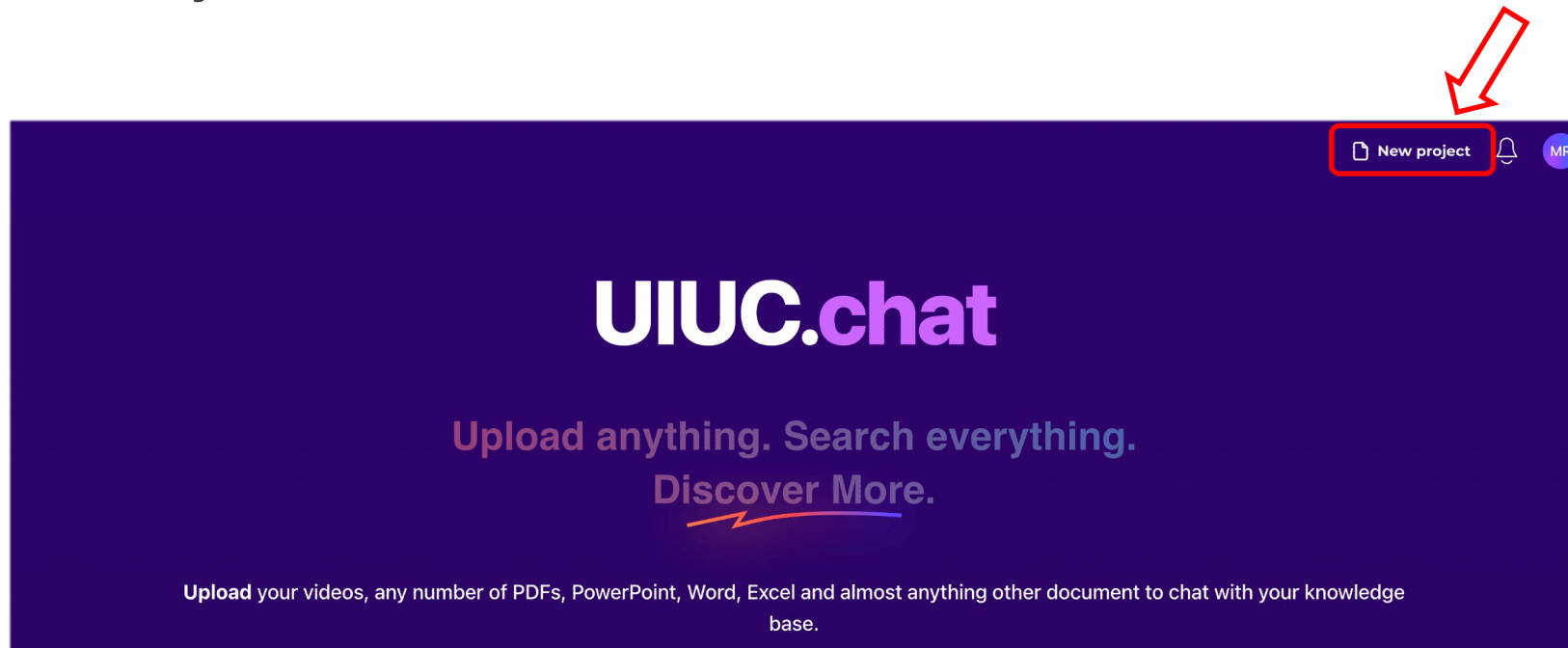
OpenAI Access

- Azure OpenAI
 - azure_endpoint/base_url
 - api_key
 - model/deployment_name
- How to get access?
 - Send an email to rohan13@illinois.edu with subject “Azure OpenAI credentials for Hackathon - <Team Name>”
- Use it wisely! CAll is kind enough to provide us OpenAI API credits 😊



