```python
# Install dependencies
!apt-get install sqlite3 -y
import sqlite3

# Create and populate a SQLite database only if it doesn't exist
fake_db_schema = """
CREATE TABLE IF NOT EXISTS employees (
    id INTEGER PRIMARY KEY,
    name TEXT NOT NULL,
    department TEXT NOT NULL,
    salary INTEGER,
    year INTEGER
);

INSERT OR IGNORE INTO employees (id, name, department, salary, year)
VALUES
(1, 'Alice', 'Engineering', 75000, 2020),
(2, 'Bob', 'HR', 55000, 2020),
(3, 'Charlie', 'Engineering', 80000, 2021),
(4, 'Diana', 'Engineering', 85000, 2021),
(5, 'Eve', 'Marketing', 60000, 2020);
"""

db_conn = sqlite3.connect("example.db")
db_cursor = db_conn.cursor()
db_cursor.executescript(fake_db_schema)
db_conn.commit()
db_conn.close()

print("Database initialized successfully.")
```

```
E: Could not open lock file /var/lib/dpkg/lock-frontend - open (13:
Permission denied)
E: Unable to acquire the dpkg frontend lock (/var/lib/dpkg/lock-
frontend), are you root?
Database initialized successfully.
```

```python
!pip install -U langchain==0.3.0
!pip install -U langchain-community==0.3.0
!pip install -U langchain-core==0.3.0
!pip install -U langchain-groq
!pip uninstall pydantic -y
!pip install -U pydantic==2.9.2
!!pip show langchain
!!python --version
!!pip install -U langchain-openai==0.2.0
```

```
Requirement already satisfied: langchain==0.3.0 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (0.3.0)
```

```
Requirement already satisfied: PyYAML>=5.3 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from langchain==0.3.0) (6.0.2)
Requirement already satisfied: SQLAlchemy<3,>=1.4 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from langchain==0.3.0) (2.0.35)
Requirement already satisfied: aiohttp<4.0.0,>=3.8.3 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from langchain==0.3.0) (3.11.8)
Requirement already satisfied: async-timeout<5.0.0,>=4.0.0 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from langchain==0.3.0) (4.0.3)
Requirement already satisfied: langchain-core<0.4.0,>=0.3.0 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from langchain==0.3.0) (0.3.21)
Requirement already satisfied: langchain-text-splitters<0.4.0,>=0.3.0
in /home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from langchain==0.3.0) (0.3.2)
Requirement already satisfied: langsmith<0.2.0,>=0.1.17 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from langchain==0.3.0) (0.1.147)
Requirement already satisfied: numpy<2,>=1 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from langchain==0.3.0) (1.26.4)
Requirement already satisfied: pydantic<3.0.0,>=2.7.4 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from langchain==0.3.0) (2.9.2)
Requirement already satisfied: requests<3,>=2 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from langchain==0.3.0) (2.32.3)
Requirement already satisfied: tenacity!=8.4.0,<9.0.0,>=8.1.0 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from langchain==0.3.0) (8.5.0)
Requirement already satisfied: aiohappyeyeballs>=2.3.0 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from aiohttp<4.0.0,>=3.8.3->langchain==0.3.0) (2.4.3)
Requirement already satisfied: aiosignal>=1.1.2 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from aiohttp<4.0.0,>=3.8.3->langchain==0.3.0) (1.3.1)
Requirement already satisfied: attrs>=17.3.0 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from aiohttp<4.0.0,>=3.8.3->langchain==0.3.0) (24.2.0)
Requirement already satisfied: frozenlist>=1.1.1 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from aiohttp<4.0.0,>=3.8.3->langchain==0.3.0) (1.5.0)
Requirement already satisfied: multidict<7.0,>=4.5 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from aiohttp<4.0.0,>=3.8.3->langchain==0.3.0) (6.1.0)
Requirement already satisfied: propcache>=0.2.0 in
```

```
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from aiohttp<4.0.0,>=3.8.3->langchain==0.3.0) (0.2.0)
Requirement already satisfied: yarl<2.0,>=1.17.0 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from aiohttp<4.0.0,>=3.8.3->langchain==0.3.0) (1.18.0)
Requirement already satisfied: jsonpatch<2.0,>=1.33 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from langchain-core<0.4.0,>=0.3.0->langchain==0.3.0) (1.33)
Requirement already satisfied: packaging<25,>=23.2 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from langchain-core<0.4.0,>=0.3.0->langchain==0.3.0) (24.2)
Requirement already satisfied: typing-extensions>=4.7 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from langchain-core<0.4.0,>=0.3.0->langchain==0.3.0)
(4.12.2)
Requirement already satisfied: httpx<1,>=0.23.0 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from langsmith<0.2.0,>=0.1.17->langchain==0.3.0) (0.28.0)
Requirement already satisfied: orjson<4.0.0,>=3.9.14 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from langsmith<0.2.0,>=0.1.17->langchain==0.3.0) (3.10.12)
Requirement already satisfied: requests-toolbelt<2.0.0,>=1.0.0 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from langsmith<0.2.0,>=0.1.17->langchain==0.3.0) (1.0.0)
Requirement already satisfied: annotated-types>=0.6.0 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from pydantic<3.0.0,>=2.7.4->langchain==0.3.0) (0.7.0)
Requirement already satisfied: pydantic-core==2.23.4 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from pydantic<3.0.0,>=2.7.4->langchain==0.3.0) (2.23.4)
Requirement already satisfied: charset-normalizer<4,>=2 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from requests<3,>=2->langchain==0.3.0) (3.4.0)
Requirement already satisfied: idna<4,>=2.5 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from requests<3,>=2->langchain==0.3.0) (3.10)
Requirement already satisfied: urllib3<3,>=1.21.1 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from requests<3,>=2->langchain==0.3.0) (2.2.3)
Requirement already satisfied: certifi>=2017.4.17 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from requests<3,>=2->langchain==0.3.0) (2024.8.30)
Requirement already satisfied: greenlet!=0.4.17 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from SQLAlchemy<3,>=1.4->langchain==0.3.0) (3.1.1)
Requirement already satisfied: anyio in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from httpx<1,>=0.23.0->langsmith<0.2.0,>=0.1.17-
>langchain==0.3.0) (4.6.2.post1)
```

