



LangChain 101

Austin LangChain Users Group

Agenda

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



Welcome - Austin LangChain

- Local Austin LangChain User Group
 - Twitter - [@AustinLangChain](https://twitter.com/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



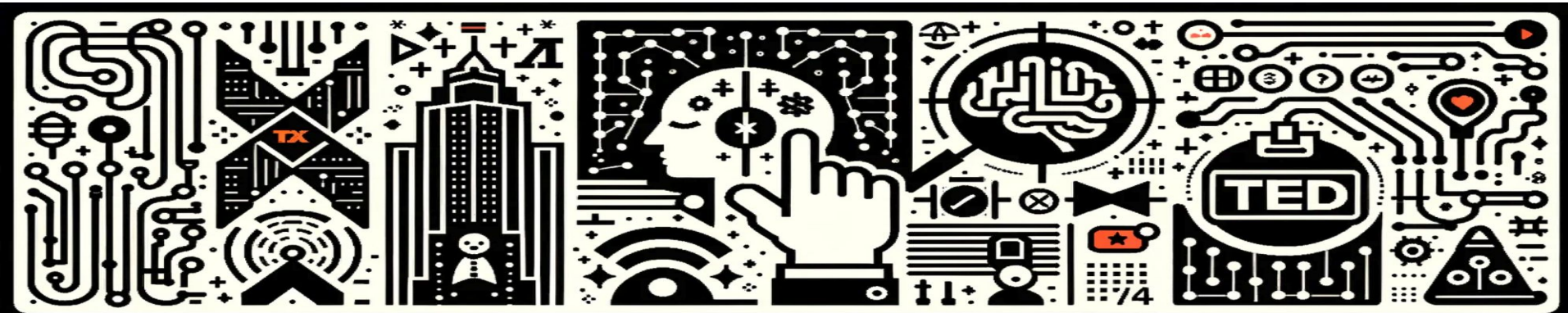
What we are building

- 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



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

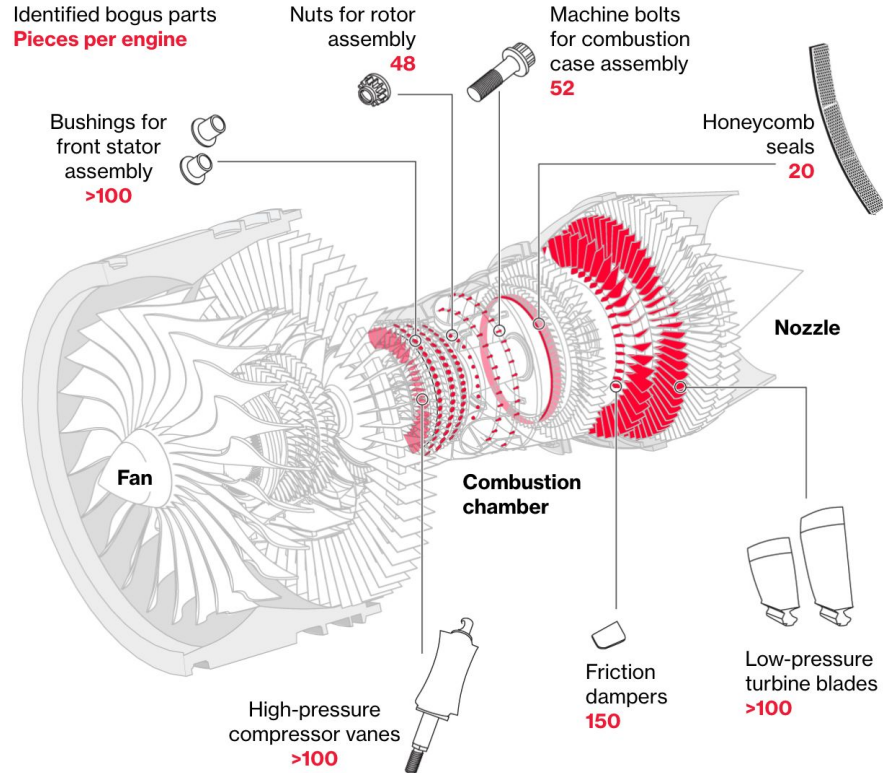
