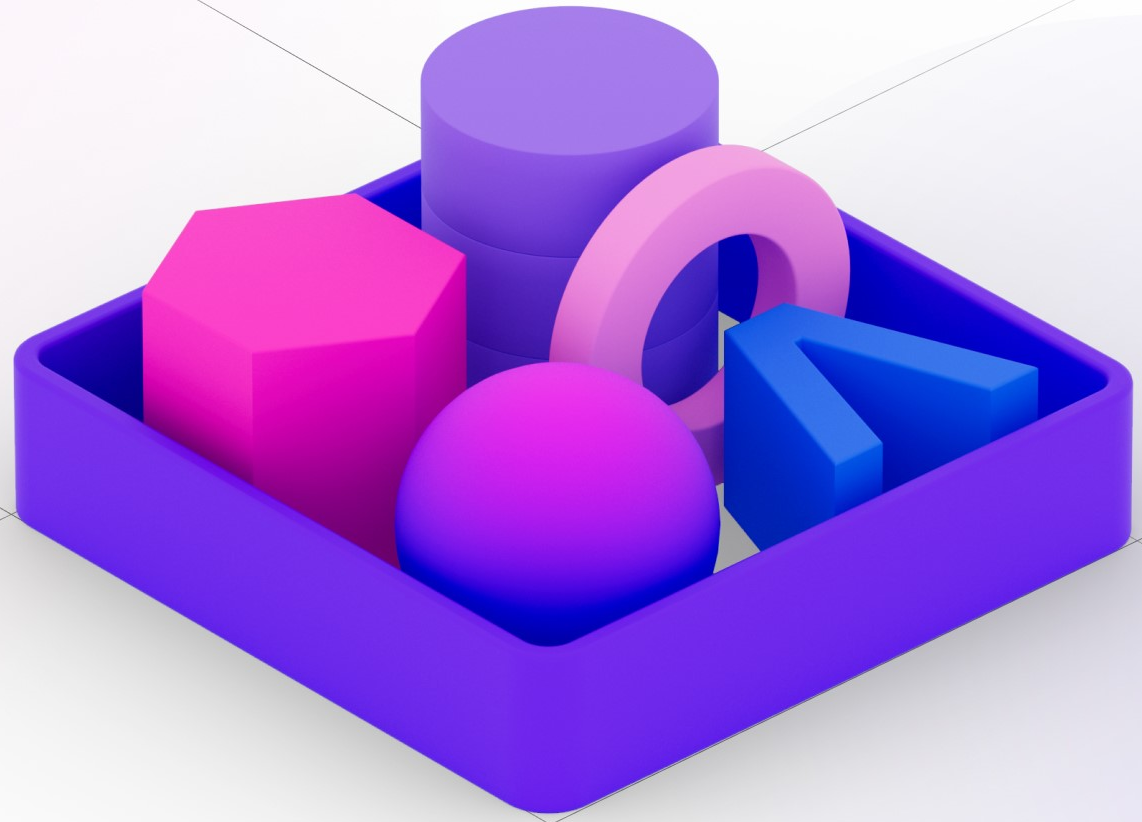
.NET Conf



Using OpenAI API through Azure Cloud

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About Me

Name: **Muhammad Abdugafarov**

Company: **Silk Road Professionals**

Position: **Engineering Team Lead**

Years of Experience: **6**

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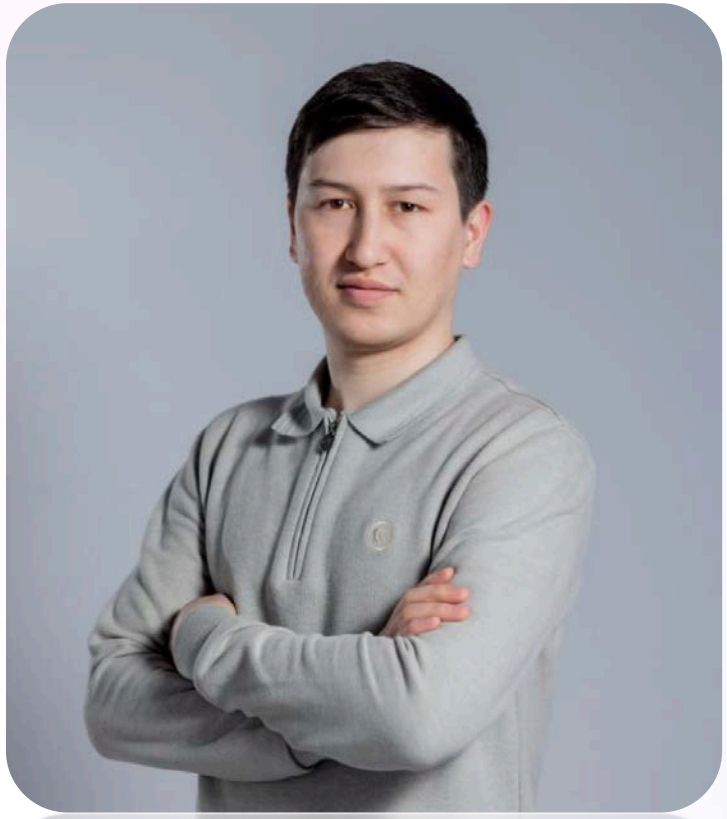
/dev-muhammad



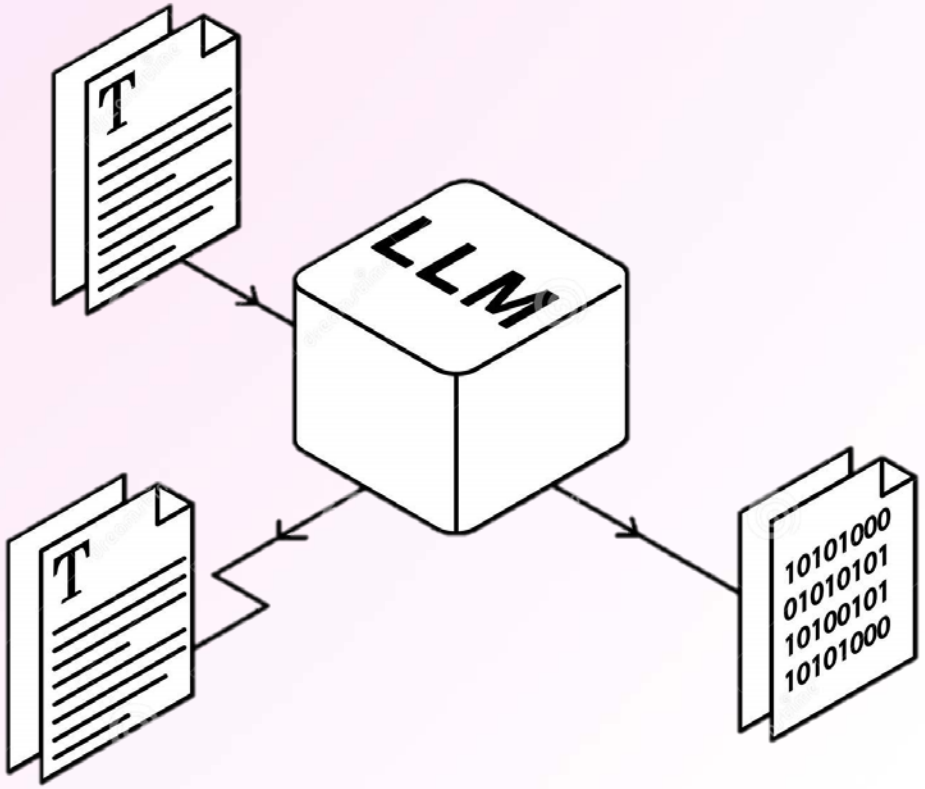
Agenda

1. Overview of AI
2. Understanding Large Language Models (LLM)
3. Exploring Actionable AI
4. Cloud LLM Providers
5. Integrating LLM into .NET Projects
6. Demonstration and Best Practices

Overview of AI

Artificial Intelligence (AI) simulates human intelligence in machines. It encompasses various technologies like machine learning, neural networks, and natural language processing. AI applications range from virtual assistants to recommendation systems.

