



# Semantic Kernel과 MCP로 나만의 자비스 만들기

윤금재

# 목차

1. Intro
2. Semantic Kernel
3. MCP
4. Demo



# 윤금재

- 영남대학교 20학번 컴퓨터공학과
- 현 MCT, MLSA
- Global AI community in Daegu

 @KeumJaeYoon



## 법적 고지

**이 프레젠테이션에는 공개가 제한된 NDA(비밀유지계약) 내용이 포함되어 있습니다.**

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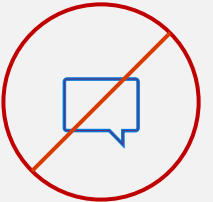
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**모든 NDA(비밀유지계약) 내용에는 표시가 되어 있습니다. 모든 일정은 사전 통보 없이 변경될 수 있습니다.**

# 협찬 및 후원사

## 플래티넘



## 골드



## 실버



## 브론즈



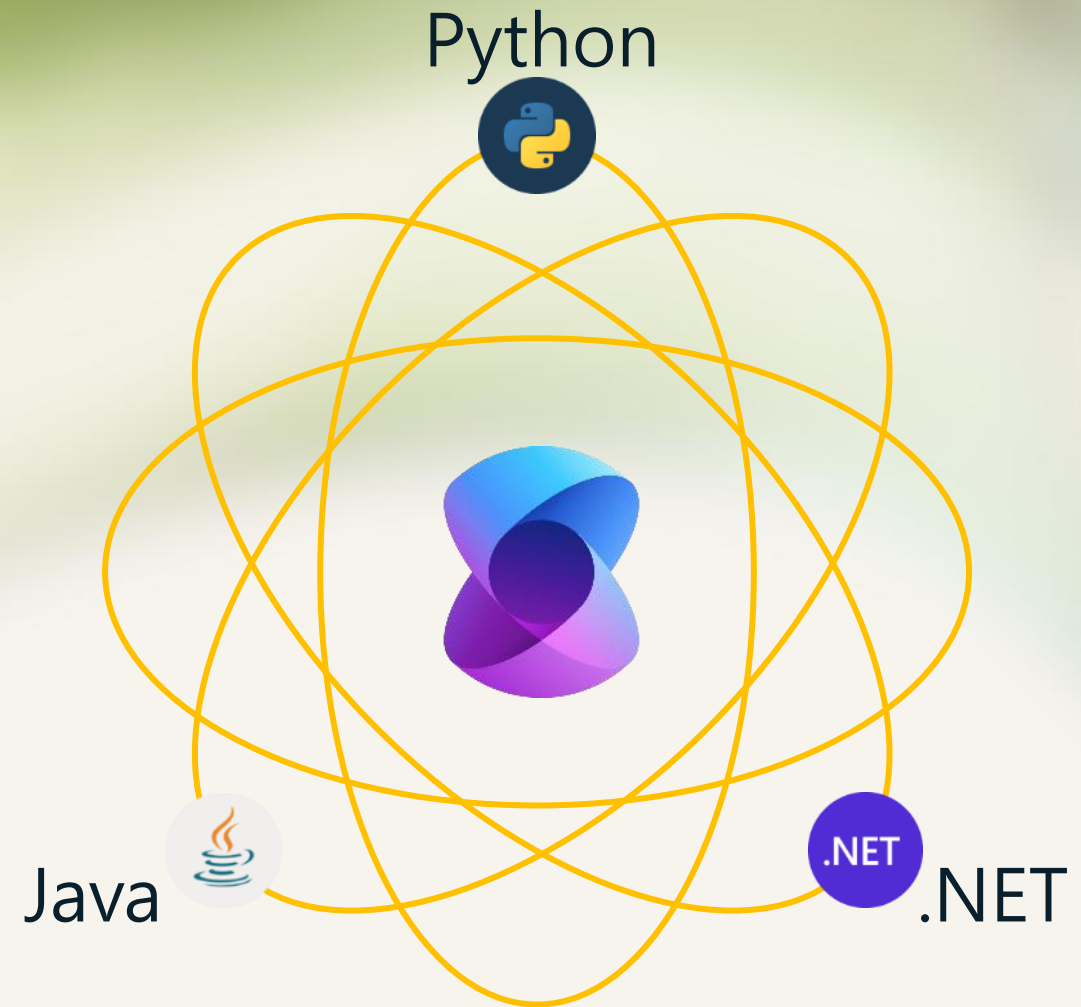




# Semantic Kernel

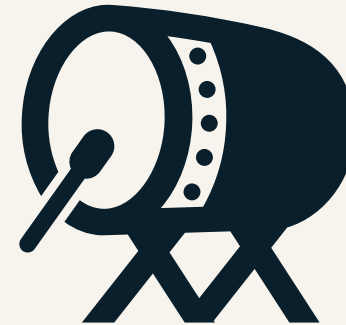


Semantic Kernel is  
**lightweight**  
**open-source**  
orchestration **middleware**  
that lets you easily add AI to y  
our apps

