🦜🔗 LangChain 101

Austin LangChain Users Group

Agenda

- Mixer
- Welcome Message
- News & Announcements
- Lecture
- Labs

Welcome - Austin LangChain

- Local Austin LangChain User Group
  - Twitter - @AustinLangChain
  - Github - https://github.com/colinmcnamara/austin_langchain
  - Meetup - https://www.meetup.com/austin-lanchain-ai-group/
  - Discord - https://discord.gg/fjQfpwcsZX
- Monthly in person meetings & workshops
- Low stress, learning and sharing
- Connect with other early adopters
- Learn, Share, Grow

- CoC - **Be cool** to each other, no gross behavior

What we are building

- Community of builders centered around austin
- Users of LangChain
- Developers of LangChain
- Investors in AI Applications, People, and Platforms
- Contributors to Hackathons
- Friendly, Fun, Growth oriented environment

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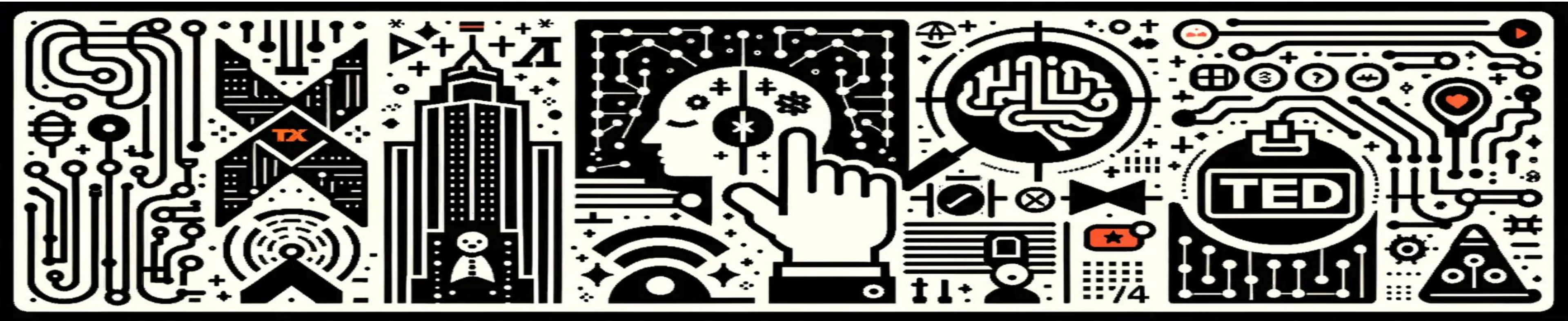
News and Announcements

- Austin LangChain Users Group formed in Austin: here
- TED AI Hackathon Kickoff [Oct 14]: here
- Reddit AMA 10/24 - r/langchain
- Cognitive Architectures for Language Agents (CoALA) webinar: here
- Shortwave Assistant Deepdive Webinar: here



🦜🔗 LangChain 101

Lecture & Labs

About Me - Colin McNamara

- **Home:** Austin, East Side
- **Work:** Managing Partner, Engineering & Finance @ Always Cool Brands
- **Background:** Hyperscale Cloud Engineering & Operations
- **FOSS:** Linux, OpenStack, OpenDaylight, …
- **Using LangChain:** Business operations
- **Goals:** grow skills, grow community, automate operations

