LLMs: A Crash Course in Powering up Applications

Instructor: Andrew Suter-Morris

Introduction – Andrew Suter-Morris

CTO, Forming AI & PreNav - GenAI and Diffusion Based Modeling. Synthetic Imagery
Senior Tech Lead, Ex-Microsoft - ~10 years on HoloLens and Synthetic Data
BS/MS in CompSci + Mathematics - Colorado School of Mines

Microsoft

PRENAV

FORMING AI

COLORADO SCHOOL OF MINES @150 | 1874-2024

Today's Agenda

	10:00 - 10:20 MT
h:00 - h:05	Brief introduction to LLMs and Use Cases
h:05 - h:10	• Tools & Setup • Introduction to Gradio • HuggingFace - Datasets and Models
h:10-h:15	• Text Analysis • Text Analysis w/ Hugging Face • Chatbot w/ ChatGPT
h:15 - h:19	LangChain & LangSmith
h:19-h:20	Summary and Questions

LLMs

Home › AI & Machine Learning

Nvidia's new coding LLM will make you a better programmer and can run on a CPU

Nvidia, in collaboration with HuggingFace and ServiceNow, has released StarCoder2, and it will help you generate code.

BY ADAM CONWAY PUBLISHED MAR 1, 2024

MANY THINGS FREQUENTLY —

Words are flowing out like endless rain: Recapping a busy week of LLM news

Gemini 1.5 Pro launch, new version of GPT-4 Turbo, new Mistral model, and more.

BENJ EDWARDS - 4/12/2024, 2:31 PM

ChatGPT has entered the classroom: how LLMs could transform education

Researchers, educators and companies are experimenting with ways to turn flaw but famous large language models into trustworthy, accurate 'thought partners' learning.

By Andy Extance

Multi-AI collaboration helps reasoning and factual accuracy in large language models

Researchers use multiple AI models to collaborate, debate and improve their reasoning abilities to advance the performance of LLMs while increasing accountability and factual accuracy.

Rachel Gordon | MIT CSAIL

Use Cases?

- What use cases can you think of for using LLMs?

Use Cases

- Text Summarization
- Chatbot and Agents
- Code Analysis and CodeGen
- Synthetic and/or Structured Data
- Translation
- Content Creation

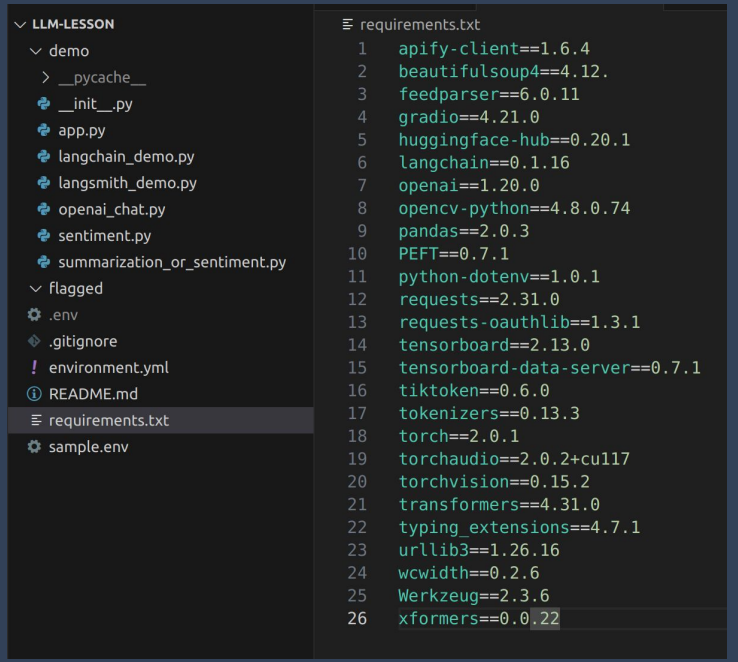
Goal

- View different use case implementations and frameworks
- You'll get a view of the possibilities, and how that may apply in your own line of work or interviews

Tools & Setup

- I prefer Debian based systems, but Win, *Nix and MacOS should all work
- Things you'll need
  - VSCode (or editor of your choice)
  - Anaconda (or venv of your choice)
    - I use Python 3.10 for my environment
  - LangChain, OpenAPI and Apify API keys
- Setup

```
git clone https://github.com/asutermo/llm-lesson
cd <src>
touch .env
conda install -n base conda-libmamba-solver
conda config --set solver libmamba
conda env create -f environment.yml
conda activate llm-lesson
```



Questions

- Do you have any familiarity with Gradio or Streamlit? Which do you prefer and why?