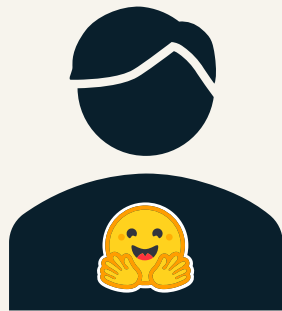
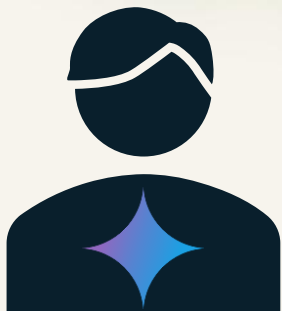
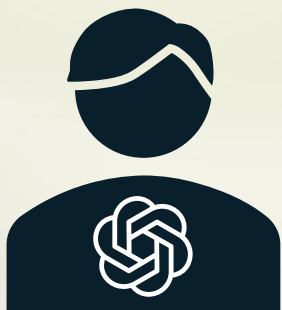




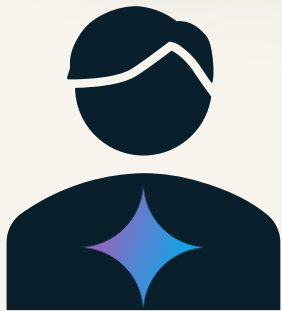
# Orchestration?