Always Cool Brands - LangChain Use Case - Due Diligence

Our Business

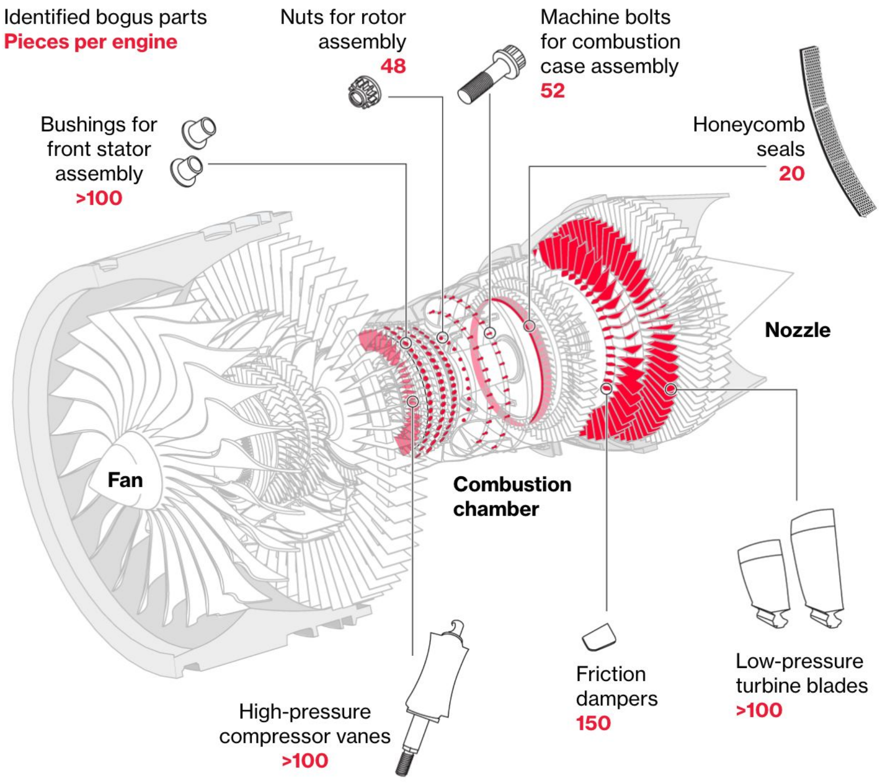
- Product Design - Brand & Private Label
  - D2C, Retail, Grocery, Club
- Engineering, Sourcing & Financing
- Regulatory - SQF, HASSUP, CAPA, SEC

RAG Solution for Due Diligence

- Docs + Workshops -> Vector Stores
- Python -> Markdown -> Git
- **Identified fraud** in our supply chain

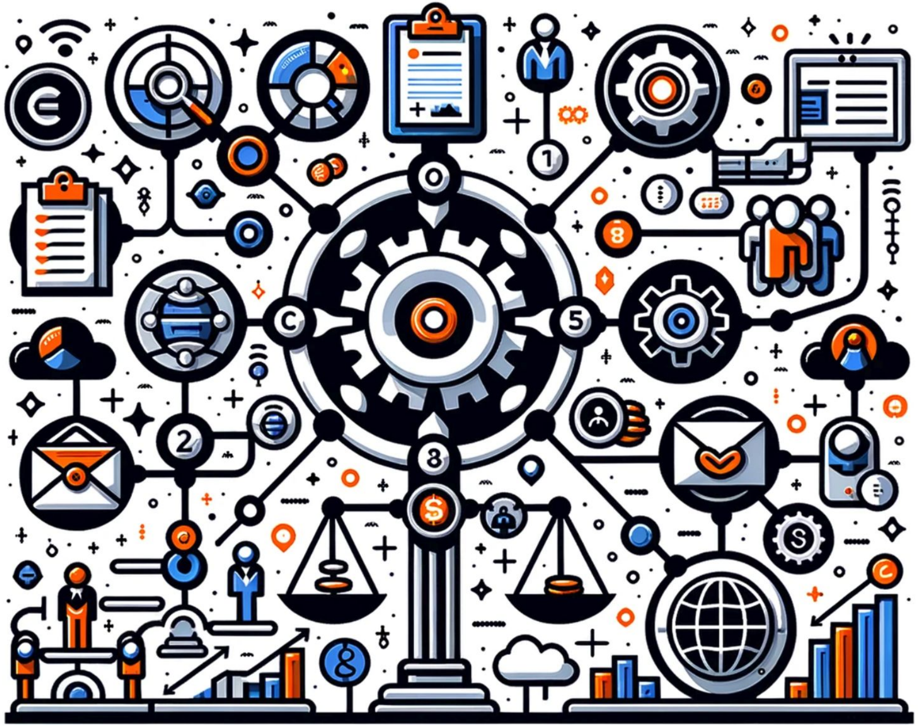
How safe is your next flight?

- London distributor AOG Technics - fake parts with forged documents.
- 90+ fake certificates and bogus parts on 126 engines.
- Fraud exposed weaknesses in parts market.
- Airlines urgently removing fake parts - Costing millions



How do we scale this?