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Requirement already satisfied: httpcore==1.* in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from httpx<1,>=0.23.0->langsmith<0.2.0,>=0.1.17-
>langchain==0.3.0) (1.0.7)
Requirement already satisfied: h11<0.15,>=0.13 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from httpcore==1.*->httpx<1,>=0.23.0-
>langsmith<0.2.0,>=0.1.17->langchain==0.3.0) (0.14.0)
Requirement already satisfied: jsonpointer>=1.9 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from jsonpatch<2.0,>=1.33->langchain-core<0.4.0,>=0.3.0-
>langchain==0.3.0) (3.0.0)
Requirement already satisfied: sniffio>=1.1 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from anyio->httpx<1,>=0.23.0->langsmith<0.2.0,>=0.1.17-
>langchain==0.3.0) (1.3.1)
Requirement already satisfied: exceptiongroup>=1.0.2 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from anyio->httpx<1,>=0.23.0->langsmith<0.2.0,>=0.1.17-
>langchain==0.3.0) (1.2.2)
Requirement already satisfied: langchain-community==0.3.0 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (0.3.0)
Requirement already satisfied: PyYAML>=5.3 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from langchain-community==0.3.0) (6.0.2)
Requirement already satisfied: SQLAlchemy<3,>=1.4 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from langchain-community==0.3.0) (2.0.35)
Requirement already satisfied: aiohttp<4.0.0,>=3.8.3 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from langchain-community==0.3.0) (3.11.8)
Requirement already satisfied: dataclasses-json<0.7,>=0.5.7 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from langchain-community==0.3.0) (0.6.7)
Requirement already satisfied: langchain<0.4.0,>=0.3.0 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from langchain-community==0.3.0) (0.3.0)
Requirement already satisfied: langchain-core<0.4.0,>=0.3.0 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from langchain-community==0.3.0) (0.3.21)
Requirement already satisfied: langsmith<0.2.0,>=0.1.112 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from langchain-community==0.3.0) (0.1.147)
Requirement already satisfied: numpy<2,>=1 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from langchain-community==0.3.0) (1.26.4)
Requirement already satisfied: pydantic-settings<3.0.0,>=2.4.0 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
```

```
packages (from langchain-community==0.3.0) (2.6.1)
Requirement already satisfied: requests<3,>=2 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from langchain-community==0.3.0) (2.32.3)
Requirement already satisfied: tenacity!=8.4.0,<9.0.0,>=8.1.0 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from langchain-community==0.3.0) (8.5.0)
Requirement already satisfied: aiohappyeyeballs>=2.3.0 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from aiohttp<4.0.0,>=3.8.3->langchain-community==0.3.0)
(2.4.3)
Requirement already satisfied: aiosignal>=1.1.2 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from aiohttp<4.0.0,>=3.8.3->langchain-community==0.3.0)
(1.3.1)
Requirement already satisfied: async-timeout<6.0,>=4.0 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from aiohttp<4.0.0,>=3.8.3->langchain-community==0.3.0)
(4.0.3)
Requirement already satisfied: attrs>=17.3.0 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from aiohttp<4.0.0,>=3.8.3->langchain-community==0.3.0)
(24.2.0)
Requirement already satisfied: frozenlist>=1.1.1 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from aiohttp<4.0.0,>=3.8.3->langchain-community==0.3.0)
(1.5.0)
Requirement already satisfied: multidict<7.0,>=4.5 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from aiohttp<4.0.0,>=3.8.3->langchain-community==0.3.0)
(6.1.0)
Requirement already satisfied: propcache>=0.2.0 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from aiohttp<4.0.0,>=3.8.3->langchain-community==0.3.0)
(0.2.0)
Requirement already satisfied: yarl<2.0,>=1.17.0 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from aiohttp<4.0.0,>=3.8.3->langchain-community==0.3.0)
(1.18.0)
Requirement already satisfied: marshmallow<4.0.0,>=3.18.0 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from dataclasses-json<0.7,>=0.5.7->langchain-
community==0.3.0) (3.23.1)
Requirement already satisfied: typing-inspect<1,>=0.4.0 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from dataclasses-json<0.7,>=0.5.7->langchain-
community==0.3.0) (0.9.0)
Requirement already satisfied: langchain-text-splitters<0.4.0,>=0.3.0
in /home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
```

```
packages (from langchain<0.4.0,>=0.3.0->langchain-community==0.3.0)
(0.3.2)
Requirement already satisfied: pydantic<3.0.0,>=2.7.4 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from langchain<0.4.0,>=0.3.0->langchain-community==0.3.0)
(2.9.2)
Requirement already satisfied: jsonpatch<2.0,>=1.33 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from langchain-core<0.4.0,>=0.3.0->langchain-
community==0.3.0) (1.33)
Requirement already satisfied: packaging<25,>=23.2 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from langchain-core<0.4.0,>=0.3.0->langchain-
community==0.3.0) (24.2)
Requirement already satisfied: typing-extensions>=4.7 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from langchain-core<0.4.0,>=0.3.0->langchain-
community==0.3.0) (4.12.2)
Requirement already satisfied: httpx<1,>=0.23.0 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from langsmith<0.2.0,>=0.1.112->langchain-community==0.3.0)
(0.28.0)
Requirement already satisfied: orjson<4.0.0,>=3.9.14 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from langsmith<0.2.0,>=0.1.112->langchain-community==0.3.0)
(3.10.12)
Requirement already satisfied: requests-toolbelt<2.0.0,>=1.0.0 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from langsmith<0.2.0,>=0.1.112->langchain-community==0.3.0)
(1.0.0)
Requirement already satisfied: python-dotenv>=0.21.0 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from pydantic-settings<3.0.0,>=2.4.0->langchain-
community==0.3.0) (1.0.1)
Requirement already satisfied: charset-normalizer<4,>=2 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from requests<3,>=2->langchain-community==0.3.0) (3.4.0)
Requirement already satisfied: idna<4,>=2.5 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from requests<3,>=2->langchain-community==0.3.0) (3.10)
Requirement already satisfied: urllib3<3,>=1.21.1 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from requests<3,>=2->langchain-community==0.3.0) (2.2.3)
Requirement already satisfied: certifi>=2017.4.17 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from requests<3,>=2->langchain-community==0.3.0) (2024.8.30)
Requirement already satisfied: greenlet!=0.4.17 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from SQLAlchemy<3,>=1.4->langchain-community==0.3.0) (3.1.1)
```