RAG Solution for Due Diligence

- 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



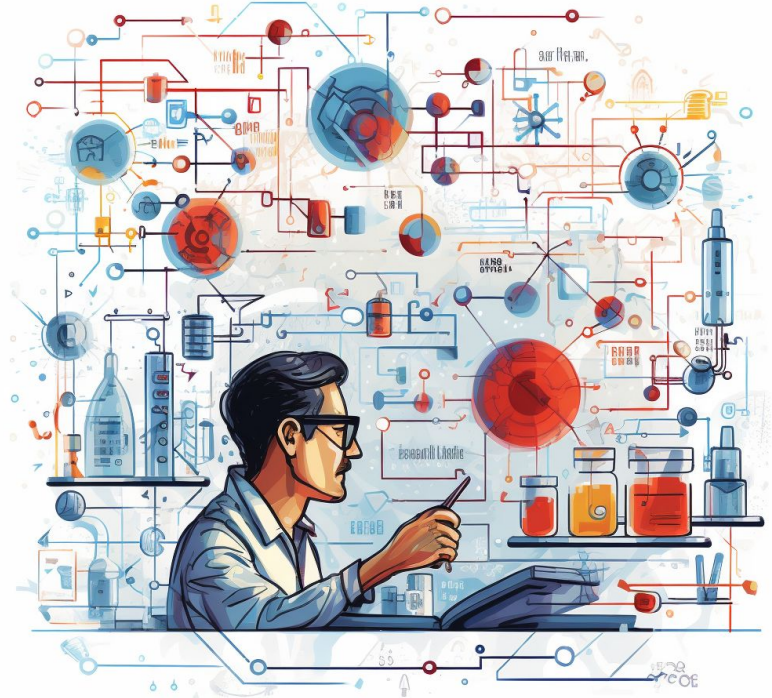
Lab Series - Our journey into production

- **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

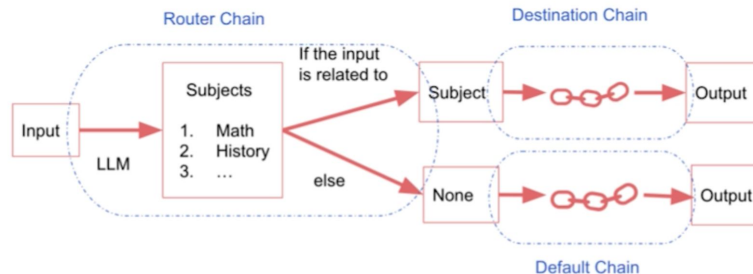
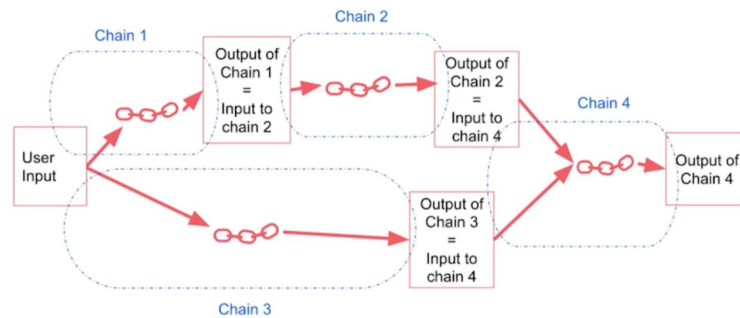
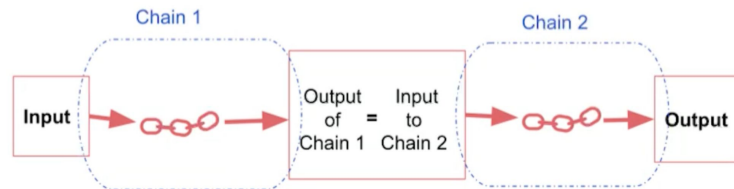
prompt_template = PromptTemplate.from_template(
    "Tell me a {adjective} joke about {content}."
)
prompt_template.format(adjective="funny", content="chickens")

