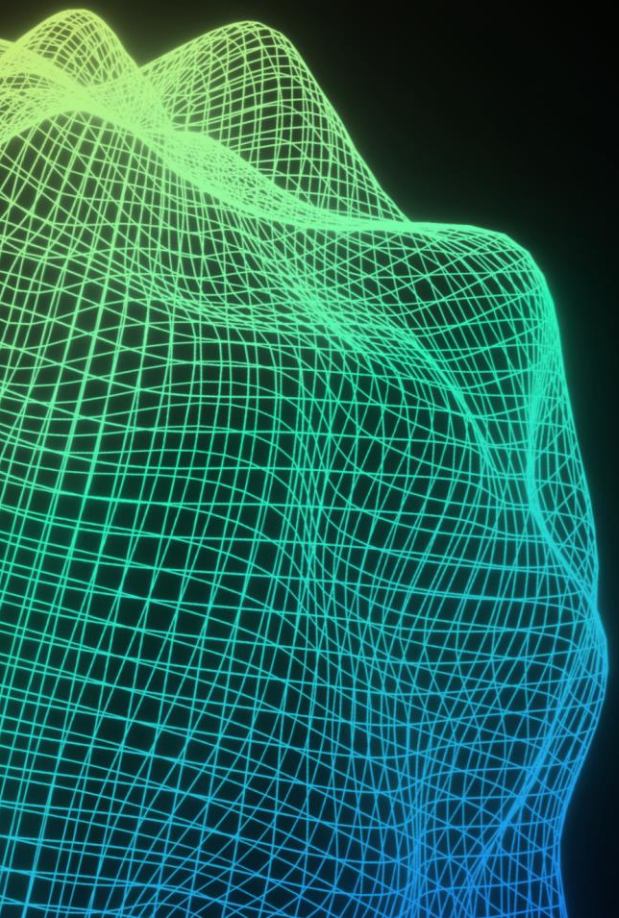

Learning Week 2023

Work with LLMs using Semantic Kernel

Workshop

→

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04 Practice: Chaining

05 Plugins and Build In Functions

06 Practice: Combine all together

Ruslan Shpileuski

Lead Software Engineer

An AI developer specializing in GPT-powered chatbots, with expertise in Microsoft Bot Framework on Azure. Experienced with models like GPT-3.5 and GPT-4, using the Semantic Kernel for AI orchestration, and a proven track record in successful chatbot implementations.

Daria Grishenkova

Associate Chief Software Engineer

My name is Daria and I am a Associate Chief Software Engineer with a primary focus on the .Net stack. Additionally, I am an AI enthusiast and actively participates in AI Hackathons. On top of that, I emerged as one of the winners of the AnyWhere Club AI Hackathon.

Roman Patutin

Chief Software Engineer

I am an AI enthusiast from Batumi, Georgia. In addition to my primary project responsibilities, over the past year, I have been actively involved in a variety of AI-related activities within our company. I am one of the organizers of the GitHub CoPilot hackathon and won second place in the Anywhere AI Hackathon.

