

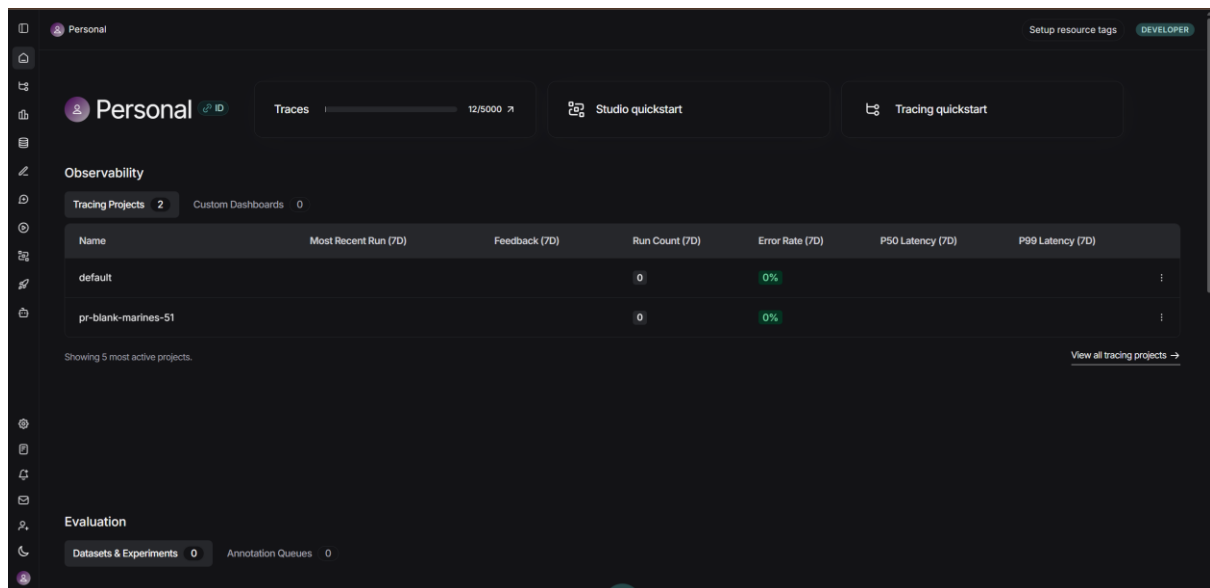
Session – 6&7

Date: October 18, 2025

Lang Graph and OpenAI Agents SDK

Part 1: Lang Graph

Lang Graph is described as a platform for building stable and resilient agentic applications. It is part of the Lang chain ecosystem but can be used independently.



Key Concepts

- **Purpose:** Lang Graph is an abstraction layer designed to organize complex workflows that involve interconnected processes, feedback loops, and multiple agents. It focuses on stability, resiliency, and repeatability.
- **Use Cases:**
 - Designing agent-driven user experiences.
 - Managing multi-agent collaboration.
 - Incorporating a "human-in-the-loop" for verification or decisions.
 - Handling conversation history and memory.
 - "Time travel," which allows restoring a process to a specific past step.
- **Lang Smith:** This is a separate monitoring tool that Lang Graph can integrate with for observability and debugging.

Lang Graph Terminology

Agent workflows are represented as graphs using the following components:

- **State:**
 - **Definition:** Represents the current, immutable snapshot of the application.
 - **Reducer:** A function that defines *how* to update a field in the state. When a node returns an update, the reducer specifies how to combine this new value with the existing value in the state.
- **Nodes:**
 - **Definition:** Python functions that represent the logic or "work" of an agent.
 - **Function:** A node receives the current State as input, performs its logic (e.g., calls an LLM, runs a tool), and returns an updated State.
 - *In short: Nodes do the work.*
- **Edges:**
 - **Definition:** Python functions that determine the next step in the workflow.
 - **Function:** An edge receives the current State and decides which node to execute next. This flow can be fixed or conditional (e.g., "if the agent needs a tool, go to the tool_node").
 - *In short: Edges choose what to do next.*

