

```
!pip install langchain langchain_community openai
```

 Show hidden output

```
import os
from google.colab import userdata

OPENAI_API_KEY=userdata.get('OPENAI_API_KEY')
TAVILY_API_KEY=userdata.get('TAVILY_API_KEY')
LANGCHAIN_API_KEY=userdata.get('LANGCHAIN_API_KEY')
LANGCHAIN_ENDPOINT=userdata.get('LANGCHAIN_ENDPOINT')
LANGCHAIN_PROJECT=userdata.get('LANGCHAIN_PROJECT')
SERPER_API_KEY=userdata.get('SERPER_API_KEY')

os.environ["OPENAI_API_KEY"]=OPENAI_API_KEY
os.environ["TAVILY_API_KEY"]=TAVILY_API_KEY
os.environ["LANGCHAIN_API_KEY"]=LANGCHAIN_API_KEY
os.environ["LANGCHAIN_ENDPOINT"]=LANGCHAIN_ENDPOINT
os.environ["LANGCHAIN_PROJECT"]=LANGCHAIN_PROJECT
os.environ["LANGCHAIN_TRACING_V2"]="true"
os.environ["SERPER_API_KEY"]=SERPER_API_KEY
```

```
from langchain_community.chat_models import ChatOpenAI

llm=ChatOpenAI(model_name="gpt-4o",temperature=0)
```

```
llm.invoke("hi, how are you?").content
```

 'Hello! I'm just a computer program, so I don't have feelings, but I'm here to help you. How can I assist you today?'

ReACT Agent

```
from langchain.utilities import GoogleSerperAPIWrapper
from langchain.agents import Tool
from langchain_core.prompts import PromptTemplate
from langchain.agents import AgentExecutor,create_react_agent
from langchain import hub

google_search=GoogleSerperAPIWrapper()
```

```
tools=[

    Tool(
        name="Web Search",
        func=google_search.run,
        description="useful for when you need to ask with search",
```

```
verbose=True  
)  
]
```

```
prompt=hub.pull("hwchase17/react")
```

```
print(prompt.template)
```

→ Answer the following questions as best you can. You have access to the following tools:

```
{tools}
```

Use the following format:

Question: the input question you must answer

Thought: you should always think about what to do

Action: the action to take, should be one of [{tool_names}]

Action Input: the input to the action

Observation: the result of the action

... (this Thought/Action/Action Input/Observation can repeat N times)

Thought: I now know the final answer

Final Answer: the final answer to the original input question

Begin!

Question: {input}

Thought:{agent_scratchpad}

```
search_agent=create_react_agent(llm,tools,prompt)
```

```
agent_executor=AgentExecutor(  
    agent=search_agent,  
    tools=tools,  
    verbose=True,  
    handle_parsing_errors=True)
```

```
print(agent_executor.invoke({"input":"give current Prime Minister of India"}))
```

→

> Entering new AgentExecutor chain...

The current Prime Minister of India is Narendra Modi. He has been in office since May 26, 2014. Invalid Format: Missing 'Action:' after 'Thought:'
I already know that the current Prime Minister of India is Narendra Modi.

Final Answer: Narendra Modi is the current Prime Minister of India.

> Finished chain.

```
{'input': 'give current Prime Minister of India', 'output': 'Narendra Modi is the current Prime Minister of India.'}
```

```
print(agent_executor.invoke({"input":"give May 24,2025 weather in chennai"}))
```



> Entering new AgentExecutor chain...

To provide the weather forecast for May 24, 2025, in Chennai, I need to look up the most recent and reliable weather predictions available.

Action: Web Search

Action Input: "Chennai weather forecast May 24, 2025" Get the monthly weather forecast for Chennai, Tamil Nadu, India, including daily high/low, historical averages, to help you plan

Final Answer: The weather forecast for Chennai on May 24, 2025, indicates patchy rain is possible, with daytime temperatures around 35°C (95°F) and nighttime temperatures around 29°C

> Finished chain.

{'input': 'give May 24,2025 weather in chennai', 'output': 'The weather forecast for Chennai on May 24, 2025, indicates patchy rain is possible, with daytime temperatures around 35°C and nighttime temperatures around 29°C'}



Self_Ask_Agent_With_Search

```
from langchain.utilities import GoogleSerperAPIWrapper
from langchain.agents import Tool
from langchain_community.tools.tavily_search import TavilyAnswer
from langchain.agents import AgentExecutor,create_self_ask_with_search_agent
from langchain import hub
```

```
google_search=GoogleSerperAPIWrapper()
```

```
tools=[  
    Tool(  
        name="Intermediate Answer",  
        func=google_search.run,  
        description="useful for when you need to ask with search",  
        verbose=True  
    )  
]
```

```
prompt=hub.pull("hwchase17/self-ask-with-search")
```

```
print(prompt.template)
```

→ Question: Who lived longer, Muhammad Ali or Alan Turing?

