Deep Dive into AI Agents using Semantic Kernel

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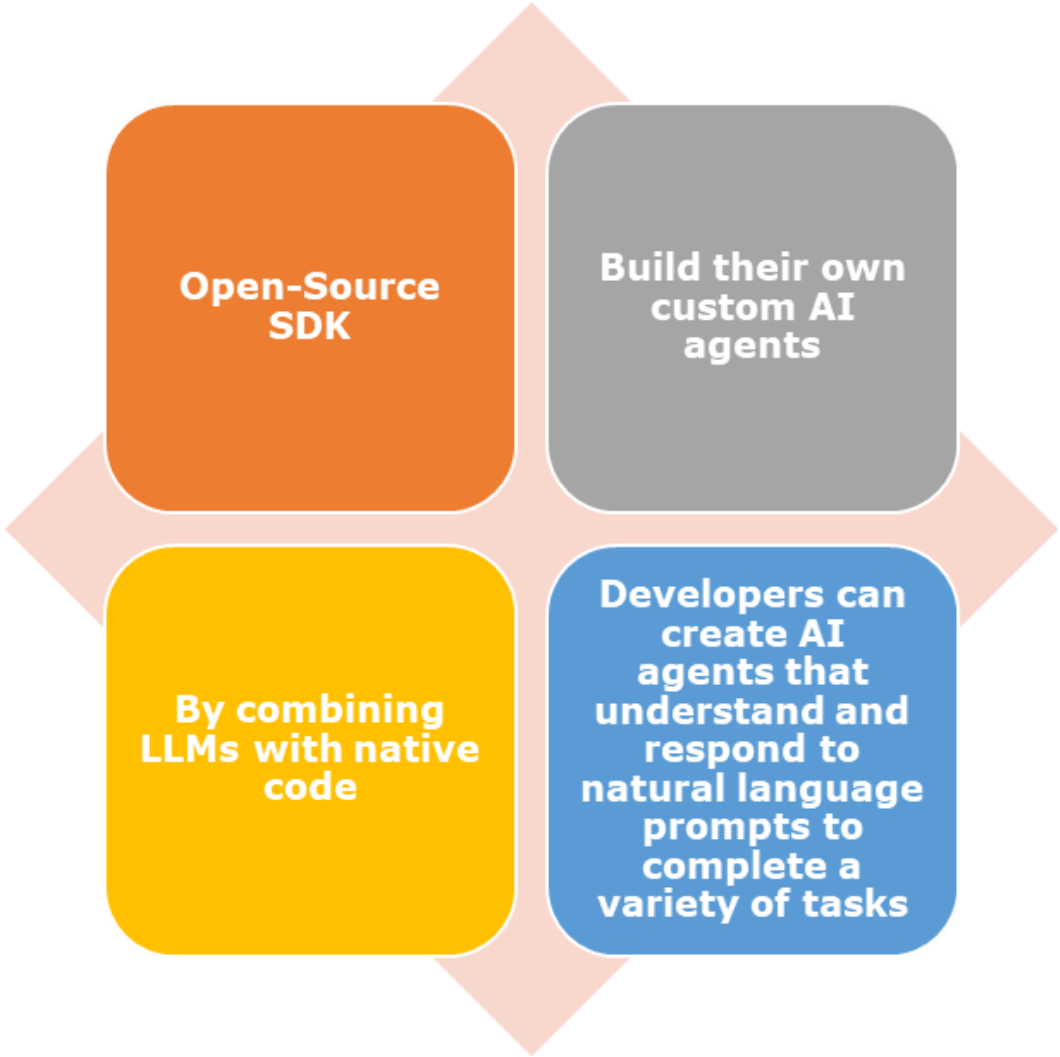
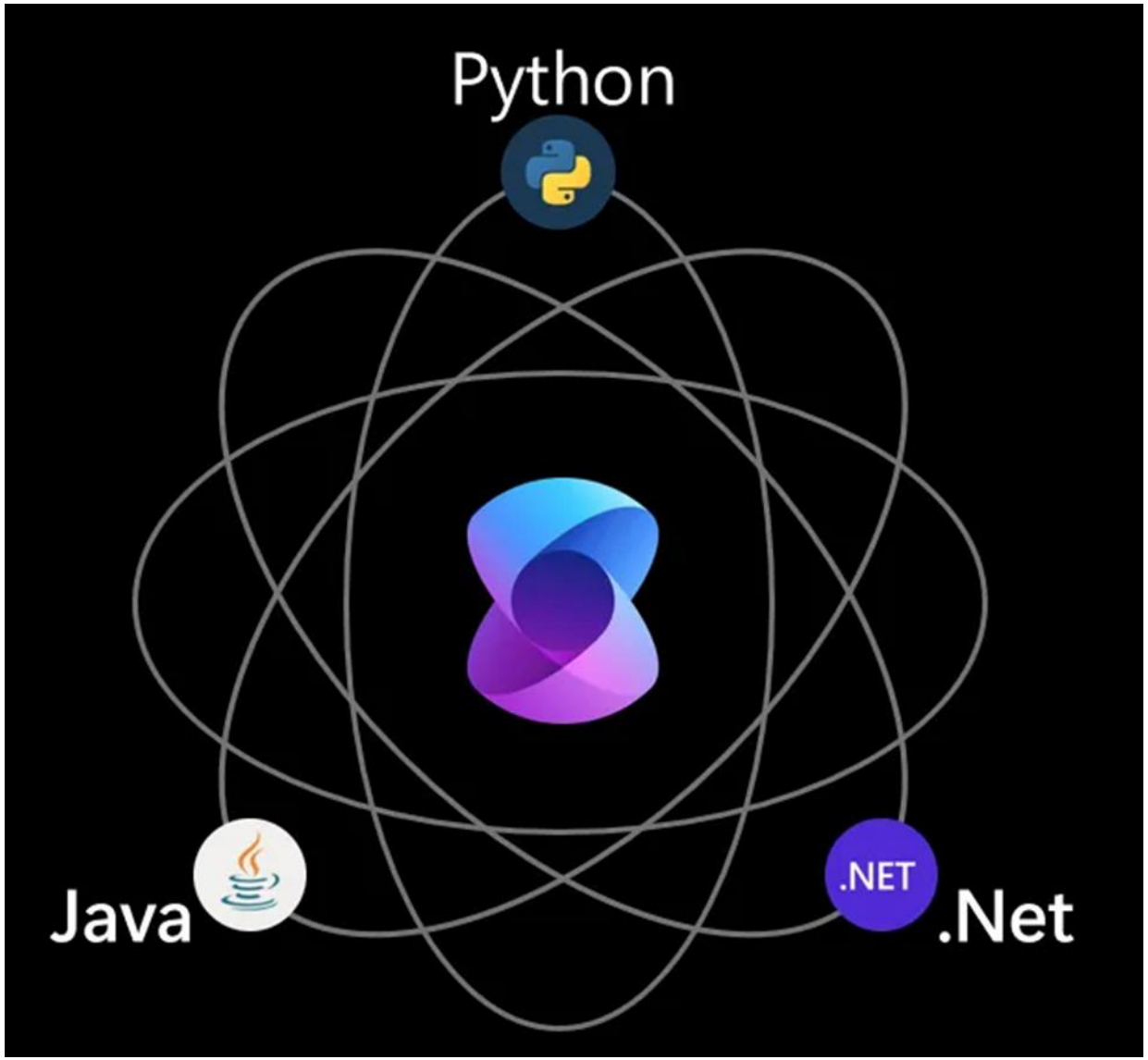
Agenda