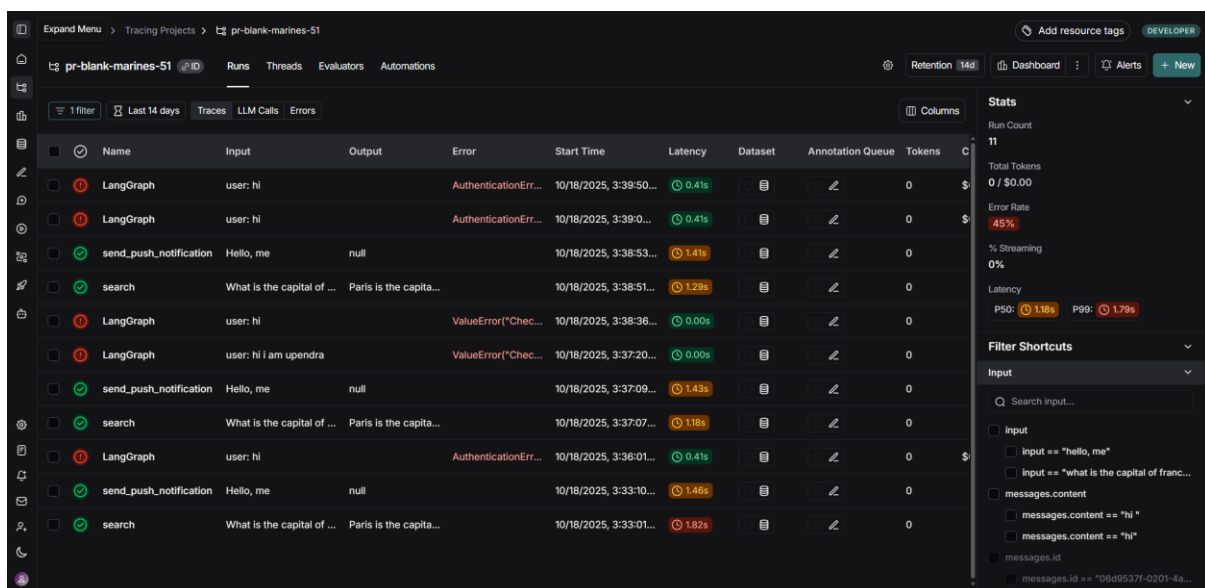
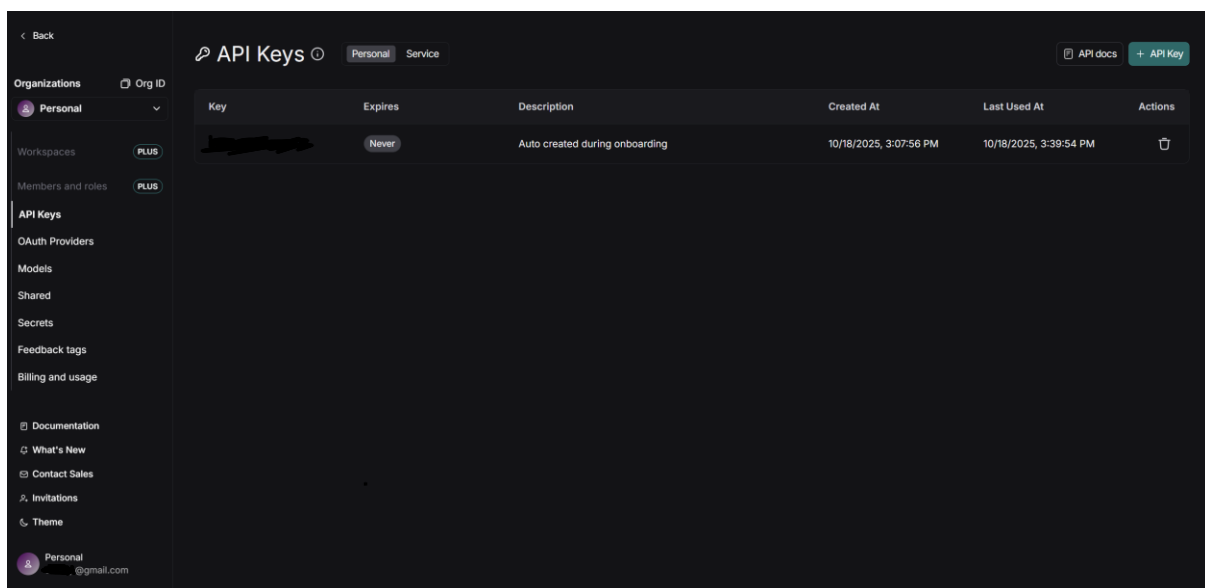
Building a Graph (5 Steps)

1. **Define the state:** Determine the data structure that will be passed around.
2. **Start the graph builder:** Instantiate the graph.
3. **Create a Node:** Define your Python functions (the logic).
4. **Create Edges:** Define the connections and logic flow between nodes.
5. **Compile the graph:** Assemble the nodes and edges into a runnable application.