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

LangChain Key Concepts

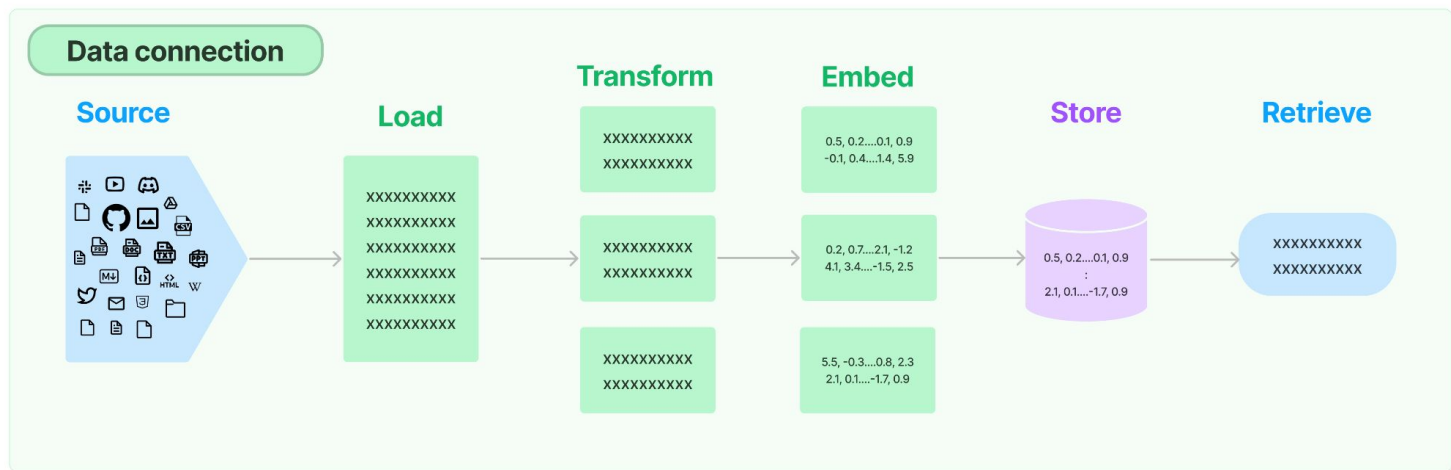
- Chains

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



LangChain Key Concepts

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



LangChain Key Concepts

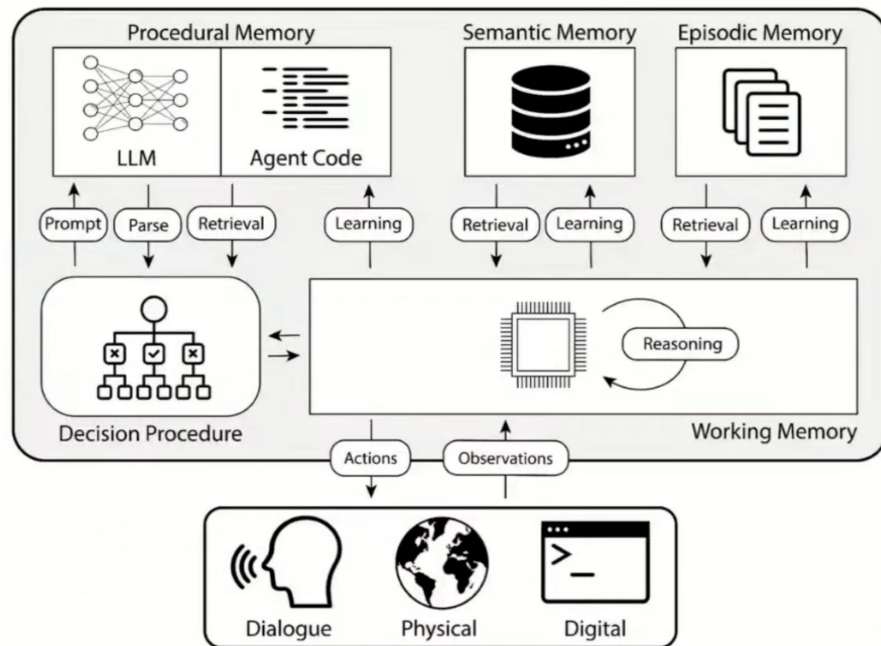
- Tools
 - Set of functions available to agents
 - Internet Search
 - Multiple Vector Stores
 - 50+ more

LangChain Key Concepts

- Agents

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

The CoALA framework





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

Colin McNamara

colin@2cups.com

ColinMcNamara

Manage account

View API keys

Invite team

Visit ChatGPT

Visit DALL-E

Help

Pricing

Terms & policies

Log out

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

The screenshot shows the GitHub interface for the repository `austin_langchain`. The file `101-1-streamlit_streaming.ipynb` is selected. A callout box with the text "Click Here" and an arrow points to the "Open in Colab" button.