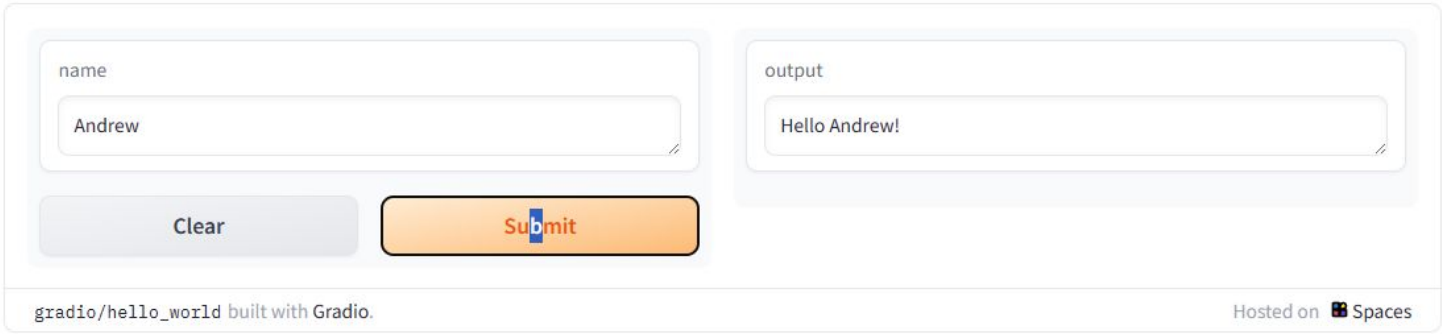
Gradio

- An easy way to get started with low barrier to entry

```python
import gradio as gr


def greet(name):
    return "Hello " + name + "!"


demo = gr.Interface(fn=greet, inputs="text", outputs="text")
demo.launch()
```