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What is Semantic Kernel

Theory

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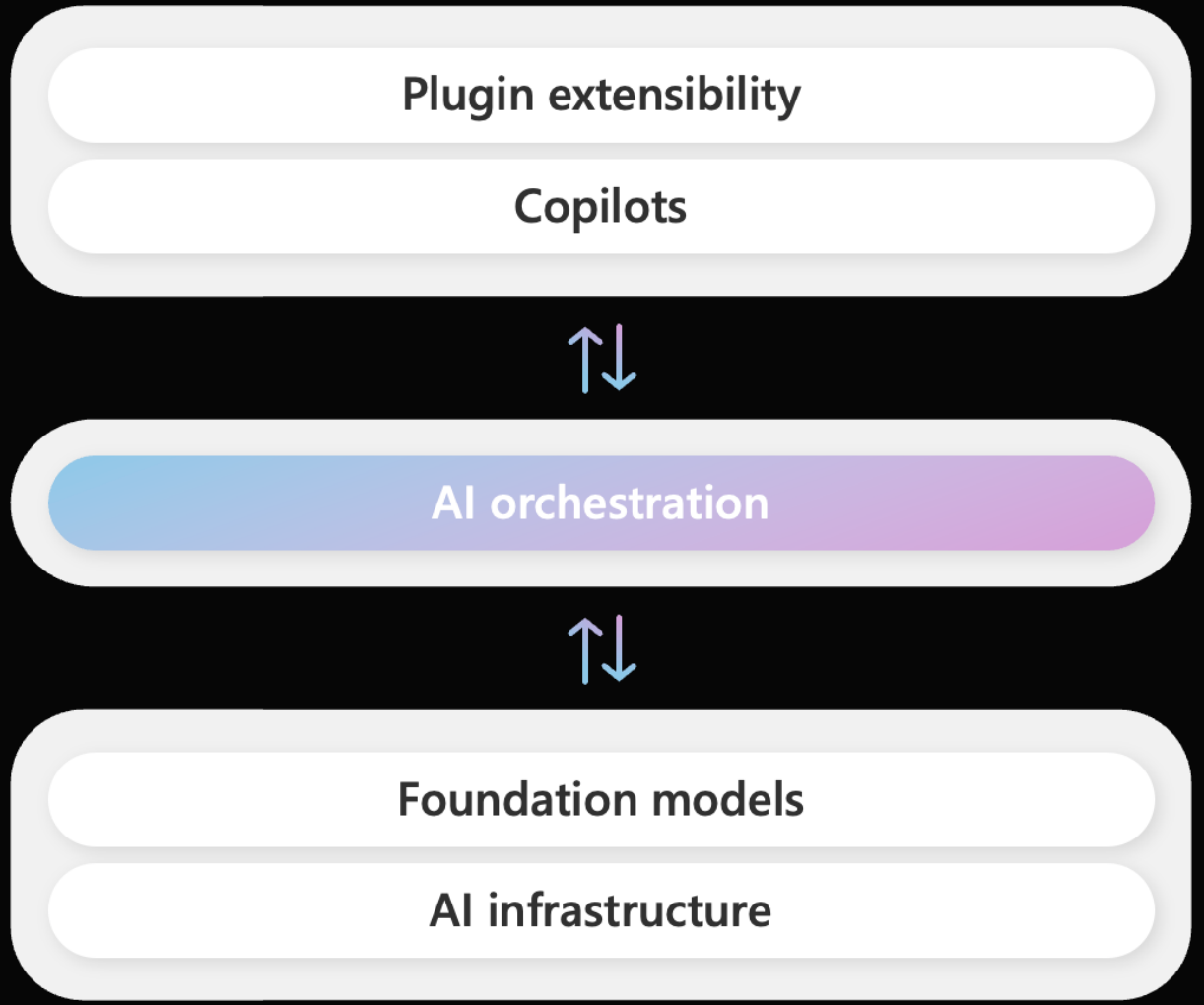
Center of the copilot stack...



What is Semantic Kernel

AI orchestration SDK

Allows developers to flexibly integrate AI services into their existing apps

- Memories
- Planner
- Connectors
- Custom plugins

What is Semantic Kernel

Model

A model refers to a specific instance or version of an LLM API

Supported models

- OpenAI
- Azure OpenAI
- HuggingFace
- And “to be continued”