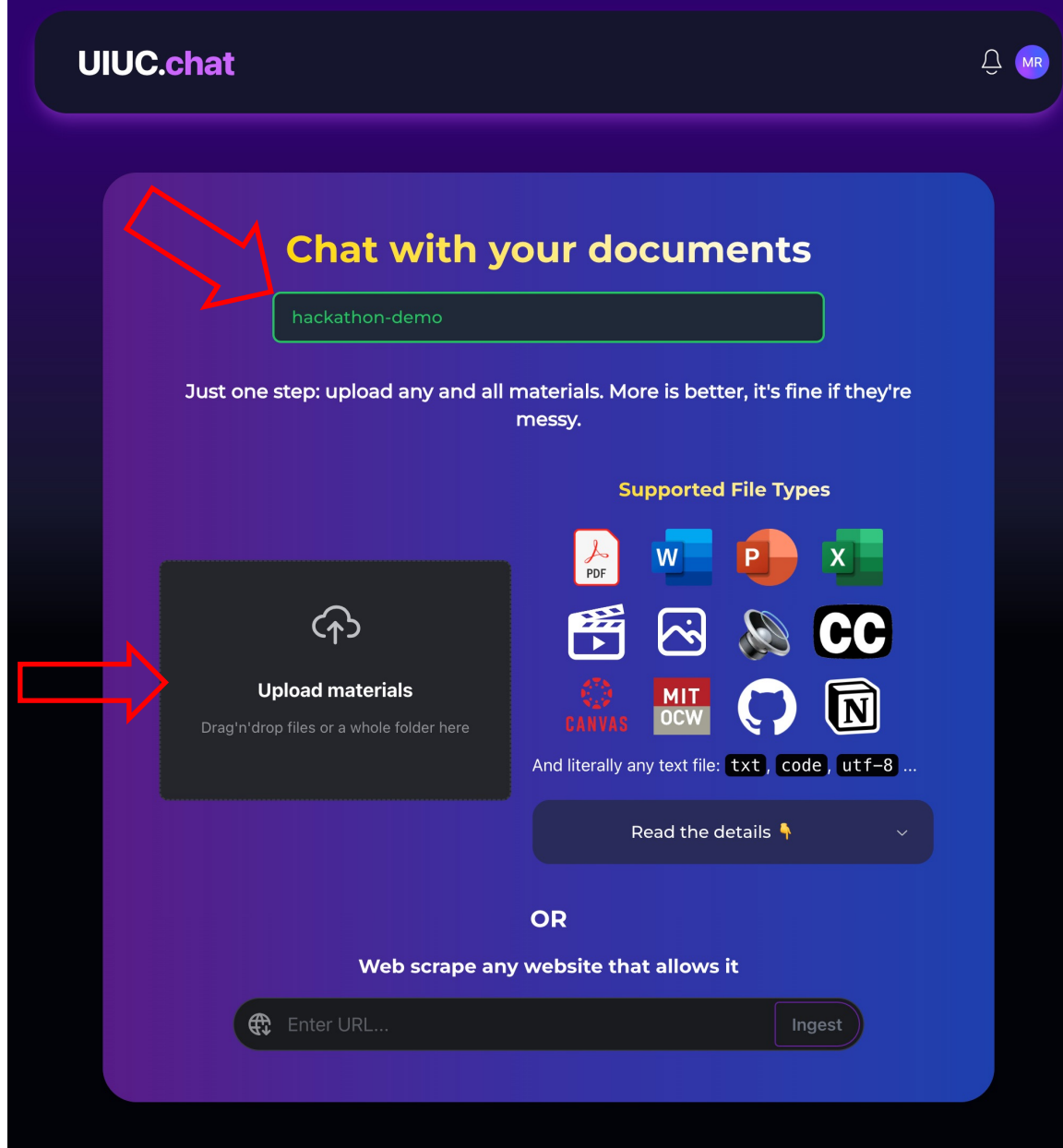
UIUC.chat

- Incorporates RAG for enhanced, context-aware responses from LLM
- Go to <https://uiuc.chat>
- Create New Project
- Login



UIUC.chat (cont.)

- Add your team's name in the project name
- Get all documents from [Drive](#) and upload them to the project
- Wait for documents to get ingested and redirection to "Materials" tab



UIUC.chat (cont.)