- Integrations into key apps
  - Hubspot
  - Email / Chat
  - Gdocs
  - Product websites
- Control Cost at Scale
  - 40MM unit orders normal for retail
- Protect against Data Leakage
  - API endpoints vs public chat
- Address Bias in reports
  - Ragas, Human as Agent
- Audit and Control
  - Constitutional AI in pipelines
  - Safety Controls at user interface

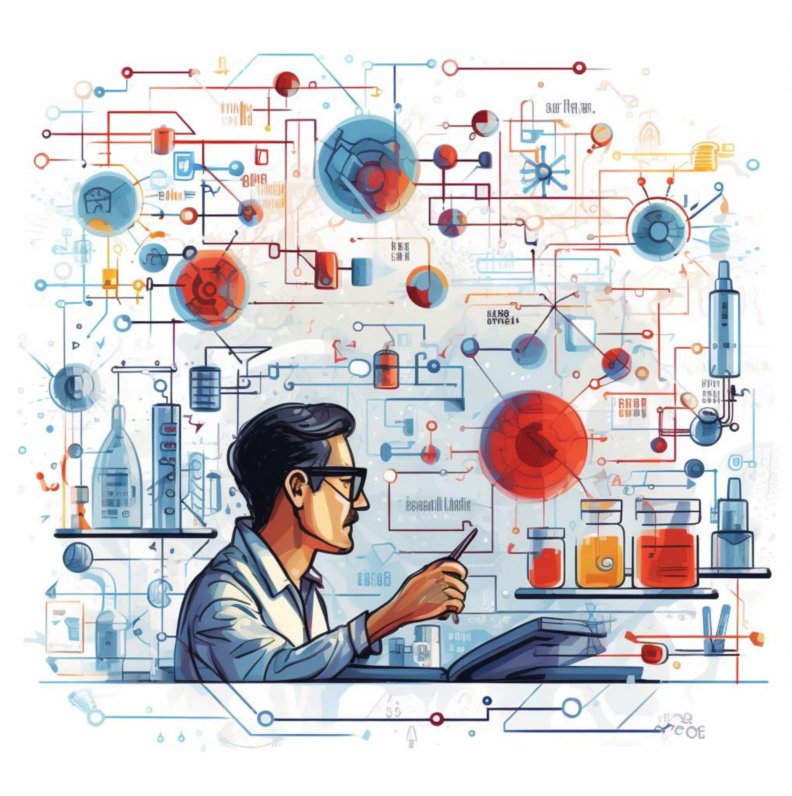


Lab Series - Our journey into production

- **LC101 - Intro to AI Microservices (Colab, Python, Streamlit)**
- LC102 - Enrich with data (Retrievers, Loaders, Ragas)
- LC103-9 - (Tools, Retrievers, Agents, Logic, Chains, Vector Stores)
- LC110 - Logging - (STD_OUT, LangSmith)
- LC201 - Local LangChain (Docker, Nginx)
- LC202 - Cloud Langchain (K8s, Netlify, Streamlit, GCE)
- LC203 - GitOps workflows(AI Microservices from repo commit)
- LC204 - Pipelines (git actions, netlify)
- LC205 - Reporting (Loki, SigNoz, LangSmith)

Course Structure

- Conceptual Overview (lecture)
- Labs, run in browser on Google Colab
- Conceptual Reinforcement
- More labs
- … etc



What is LangChain?

- **Open-Source** library for building LLM applications
- Founded by Harrison Chase
- **Python** and **Typescript** packages
- Focused on composition and modularity
  - Modular components & Implementations
  - Common use cases that combine components together

LangChain Key Concepts

- Models
    - LLM Integrations: 20+
    - Chat Models
    - Text Embeddings Models: 10+

LangChain Key Concepts

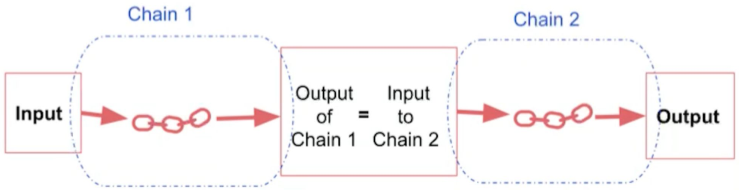
- Prompts
  - Features
    - Separate instructions & user input
    - Supports variable placeholders (e.g., {variable_name})
    - Composable for text & chat prompts
  - Types
    - PromptTemplate (text)
    - ChatPromptTemplate (chat)
    - Chain & Message templates