Supported models

ChatCompletion

OpenAIChatCompletion

AzureOpenAIChatCompletion

TextGeneration

OpenAITextGeneration

AzureOpenAITextGeneration

HuggingFaceTextGeneration

TextToImage

OpenAITextToImage

AzureOpenAITextToImage

Prompts

Natural language instruction that tells the LLM what to do

Prompt template language

Allows add parameters to the prompts

Allows combine/chain prompts

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Call LLMs

Practical part

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Chaining LLM Calls

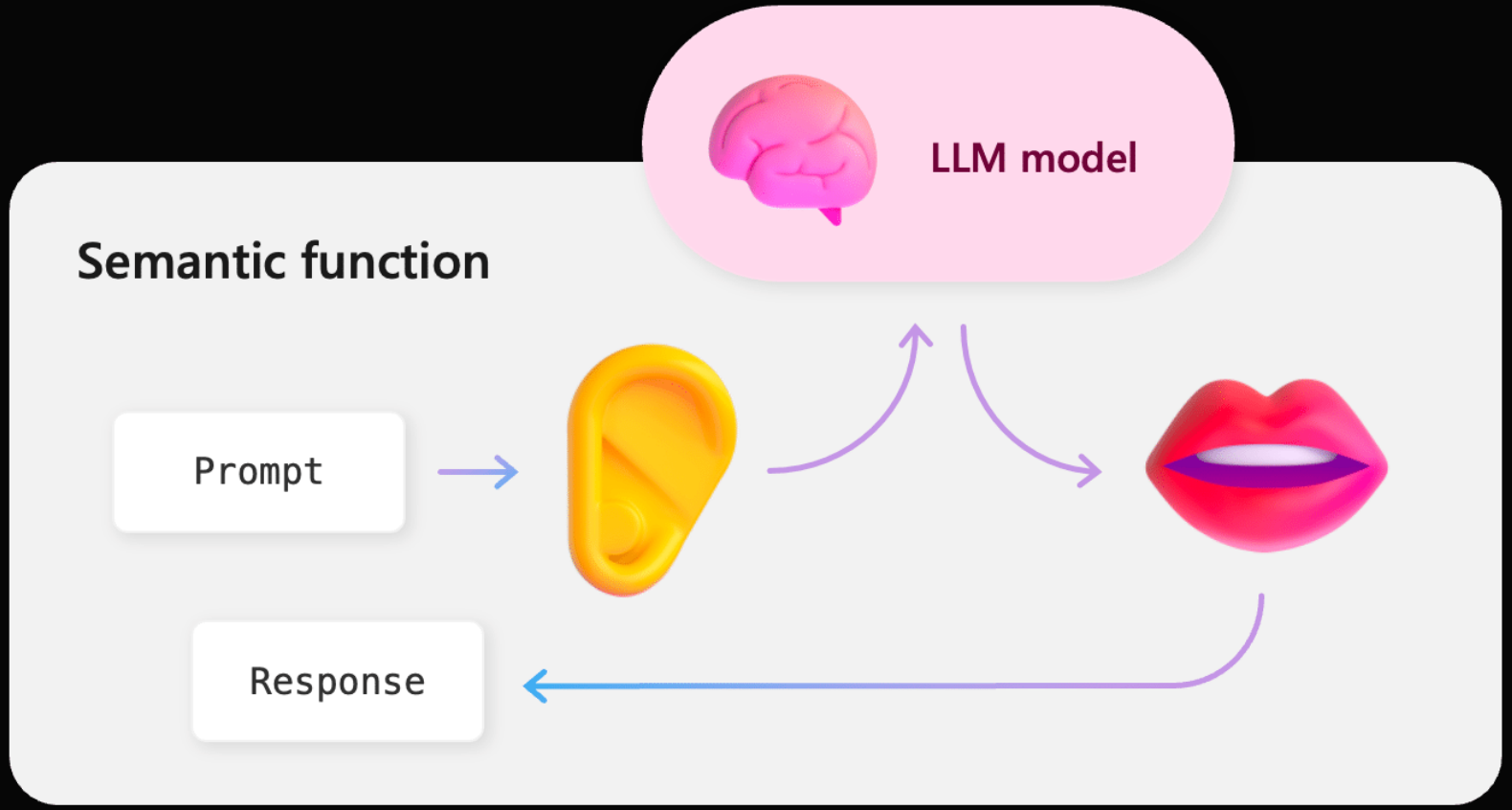
Theory

Two types of functions

Semantic Function

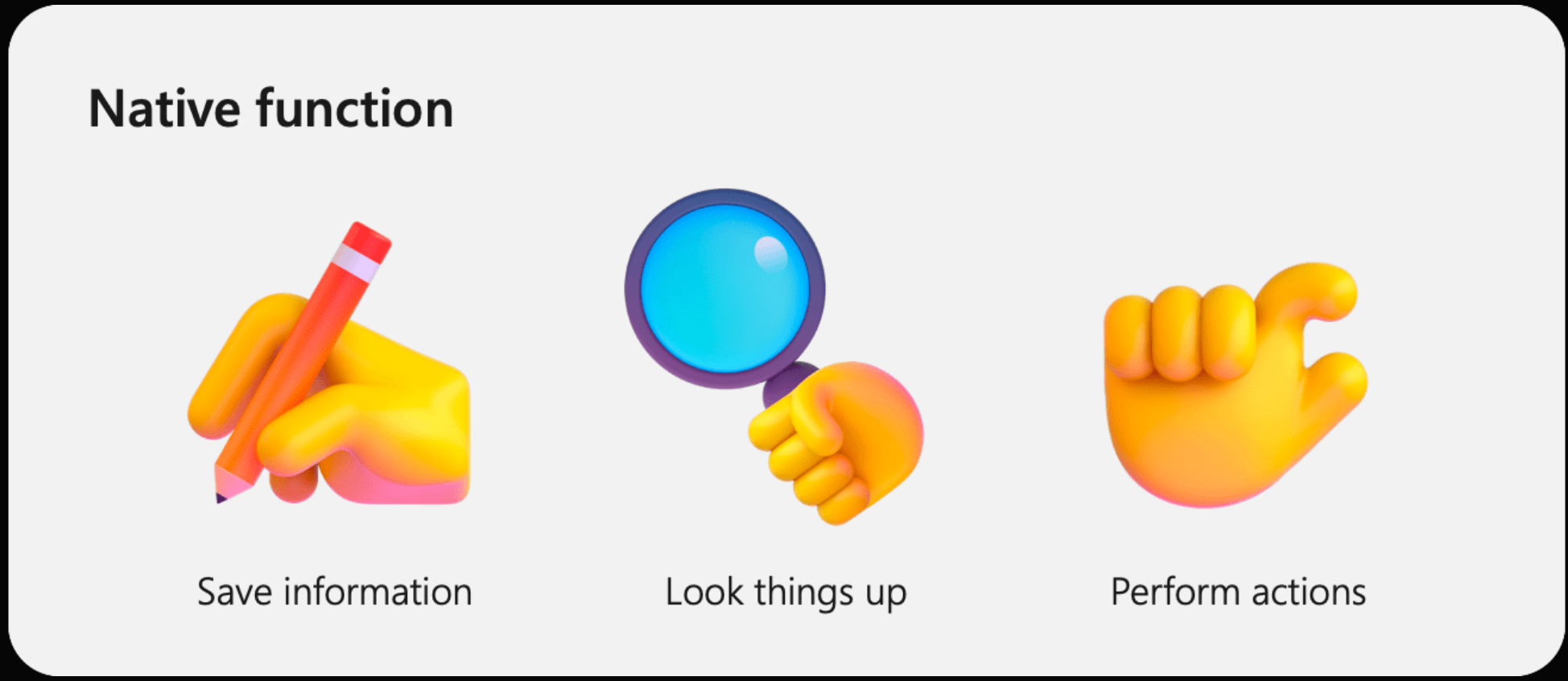
Native Function

Semantic functions



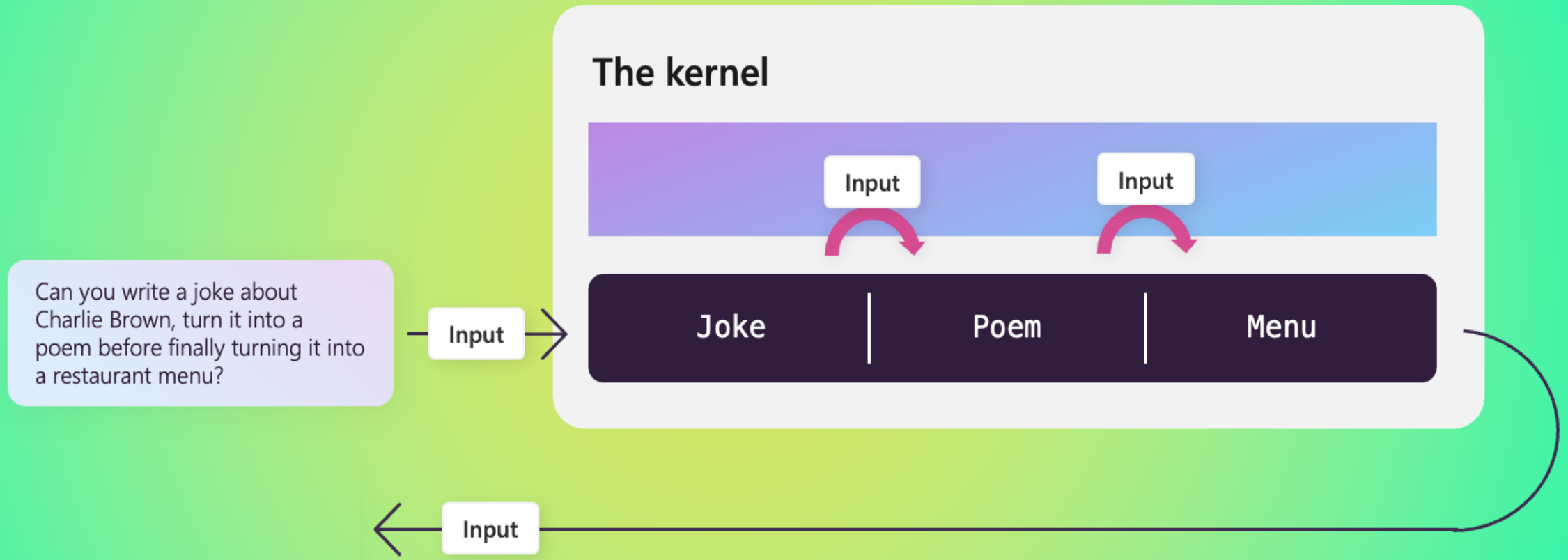
Communication with LLMs

Native functions



Works with environments

Chaining functions together



Similar Unix Pipes

Chaining functions together

- Passing data to semantic functions with input
- Passing more parameters with native functions
- Change context variables during runtime
- Add variables

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Chaining

Practical part

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Plugins and Build In Functions

Theory

What is plugins?

- Fundamental building blocks of Semantic Kernel
- Encapsulate capabilities into a single unit of functionality that can then be run by the kernel
- Can consist of both native code and requests to AI services
- Adopted the OpenAI plugin specification as the standard for plugins