```
Requirement already satisfied: anyio in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from httpx<1,>=0.23.0->langsmith<0.2.0,>=0.1.112->langchain-
community==0.3.0) (4.6.2.post1)
Requirement already satisfied: httpcore==1.* in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from httpx<1,>=0.23.0->langsmith<0.2.0,>=0.1.112->langchain-
community==0.3.0) (1.0.7)
Requirement already satisfied: h11<0.15,>=0.13 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from httpcore==1.*->httpx<1,>=0.23.0-
>langsmith<0.2.0,>=0.1.112->langchain-community==0.3.0) (0.14.0)
Requirement already satisfied: jsonpointer>=1.9 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from jsonpatch<2.0,>=1.33->langchain-core<0.4.0,>=0.3.0-
>langchain-community==0.3.0) (3.0.0)
Requirement already satisfied: annotated-types>=0.6.0 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from pydantic<3.0.0,>=2.7.4->langchain<0.4.0,>=0.3.0-
>langchain-community==0.3.0) (0.7.0)
Requirement already satisfied: pydantic-core==2.23.4 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from pydantic<3.0.0,>=2.7.4->langchain<0.4.0,>=0.3.0-
>langchain-community==0.3.0) (2.23.4)
Requirement already satisfied: mypy-extensions>=0.3.0 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from typing-inspect<1,>=0.4.0->dataclasses-json<0.7,>=0.5.7-
>langchain-community==0.3.0) (1.0.0)
Requirement already satisfied: sniffio>=1.1 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from anyio->httpx<1,>=0.23.0->langsmith<0.2.0,>=0.1.112-
>langchain-community==0.3.0) (1.3.1)
Requirement already satisfied: exceptiongroup>=1.0.2 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from anyio->httpx<1,>=0.23.0->langsmith<0.2.0,>=0.1.112-
>langchain-community==0.3.0) (1.2.2)
Collecting langchain-core==0.3.0
  Using cached langchain_core-0.3.0-py3-none-any.whl.metadata (6.2 kB)
Requirement already satisfied: PyYAML>=5.3 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from langchain-core==0.3.0) (6.0.2)
Requirement already satisfied: jsonpatch<2.0,>=1.33 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from langchain-core==0.3.0) (1.33)
Requirement already satisfied: langsmith<0.2.0,>=0.1.117 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from langchain-core==0.3.0) (0.1.147)
Requirement already satisfied: packaging<25,>=23.2 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
```

```
packages (from langchain-core==0.3.0) (24.2)
Requirement already satisfied: pydantic<3.0.0,>=2.5.2 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from langchain-core==0.3.0) (2.9.2)
Requirement already satisfied: tenacity!=8.4.0,<9.0.0,>=8.1.0 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from langchain-core==0.3.0) (8.5.0)
Requirement already satisfied: typing-extensions>=4.7 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from langchain-core==0.3.0) (4.12.2)
Requirement already satisfied: jsonpointer>=1.9 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from jsonpatch<2.0,>=1.33->langchain-core==0.3.0) (3.0.0)
Requirement already satisfied: httpx<1,>=0.23.0 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from langsmith<0.2.0,>=0.1.117->langchain-core==0.3.0)
(0.28.0)
Requirement already satisfied: orjson<4.0.0,>=3.9.14 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from langsmith<0.2.0,>=0.1.117->langchain-core==0.3.0)
(3.10.12)
Requirement already satisfied: requests<3,>=2 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from langsmith<0.2.0,>=0.1.117->langchain-core==0.3.0)
(2.32.3)
Requirement already satisfied: requests-toolbelt<2.0.0,>=1.0.0 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from langsmith<0.2.0,>=0.1.117->langchain-core==0.3.0)
(1.0.0)
Requirement already satisfied: annotated-types>=0.6.0 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from pydantic<3.0.0,>=2.5.2->langchain-core==0.3.0) (0.7.0)
Requirement already satisfied: pydantic-core==2.23.4 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from pydantic<3.0.0,>=2.5.2->langchain-core==0.3.0) (2.23.4)
Requirement already satisfied: anyio in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from httpx<1,>=0.23.0->langsmith<0.2.0,>=0.1.117->langchain-
core==0.3.0) (4.6.2.post1)
Requirement already satisfied: certifi in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from httpx<1,>=0.23.0->langsmith<0.2.0,>=0.1.117->langchain-
core==0.3.0) (2024.8.30)
Requirement already satisfied: httpcore==1.* in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from httpx<1,>=0.23.0->langsmith<0.2.0,>=0.1.117->langchain-
core==0.3.0) (1.0.7)
Requirement already satisfied: idna in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
```

packages (from httpx<1,>=0.23.0->langsmith<0.2.0,>=0.1.117->langchain-core==0.3.0) (3.10)
Requirement already satisfied: h11<0.15,>=0.13 in /home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-packages (from httpcore==1.*->httpx<1,>=0.23.0->langsmith<0.2.0,>=0.1.117->langchain-core==0.3.0) (0.14.0)
Requirement already satisfied: charset-normalizer<4,>=2 in /home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-packages (from requests<3,>=2->langsmith<0.2.0,>=0.1.117->langchain-core==0.3.0) (3.4.0)
Requirement already satisfied: urllib3<3,>=1.21.1 in /home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-packages (from requests<3,>=2->langsmith<0.2.0,>=0.1.117->langchain-core==0.3.0) (2.2.3)
Requirement already satisfied: sniffio>=1.1 in /home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-packages (from anyio->httpx<1,>=0.23.0->langsmith<0.2.0,>=0.1.117->langchain-core==0.3.0) (1.3.1)
Requirement already satisfied: exceptiongroup>=1.0.2 in /home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-packages (from anyio->httpx<1,>=0.23.0->langsmith<0.2.0,>=0.1.117->langchain-core==0.3.0) (1.2.2)
Using cached langchain_core-0.3.0-py3-none-any.whl (405 kB)
Installing collected packages: langchain-core
  Attempting uninstall: langchain-core
    Found existing installation: langchain-core 0.3.21
    Uninstalling langchain-core-0.3.21:
      Successfully uninstalled langchain-core-0.3.21
ERROR: pip's dependency resolver does not currently take into account all the packages that are installed. This behaviour is the source of the following dependency conflicts.
langchain-groq 0.2.1 requires langchain-core<0.4.0,>=0.3.15, but you have langchain-core 0.3.0 which is incompatible.
langchain-text-splitters 0.3.2 requires langchain-core<0.4.0,>=0.3.15, but you have langchain-core 0.3.0 which is incompatible.
Successfully installed langchain-core-0.3.0
Requirement already satisfied: langchain-groq in /home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-packages (0.2.1)
Requirement already satisfied: groq<1,>=0.4.1 in /home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-packages (from langchain-groq) (0.13.0)
Collecting langchain-core<0.4.0,>=0.3.15 (from langchain-groq)
  Using cached langchain_core-0.3.21-py3-none-any.whl.metadata (6.3 kB)
Requirement already satisfied: anyio<5,>=3.5.0 in /home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-packages (from groq<1,>=0.4.1->langchain-groq) (4.6.2.post1)
Requirement already satisfied: distro<2,>=1.7.0 in

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/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from groq<1,>=0.4.1->langchain-groq) (1.9.0)
Requirement already satisfied: httpx<1,>=0.23.0 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from groq<1,>=0.4.1->langchain-groq) (0.28.0)
Requirement already satisfied: pydantic<3,>=1.9.0 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from groq<1,>=0.4.1->langchain-groq) (2.9.2)
Requirement already satisfied: sniffio in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from groq<1,>=0.4.1->langchain-groq) (1.3.1)
Requirement already satisfied: typing-extensions<5,>=4.7 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from groq<1,>=0.4.1->langchain-groq) (4.12.2)
Requirement already satisfied: PyYAML>=5.3 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from langchain-core<0.4.0,>=0.3.15->langchain-groq) (6.0.2)
Requirement already satisfied: jsonpatch<2.0,>=1.33 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from langchain-core<0.4.0,>=0.3.15->langchain-groq) (1.33)
Requirement already satisfied: langsmith<0.2.0,>=0.1.125 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from langchain-core<0.4.0,>=0.3.15->langchain-groq)
(0.1.147)
Requirement already satisfied: packaging<25,>=23.2 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from langchain-core<0.4.0,>=0.3.15->langchain-groq) (24.2)
Requirement already satisfied: tenacity!=8.4.0,<10.0.0,>=8.1.0 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from langchain-core<0.4.0,>=0.3.15->langchain-groq) (8.5.0)
Requirement already satisfied: idna>=2.8 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from anyio<5,>=3.5.0->groq<1,>=0.4.1->langchain-groq) (3.10)
Requirement already satisfied: exceptiongroup>=1.0.2 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from anyio<5,>=3.5.0->groq<1,>=0.4.1->langchain-groq)
(1.2.2)
Requirement already satisfied: certifi in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from httpx<1,>=0.23.0->groq<1,>=0.4.1->langchain-groq)
(2024.8.30)
Requirement already satisfied: httpcore==1.* in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from httpx<1,>=0.23.0->groq<1,>=0.4.1->langchain-groq)
(1.0.7)
Requirement already satisfied: h11<0.15,>=0.13 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from httpcore==1.*->httpx<1,>=0.23.0->groq<1,>=0.4.1-
>langchain-groq) (0.14.0)
```