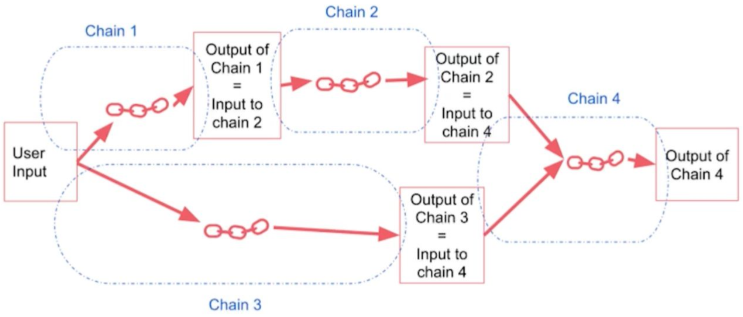
Prompt Template (Similar to sed/awk)

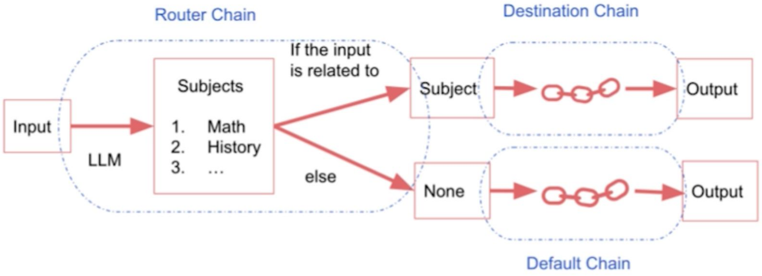
```
from langchain.prompts import PromptTemplate

prompt_template = PromptTemplate.from_template(
    "Tell me a {adjective} joke about {content}."
)
prompt_template.format(adjective="funny", content="chickens")

"Tell me a funny joke about chickens."
```

LangChain Key Concepts

- Chains
  - LLM Chains
  - Sequential Chains
  - Router Chains
  - Transformation Chains
  -
  - Building blocks for other chains
  - Application specific chains: 20+

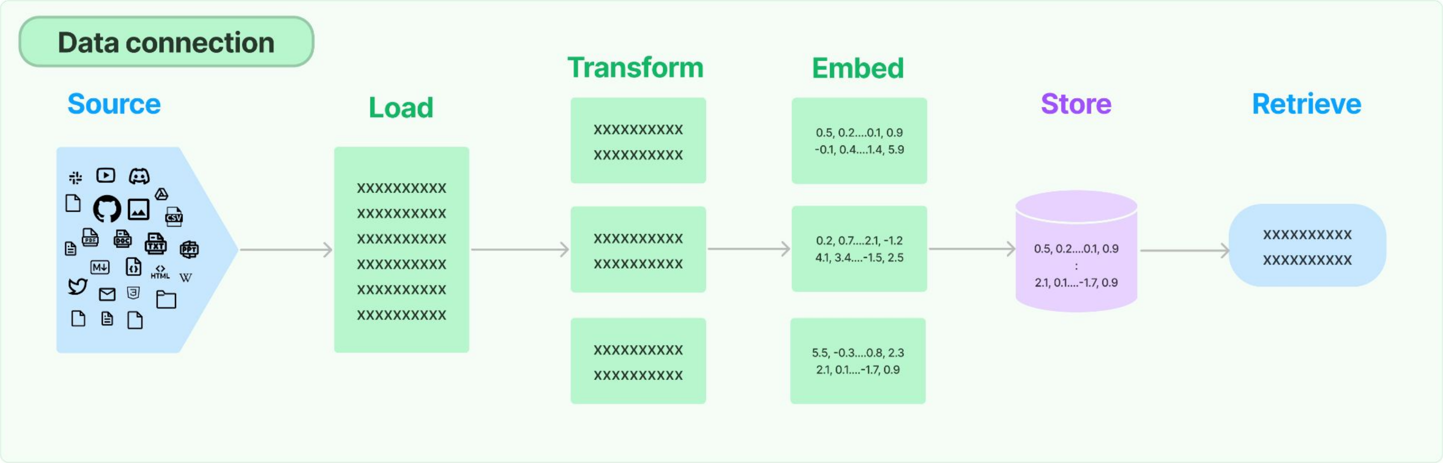



Chain 1
Chain 2
Chain 4
Chain 3
User Input
Output of Chain 1 = Input to chain 2
Output of Chain 2 = Input to chain 4
Output of Chain 3 = Input to chain 4
Output of Chain 4



LangChain Key Concepts

- Indexes
  - Document Loaders: 50+
  - Text Splitters: 10+
  - Vector Stores: 10+
  - Retrievers: 5+