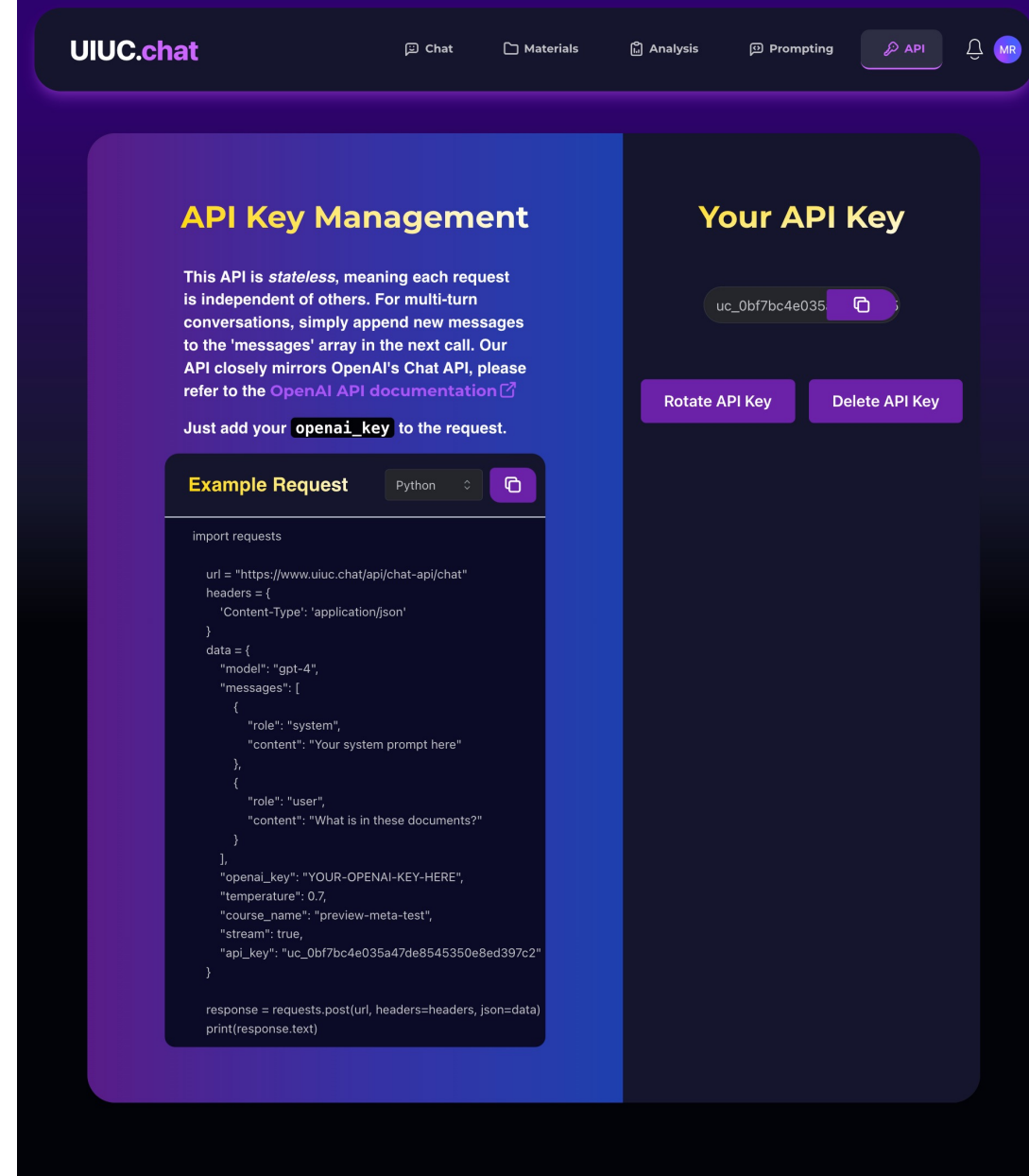
- Materials tab will help you configure project settings
- Add the Azure OpenAI API Key shared over email in the “Project-wide OpenAI key”
- Use the Chatbot/API from their respective tabs

The screenshot shows the UIUC.chat web application interface. At the top, a navigation bar includes the logo 'UIUC.chat' and tabs for 'Chat', 'Materials' (which is active), 'Analysis', 'Prompting', 'API', and a user profile icon 'MR'. The main content area is divided into two panels. The left panel, titled 'hackathon-demo', features an 'Upload materials' section with a cloud upload icon and the text 'Drag'n'drop files or a whole folder here'. Below this is a 'Supported File Types' section displaying icons for PDF, Word, PowerPoint, Excel, video, images, audio, Creative Commons, Canvas, MIT OCW, GitHub, and a book icon. It also mentions 'And literally any text file: txt, code, utf-8 ...' and has a 'Read the details' button. The right panel contains configuration settings. The 'Project-wide OpenAI key' section includes a text input field and a 'Submit' button, with a red arrow pointing to it. Below this is 'Model Access Control' with a dropdown menu. The 'Visibility' section has a dropdown menu and a checkbox for 'Course is public. Click to change.' The 'Admins' section has a dropdown menu and a text input for 'Paste emails, even messy lists from i'. The 'Branding' section has a 'Set a greeting' dropdown menu.

UIUC.chat (cont.)

Using Vectorstores

- Create your own (FAISS, Pinecone)
- Create project on UIUC.chat and use public endpoint to get OpenAI response
- Create project on UIUC.chat and use backend endpoint to get relevant documents