Gradio Complex Example - Automatic1111

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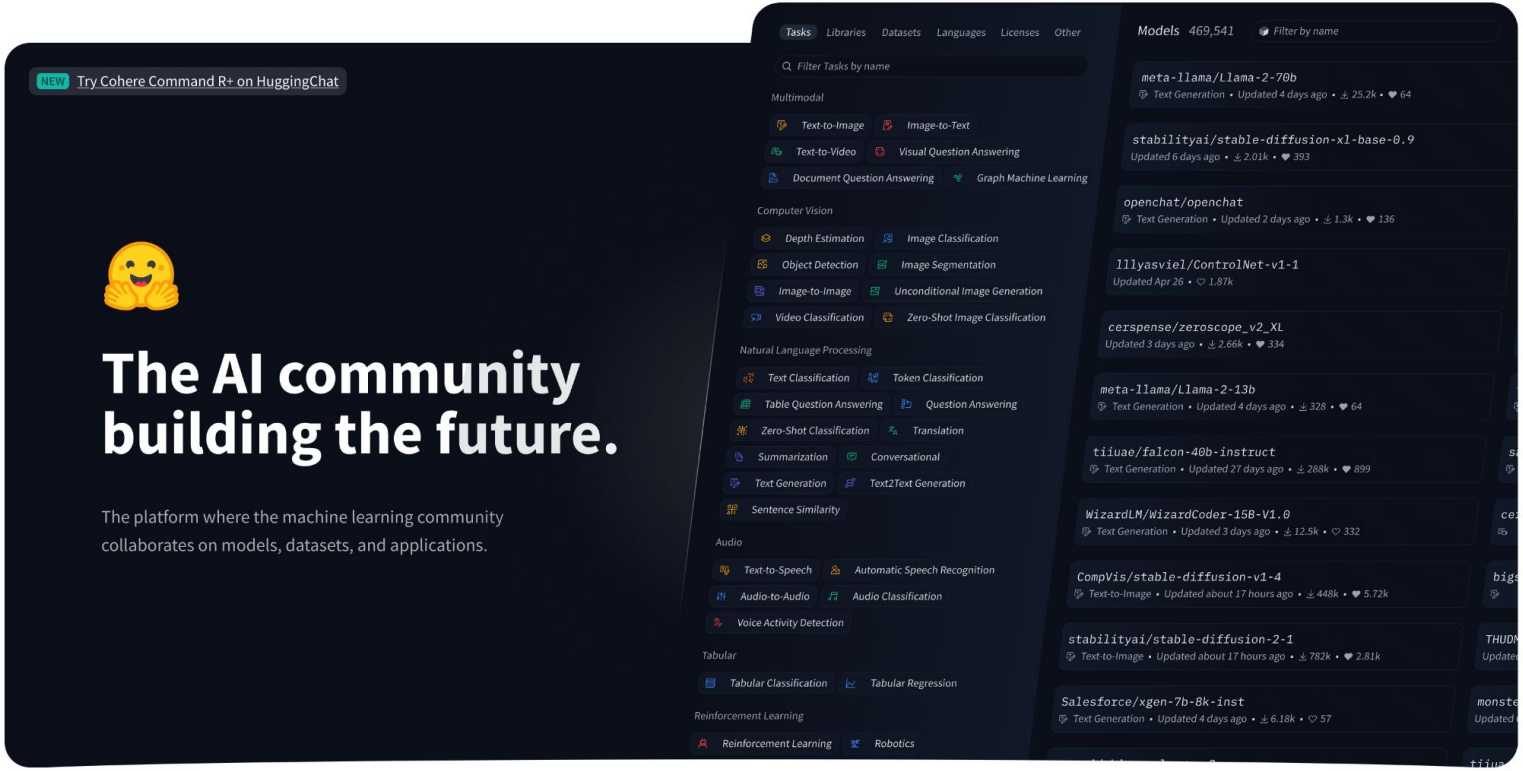