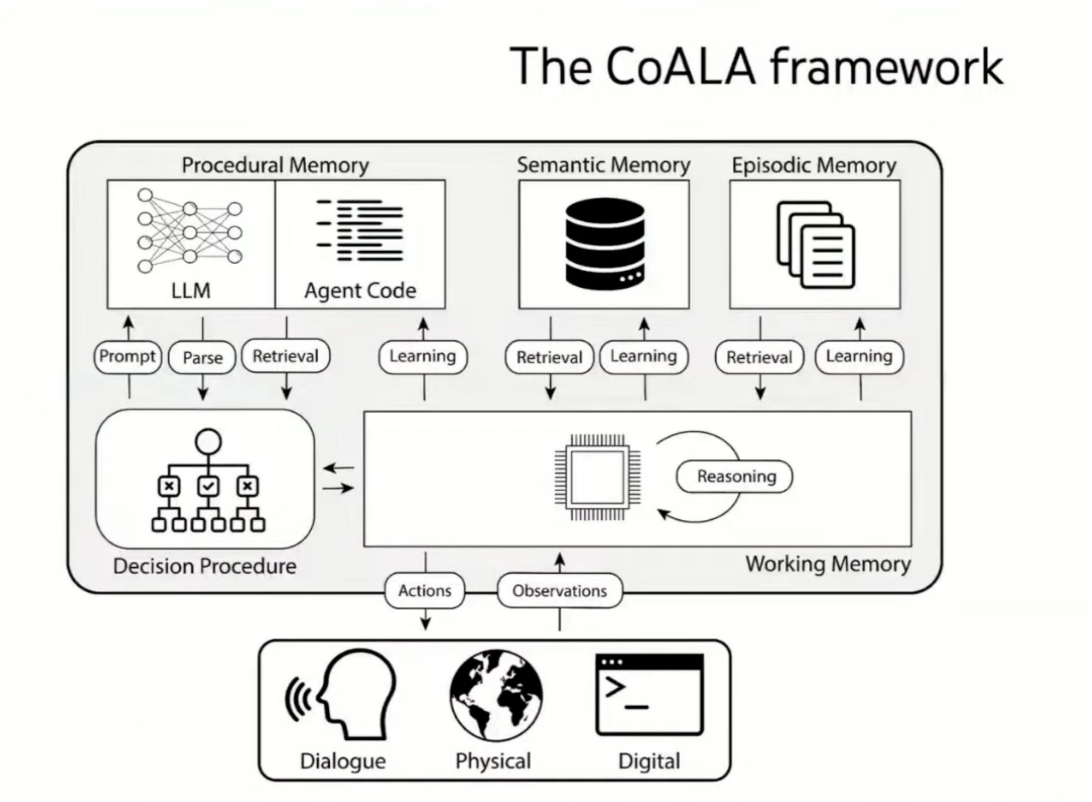


LangChain Key Concepts

- Tools
  - Set of functions available to agents
  - Internet Search
  - Multiple Vector Stores
  - 50+ more

