

# OpenAPI Agent

## Contents

- Initialization
- Example: agent capable of analyzing OpenAPI spec and making requests

This notebook showcases an agent designed to interact with an OpenAPI spec and make a correct API request based on the information it has gathered from the spec.

In the below example, we are using the OpenAPI spec for the OpenAI API, which you can find [here](#).

## Initialization

```
import os
import yaml

from langchain.agents import create_openapi_agent
from langchain.agents.agent_toolkits import OpenAPIToolkit
from langchain.llms.openai import OpenAI
from langchain.requests import RequestsWrapper
from langchain.tools.json.tool import JsonSpec
```

```
with open("openai_openapi.yml") as f:
    data = yaml.load(f, Loader=yaml.FullLoader)
json_spec=JsonSpec(dict_=data, max_value_length=4000)
headers = {
    "Authorization": f"Bearer {os.getenv('OPENAI_API_KEY')}"
}
requests_wrapper=RequestsWrapper(headers=headers)
openapi_toolkit = OpenAPIToolkit.from_llm(OpenAI(temperature=0), json_spec,
requests_wrapper, verbose=True)
openapi_agent_executor = create_openapi_agent(
    llm=OpenAI(temperature=0),
    toolkit=openapi_toolkit,
    verbose=True
```

[Skip to main content](#)

# Example: agent capable of analyzing OpenAPI spec and making requests

```
openapi_agent_executor.run("Make a post request to openai /completions. The prompt should be 'tell me a joke.'")
```

> Entering new AgentExecutor chain...

Action: json\_explorer

Action Input: What is the base url for the API?

> Entering new AgentExecutor chain...

Action: json\_spec\_list\_keys

Action Input: data

Observation: ['openapi', 'info', 'servers', 'tags', 'paths', 'components', 'x-oaiMeta']

Thought: I should look at the servers key to see what the base url is

Action: json\_spec\_list\_keys

Action Input: data["servers"][0]

Observation: ValueError('Value at path `data["servers"][0]` is not a dict, get the value directly.')

Thought: I should get the value of the servers key

Action: json\_spec\_get\_value

Action Input: data["servers"][0]

Observation: {'url': 'https://api.openai.com/v1'}

Thought: I now know the base url for the API

Final Answer: The base url for the API is https://api.openai.com/v1

> Finished chain.

Observation: The base url for the API is https://api.openai.com/v1

Thought: I should find the path for the /completions endpoint.

Action: json\_explorer

Action Input: What is the path for the /completions endpoint?

> Entering new AgentExecutor chain...

Action: json\_spec\_list\_keys

Action Input: data

Observation: ['openapi', 'info', 'servers', 'tags', 'paths', 'components', 'x-oaiMeta']

Thought: I should look at the paths key to see what endpoints exist

Action: json\_spec\_list\_keys

Action Input: data["paths"]

Observation: ['/engines', '/engines/{engine\_id}', '/completions', '/edits', '/images/generations', '/images/edits', '/images/variations', '/embeddings', '/engines/{engine\_id}/search', '/files', '/files/{file\_id}', '/files/{file\_id}/content', '/answers', '/classifications', '/fine-tunes', '/fine-

[Skip to main content](#)

Thought: I now know the path for the /completions endpoint

Final Answer: data["paths"][2]

> Finished chain.

Observation: data["paths"][2]

Thought: I should find the required parameters for the POST request.

Action: json\_explorer

Action Input: What are the required parameters for a POST request to the /completions endpoint?

> Entering new AgentExecutor chain...

Action: json\_spec\_list\_keys

Action Input: data

Observation: ['openapi', 'info', 'servers', 'tags', 'paths', 'components', 'x-oaiMeta']

Thought: I should look at the paths key to see what endpoints exist

Action: json\_spec\_list\_keys

Action Input: data["paths"]

Observation: ['/engines', '/engines/{engine\_id}', '/completions', '/edits', '/images/generations', '/images/edits', '/images/variations', '/embeddings', '/engines/{engine\_id}/search', '/files', '/files/{file\_id}', '/files/{file\_id}/content', '/answers', '/classifications', '/fine-tunes', '/fine-tunes/{fine\_tune\_id}', '/fine-tunes/{fine\_tune\_id}/cancel', '/fine-tunes/{fine\_tune\_id}/events', '/models', '/models/{model}', '/moderations']

Thought: I should look at the /completions endpoint to see what parameters are required

Action: json\_spec\_list\_keys

Action Input: data["paths"]["completions"]

Observation: ['post']

Thought: I should look at the post key to see what parameters are required

Action: json\_spec\_list\_keys

Action Input: data["paths"]["completions"]["post"]

Observation: ['operationId', 'tags', 'summary', 'requestBody', 'responses', 'x-oaiMeta']

Thought: I should look at the requestBody key to see what parameters are required

Action: json\_spec\_list\_keys

Action Input: data["paths"]["completions"]["post"]["requestBody"]

Observation: ['required', 'content']

Thought: I should look at the content key to see what parameters are required

Action: json\_spec\_list\_keys

Action Input: data["paths"]["completions"]["post"]["requestBody"]["content"]

Observation: ['application/json']

Thought: I should look at the application/json key to see what parameters are required

Action: json\_spec\_list\_keys

Action Input: data["paths"]["completions"]["post"]["requestBody"]["content"]["application/json"]

Observation: ['schema']

Thought: I should look at the schema key to see what parameters are required

Action: json\_spec\_list\_keys

Action Input: data["paths"]["completions"]["post"]["requestBody"]["content"]["application/json"]["schema"]

Observation: ['\$ref']

[Skip to main content](#)

```

Action Input: data["paths"]["completions"]["post"]["requestBody"]["content"]
["application/json"]["schema"]["$ref"]
Observation: ValueError('Value at path `data["paths"]["completions"]["post"]
["requestBody"]["content"]["application/json"]["schema"]["$ref"]` is not a dict,
get the value directly.')
Thought: I should look at the $ref key to get the value directly
Action: json_spec_get_value
Action Input: data["paths"]["completions"]["post"]["requestBody"]["content"]
["application/json"]["schema"]["$ref"]
Observation: #/components/schemas/CreateCompletionRequest
Thought: I should look at the CreateCompletionRequest schema to see what
parameters are required
Action: json_spec_list_keys
Action Input: data["components"]["schemas"]["CreateCompletionRequest"]
Observation: ['type', 'properties', 'required']
Thought: I should look at the required key to see what parameters are required
Action: json_spec_get_value
Action Input: data["components"]["schemas"]["CreateCompletionRequest"]["required"]
Observation: ['model']
Thought: I now know the final answer
Final Answer: The required parameters for a POST request to the /completions
endpoint are 'model'.

```

> Finished chain.

```

Observation: The required parameters for a POST request to the /completions
endpoint are 'model'.
Thought: I now know the parameters needed to make the request.
Action: requests_post
Action Input: { "url": "https://api.openai.com/v1/completions", "data": { "model":
"davinci", "prompt": "tell me a joke" } }
Observation: {"id":"cml-
6oeEcNETfq8TOuIUQvAct6NrBXihs","object":"text_completion","created":1677529082,"mod
el":"davinci","choices":[{"text":"\n\n\n\nLove is a battlefield\n\n\n\nIt's
me...And some","index":0,"logprobs":null,"finish_reason":"length"}],"usage":
{"prompt_tokens":4,"completion_tokens":16,"total_tokens":20}}

Thought: I now know the final answer.
Final Answer: Love is a battlefield. It's me...And some.

```

> Finished chain.

"Love is a battlefield. It's me...And some."