SEMANTIC KERNEL



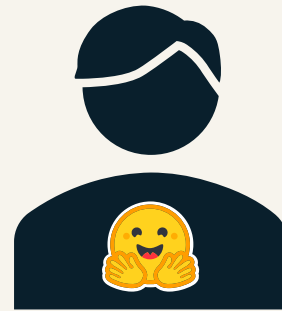
유튜브 영상 요약



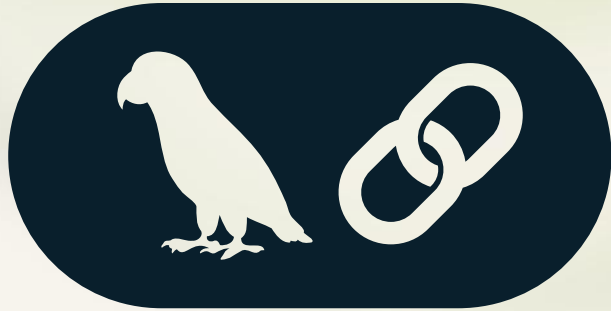
문서에 내용 추가



요약한 내용 번역



앞뒤 맥락 다듬기



LangChain

VS



Semantic Kernel

SEMANTIC KERNEL



기업용 앱 친화적



플러그인



멀티 에이전트



SEMANTIC KERNEL



기업용 앱 친화적



플러그인



멀티 에이전트

SEMANTIC KERNEL



기업용 앱 친화적



플러그인



멀티 에이전트

SEMANTIC KERNEL



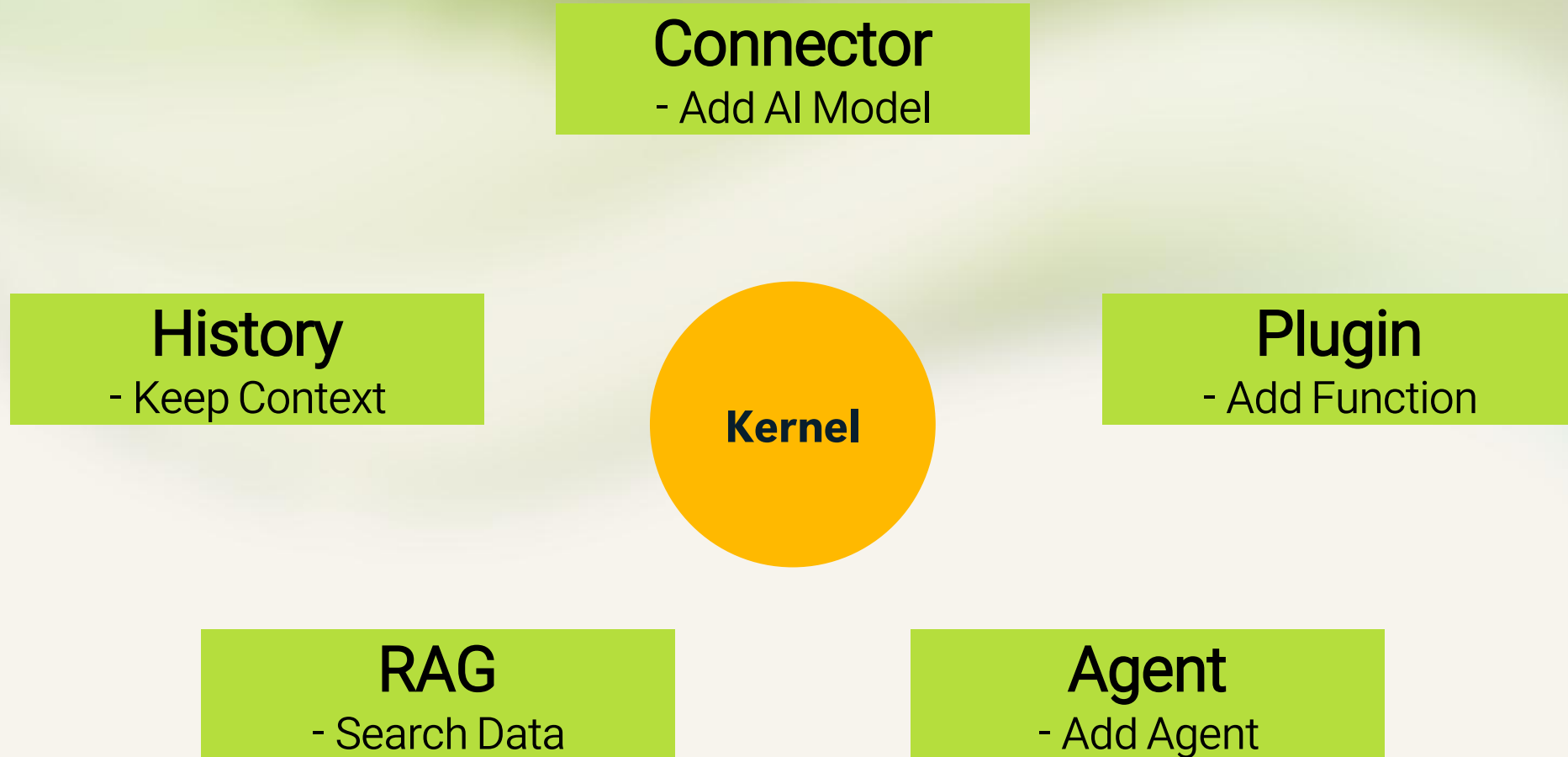
기업용 앱 친화적



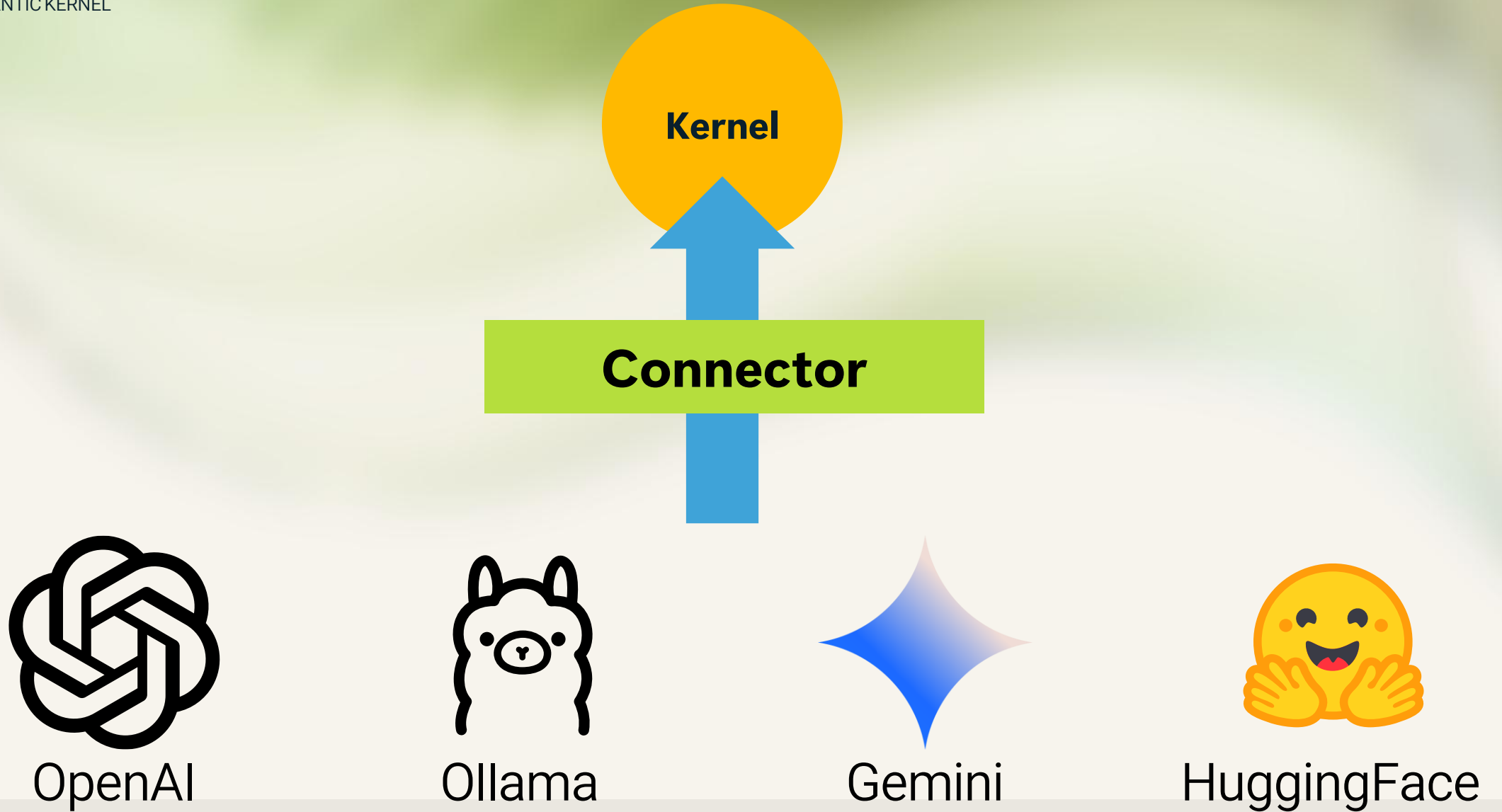
플러그인



멀티 에이전트



SEMANTIC KERNEL



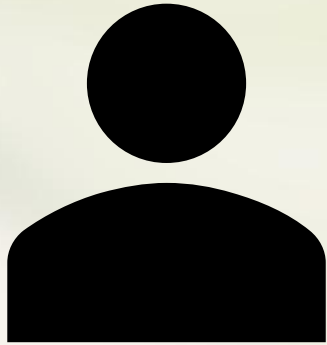


## Program.cs

```
var builder = Kernel.CreateBuilder();

builder.AddAzureOpenAIChatCompletion(
    modelId: "gpt-4o",
    deploymentName: "gpt-4o",
    endpoint: endpoint,
    apiKey: token
);

var kernel = builder.Build();
```