Types of plugins

Defined in configuration

Defined in code

Defined in external Packages

Types of plugins

Microsoft.SemanticKernel.Plugins.Memory
Semantic Kernel Memory Plugin

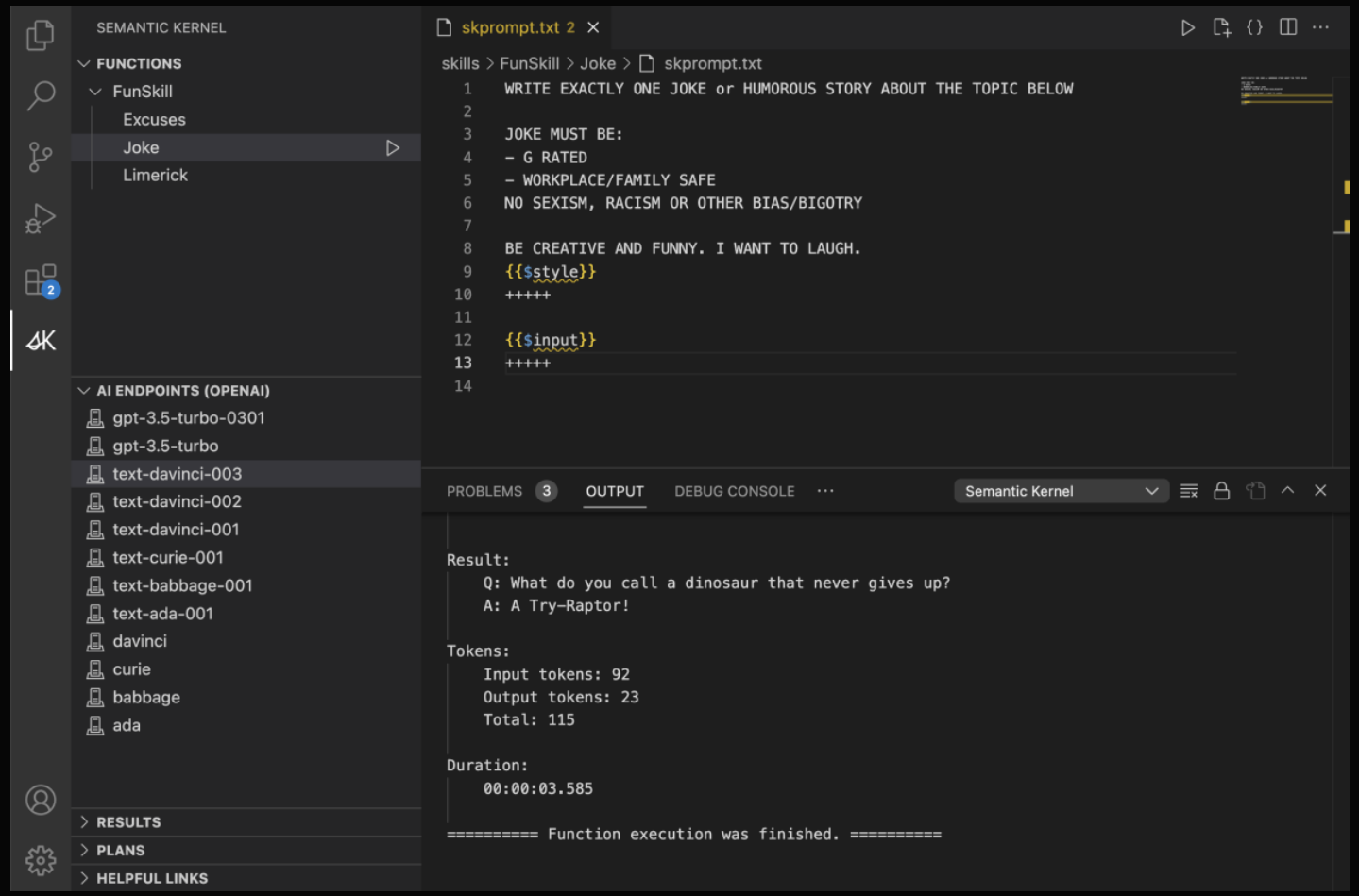
Microsoft.SemanticKernel.Plugins.Web
Semantic Kernel web plugins: search the web, download files, etc.

Microsoft.SemanticKernel.Plugins.MsGraph
Semantic Kernel Microsoft Graph Plugins: access your tenant data, schedule meetings, send emails, etc.

Microsoft.SemanticKernel.Plugins.Document
Semantic Kernel Document Plugins: Word processing, OpenXML, etc.

Microsoft.SemanticKernel.Plugins.Grpc
Semantic Kernel gRPC Plugins

VS Code Plugin



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Combine all together

Practical part

Thank you!

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