Large Language Models (LLM)

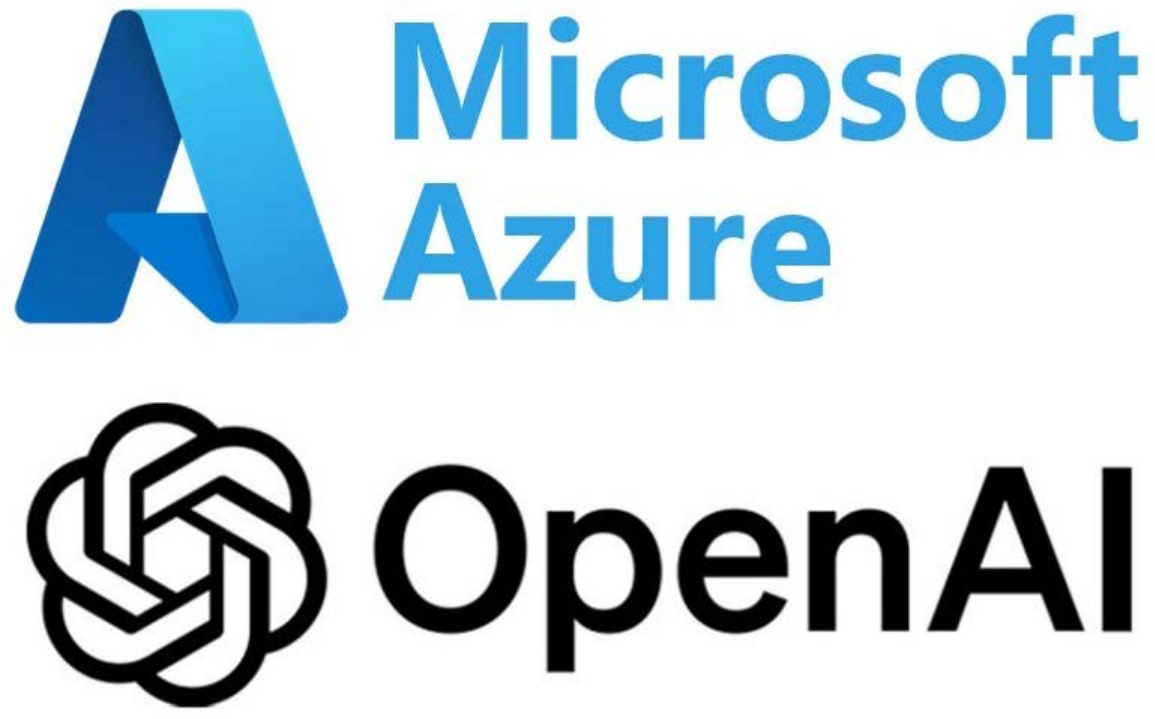


Large Language Models (LLM) are advanced AI systems trained on vast amounts of text data. They excel in tasks like text generation, translation, and summarization. LLMs, such as OpenAI's GPT, are transforming how we interact with technology.

Actionable AI

Actionable AI goes beyond traditional AI by automating tasks and enhancing decision-making processes. It enables systems to perform actions based on data insights, improving efficiency and productivity in various applications.

Cloud LLM Providers



There are several cloud providers offering LLM capabilities, including OpenAI and Azure. Using the OpenAI API directly or through Azure makes integration seamless, especially within the Microsoft ecosystem. Azure offers a straightforward way to leverage OpenAI's models, enhancing compatibility and ease of use for .NET developers.