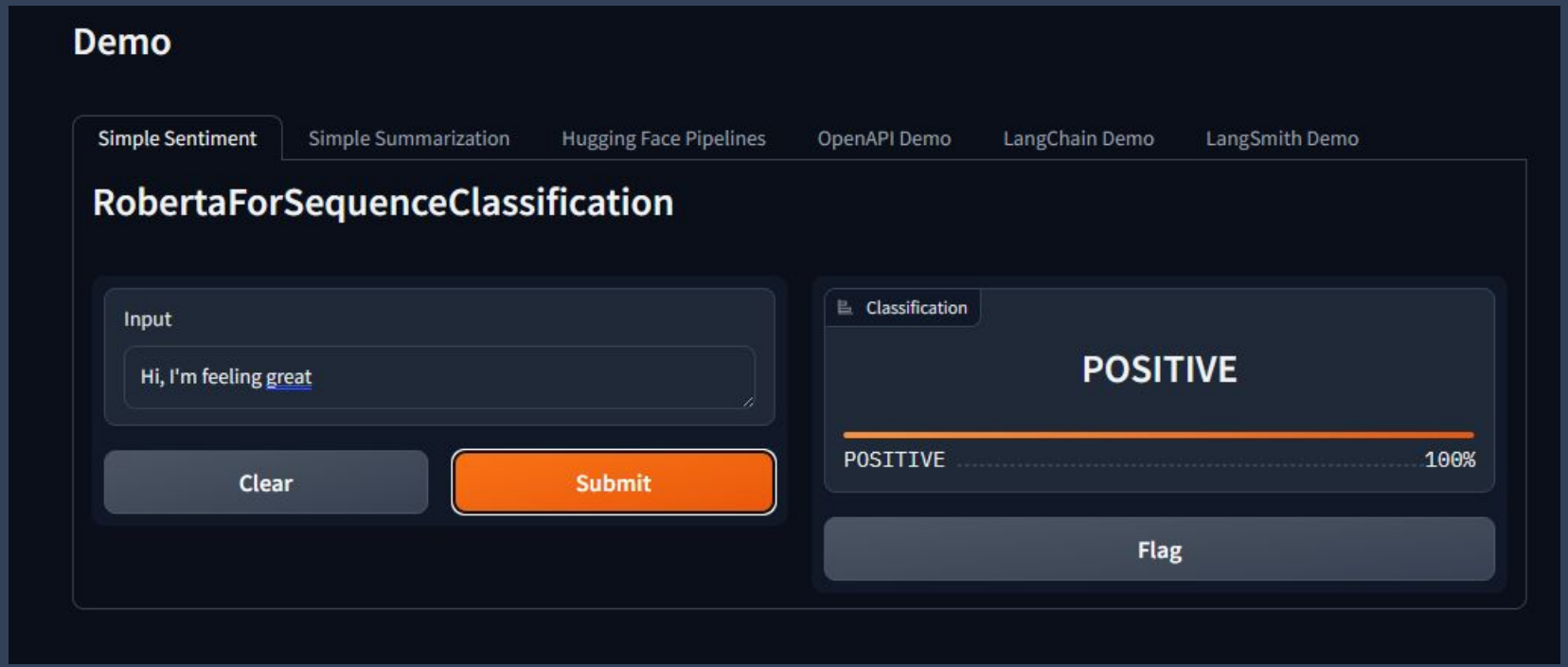
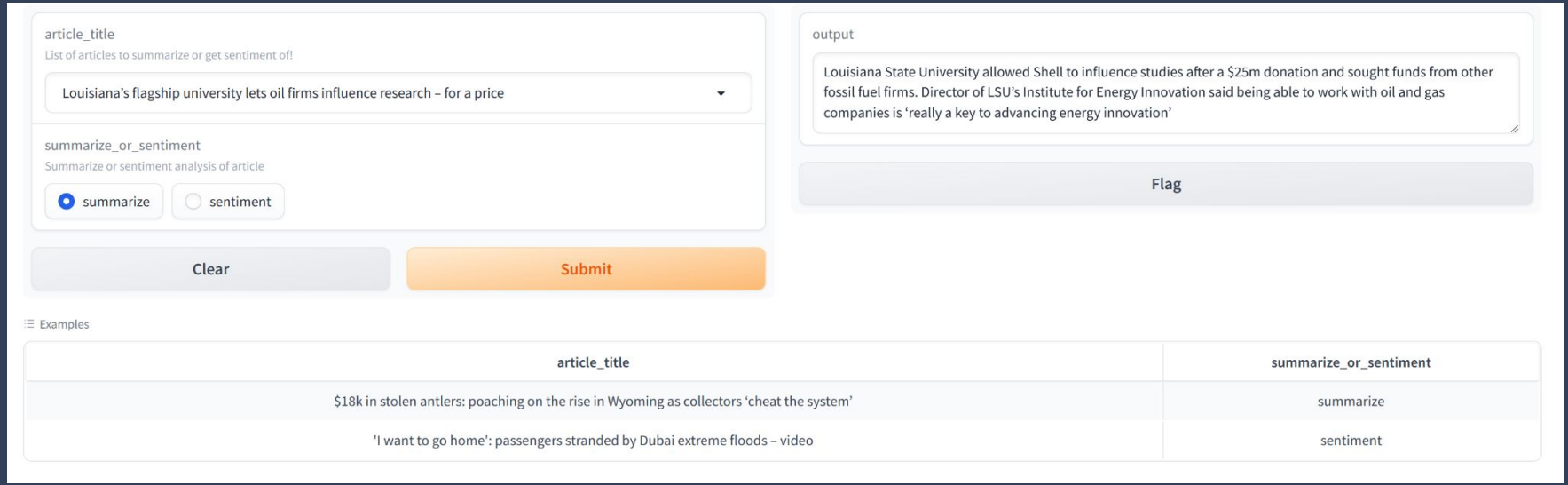
HuggingFace - Datasets and Models



