

MRKL

This notebook showcases using an agent to replicate the MRKL chain.

This uses the example Chinook database. To set it up follow the instructions on <https://database.guide/2-sample-databases-sqlite/>, placing the `.db` file in a notebooks folder at the root of this repository.

```
from langchain import LLMChain, OpenAI, SerpAPIWrapper, SQLiteDatabase,
SQLDatabaseChain
from langchain.agents import initialize_agent, Tool
```

```
llm = OpenAI(temperature=0)
search = SerpAPIWrapper()
llm_math_chain = LLMChain(llm=llm, verbose=True)
db = SQLiteDatabase.from_uri("sqlite:///../../notebooks/Chinook.db")
db_chain = SQLDatabaseChain(llm=llm, database=db, verbose=True)
tools = [
    Tool(
        name = "Search",
        func=search.run,
        description="useful for when you need to answer questions about current
events. You should ask targeted questions"
    ),
    Tool(
        name="Calculator",
        func=llm_math_chain.run,
        description="useful for when you need to answer questions about math"
    ),
    Tool(
        name="FooBar DB",
        func=db_chain.run,
        description="useful for when you need to answer questions about FooBar.
Input should be in the form of a question containing full context"
    )
]
```

```
mrkl = initialize_agent(tools, llm, agent="zero-shot-react-description",
verbose=True)
```

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```
0.43 power?")
```

> Entering new AgentExecutor chain...

I need to find out who Leo DiCaprio's girlfriend is and then calculate her age raised to the 0.43 power.

Action: Search

Action Input: "Who is Leo DiCaprio's girlfriend?"

Observation: Camila Morrone

Thought: I need to find out Camila Morrone's age

Action: Search

Action Input: "How old is Camila Morrone?"

Observation: 25 years

Thought: I need to calculate 25 raised to the 0.43 power

Action: Calculator

Action Input: $25^{0.43}$

> Entering new LLMMathChain chain...

$25^{0.43}$

```
```python
```

```
import math
```

```
print(math.pow(25, 0.43))
```

```
```
```

Answer: **3.991298452658078**

> Finished chain.

Observation: Answer: **3.991298452658078**

Thought: I now know the final answer

Final Answer: Camila Morrone is 25 years old and her age raised to the 0.43 power is **3.991298452658078**.

> Finished chain.

'Camila Morrone is 25 years old and her age raised to the 0.43 power is 3.991298452658078.'

```
mrkl.run("What is the full name of the artist who recently released an album called 'The Storm Before the Calm' and are they in the FooBar database? If so, what albums of theirs are in the FooBar database?")
```

> Entering new AgentExecutor chain...

I need to find out the artist's full name and then search the FooBar database for their albums.

Action: Search

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(and eighth international) studio album by Canadian-American singer-songwriter Alanis ...

Thought: I now need to search the FooBar database for Alanis Morissette's albums

Action: FooBar DB

Action Input: What albums by Alanis Morissette are in the FooBar database?

> Entering new SQLiteDatabaseChain chain...

What albums by Alanis Morissette are in the FooBar database?

SQLQuery: **SELECT Title FROM Album INNER JOIN Artist ON Album.ArtistId = Artist.ArtistId WHERE Artist.Name = 'Alanis Morissette' LIMIT 5;**

SQLResult: **[('Jagged Little Pill',)]**

Answer: **The albums by Alanis Morissette in the FooBar database are Jagged Little Pill.**

> Finished chain.

Observation: **The albums by Alanis Morissette in the FooBar database are Jagged Little Pill.**

Thought: I now know the final answer

Final Answer: The artist who released the album The Storm Before the Calm is Alanis Morissette and the albums of theirs in the FooBar database are Jagged Little Pill.

> Finished chain.

'The artist who released the album The Storm Before the Calm is Alanis Morissette and the albums of theirs in the FooBar database are Jagged Little Pill.'