Integrating LLM into .NET Projects

To use Azure OpenAI API

you need to get:

1) API key
2) API endpoint
3) Model deployment name

OpenAIService.cs

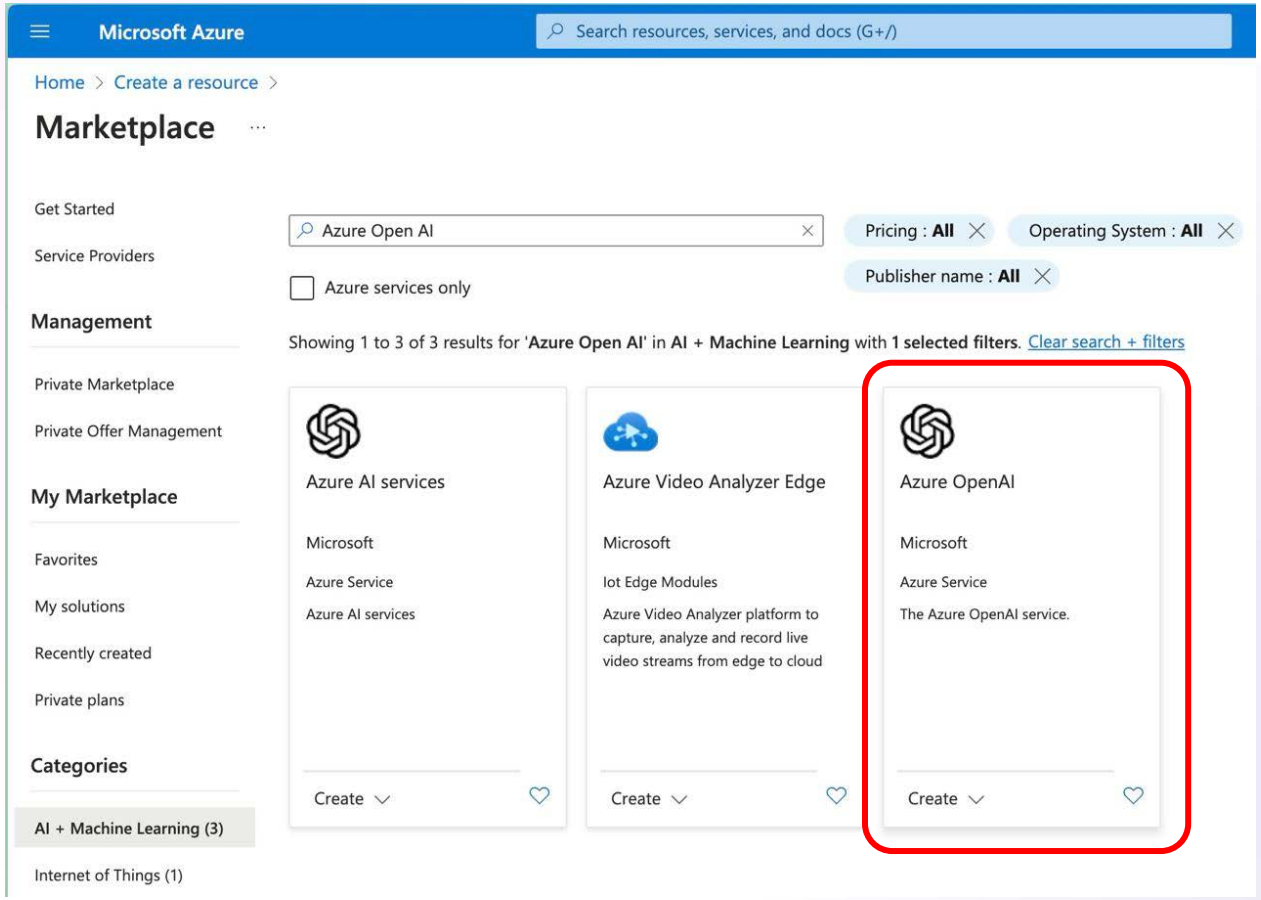
```cs
using System.Threading.Tasks;
using Azure;
using Azure.AI.OpenAI;
using Microsoft.Extensions.Configuration;

namespace ToDoAssistant.Services;

public class OpenAIService
{
    private readonly OpenAIClient _client;
    private readonly string _deploymentName;
    private readonly ToDoService _toDoService;

    public OpenAIService(IConfiguration configuration)
    {
        var apiKey = configuration["OpenAI:ApiKey"];
        var endpoint = configuration["OpenAI:Endpoint"];
        _deploymentName = configuration["OpenAI:DeploymentName"];
        _client = new OpenAIClient(new Uri(endpoint), new AzureKeyCredential(apiKey));
    }
  // rest of the code
}
```