Text Sentiment using HuggingFace



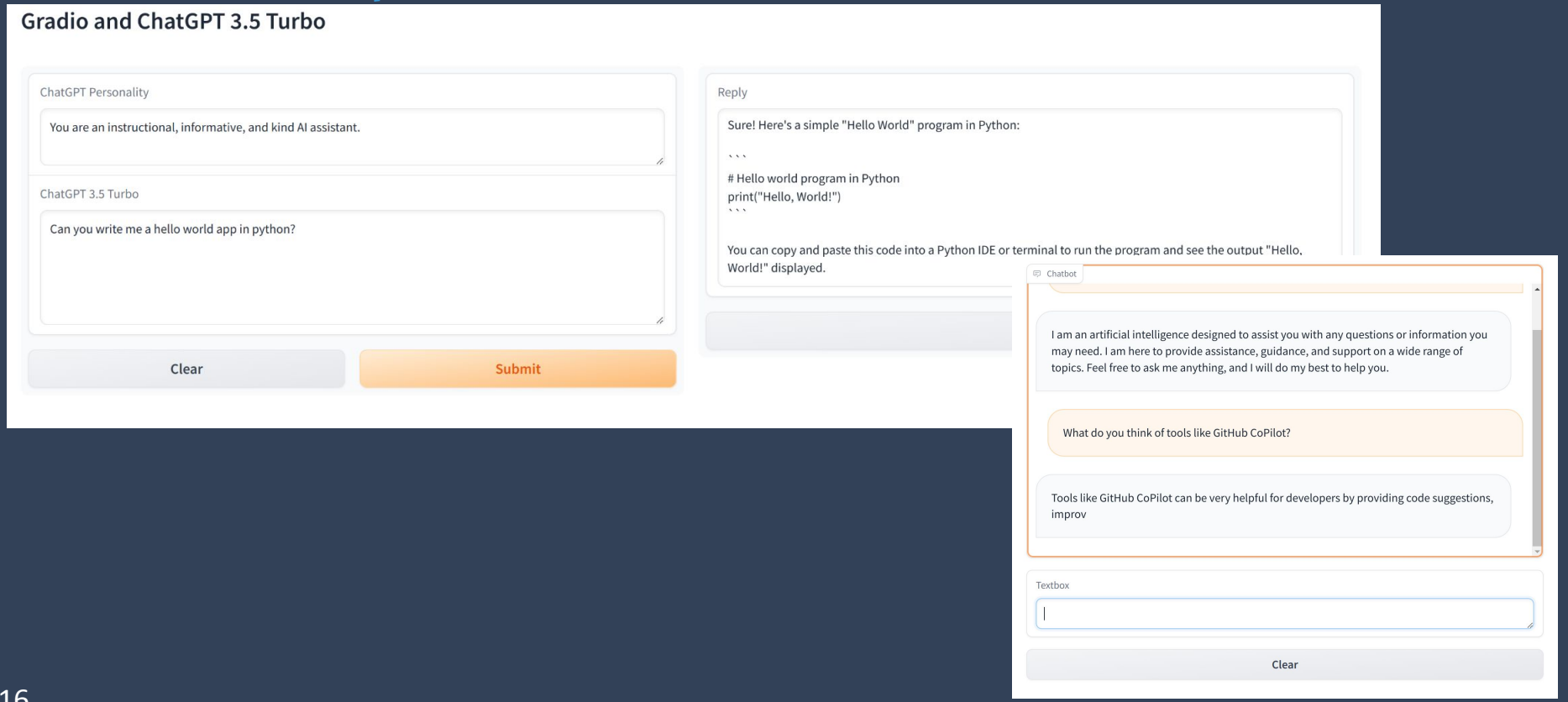
Text Summarization And Sentiment using HuggingFace



Text Analysis

- What are some real world use-cases for this? Why might you consider using this?