대구 날씨 알려줘



getWeather( )



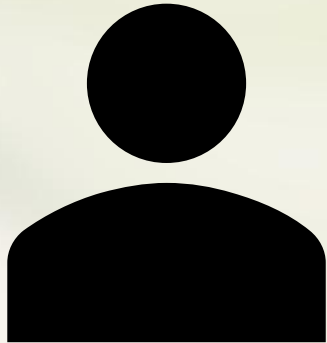
sendMessage( )



bookTrain( )



searchBing( )



뭐 써야하지..?



getWeather( )



sendMessage( )



bookTrain( )



searchBing( )

## WeatherPlugin.cs

```
[KernelFunction("get_weather")]  
[Description("Gets the current weather details for a city")]  
[return: Description("weather ID")]  
public static string GetWeather(string city)  
{  
    ...  
}
```

## SEMANTIC KERNEL



```
1 [KernelFunction("get_weather")]
2 [Description("Gets the current weather details for a city")]
3 public static string GetWeather(string city)
4 {
5     return weathers.TryGetValue(city, out WeatherData? data)
6         ? $"Weather forecast for {city}:\n" +
7           $"Temperature: {data.Temperature}°C\n" +
8           $"Humidity: {data.Humidity}%\n" +
9           $"Condition: {data.Condition}"
10    : $"Sorry, we do not have weather data for {city}.";
11 }
```



**Kernel**

이거구나!



getWeather( )



sendMessage( )

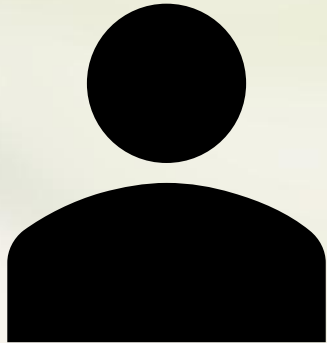


bookTrain( )



searchBing( )





이번엔 서울 알려줘



getWeather( )



sendMessage( )



bookTrain( )



searchBing( )

SEMANTIC KERNEL



서울... 뭐요?



서울... 뭐요?



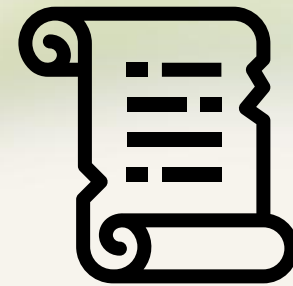
ChatHistory

## Program.cs

```
var history = new ChatHistory();  
...  
history.AddUserMessage(input);  
...  
history.AddAssistantMessage(message!);
```



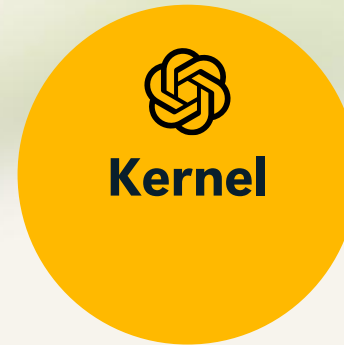
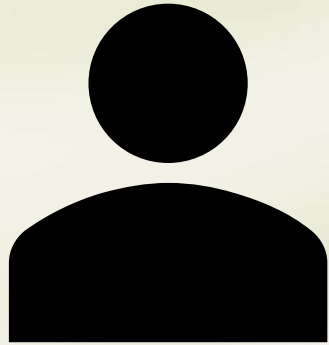
아까 대구 날씨 물어봤었으니  
서울의 날씨를 묻는거구나...!



ChatHistory



SEMANTIC KERNEL



인터넷에서 검색해줘!!!

SEMANTIC KERNEL



Azure Cosmos DB



**Kernel**



Pinecone



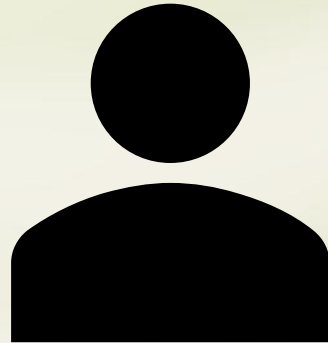
Bing



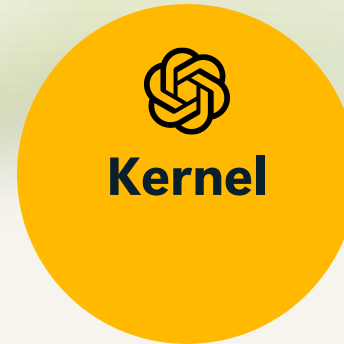
Google

## BingSearch.cs

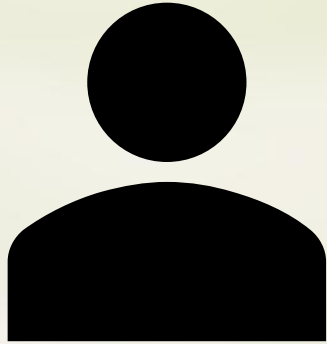
```
var textSearch = new BingTextSearch(  
    apiKey: "<Bing API Key>");  
  
KernelSearchResults<string> searchResults  
    = await textSearch.SearchAsync(query, new() { Top = 4 });
```



제품 기획도 가능...? ㅎㅎ



못해요...