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Requirement already satisfied: jsonpointer>=1.9 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from jsonpatch<2.0,>=1.33->langchain-core<0.4.0,>=0.3.15-
>langchain-groq) (3.0.0)
Requirement already satisfied: orjson<4.0.0,>=3.9.14 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from langsmith<0.2.0,>=0.1.125->langchain-
core<0.4.0,>=0.3.15->langchain-groq) (3.10.12)
Requirement already satisfied: requests<3,>=2 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from langsmith<0.2.0,>=0.1.125->langchain-
core<0.4.0,>=0.3.15->langchain-groq) (2.32.3)
Requirement already satisfied: requests-toolbelt<2.0.0,>=1.0.0 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from langsmith<0.2.0,>=0.1.125->langchain-
core<0.4.0,>=0.3.15->langchain-groq) (1.0.0)
Requirement already satisfied: annotated-types>=0.6.0 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from pydantic<3,>=1.9.0->groq<1,>=0.4.1->langchain-groq)
(0.7.0)
Requirement already satisfied: pydantic-core==2.23.4 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from pydantic<3,>=1.9.0->groq<1,>=0.4.1->langchain-groq)
(2.23.4)
Requirement already satisfied: charset-normalizer<4,>=2 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from requests<3,>=2->langsmith<0.2.0,>=0.1.125->langchain-
core<0.4.0,>=0.3.15->langchain-groq) (3.4.0)
Requirement already satisfied: urllib3<3,>=1.21.1 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from requests<3,>=2->langsmith<0.2.0,>=0.1.125->langchain-
core<0.4.0,>=0.3.15->langchain-groq) (2.2.3)
Using cached langchain_core-0.3.21-py3-none-any.whl (409 kB)
Installing collected packages: langchain-core
  Attempting uninstall: langchain-core
    Found existing installation: langchain-core 0.3.0
    Uninstalling langchain-core-0.3.0:
      Successfully uninstalled langchain-core-0.3.0
Successfully installed langchain-core-0.3.21
Found existing installation: pydantic 2.9.2
Uninstalling pydantic-2.9.2:
  Successfully uninstalled pydantic-2.9.2
Collecting pydantic==2.9.2
  Using cached pydantic-2.9.2-py3-none-any.whl.metadata (149 kB)
Requirement already satisfied: annotated-types>=0.6.0 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from pydantic==2.9.2) (0.7.0)
Requirement already satisfied: pydantic-core==2.23.4 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from pydantic==2.9.2) (2.23.4)
```

```
Requirement already satisfied: typing-extensions>=4.6.1 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from pydantic==2.9.2) (4.12.2)
Using cached pydantic-2.9.2-py3-none-any.whl (434 kB)
Installing collected packages: pydantic
Successfully installed pydantic-2.9.2