Other Definitions

- **Super-Step:**
 - **Definition:** A single iteration over the graph nodes. Nodes that can run in parallel are part of the same super-step, while sequential nodes belong to separate super-steps.

- **Memory and Persistence**
 - **SQLite:** The labs demonstrated using SQLite to implement both persistent (on-disk) and in-memory storage for the agent's conversation history.
- **Implementation Details & Decorators**
 - The labs utilized specific decorators to build workflows, such as `@function_tool` to define tools for agents and `@input_guardrails` to enforce controls.



Part 2: OpenAI Agents SDK & Async Python

Async Python (Asyncio)

- **Asyncio:**
 - **Definition:** A Python library for asynchronous programming. It is described as a lightweight alternative to traditional multithreading (which is OS-level) or multiprocessing.
- **Coroutines:**
 - **Definition:** A special function defined using the `async def` syntax. It is the core building block of asyncio applications.
 - **Behavior:** Calling a coroutine does *not* execute it immediately; it returns a *coroutine object*.
 - **Execution:** You must use `await` to run the coroutine, which schedules it on the event loop. While one coroutine is awaiting (e.g., waiting for an API response), the event loop can run other tasks.
- **Key asyncio Functions:**
 - `asyncio.gather()`: Used to run multiple tasks concurrently.
 - `asyncio.run()`: Used to run a main async function from synchronous code.

OpenAI Agents SDK Terminology

The SDK is described as lightweight and flexible.

- **Agents:**
 - **Definition:** Represent the Large Language Models (LLMs) themselves.
- **Handoffs:**
 - **Definition:** Represent interactions between agents, specifically the act of "giving over control" from one agent to another.
- **Guardrails:**
 - **Definition:** Represent controls or checks within the workflow (e.g., a "Name check" before proceeding).

Workflow Concepts

- **Agents as Tools:** An agent can be used as a "tool" that another agent can call.
- **Multi-Agent Workflows:** The labs demonstrated complex workflows where a "Sales Manager" agent would "handoff" a task to multiple other agents (e.g.,

"Professional," "Engaging," "Busy" sales agents). It would then evaluate their parallel outputs and select the best one.

- **Combined Flows:** More advanced labs combined guardrails, tools, and handoffs into a single, comprehensive agent.

"Vibe Coding" (Tips for LLM Code Generation)

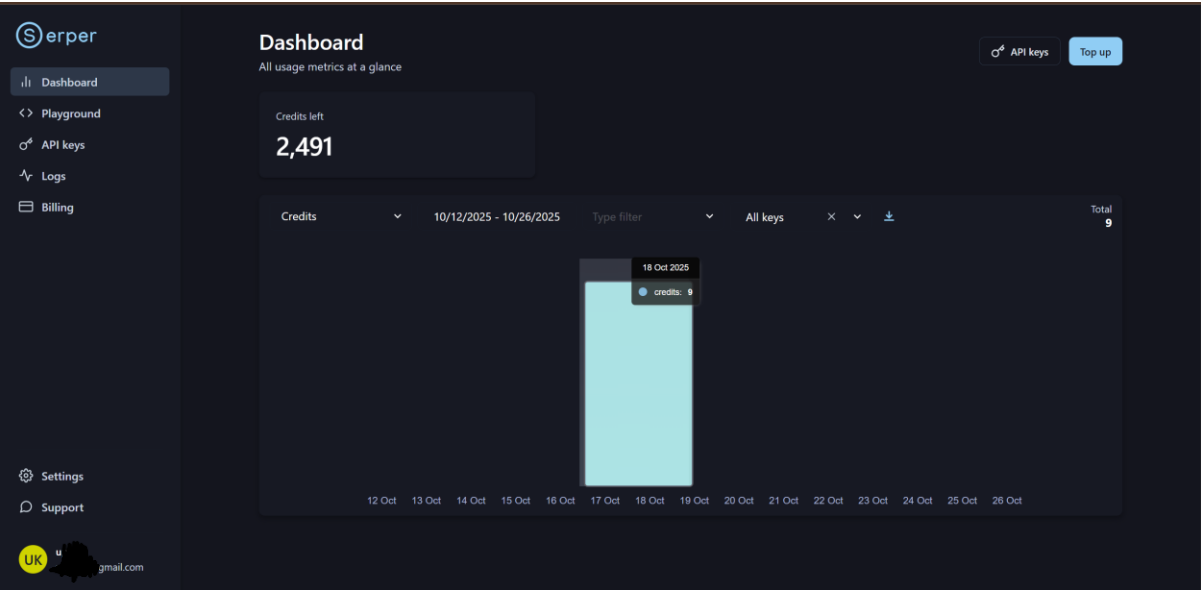
A set of 5 tips was provided for getting better results from LLMs when generating code:

1. **Good vibes:** Prompt clearly (e.g., ask for short answers, specify latest APIs).
2. **Vibe but verify:** Ask two different LLMs the same question to compare results.
3. **Step up the vibe:** Ask the LLM to break down a complex request into smaller, independently testable steps.
4. **Vibe and validate:** Ask one LLM to generate code, then ask another LLM to check or validate it.
5. **Vibe with variety:** Ask for multiple (e.g., three) different solutions to the same problem, then pick the best one.

Part 3: External Tools

Serper.dev

- A Google Search API provider.
- **Details:** Described in the notes as the "cheapest google search api."
- **Usage:** It provides a free tier of 2,500 queries and is used by agents to perform web searches.
- **Setup:** Requires signing up at serper.dev and storing the provided API key (as SERPER_API_KEY) in an environment file.



Serper

Dashboard

Playground

API keys

Logs

Billing

Settings

Support

UK@gmail.com

API Keys

Your keys to unlock the power of Serper

Create New Key

Name	API Key		Actions
default	👁️📄	Reset
Default key	👁️📄	Reset

Serper

Dashboard

Playground

API keys

Logs

Billing

Settings

Support

UK@gmail.com

Activity logs

An overview of your latest requests

Anonymize queries

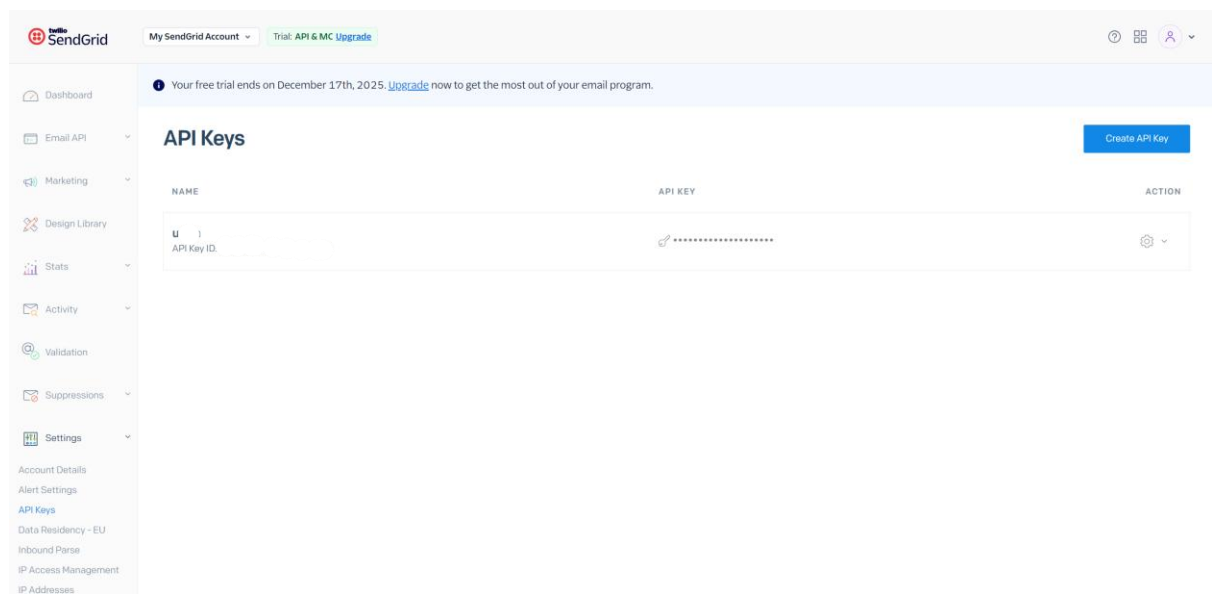
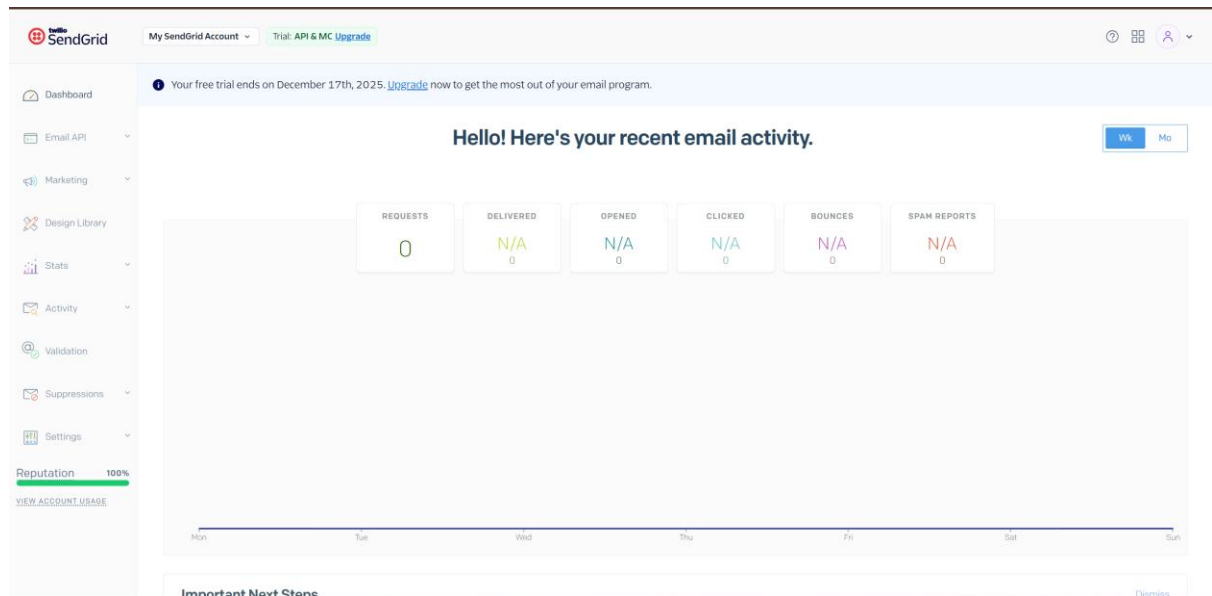
Refresh