LangChain Key Concepts

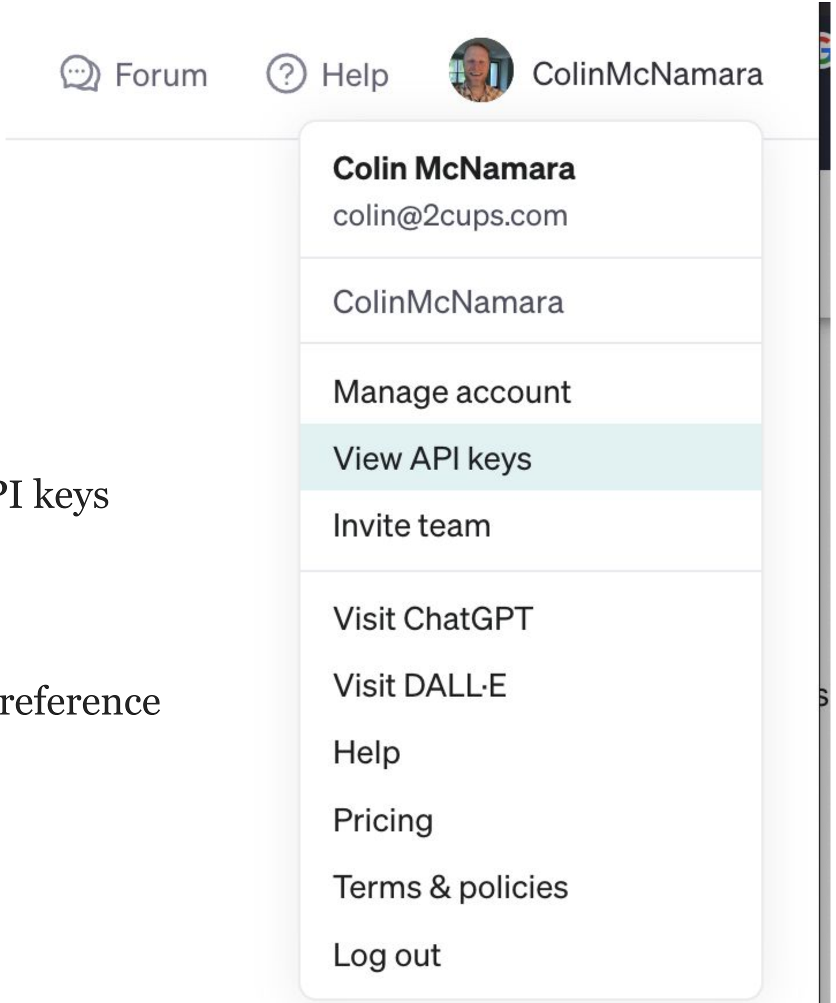
- Agents
  - Independent Entity
  - Has access to tools
  - Reasons, Acts (ReAct)
  - Combination of
    - LLM
    - Code
    - Memory
    - Tools



🦜🔗 Labs!!!

Lab - get your OpenAI key

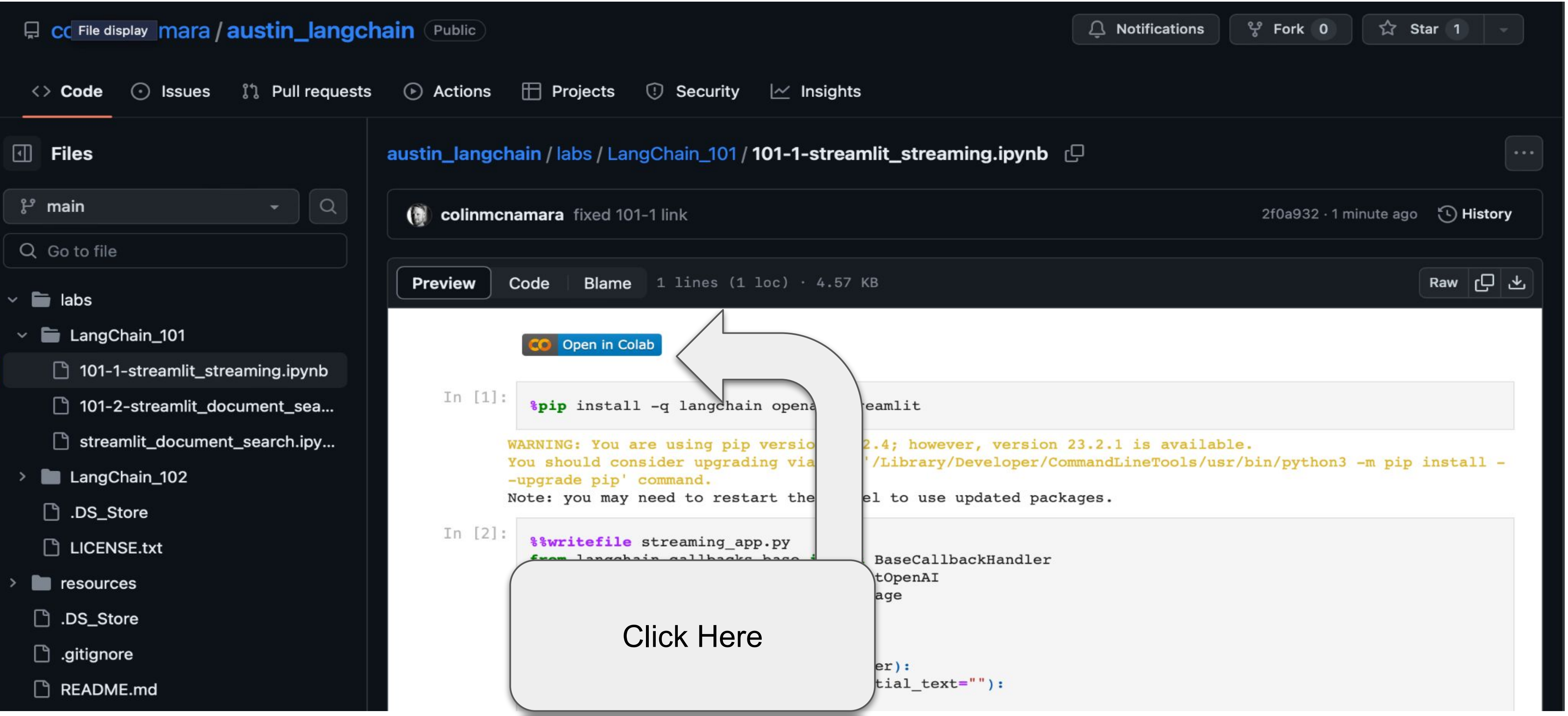
1. Go to https://openai.com/
2. Click on Menu > Developers > Overview
3. Click on your Profile image (top right) > View API keys
4. Click on `+ Create new secret key`
5. Enter an optional `Name` for the API key for future reference
6. Save this key using a password manager