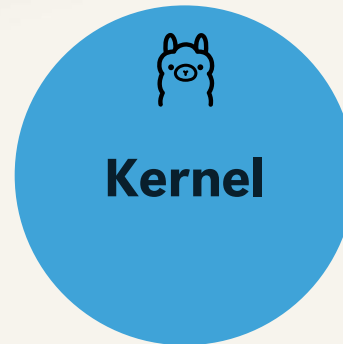
여럿이면 되겠지? 파이팅!



아이디어 구상



마케팅



디자인



검토

## Agent.cs

```
var managerName = "Manager";  
var managerInstructions = "...";  
  
var designerName = "Designer";  
var designerInstructions = "...";  
  
var agentManager = new ChatCompletionAgent()  
{  
    Name = managerName,  
    Instructions = managerInstructions,  
    Kernel = kernel  
};  
...
```

## Agent.cs

```
var selectionFunction =  
    AgentGroupChat.CreatePromptFunctionForStrategy(  
        $$$"  
        Determine which participant takes the next turn in a conversation based on the the  
        most recent participant.  
        State only the name of the participant to take the next turn.  
        No participant should take more than one turn in a row.  
  
        Choose only from these participants:  
        - {{{managerName}}}  
        - {{{designerName}}}  
  
        Always follow these rules when selecting the next participant:  
        - After {{{designerName}}}, it is {{{managerName}}}'s turn.  
        - After {{{managerName}}}, it is {{{designerName}}}'s turn.  
  
        History:  
        {{$history}}  
        """);
```



## Agent.cs

```
var terminationFunction =  
    AgentGroupChat.CreatePromptFunctionForStrategy(  
        ""  
  
        Determine if the design has been approved. If so, respond    with a single word: yes  
  
        History:  
        {{$history}}  
        """);
```

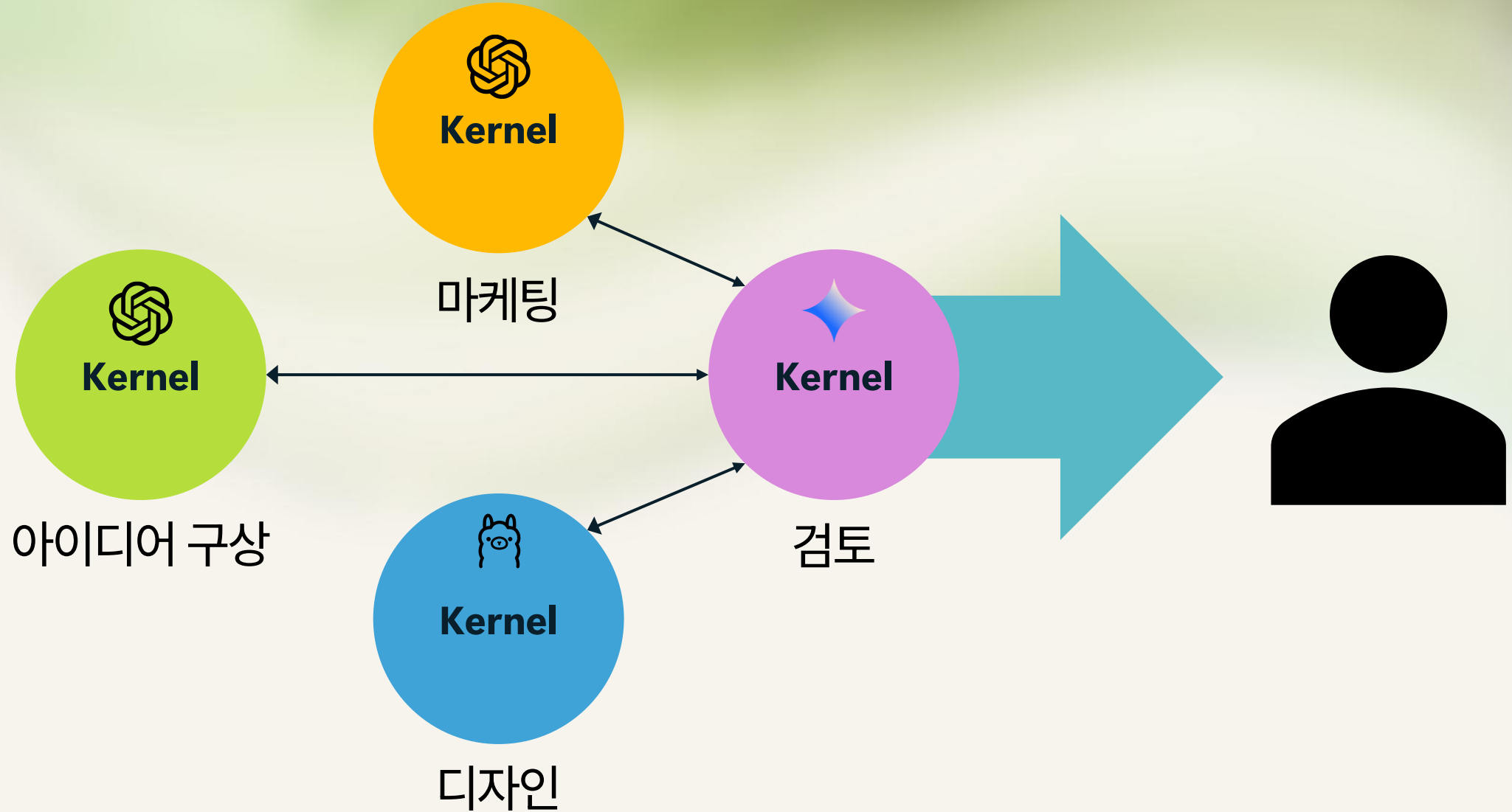
## Agent.cs

```
var chat = new AgentGroupChat(agentManager, agentDesigner)
{
    ExecutionSettings = new AgentGroupChatSettings()
    {
        SelectionStrategy = ...
        {
            InitialAgent = agentManager,
            ...
        },
        TerminationStrategy = ...
        {
            Agents = [ agentDesigner ],
            ...
        }
    }
}
```