['Collecting langchain-openai==0.2.0',
 '  Using cached langchain_openai-0.2.0-py3-none-any.whl.metadata (2.6
kB)',
 'Requirement already satisfied: langchain-core<0.4,>=0.3 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from langchain-openai==0.2.0) (0.3.21)',
 'Collecting openai<2.0.0,>=1.40.0 (from langchain-openai==0.2.0)',
 '  Downloading openai-1.55.3-py3-none-any.whl.metadata (24 kB)',
 'Collecting tiktoken<1,>=0.7 (from langchain-openai==0.2.0)',
 '  Downloading tiktoken-0.8.0-cp310-cp310-
manylinux_2_17_x86_64.manylinux2014_x86_64.whl.metadata (6.6 kB)',
 'Requirement already satisfied: PyYAML>=5.3 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from langchain-core<0.4,>=0.3->langchain-openai==0.2.0)
(6.0.2)',
 'Requirement already satisfied: jsonpatch<2.0,>=1.33 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from langchain-core<0.4,>=0.3->langchain-openai==0.2.0)
(1.33)',
 'Requirement already satisfied: langsmith<0.2.0,>=0.1.125 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from langchain-core<0.4,>=0.3->langchain-openai==0.2.0)
(0.1.147)',
 'Requirement already satisfied: packaging<25,>=23.2 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from langchain-core<0.4,>=0.3->langchain-openai==0.2.0)
(24.2)',
 'Requirement already satisfied: pydantic<3.0.0,>=2.5.2 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from langchain-core<0.4,>=0.3->langchain-openai==0.2.0)
(2.9.2)',
 'Requirement already satisfied: tenacity!=8.4.0,<10.0.0,>=8.1.0 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from langchain-core<0.4,>=0.3->langchain-openai==0.2.0)
(8.5.0)',
 'Requirement already satisfied: typing-extensions>=4.7 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from langchain-core<0.4,>=0.3->langchain-openai==0.2.0)
(4.12.2)',
 'Requirement already satisfied: anyio<5,>=3.5.0 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from openai<2.0.0,>=1.40.0->langchain-openai==0.2.0)
(4.6.2.post1)',
```

'Requirement already satisfied: distro<2,>=1.7.0 in /home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-packages (from openai<2.0.0,>=1.40.0->langchain-openai==0.2.0) (1.9.0)',
'Requirement already satisfied: httpx<1,>=0.23.0 in /home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-packages (from openai<2.0.0,>=1.40.0->langchain-openai==0.2.0) (0.28.0)',
'Collecting jiter<1,>=0.4.0 (from openai<2.0.0,>=1.40.0->langchain-openai==0.2.0)',
' Downloading jiter-0.8.0-cp310-cp310-manylinux_2_17_x86_64.manylinux2014_x86_64.whl.metadata (5.2 kB)',
'Requirement already satisfied: sniffio in /home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-packages (from openai<2.0.0,>=1.40.0->langchain-openai==0.2.0) (1.3.1)',
'Collecting tqdm>4 (from openai<2.0.0,>=1.40.0->langchain-openai==0.2.0)',
' Downloading tqdm-4.67.1-py3-none-any.whl.metadata (57 kB)',
'Collecting regex>=2022.1.18 (from tiktoken<1,>=0.7->langchain-openai==0.2.0)',
' Downloading regex-2024.11.6-cp310-cp310-manylinux_2_17_x86_64.manylinux2014_x86_64.whl.metadata (40 kB)',
'Requirement already satisfied: requests>=2.26.0 in /home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-packages (from tiktoken<1,>=0.7->langchain-openai==0.2.0) (2.32.3)',
'Requirement already satisfied: idna>=2.8 in /home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-packages (from anyio<5,>=3.5.0->openai<2.0.0,>=1.40.0->langchain-openai==0.2.0) (3.10)',
'Requirement already satisfied: exceptiongroup>=1.0.2 in /home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-packages (from anyio<5,>=3.5.0->openai<2.0.0,>=1.40.0->langchain-openai==0.2.0) (1.2.2)',
'Requirement already satisfied: certifi in /home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-packages (from httpx<1,>=0.23.0->openai<2.0.0,>=1.40.0->langchain-openai==0.2.0) (2024.8.30)',
'Requirement already satisfied: httpcore==1.* in /home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-packages (from httpx<1,>=0.23.0->openai<2.0.0,>=1.40.0->langchain-openai==0.2.0) (1.0.7)',
'Requirement already satisfied: h11<0.15,>=0.13 in /home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-packages (from httpcore==1.*->httpx<1,>=0.23.0->openai<2.0.0,>=1.40.0->langchain-openai==0.2.0) (0.14.0)',
'Requirement already satisfied: jsonpointer>=1.9 in /home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-packages (from jsonpatch<2.0,>=1.33->langchain-core<0.4,>=0.3-

```
>langchain-openai==0.2.0) (3.0.0)',
 'Requirement already satisfied: orjson<4.0.0,>=3.9.14 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from langsmith<0.2.0,>=0.1.125->langchain-core<0.4,>=0.3-
>langchain-openai==0.2.0) (3.10.12)',
 'Requirement already satisfied: requests-toolbelt<2.0.0,>=1.0.0 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from langsmith<0.2.0,>=0.1.125->langchain-core<0.4,>=0.3-
>langchain-openai==0.2.0) (1.0.0)',
 'Requirement already satisfied: annotated-types>=0.6.0 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from pydantic<3.0.0,>=2.5.2->langchain-core<0.4,>=0.3-
>langchain-openai==0.2.0) (0.7.0)',
 'Requirement already satisfied: pydantic-core==2.23.4 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from pydantic<3.0.0,>=2.5.2->langchain-core<0.4,>=0.3-
>langchain-openai==0.2.0) (2.23.4)',
 'Requirement already satisfied: charset-normalizer<4,>=2 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from requests>=2.26.0->tiktoken<1,>=0.7->langchain-
openai==0.2.0) (3.4.0)',
 'Requirement already satisfied: urllib3<3,>=1.21.1 in
/home/adityatiwari/anaconda3/envs/try_anaconda/lib/python3.10/site-
packages (from requests>=2.26.0->tiktoken<1,>=0.7->langchain-
openai==0.2.0) (2.2.3)',
 'Using cached langchain_openai-0.2.0-py3-none-any.whl (51 kB)',
 'Downloading openai-1.55.3-py3-none-any.whl (389 kB)',
 'Downloading tiktoken-0.8.0-cp310-cp310-
manylinux_2_17_x86_64.manylinux2014_x86_64.whl (1.2 MB)',
 '\x1b[?25l   \x1b[38;5;237m━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━\
x1b[0m \x1b[32m0.0/1.2 MB\x1b[0m \x1b[31m?\x1b[0m eta \x1b[36m-:--:--\
x1b[0m',
 '\x1b[2K   \
x1b[38;2;114;156;31m━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━\x1b[0m \
x1b[32m1.2/1.2 MB\x1b[0m \x1b[31m10.7 MB/s\x1b[0m eta \x1b[36m0:00:00\
x1b[0m',
 '\x1b[?25hDownloading jiter-0.8.0-cp310-cp310-
manylinux_2_17_x86_64.manylinux2014_x86_64.whl (343 kB)',
 'Downloading regex-2024.11.6-cp310-cp310-
manylinux_2_17_x86_64.manylinux2014_x86_64.whl (781 kB)',
 '\x1b[?25l   \x1b[38;5;237m━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━\
x1b[0m \x1b[32m0.0/781.7 kB\x1b[0m \x1b[31m?\x1b[0m eta \
x1b[36m-:--:--\x1b[0m',
 '\x1b[2K   \
x1b[38;2;114;156;31m━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━\x1b[0m \
x1b[32m781.7/781.7 kB\x1b[0m \x1b[31m9.9 MB/s\x1b[0m eta \
x1b[36m0:00:00\x1b[0m',
 '\x1b[?25hDownloading tqdm-4.67.1-py3-none-any.whl (78 kB)',
 'Installing collected packages: tqdm, regex, jiter, tiktoken, openai,
```