LAB101-1 - Accessing Chat Model via API

- Required: OpenAI API Key: (keep this a secret)
- Required: Google account
- Use free Colab instance: https://colab.research.google.com
- Repo: https://github.com/colinmcnamara/austin_langchain/
- Notebook: /labs/LangChain_101/streemlit_streaming.ipynb

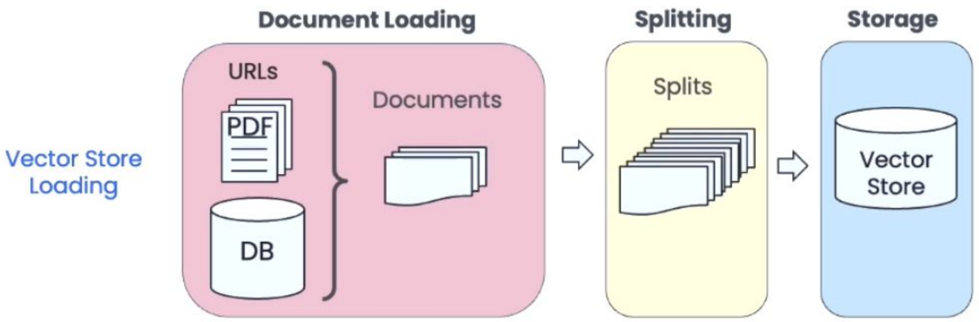
Open in Notebook in Colab

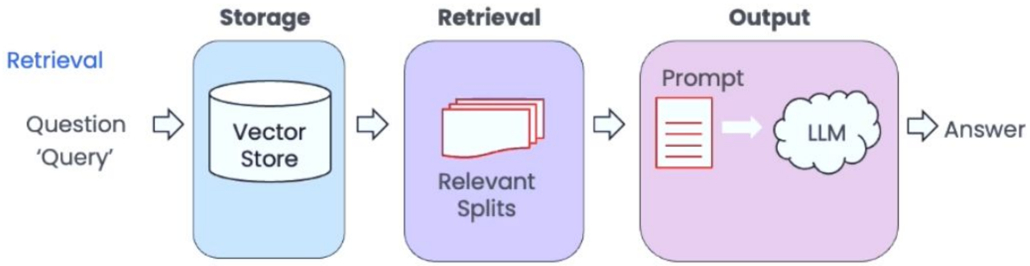

cc File display mara / austin_langchain
Public
Notifications
Fork 0
Star 1
Code
Issues
Pull requests
Actions
Projects
Security
Insights
Files
main
Go to file
labs
LangChain_101
101-1-streamlit_streaming.ipynb
101-2-streamlit_document_sea...
streamlit_document_search.ipy...
LangChain_102
.DS_Store
LICENSE.txt
resources
.DS_Store
.gitignore
README.md
austin_langchain / labs / LangChain_101 / 101-1-streamlit_streaming.ipynb
colinmcnamara fixed 101-1 link
2f0a932 · 1 minute ago
History
Preview
Code
Blame
1 lines (1 loc) · 4.57 KB
Raw
Open in Colab

```
In [1]:  %pip install -q langchain opena      eamlit

WARNING: You are using pip versio      2.4; however, version 23.2.1 is available.
You should consider upgrading via      '/Library/Developer/CommandLineTools/usr/bin/python3 -m pip install -
-upgrade pip' command.
Note: you may need to restart the      el to use updated packages.

In [2]:  %%writefile streaming_app.py
                                      BaseCallbackHandler
                                      tOpenAI
                                      age



                                      er):
                                      tial_text=""):
```