## Agent.cs

```
chat.AddChatMessage(  
    new ChatMessageContent(AuthorRole.User, input));  
  
var response = chat.InvokeStreamingAsync();
```

SEMANTIC KERNEL



MODEL-CONTEXT-PROTOCOL



NETFLIX





NETFLIX



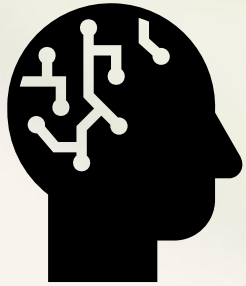
모든 API를 일일이 연결해야하나?



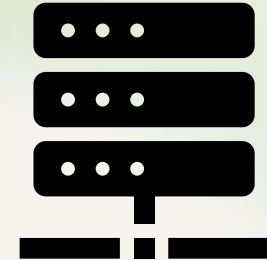
MCP







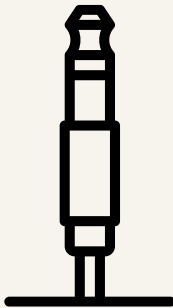
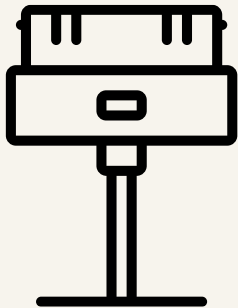
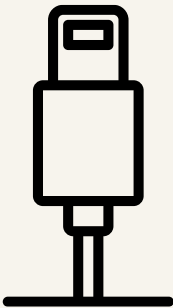
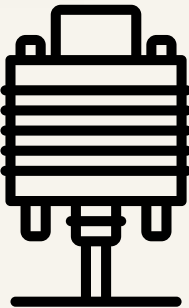
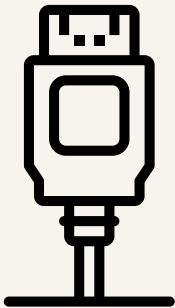
ToolFormer  
ReAct  
LangChain  
AutoGPT  
HuggingGPT  
...