```
langchain-openai',
 'Successfully installed jiter-0.8.0 langchain-openai-0.2.0 openai-
1.55.3 regex-2024.11.6 tiktoken-0.8.0 tqdm-4.67.1']

import os
from getpass import getpass
from langchain import hub
from langchain.sql_database import SQLDatabase
from langchain.agents import AgentExecutor, create_react_agent,
create_openai_tools_agent
from langchain.prompts import PromptTemplate
from langchain_core.callbacks import StdOutCallbackHandler
from groq import Groq
from langchain.tools import tool
from langchain.tools.render import render_text_description
from langchain_community.agent_toolkits import create_sql_agent
from langchain_groq import ChatGroq
from langchain_core.output_parsers import BaseOutputParser
from langchain.globals import set_debug, set_verbose
from pydantic import BaseModel, Field
from langchain_core.runnables import RunnablePassthrough
from langchain.memory import ConversationBufferMemory
from langchain_core.runnables.history import
RunnableWithMessageHistory
from langchain_community.agent_toolkits.sql.toolkit import
SQLDatabaseToolkit
from langchain_core.callbacks import Callbacks
from langchain_core.caches import BaseCache
from typing import List
from langchain.llms import OpenAI
from langchain_openai import ChatOpenAI

#Flags for debugging
set_debug(False)
set_verbose(True)

# Load the stable database
db = SQLDatabase.from_uri("sqlite:///example.db")
print("Database loaded successfully.")

# Ensure BaseCache is initialized
# Explicitly set the required fields (if any)
# Create and rebuild toolkit
BaseCache.cache = {}
# SQLDatabaseToolkit(db=db, llm=llm, Callbacks=[]).model_rebuild()
SQLDatabaseToolkit.model_rebuild(_types_namespace={'BaseCache':
BaseCache, 'Callbacks': Callbacks})
session_id="test-session"

# Set up API key (for LLM integration, e.g., OpenAI or Groq)
```

```python
OPENAI_API_KEY="*************************************************"

# Set the OpenAI API key

os.environ["OPENAI_API_KEY"] = getpass("OpenAI Api Key:")

# os.environ["GROQ_API_KEY"] = getpass("Groq API Key:")
# llama3-70b-8192 got the answer (took 10 iterations)

# mixtral-8x7b-32768 no


# gemma2-9b-it partial answer couldn't extract the year of joining
# llama-3.1-8b-instant no
# gemma-7b-it no answer

# llama3-70b-8192 got the answer (took 5 iterations)

# llama3-8b-8192 got partial answer

# distil-whisper-large-v3-en doesn't support chat completions

# llama-3.2-1b-preview got stuck in Agent Executor chain no answer



llm=ChatOpenAI(model_name="gpt-4o", temperature=0, streaming=True)
# llm=ChatGroq(model_name="llama3-70b-8192", temperature=0,
# groq_api_key=GROQ_API_KEY, streaming=True)
# Initialize Conversation Memory
memory = ConversationBufferMemory(llm=llm, memory_key="history",
input_key="input", output_key="output", return_messages=False)
memory.save_context({"input": "bar"}, {"output": "foo"})

# Debugging Handler

handler = StdOutCallbackHandler()

@tool
def execute_sql_query(input_text: str) -> str:
    """

    Tool to handle SQL queries.

    """
    sql_agent = create_sql_agent(llm=llm, db=db, memory=memory,
verbose=True)
```

```python
        return sql_agent.invoke(input_text)
```

```python
# # Create a RunnablePassthrough for output handling
```

```python
# sql_output_runnable = RunnablePassthrough()
```

```python
tools = [execute_sql_query]
```

```python
# Prefix and suffix for the prompt template
```

```python
prefix = """
```

You are an intelligent assistant that can help generate SQL queries based on natural language questions.

You have access to a SQL database with the following schema:

- employees table:

- **id**: Integer, Primary Key

- **name**: Text, Employee name

- **department**: Text, Department the employee works in

- **salary**: Integer, Employee's salary

- **year**: Integer, Year the employee was active

Use the database to generate SQL queries for the questions. When generating SQL queries, always ensure the query follows the SQL syntax for SQLite.

```python
"""
```

```python
# Create PromptTemplate
```

```python
template = """
```

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

{tools}

Answer the following questions as best you can. Use tools when necessary.

If the question is relational (e.g., how it connects to a previous question), reference the chat history provided below. If the question

involves a database, perform SQL actions. If unclear, clarify with the user.
THE PREVIOUS QUESTIONS ARE NOT TOOLS. DO NOT USE THEM IN Action: or
Action_Input:. They are only for your context only.
Relevant pieces of previous conversation:
{history}
(You do not need to use these pieces of information if not relevant)

Use the following format:

Question: the input question you must answer. Do not get stuck in a
infinite loop.

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)

Final Answer: ALWAYS RETURN THE DATA AS THE FINAL ANSWER. DO NOT
RETURN 'I DON'T KNOW' OR ANY OTHER TEXT.

Begin!

Question: {input}
Thought: {agent_scratchpad}

"""

suffix = """

Here are a few examples to guide you:

1. **Question**: "How many employees are there in the year 2020?"

SQL Query:

SELECT COUNT(*)

 FROM employees WHERE year = 2020;

2. **Question**: "What is the salary of Alice?"

SQL Query:

SELECT salary FROM employees WHERE name = 'Alice';

```
3. **Question**: "Which employees work in Engineering?"

**SQL Query**:

SELECT name FROM employees WHERE department = 'Engineering';

You can create SQL queries for any question you are asked. Remember to
always return an answer.

"""

prompt = PromptTemplate.from_template(
prefix=prefix,
template=template,
suffix=suffix
).partial(
tools=render_text_description(tools),
tool_names=", ".join([t.name for t in tools]),
)

# SQL Agent Chain
react_agent = create_react_agent(
llm=llm,
tools=tools,
prompt=prompt,
stop_sequence=["Observation:"],
# output_parser=custom_json_output_parser
)

agent_executor = AgentExecutor(agent=react_agent, tools=tools,
memory=memory, verbose=True,handle_parsing_errors=True,
max_iterations=5)

# agent_with_chat_history = RunnableWithMessageHistory(
#     agent_executor,
#     # This is needed because in most real world scenarios, a session
id is needed
#     # It isn't really used here because we are using a simple in
memory ChatMessageHistory
#     lambda session_id: memory,
#     input_messages_key="input",
#     history_messages_key="chat_history",
# )

# , memory=memory
# , max_execution_time=10
# early_stopping_method="Final Answer:"
# Function to convert text to SQL using the agent
# def text_to_sql(input_text: str):
```

```python
#   try:
#     return agent_executor.invoke({"input": input_text})
#   except Exception as e:
#     print(f"Error: {e}")
#   return None

def text_to_sql_with_memory(input_text: str):
    try:
        # Pass the input through the agent executor with memory
        # Retrieve response from memory-based executor
        return agent_executor.invoke({"input": input_text})

    except Exception as e:
        print(f"Error: {e}")
        return None
```

Database loaded successfully.

OpenAI Api Key: ········