- **Semantic Kernel – in a nutshell**
- **AI Agents**
- **AI Agents Capabilities**
- **Why Semantic Kernel?**
- **Semantic Kernel Architecture**
- **AI Agents Components**
- **Building your First Agents – Hands-on**
- **Built-in Plugins – Hands-on**
- **Creating Prompt Templates – Hands-on**
- **Use Personas in Prompts – Hands-on**

What is Semantic Kernel?



Supported Semantic Kernel Languages



Supported AI Endpoints

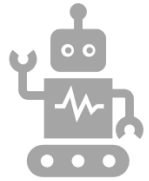
Azure OpenAI

OpenAI

Hugging Face

What’s an AI Agents?

A program that can achieve predetermined goals.



AI agents are powered by large language models (LLMs) that are trained on massive amounts of data.

An AI agent can fulfill a wide variety of tasks with some or minimal human intervention.

AI Agents Capabilities

Write code

Compose emails

Summarize meetings

Provide recommendations

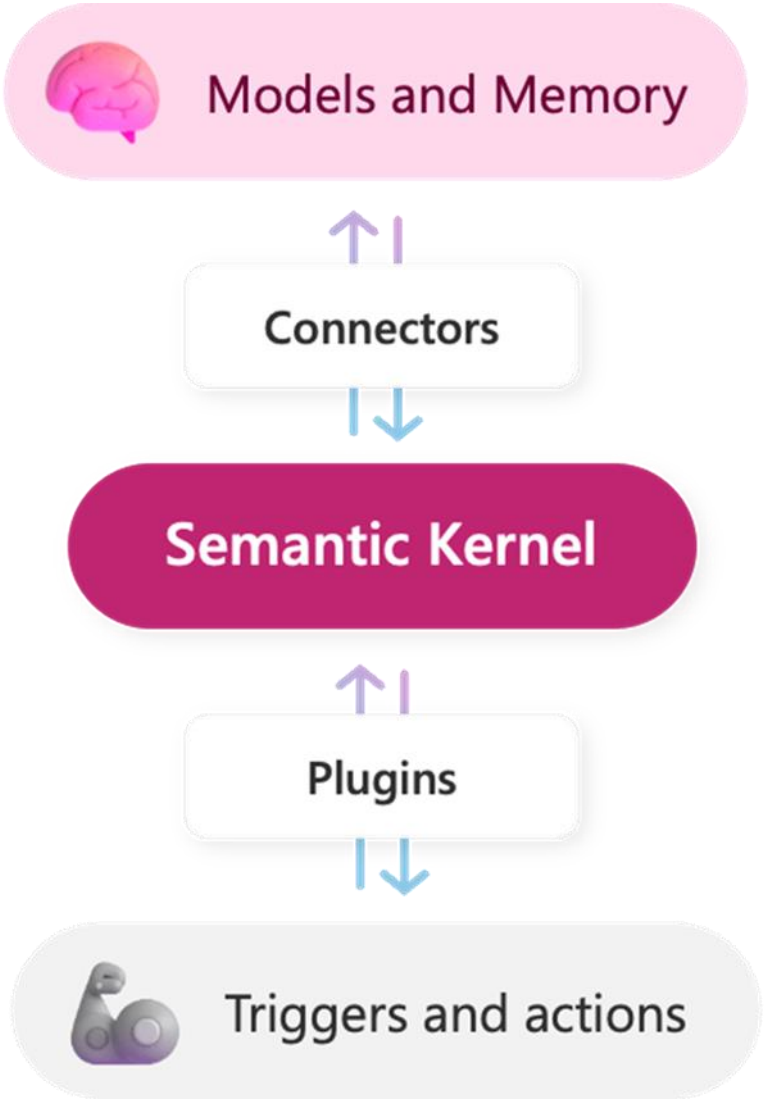
Why Semantic Kernel?

Streamlined Integration – Simplifies integration of AI capabilities into existing applications, providing a cohesive solution for enterprise products.

Reduced Learning Curve – No need to learn the APIs of LLMs

Enhanced Reliability - The SDK supports the ability to fine tune prompts and plan tasks to create a controlled and predictable user experience.

Semantic Kernel Architecture



Agents Components

- Retrieve the information – **Plugins**
- Plan how to use that information – **Planners**
- Respond back to user or perform an action - **Personas**

Prerequisites

- Azure Subscription
- Azure OpenAI resource model with compatible region
- Create GPT-4o Deployment