Click Here

Retrieval Augment Generation

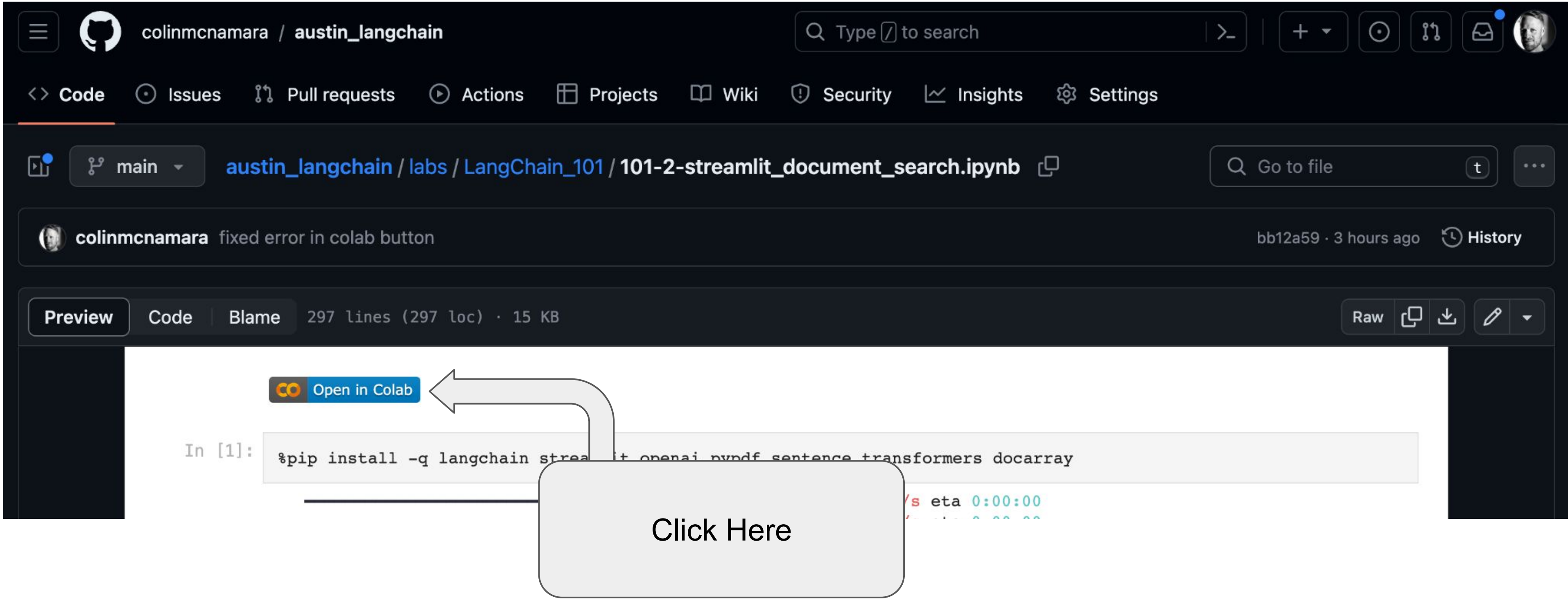




LAB101.2 - Document Search

- Required: OpenAI API Key: (keep this a secret)
- Required: Google account
- Use free Colab instance: https://colab.research.google.com
- Repo: https://github.com/colinmcnamara/austin_langchain/
- Notebook: https://github.com/colinmcnamara/austin_langchain/blob/main/labs/LangChain_101/101-2-streamlit_document_search.ipynb

Open Notebook in Colab



austin_langchain / labs / LangChain_101 / 101-2-streamlit_document_search.ipynb

colinmcnamara fixed error in colab button bb12a59 · 3 hours ago

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```
In [1]: %pip install -q langchain strea...it openai pypdf sentence transformers docarray
```

```
/s eta 0:00:00
```

Click Here

Thank you - Please Join

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  - Discord - https://discord.gg/SDwD254V
  - Monthly in person meetings & workshop
  - Monthly remote lab repeat
- Low stress, learning and sharing
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