```python
# # Update the chat memory manually
# memory.save_context({"input": query1}, {"response": final_answer})

query1 = "What is the salary of Alice?"
print("Bot Response:", text_to_sql_with_memory(query1))

print("Current Chat History:")
print(memory)
```

> Entering new AgentExecutor chain...
To answer this question, I need to query the database to find Alice's salary.

Action: execute_sql_query

Action Input: SELECT salary FROM employees WHERE name = 'Alice';

(Note: The table name 'employees' is assumed. If the actual table name is different, please provide it.)

> Entering new SQL Agent Executor chain...
Action: sql_db_list_tables
Action Input: ""employeesThe table "employees" exists in the database.
I should check the schema of the "employees" table to ensure that the column "name" and "salary" exist.
Action: sql_db_schema
Action Input: employees
CREATE TABLE employees (
        id INTEGER,
```

```
      name TEXT NOT NULL,
      department TEXT NOT NULL,
      salary INTEGER,
      year INTEGER,
      PRIMARY KEY (id)
)

/*
3 rows from employees table:
id   name department salary   year
1   Alice Engineering   75000 2020
2   Bob   HR   55000 2020
3   Charlie   Engineering   80000 2021
*/
```
The "employees" table contains the columns "name" and "salary". I can now construct a query to find the salary of the employee named 'Alice'.

Action: sql_db_query_checker
Action Input: SELECT salary FROM employees WHERE name = 'Alice' LIMIT 10;

> Entering new LLMChain chain...
Prompt after formatting:

SELECT salary FROM employees WHERE name = 'Alice' LIMIT 10;
Double check the sqlite query above for common mistakes, including:
- Using NOT IN with NULL values
- Using UNION when UNION ALL should have been used
- Using BETWEEN for exclusive ranges
- Data type mismatch in predicates
- Properly quoting identifiers
- Using the correct number of arguments for functions
- Casting to the correct data type
- Using the proper columns for joins

If there are any of the above mistakes, rewrite the query. If there are no mistakes, just reproduce the original query.

Output the final SQL query only.

SQL Query:

> Finished chain.
```sql
SELECT salary FROM employees WHERE name = 'Alice' LIMIT 10;
```
The query is correct and ready to be executed. I will now run the query to find the salary of the employee named 'Alice'.

Action: sql_db_query
Action Input: SELECT salary FROM employees WHERE name = 'Alice' LIMIT

```
10;[(75000,)]I now know the final answer.

Final Answer: The salary of the employee named 'Alice' is 75,000.

> Finished chain.
{'input': "SELECT salary FROM employees WHERE name = 'Alice';\n\
n(Note: The table name 'employees' is assumed. If the actual table
name is different, please provide it.)", 'output': "The salary of the
employee named 'Alice' is 75,000."}Final Answer: The salary of Alice
is 75,000.

> Finished chain.
Bot Response: {'input': 'What is the salary of Alice?', 'history':
'Human: bar\nAI: foo', 'output': 'The salary of Alice is 75,000.'}
Current Chat History:
chat_memory=InMemoryChatMessageHistory(messages=[HumanMessage(content=
'bar', additional_kwargs={}, response_metadata={}),
AIMessage(content='foo', additional_kwargs={}, response_metadata={}),
HumanMessage(content='What is the salary of Alice?',
additional_kwargs={}, response_metadata={}), AIMessage(content='The
salary of Alice is 75,000.', additional_kwargs={},
response_metadata={})]) output_key='output' input_key='input'

query2 = "What was the name of the person in previous question?"
response2 = text_to_sql_with_memory(query2)
print("Bot Response:", response2)

print("Current Chat History:")
print(memory)


> Entering new AgentExecutor chain...
The previous question mentioned "Alice" in the context of salary.

Final Answer: Alice

> Finished chain.
Bot Response: {'input': 'What was the name of the person in previous
question?', 'history': 'Human: bar\nAI: foo\nHuman: What is the salary
of Alice?\nAI: The salary of Alice is 75,000.', 'output': 'Alice'}
Current Chat History:
chat_memory=InMemoryChatMessageHistory(messages=[HumanMessage(content=
'bar', additional_kwargs={}, response_metadata={}),
AIMessage(content='foo', additional_kwargs={}, response_metadata={}),
HumanMessage(content='What is the salary of Alice?',
additional_kwargs={}, response_metadata={}), AIMessage(content='The
salary of Alice is 75,000.', additional_kwargs={},
response_metadata={}), HumanMessage(content='What was the name of the
person in previous question?', additional_kwargs={},
```

```python
response_metadata={}), AIMessage(content='Alice',
additional_kwargs={}, response_metadata={})]) output_key='output'
input_key='input'

query3 = "What did I ask in the previous question?"
print("Bot Response:", text_to_sql_with_memory(query3))

print("Current Chat History:")
print(memory)
```

```
> Entering new AgentExecutor chain...
The previous question you asked was: "What was the name of the person
in previous question?"Invalid Format: Missing 'Action:' after
'Thought:The previous question you asked was: "What was the name of
the person in previous question?"Invalid Format: Missing 'Action:'
after 'Thought:Action: None

Final Answer: The previous question you asked was: "What was the name
of the person in previous question?"

> Finished chain.
Bot Response: {'input': 'What did I ask in the previous question?',
'history': 'Human: bar\nAI: foo\nHuman: What is the salary of Alice?\
nAI: The salary of Alice is 75,000.\nHuman: What was the name of the
person in previous question?\nAI: Alice', 'output': 'The previous
question you asked was: "What was the name of the person in previous
question?"'}
Current Chat History:
chat_memory=InMemoryChatMessageHistory(messages=[HumanMessage(content=
'bar', additional_kwargs={}, response_metadata={}),
AIMessage(content='foo', additional_kwargs={}, response_metadata={}),
HumanMessage(content='What is the salary of Alice?',
additional_kwargs={}, response_metadata={}), AIMessage(content='The
salary of Alice is 75,000.', additional_kwargs={},
response_metadata={}), HumanMessage(content='What was the name of the
person in previous question?', additional_kwargs={},
response_metadata={}), AIMessage(content='Alice',
additional_kwargs={}, response_metadata={}),
HumanMessage(content='What did I ask in the previous question?',
additional_kwargs={}, response_metadata={}), AIMessage(content='The
previous question you asked was: "What was the name of the person in
previous question?"', additional_kwargs={}, response_metadata={})])
output_key='output' input_key='input'
```

```python
query4 = "Compare the salaries of Alice and Diana."
print("Bot Response:", text_to_sql_with_memory(query4))

print("Current Chat History:")
print(memory)
```

```
> Entering new AgentExecutor chain...
To compare the salaries of Alice and Diana, I need to retrieve their
salary information from the database.

Action: execute_sql_query

Action Input: SELECT name, salary FROM employees WHERE name IN
('Alice', 'Diana');



> Entering new SQL Agent Executor chain...
Action: sql_db_list_tables
Action Input: ""employeesThe database contains a table named
"employees". I should check the schema of this table to understand its
structure and the available columns.

Action: sql_db_schema
Action Input: "employees"
CREATE TABLE employees (
      id INTEGER,
      name TEXT NOT NULL,
      department TEXT NOT NULL,
      salary INTEGER,
      year INTEGER,
      PRIMARY KEY (id)
)

/*
3 rows from employees table:
id    name  department salary      year
1     Alice Engineering      75000 2020
2     Bob   HR    55000 2020
3     Charlie     Engineering       80000 2021
*/The "employees" table contains the columns "id", "name",
"department", "salary", and "year". The query provided is asking for
the "name" and "salary" of employees named 'Alice' or 'Diana'. I will
construct a query to retrieve this information.

Action: sql_db_query_checker
Action Input: "SELECT name, salary FROM employees WHERE name IN
('Alice', 'Diana') LIMIT 10;"

> Entering new LLMChain chain...
Prompt after formatting:

SELECT name, salary FROM employees WHERE name IN ('Alice', 'Diana')
LIMIT 10;
```