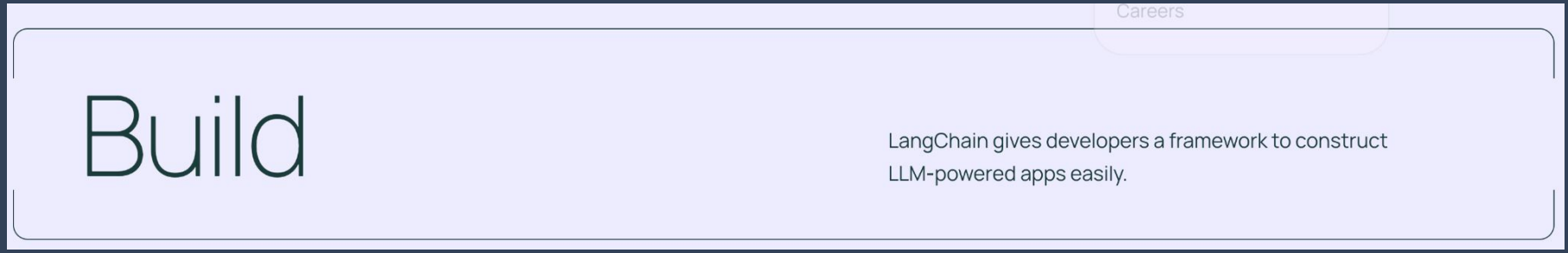
Chat with OpenAI



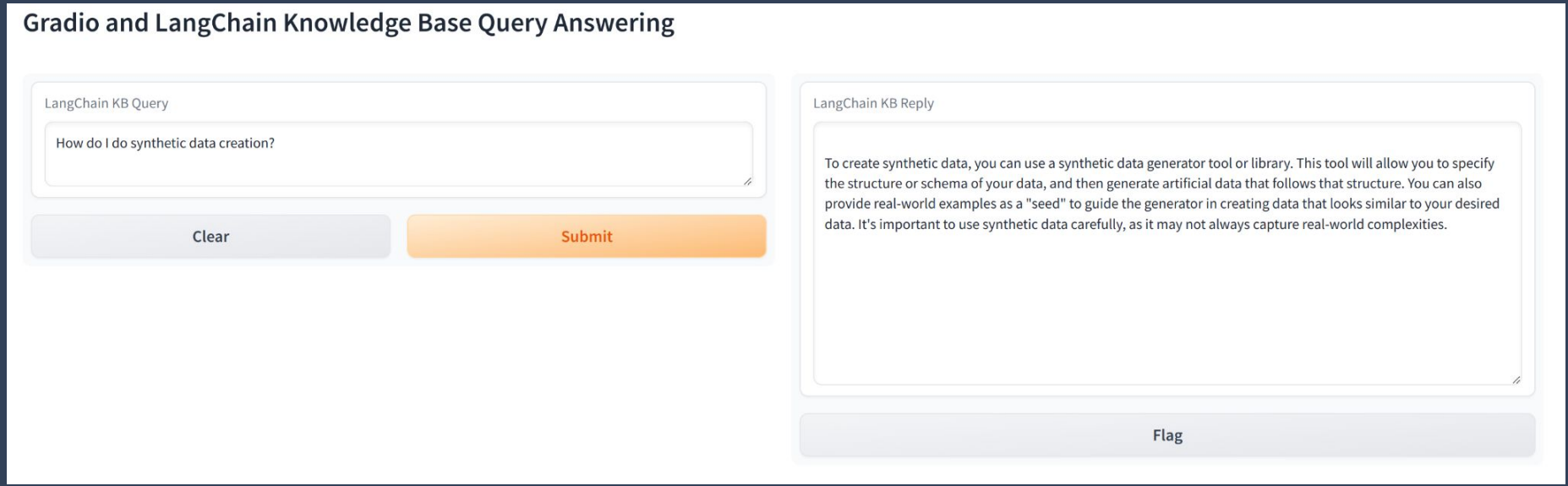
GPT and The Rise of AI Assistants

- ChatGPT
- HuggingChat
- Microsoft’s series of CoPilots
- Google Gemini (Bard)

LangChain


Careers
Build
LangChain gives developers a framework to construct
LLM-powered apps easily.

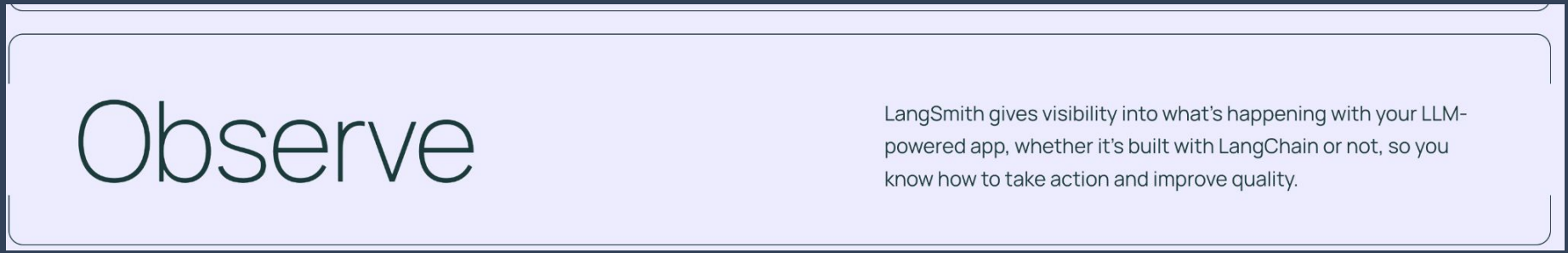
LangChain and Apify



LangChain

- What do you think that Apify might be useful for?
- Brief Aside: Why use Synthetic Data?