Repository Header:

- File display: `marla / austin_langchain` (Public)
- Notifications
- Fork: 0
- Star: 1

Navigation Bar:

- <> Code
- Issues
- Pull requests
- Actions
- Projects
- Security
- Insights

Files Panel (Left):

- 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

File View (Right):

`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 Copy Download

Code Content:

```
In [1]: !pip install -q langchain openai streamlit

WARNING: You are using pip version 23.2.1; however, version 23.2.1 is available.
You should consider upgrading via the 'python3 -m pip install --upgrade pip' command.
Note: you may need to restart the terminal to use updated packages.

In [2]: %%writefile streaming_app.py
from langchain.callbacks.base import BaseCallbackHandler
from openai import OpenAI
page = ...

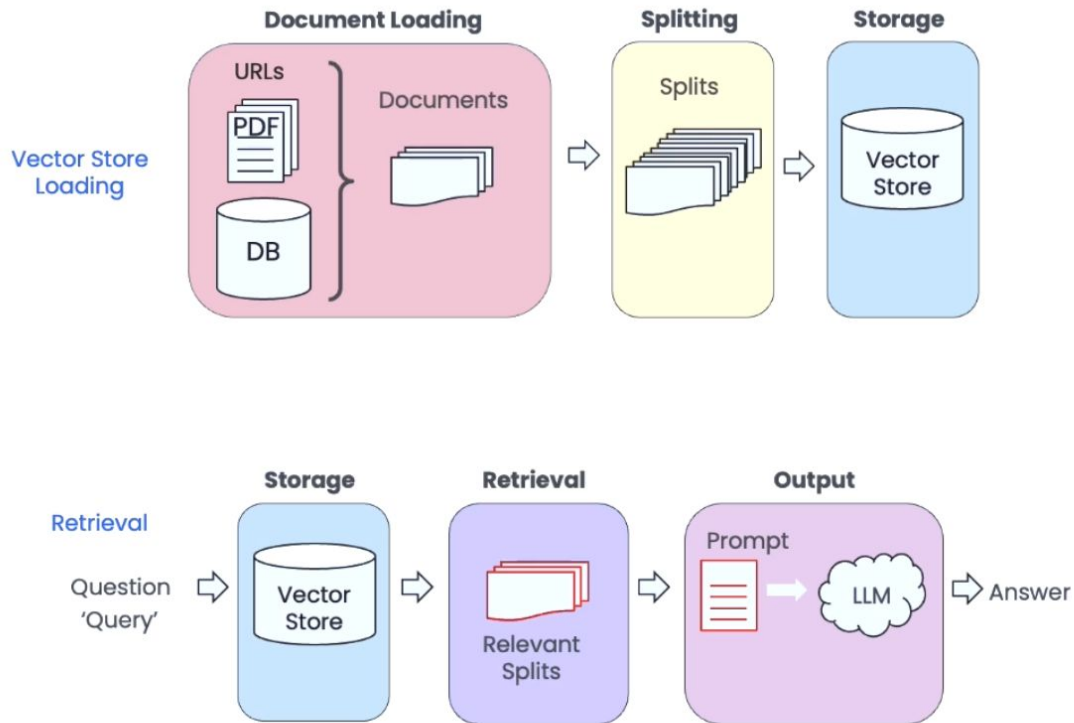
def ...
    er):
    tial_text=""):
```

LAB101.3 - Chat w/ internet 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://colab.research.google.com/github/colinmcnamara/austin_langchain/blob/main/labs/LangChain_101/101-3-search-chat.ipynb



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



Thank you - Please Join

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 - Meetup - <https://www.meetup.com/austin-lanchain-ai-group/>
 - Discord - <https://discord.gg/SDwD254V>
 - Monthly in person meetings & workshop
 - Monthly remote lab repeat
- Low stress, learning and sharing
- Connect with other early adopters
- Learn, Share, Grow