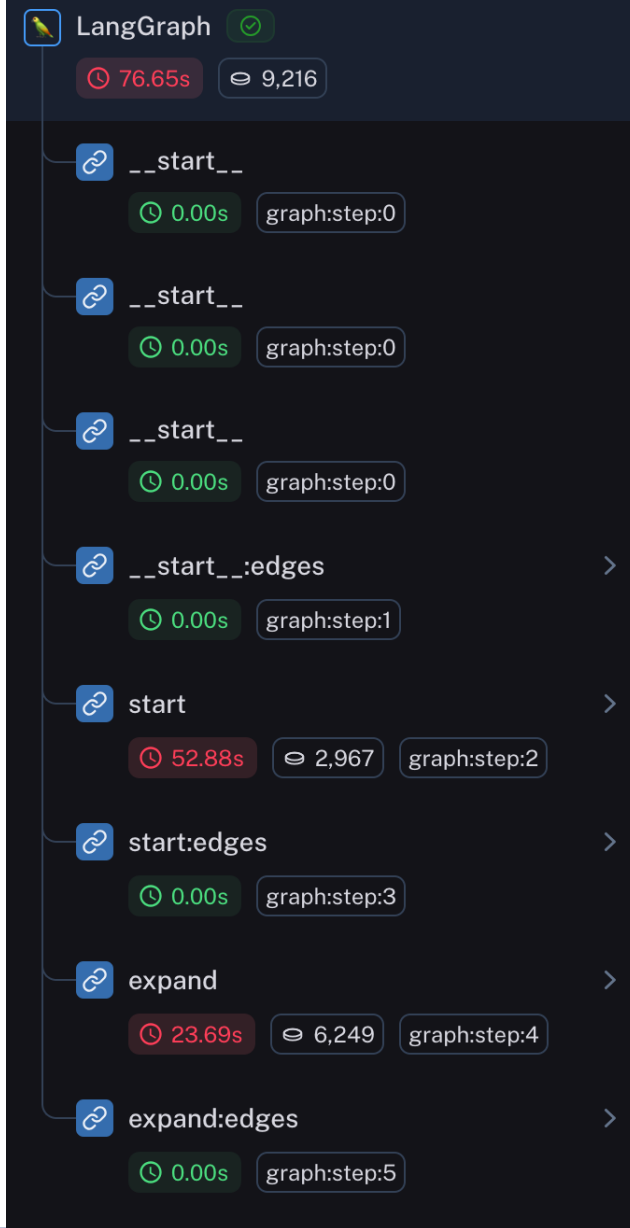


Agents/Workflows

- Example Agent - <https://github.com/UIUC-Chatbot/workflow-agent>
- Example Workflows - <https://github.com/rohan-uiuc/ncsa-hackathon-workflows>

Other relevant links:

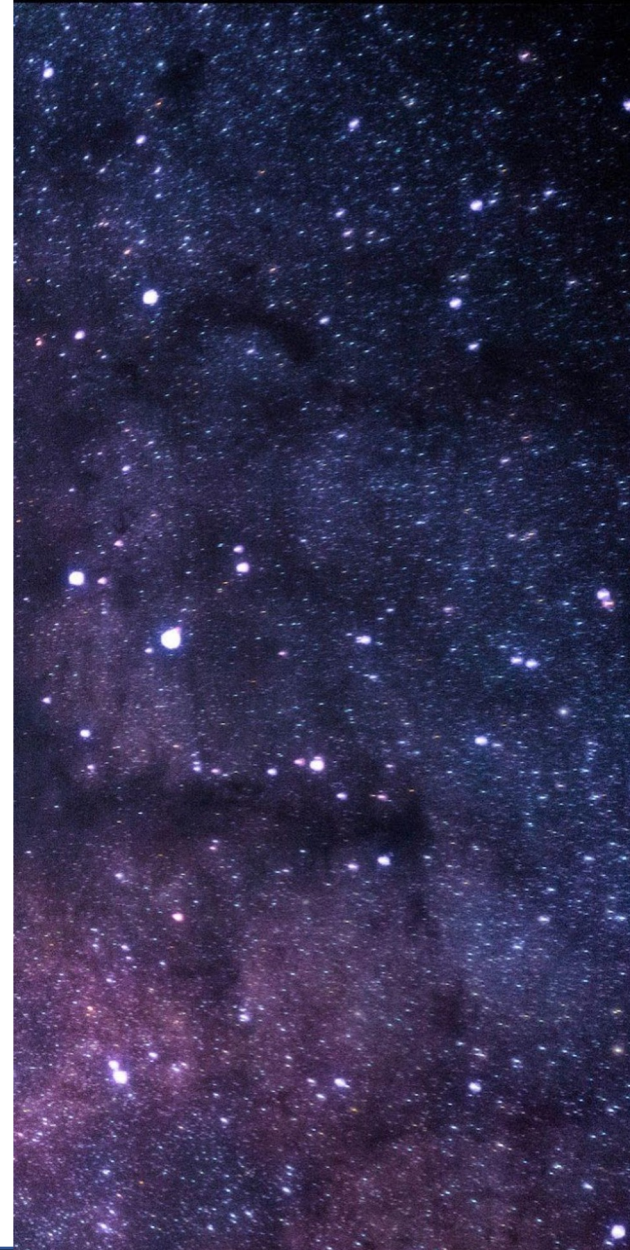
- How to create your own workflows? - <https://python.langchain.com/docs/langgraph/>
- Monitoring with langsmith - <https://python.langchain.com/docs/langsmith/>



Questions?

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Good Luck!