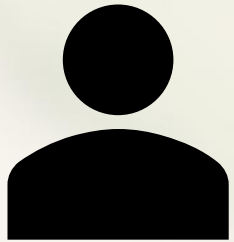
MODEL-CONTEXT-PROTOCOL



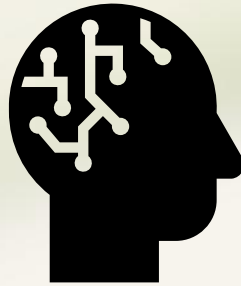
MODEL-CONTEXT-PROTOCOL



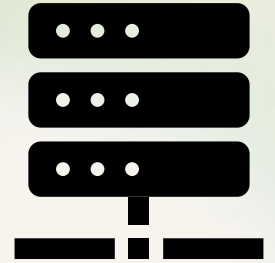
MODEL-CONTEXT-PROTOCOL



Client

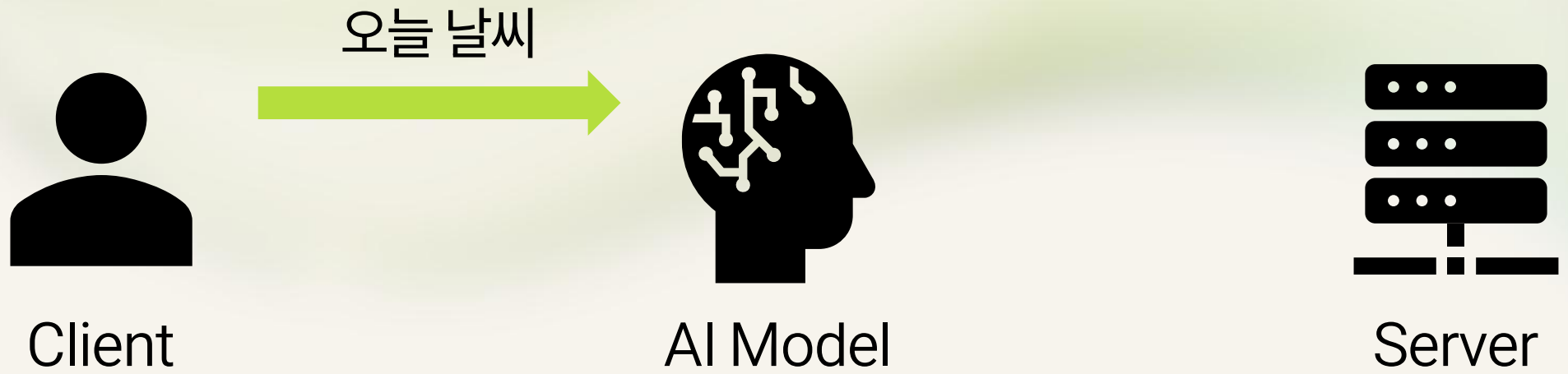


AI Model

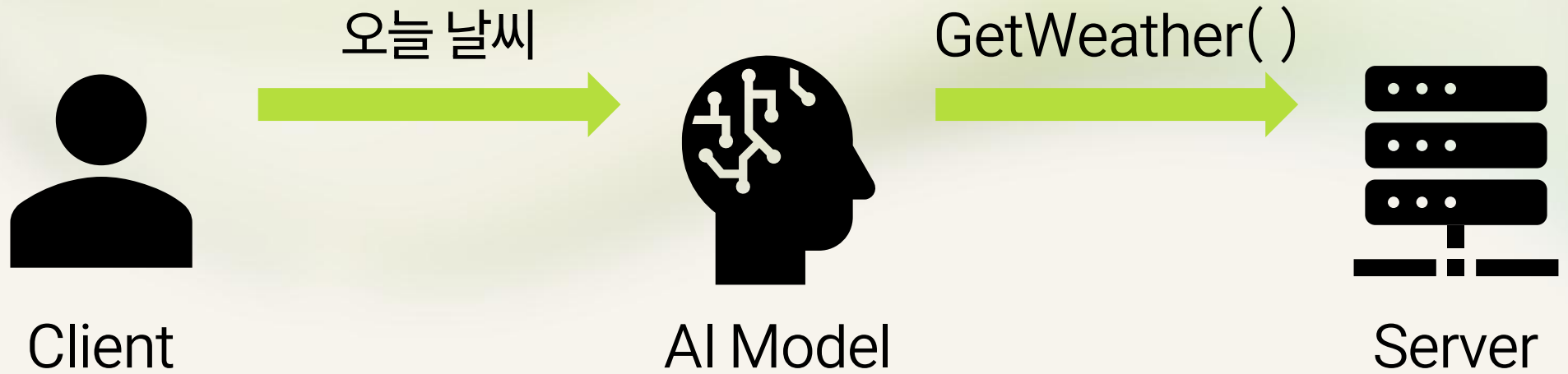


Server

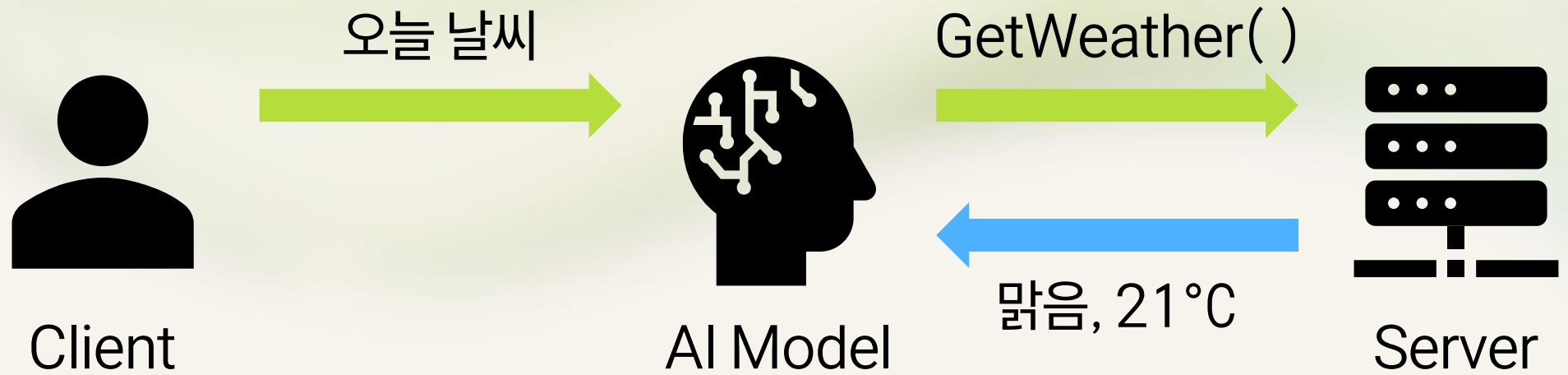
MODEL-CONTEXT-PROTOCOL



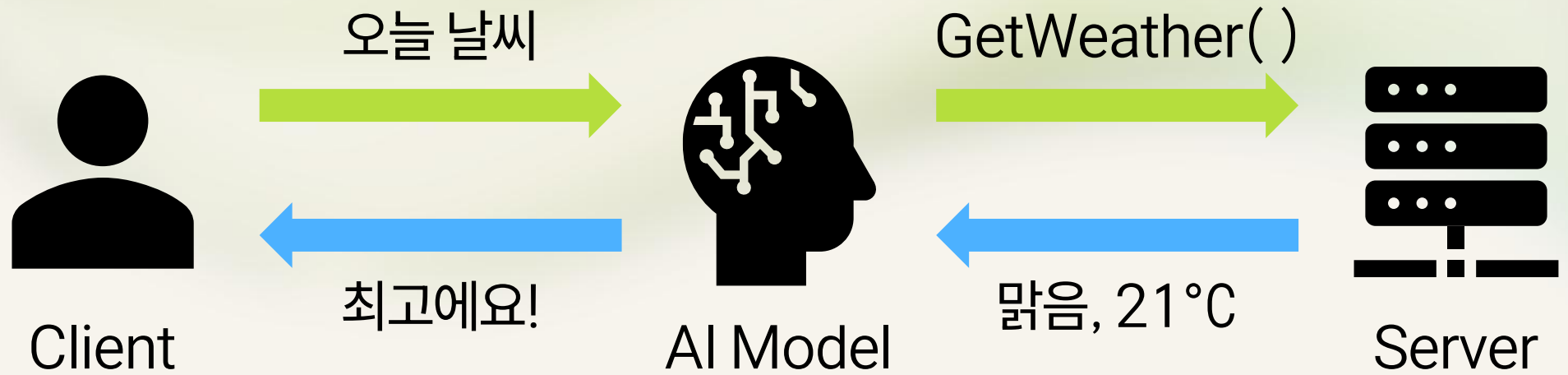
MODEL-CONTEXT-PROTOCOL



MODEL-CONTEXT-PROTOCOL



MODEL-CONTEXT-PROTOCOL





EdgeFileEditViewHistoryFavoritesProfilesTabWindowHelpMCP Servers

←https://mcp.so

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Playwright MCP server

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是国内首家兼容MCP协议的地图服

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Smithery - Model Context Protocol Registry

DocsAdd Server

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@mem0ai/mem0-memory-mcp  
Store and retrieve user-specific memories to maintain context and make informed decisions based on past interactions. Utilize a simple A...

**Slack**  
@smithery-ai/slack  
Enable interaction with Slack workspaces. Supports subscribing to Slack events through Resources.

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@wonderwhy-er/desktop-commander  
Execute terminal commands and manage files with diff editing capabilities. Coding, shell and terminal, task automation

**Sequential Thinking**  
@smithery-ai/server-sequential-thinking  
An MCP server implementation that provides a tool for dynamic and reflective problem-solving through a structured thinking process.

**Browserbase** ☺  
@browserbasehq/mcp-browserbase  
Provides cloud browser automation capabilities using Browserbase, enabling LLMs to interact with web pages, take screenshots, and execu...

**Think Tool Server**  
@PhillipRt/think-mcp-server  
Enhance your AI's reasoning capabilities with structured thinking. This server provides a dedicated space for complex problem-solvin...

Local472.96kRemote145.81kRemote16.67kRemote20.11k

Web Search 170 View all

**Brave Search**  
@smithery-ai/brave-search  
Integrate web search and local search

**DuckDuckGo Search Server**  
@nickclyde/duckduckgo-mcp-server  
Enable web search capabilities through

**Exa Search** ☺  
exa  
Fast, intelligent web search and crawling. Exa

**Perplexity Search**  
@arjunkmrm/perplexity-search  
Enable AI assistants to perform web searches



# Semantic Kernel with MCP



MODEL-CONTEXT-PROT

mcp.js

```
1  {
2    "mcp": {
3      "servers": {
4        "obsidian": {