Time	Query	Type	GL	HL	Page	Num	Credits	Response time (ms)
2025-10-18 15:38:56	What is the capital of France?	search	us	en	1	10	1	429
2025-10-18 15:38:55	What is the capital of France?	search	us	en	1	10	1	444
2025-10-18 15:37:12	What is the capital of France?	search	us	en	1	10	1	335
2025-10-18 15:37:11	What is the capital of France?	search	us	en	1	10	1	507
2025-10-18 15:33:06	What is the capital of France?	search	us	en	1	10	1	847
2025-10-18 15:31:36	What is the capital of France?	search	us	en	1	10	1	746
2025-10-18 15:31:08	What is the capital of France?	search	us	en	1	10	1	1048
2025-10-18 15:24:50	What is the capital of France?	search	us	en	1	10	1	647
2025-10-18 15:22:54	What is the capital of France?	search	us	en	1	10	1	699

PreviousNext

SendGrid

- An email delivery service.
- **Usage:** Used in labs (like Lab 6 and Lab 8) as a tool for agents to perform tasks like sending automated sales outreach emails.
- **Setup:** Requires creating an account at sendgrid.com and generating an API key.



My SendGrid Account

Trial: API & MC Upgrade

Email API

Marketing

Design Library

Stats

Activity

Email Logs

Activity Feed

Validation

Suppressions

Settings

Reputation 100%

VIEW ACCOUNT USAGE

Email Logs

Search

Filters

+ Account

+ Subject

+ Date

+ Category

+ Status

+ Response

+ Message ID

2 results

Processed At	Message ID	Recipient Email	Subject Line	Status	Response
October 18, 2025 06:50:00 AM	pRZ7gVoHTrCkVg/	... @gmail.com	Test email	Delivered	250 2.0.0 OK 1760770200 8926c6da...
October 18, 2025 05:59:40 AM	18ErwS-GTuW00K/	... @gmail.com	Test email	Delivered	250 2.0.0 OK 1760767181 af79cd13b...

Timezone

UTC+00:00 - Coordinated Universal Time

Pushover

A push notification service.

- Usage:** Integrated into the Lang Graph workflow to send real-time push notifications to a mobile device (e.g., sending the USD to INR exchange rate).