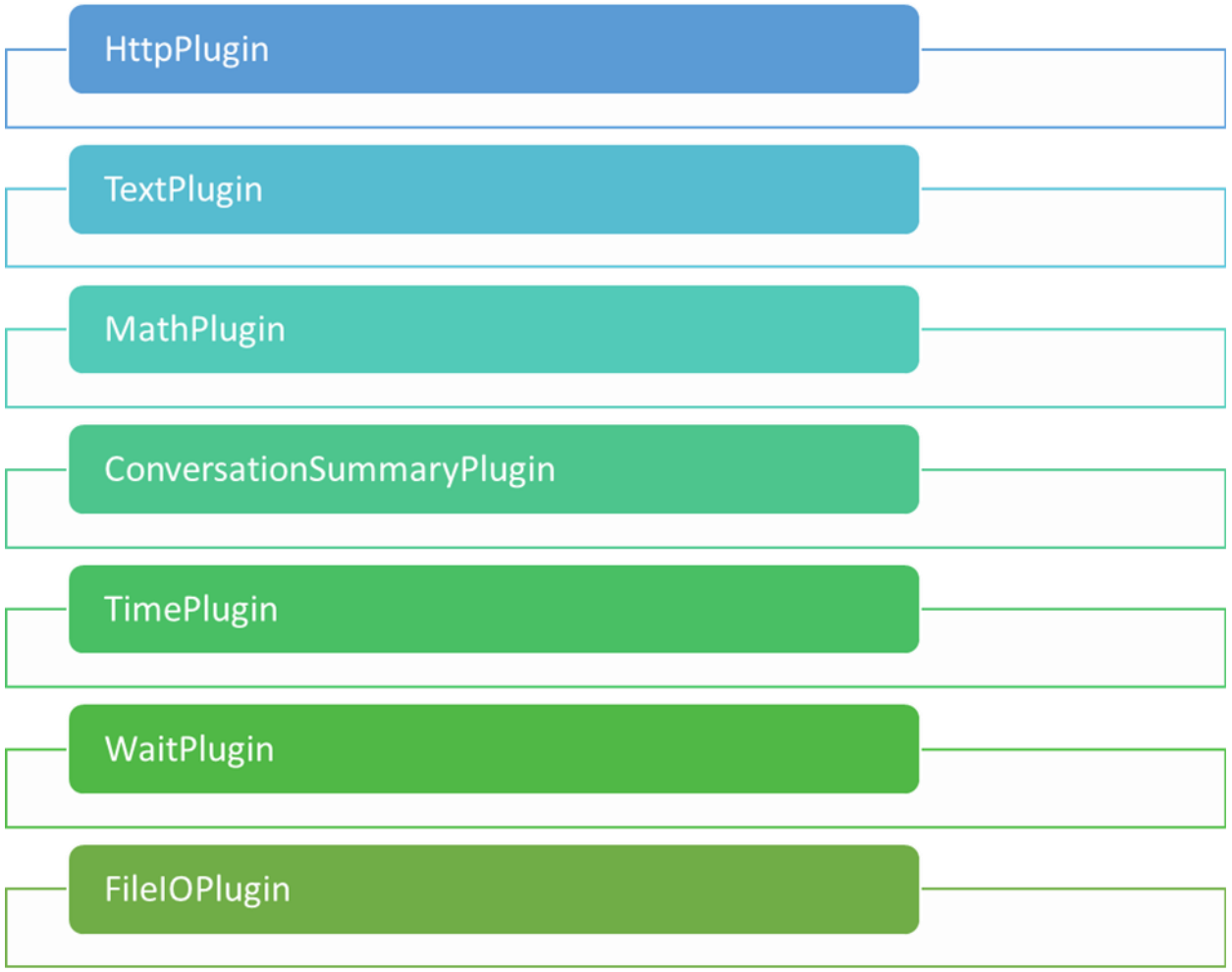
How to build your Kernel?

C#

```
using Microsoft.SemanticKernel;

// Create kernel
var builder = Kernel.CreateBuilder();
builder.AddAzureOpenAIChatCompletion(
    deploymentName: "[The name of your deployment]",
    endpoint: "[Your Azure endpoint]",
    apiKey: "[Your Azure OpenAI API key]",
    modelId: "[The name of the model]" // optional
);
var kernel = builder.Build();
```

Built-in Plugins



Create Prompt Templates

- The Semantic Kernel SDK supports a templating language that allows you to use expressions and variables in your natural language prompts.

- To embed expressions in your prompts, the templating language uses curly brackets {{...}}.

Use Personas in Prompts

- Assigning personas to your prompts can improve the quality of the responses generated by the large language model (LLM).
- Personas provide context to the LLM, allowing it to consistently generate responses that are better aligned with your user's intent

Hands-on

Let's see the hands-on Demo


Thank you.