LangSmith


Observe
LangSmith gives visibility into what's happening with your LLM-powered app, whether it's built with LangChain or not, so you know how to take action and improve quality.

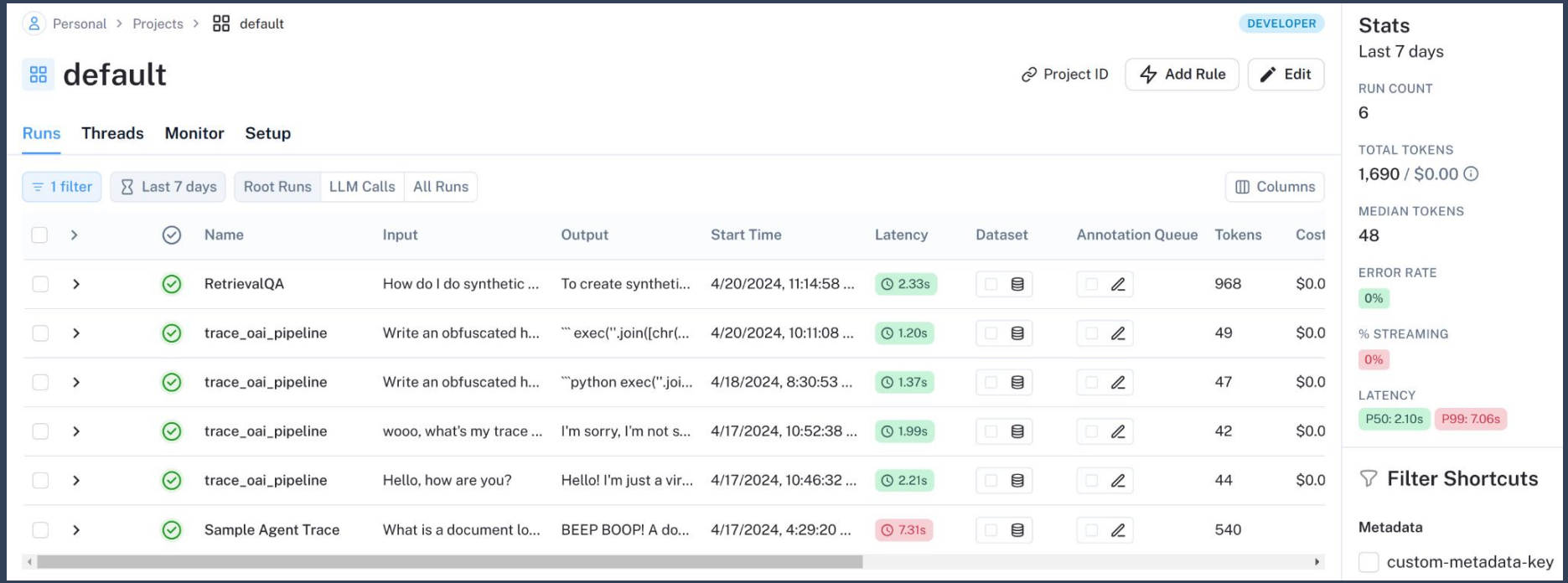
LangSmith


Gradio and ChatGPT 3.5 Turbo with Langsmith Tracing
ChatGPT Trace
Write an obfuscated hello world app in python.
Clear
Submit
Reply
```
exec('print("".join([chr(ord(c)+1) for c in "gdkkn$twfnf|"])[::-1])')
```
Flag

LangSmith

Why might tracing be useful?

LangSmith Analysis



Summary

Interfaces: Gradio
Model Hubs: HuggingFace and OpenAI
LLM Dev & Analysis Frameworks: LangChain and LangSmith