5          "command": "npx",
6          "args": ["-y", "mcp-obsidian", "/Path/to/obsidian"]
7        },
8        "filesystem": {
9          "command": "npx",
10         "args": [
11           "-y",
12           "@modelcontextprotocol/server-filesystem",
13           "/Path/to/Desktop"
14         ]
15       },
16       "puppeteer": {
17         "command": "npx",
18         "args": ["-y", "@modelcontextprotocol/server-puppeteer"]
19       }
20     }
21   }
22 }
23
```

ervers



## MODEL-CONTEXT-PROTOCOL

```
1 {
2   "mcp": {
3     "servers": {
4       "obsidian": {
5         "command": "npx",
6         "args": ["-y", "mcp-obsidian", "/Path/to/obsidian"]
7       },
8       "filesystem": {
9         "command": "npx",
10        "args": [
11          "-y",
12          "@modelcontextprotocol/server-filesystem",
13          "/Path/to/Desktop"
14        ]
15      },
16      "puppeteer": {
17        "command": "npx",
18        "args": ["-y", "@modelcontextprotocol/server-puppeteer"]
19      }
20    }
21  }
22 }
23 }
```

mcp.json

```
1 var jsonPath = Path.Combine(_rootDir, "mcp.json");
2 var json = await File.ReadAllTextAsync(jsonPath);
3 var root = System.Text.Json.Nodes.JsonNode.Parse(json);
4 var mcp = root?["mcp"]?.AsObject();
5
6 if (mcp == null)
7     throw new InvalidOperationException("mcp not found in mcp.json");
8
9 var servers = mcp["servers"]?.AsObject();
10 if (servers == null)
11     throw new InvalidOperationException(
```

parser

servers

## MCP.Service.cs

```
var mcpClient = await McpClientFactory
    .CreateAsync(new StdioClientTransport(transportOptions));

var tools = await mcpClient
    .ListToolsAsync()
    .ConfigureAwait(false);

kernel.Plugins
    .AddFromFunctions(
        pluginName,
        tools.Select(tool => tool.AsKernelFunction()));
```

## MCP.Service.cs

```
var mcpClient = await McpClientFactory  
    .CreateAsync(new StdioClientTransport(transportOptions));
```

```
var tools = await mcpClient  
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```
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    .AddFromFunctions(  
        pluginName,  
        tools.Select(tool => tool.AsKernelFunction()));
```



## MCP.Service.cs

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var mcpClient = await McpClientFactory  
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    .ConfigureAwait(false);
```

```
kernel.Plugins  
    .AddFromFunctions(  
        pluginName,  
        tools.Select(tool => tool.AsKernelFunction()));
```

Demo



**Q&A**



# Thank you!

MCT & MLSA 윤금재