Double check the sqlite query above for common mistakes, including:
- Using NOT IN with NULL values
- Using UNION when UNION ALL should have been used
- Using BETWEEN for exclusive ranges
- Data type mismatch in predicates
- Properly quoting identifiers
- Using the correct number of arguments for functions
- Casting to the correct data type
- Using the proper columns for joins

If there are any of the above mistakes, rewrite the query. If there are no mistakes, just reproduce the original query.

Output the final SQL query only.

SQL Query:

> Finished chain.
```sql
SELECT name, salary FROM employees WHERE name IN ('Alice', 'Diana')
LIMIT 10;
```The query is correct and ready to be executed. I will now run the
query to get the results.

Action: sql_db_query
Action Input: "SELECT name, salary FROM employees WHERE name IN
('Alice', 'Diana') LIMIT 10;"[('Alice', 75000), ('Diana', 85000)]I now
know the final answer.

Final Answer: The salaries of the employees are as follows: Alice has
a salary of 75,000 and Diana has a salary of 85,000.

> Finished chain.
{'input': "SELECT name, salary FROM employees WHERE name IN ('Alice',
'Diana');\n\n", 'output': 'The salaries of the employees are as
follows: Alice has a salary of 75,000 and Diana has a salary of
85,000.'}Final Answer: Alice has a salary of 75,000, while Diana has a
salary of 85,000.

> Finished chain.
Bot Response: {'input': 'Compare the salaries of Alice and Diana.',
'history': 'Human: bar\nAI: foo\nHuman: What is the salary of Alice?\
nAI: The salary of Alice is 75,000.\nHuman: What was the name of the
person in previous question?\nAI: Alice\nHuman: What did I ask in the
previous question?\nAI: The previous question you asked was: "What was
the name of the person in previous question?"', 'output': 'Alice has a
salary of 75,000, while Diana has a salary of 85,000.'}
Current Chat History:
chat_memory=InMemoryChatMessageHistory(messages=[HumanMessage(content=
'bar', additional_kwargs={}, response_metadata={}),

```
AIMessage(content='foo', additional_kwargs={}, response_metadata={}),
HumanMessage(content='What is the salary of Alice?',
additional_kwargs={}, response_metadata={}), AIMessage(content='The
salary of Alice is 75,000.', additional_kwargs={},
response_metadata={}), HumanMessage(content='What was the name of the
person in previous question?', additional_kwargs={},
response_metadata={}), AIMessage(content='Alice',
additional_kwargs={}, response_metadata={}),
HumanMessage(content='What did I ask in the previous question?',
additional_kwargs={}, response_metadata={}), AIMessage(content='The
previous question you asked was: "What was the name of the person in
previous question?"', additional_kwargs={}, response_metadata={}),
HumanMessage(content='Compare the salaries of Alice and Diana.',
additional_kwargs={}, response_metadata={}), AIMessage(content='Alice
has a salary of 75,000, while Diana has a salary of 85,000.',
additional_kwargs={}, response_metadata={})]) output_key='output'
input_key='input'

query4 = "What salary amounts were compared previously"
print("Bot Response:", text_to_sql_with_memory(query4))

print("Current Chat History:")
print(memory)


> Entering new AgentExecutor chain...
The previous comparison involved the salaries of Alice and Diana.

Final Answer: The salary amounts compared previously were 75,000 for
Alice and 85,000 for Diana.

> Finished chain.
Bot Response: {'input': 'What salary amounts were compared
previously', 'history': 'Human: bar\nAI: foo\nHuman: What is the
salary of Alice?\nAI: The salary of Alice is 75,000.\nHuman: What was
the name of the person in previous question?\nAI: Alice\nHuman: What
did I ask in the previous question?\nAI: The previous question you
asked was: "What was the name of the person in previous question?"\
nHuman: Compare the salaries of Alice and Diana.\nAI: Alice has a
salary of 75,000, while Diana has a salary of 85,000.', 'output': 'The
salary amounts compared previously were 75,000 for Alice and 85,000
for Diana.'}
Current Chat History:
chat_memory=InMemoryChatMessageHistory(messages=[HumanMessage(content=
'bar', additional_kwargs={}, response_metadata={}),
AIMessage(content='foo', additional_kwargs={}, response_metadata={}),
HumanMessage(content='What is the salary of Alice?',
additional_kwargs={}, response_metadata={}), AIMessage(content='The
salary of Alice is 75,000.', additional_kwargs={},
```

```
response_metadata={}), HumanMessage(content='What was the name of the
person in previous question?', additional_kwargs={},
response_metadata={}), AIMessage(content='Alice',
additional_kwargs={}, response_metadata={}),
HumanMessage(content='What did I ask in the previous question?',
additional_kwargs={}, response_metadata={}), AIMessage(content='The
previous question you asked was: "What was the name of the person in
previous question?"', additional_kwargs={}, response_metadata={}),
HumanMessage(content='Compare the salaries of Alice and Diana.',
additional_kwargs={}, response_metadata={}), AIMessage(content='Alice
has a salary of 75,000, while Diana has a salary of 85,000.',
additional_kwargs={}, response_metadata={}),
HumanMessage(content='What salary amounts were compared previously',
additional_kwargs={}, response_metadata={}), AIMessage(content='The
salary amounts compared previously were 75,000 for Alice and 85,000
for Diana.', additional_kwargs={}, response_metadata={})])
output_key='output' input_key='input'
```