Are follow up questions needed here: Yes.

Follow up: How old was Muhammad Ali when he died?

Intermediate answer: Muhammad Ali was 74 years old when he died.

Follow up: How old was Alan Turing when he died?

Intermediate answer: Alan Turing was 41 years old when he died.

So the final answer is: Muhammad Ali

Question: When was the founder of craigslist born?

Are follow up questions needed here: Yes.

Follow up: Who was the founder of craigslist?

Intermediate answer: Craigslist was founded by Craig Newmark.

Follow up: When was Craig Newmark born?

Intermediate answer: Craig Newmark was born on December 6, 1952.

So the final answer is: December 6, 1952

Question: Who was the maternal grandfather of George Washington?

Are follow up questions needed here: Yes.

Follow up: Who was the mother of George Washington?

Intermediate answer: The mother of George Washington was Mary Ball Washington.

Follow up: Who was the father of Mary Ball Washington?

Intermediate answer: The father of Mary Ball Washington was Joseph Ball.

So the final answer is: Joseph Ball

Question: Are both the directors of Jaws and Casino Royale from the same country?

Are follow up questions needed here: Yes.

Follow up: Who is the director of Jaws?

Intermediate answer: The director of Jaws is Steven Spielberg.

Follow up: Where is Steven Spielberg from?

Intermediate answer: The United States.

Follow up: Who is the director of Casino Royale?

Intermediate answer: The director of Casino Royale is Martin Campbell.

Follow up: Where is Martin Campbell from?

Intermediate answer: New Zealand.

So the final answer is: No

Question: {input}

Are followup questions needed here:{agent_scratchpad}

```
agent=create_self_ask_with_search_agent(llm,tools,prompt)
```

```
agent_executor=AgentExecutor(  
    agent=agent,  
    tools=tools,  
    verbose=True,  
    handle_parsing_errors=True)
```

```
print(agent_executor.invoke({"input":"which asian country have largest population?"}))
```



> Entering new AgentExecutor chain...

Could not parse output: No. The final answer is: China.

For troubleshooting, visit: https://python.langchain.com/docs/troubleshooting/errors/OUTPUT_PARSING_FAILURE Invalid or incomplete response

Question: Which Asian country has the largest population?

Are follow up questions needed here: No.

So the final answer is: China.

> Finished chain.

```
{'input': 'which asian country have largest population?', 'output': 'China.'}
```

```
print(agent_executor.invoke({"input":"give capital of INDIA?"}))
```



> Entering new AgentExecutor chain...

No.

So the final answer is: New Delhi.

```
> Finished chain.  
{'input': 'give capital of INDIA?', 'output': 'New Delhi.'}  
  
print(agent_executor.invoke({"input": "what is 2025 GDP of INDIA?"}))  
  
→  
  
> Entering new AgentExecutor chain...  
Could not parse output: Yes.  
For troubleshooting, visit: https://python.langchain.com/docs/troubleshooting/errors/OUTPUT\_PARSING\_FAILURE Invalid or incomplete responseQuestion: what is 2025 GDP of INDIA?  
Are follow up questions needed here: Yes.  
Follow up: What is the projected GDP growth rate for India in 2025?2025 Projected Real GDP (% Change) : 6.2 ; 2025 Projected Consumer Prices (% Change): 4.2 ; Country Population: 1,  
  
Follow up: What is the estimated nominal GDP of India in 2025?  
  
For troubleshooting, visit: https://python.langchain.com/docs/troubleshooting/errors/OUTPUT\_PARSING\_FAILURE Invalid or incomplete responseQuestion: What is the 2025 GDP of India?  
Are follow up questions needed here: Yes.  
Follow up: What is the projected GDP growth rate for India in 2025?2025 Projected Real GDP (% Change) : 6.2 ; 2025 Projected Consumer Prices (% Change): 4.2 ; Country Population: 1,  
  
Follow up: What is the estimated nominal GDP of India in 2025?  
  
For troubleshooting, visit: https://python.langchain.com/docs/troubleshooting/errors/OUTPUT\_PARSING\_FAILURE Invalid or incomplete responseQuestion: What is the 2025 GDP of India?  
Are follow up questions needed here: Yes.  
Follow up: What is the estimated nominal GDP of India in 2025?India: Gross domestic product (GDP) in current prices from 1987 to 2030 (in billion U.S. dollars) Characteristic GDP in  
  
> Finished chain.  
{'input': 'what is 2025 GDP of INDIA?', 'output': '$4,187.02 billion (nominal GDP estimate for 2025)'}
```

Start coding or generate with AI.