Cloud Setup

Setup Azure Open AI service:

1) Open Azure Portal:
   - https://portal.azure.com/
2) Create new resource:
   - Search Azure Open AI
   - Create resource group if needed

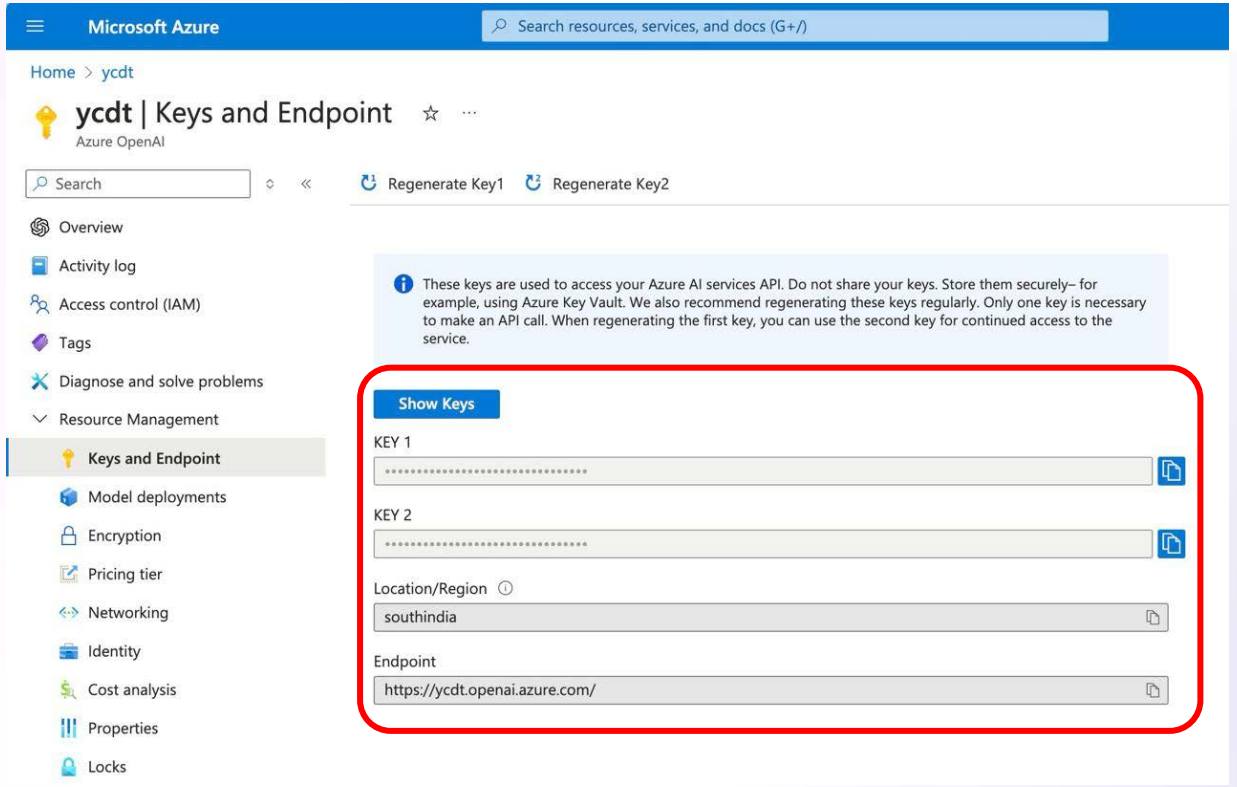
You need to setup subscription



Cloud Setup

Setup Azure Open AI service:

1) Open Azure Portal:
   - https://portal.azure.com/
2) Create new resource:
   - Search Azure Open AI
   - Create resource group if needed
3) Copy Key and Endpoint



You need to setup subscription

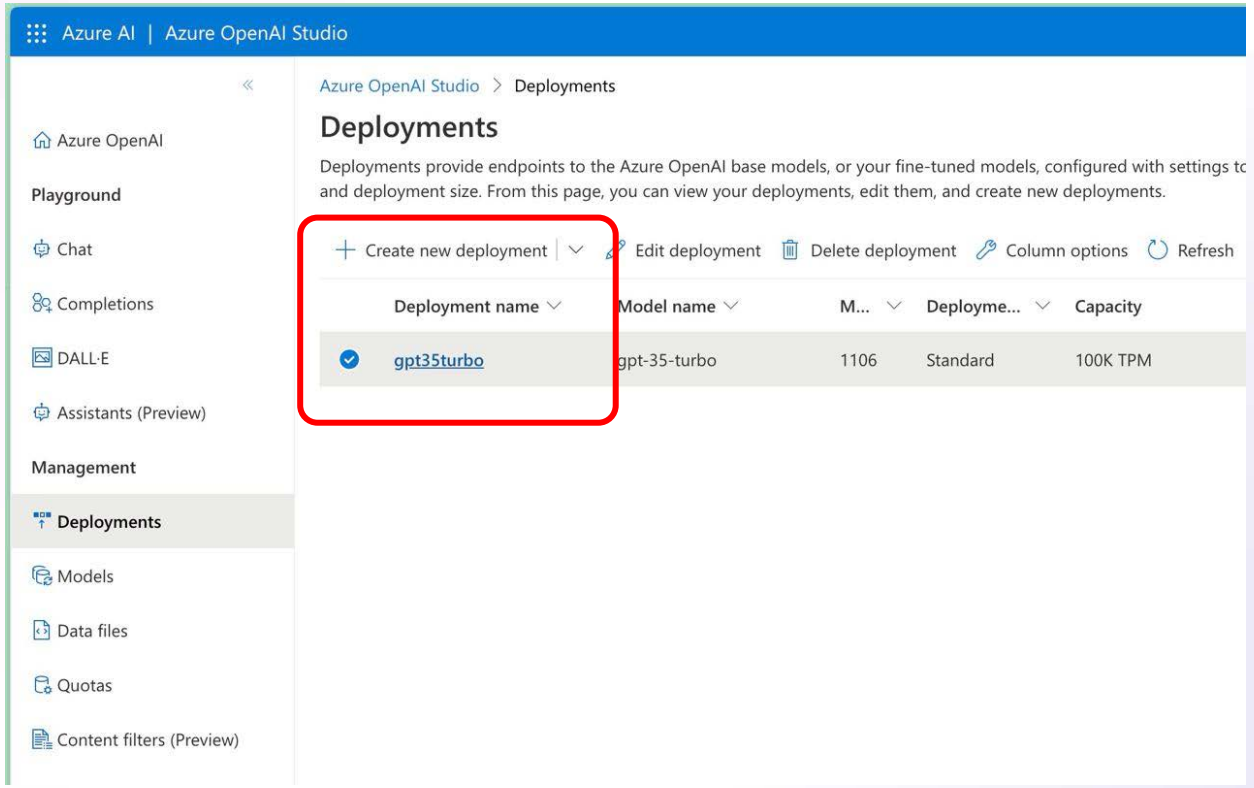
Deploy model

1) Open AI Studio to setup model

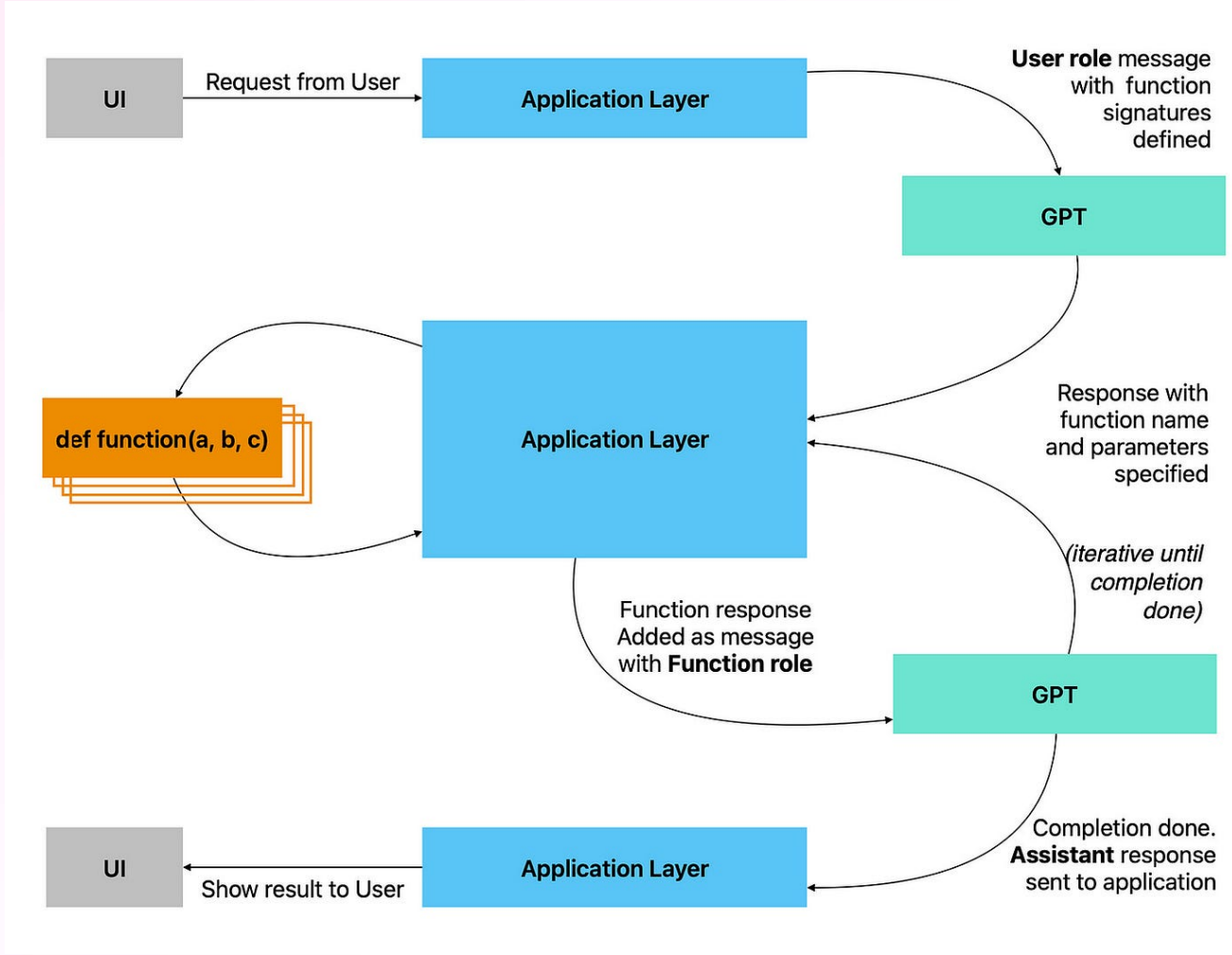
   - https://oai.azure.com

2) Deploy model

   - Get deployment name



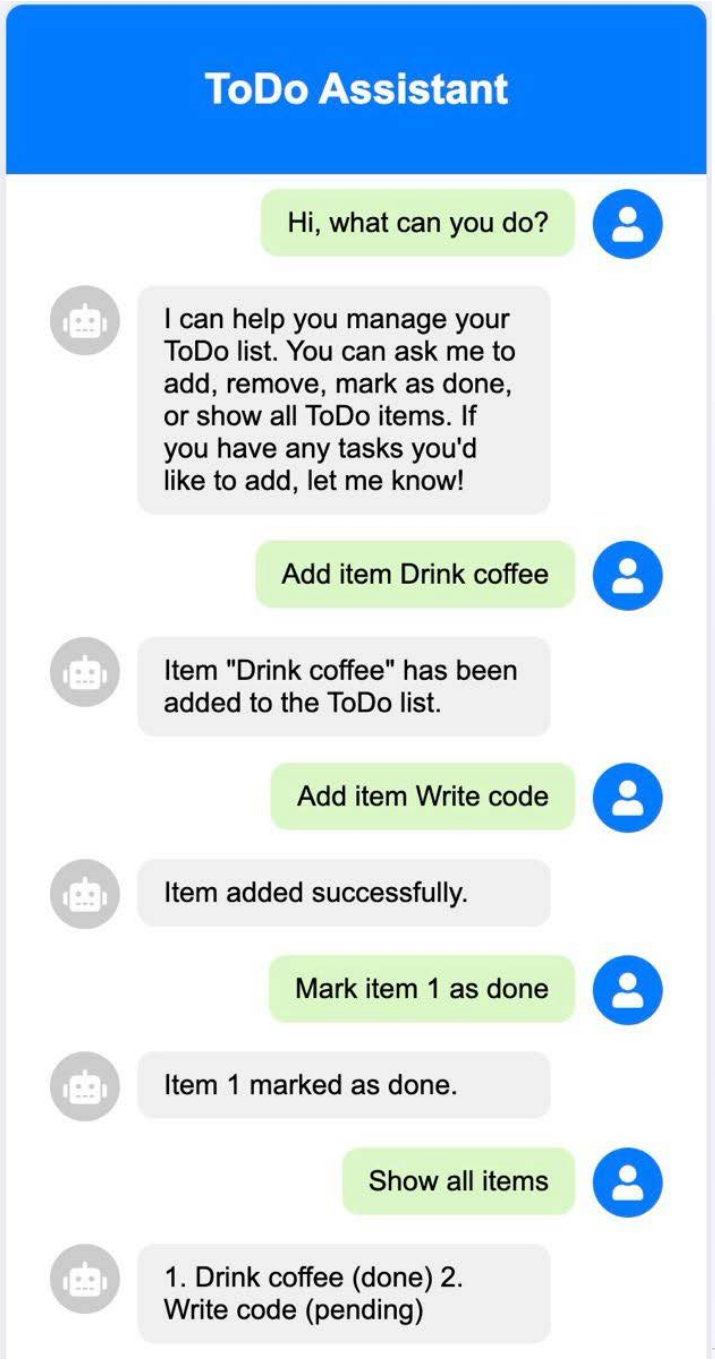
Function calling workflow



DEMO

AI To Do Assistant

To Do Assistant based on Azure Open AI and utilizing function calling capability



Source code:

/dev-muhammad/AIToDoAssistant

Conclusion

Don't be afraid to integrate AI into your project and explore the capabilities of AI.

Follow me to know about AI more:

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- /dev-muhammad

Useful Links

- https://learn.microsoft.com/en-us/dotnet/api/azure.ai.openai.chatcompletionsoptions.tools
- https://learn.microsoft.com/en-us/dotnet/ai/quickstarts/quickstart-azure-openai-tool
- https://github.com/dotnet/ai-samples?tab=readme-ov-file
- https://github.com/dotnet/ai-samples/blob/main/src/quickstarts/azure-openai-sdk/04-HikerAIPro/Program.cs
- https://github.com/Azure-Samples/openai/blob/main/Basic_Samples/Functions/dotnet/csharp/Function_calling_finding_nearby_places.ipynb
- https://medium.com/@tsr.us.2021/calling-azure-open-ai-using-functions-in-c-f19de507b1c3
- https://dev.to/esdanielgomez/using-azure-openai-service-gpt-4-in-net-2l1f