Custom functions with OpenAI Functions Agent

This notebook goes through how to integrate custom functions with OpenAI Functions agent.

Install libraries which are required to run this example notebook

```
pip install -q openai langchain yfinance
```

Define custom functions

```
import yfinance as yf
from datetime import datetime, timedelta


def get_current_stock_price(ticker):
    """Method to get current stock price"""

    ticker_data = yf.Ticker(ticker)
    recent = ticker_data.history(period="1d")
    return {"price": recent.iloc[0]["Close"], "currency":
ticker_data.info["currency"]}


def get_stock_performance(ticker, days):
    """Method to get stock price change in percentage"""

    past_date = datetime.today() - timedelta(days=days)
    ticker_data = yf.Ticker(ticker)
    history = ticker_data.history(start=past_date)
    old_price = history.iloc[0]["Close"]
    current_price = history.iloc[-1]["Close"]
    return {"percent_change": ((current_price - old_price) / old_price) *
100}
```

```
get_current_stock_price("MSFT")
```

```
    {'price': 334.57000732421875, 'currency': 'USD'}
```

```
get_stock_performance("MSFT", 30)
```

```
    {'percent_change': 1.014466941163018}
```

Make custom tools

```
from typing import Type
from pydantic import BaseModel, Field
from langchain.tools import BaseTool


class CurrentStockPriceInput(BaseModel):
    """Inputs for get_current_stock_price"""

    ticker: str = Field(description="Ticker symbol of the stock")


class CurrentStockPriceTool(BaseTool):
    name = "get_current_stock_price"
    description = """
        Useful when you want to get current stock price.
        You should enter the stock ticker symbol recognized by the yahoo
finance
        """
    args_schema: Type[BaseModel] = CurrentStockPriceInput

    def _run(self, ticker: str):
        price_response = get_current_stock_price(ticker)
        return price_response

    def _arun(self, ticker: str):
        raise NotImplementedError("get_current_stock_price does not
support async")


class StockPercentChangeInput(BaseModel):
```

```
    """Inputs for get_stock_performance"""

    ticker: str = Field(description="Ticker symbol of the stock")
    days: int = Field(description="Timedelta days to get past date from
current date")


class StockPerformanceTool(BaseTool):
    name = "get_stock_performance"
    description = """
        Useful when you want to check performance of the stock.
        You should enter the stock ticker symbol recognized by the yahoo
finance.
        You should enter days as number of days from today from which
performance needs to be check.
        output will be the change in the stock price represented as a
percentage.
        """
    args_schema: Type[BaseModel] = StockPercentChangeInput

    def _run(self, ticker: str, days: int):
        response = get_stock_performance(ticker, days)
        return response

    def _arun(self, ticker: str):
        raise NotImplementedError("get_stock_performance does not support
async")
```

API Reference:

- BaseTool from `langchain.tools`

Create Agent

```
from langchain.agents import AgentType
from langchain.chat_models import ChatOpenAI
from langchain.agents import initialize_agent

llm = ChatOpenAI(model="gpt-3.5-turbo-0613", temperature=0)

tools = [CurrentStockPriceTool(), StockPerformanceTool()]
```

```
agent = initialize_agent(tools, llm, agent=AgentType.OPENAI_FUNCTIONS,
verbose=True)
```

API Reference:

- AgentType from `langchain.agents`
- ChatOpenAI from `langchain.chat_models`
- initialize_agent from `langchain.agents`

```
agent.run(
    "What is the current price of Microsoft stock? How it has performed
over past 6 months?"
)
```

```
    > Entering new  chain...

    Invoking: `get_current_stock_price` with `{'ticker': 'MSFT'}`


    {'price': 334.57000732421875, 'currency': 'USD'}
    Invoking: `get_stock_performance` with `{'ticker': 'MSFT', 'days':
180}`


    {'percent_change': 40.163963297187905}The current price of Microsoft
stock is $334.57 USD.

    Over the past 6 months, Microsoft stock has performed well with a
40.16% increase in its price.

    > Finished chain.
```

```
    'The current price of Microsoft stock is $334.57 USD. \n\nOver the
```

```
past 6 months, Microsoft stock has performed well with a 40.16% increase
in its price.'
```

```
agent.run("Give me recent stock prices of Google and Meta?")
```

```
    > Entering new  chain...

    Invoking: `get_current_stock_price` with `{'ticker': 'GOOGL'}`


    {'price': 118.33000183105469, 'currency': 'USD'}
    Invoking: `get_current_stock_price` with `{'ticker': 'META'}`


    {'price': 287.04998779296875, 'currency': 'USD'}The recent stock price
of Google (GOOGL) is $118.33 USD and the recent stock price of Meta (META)
is $287.05 USD.

    > Finished chain.




    'The recent stock price of Google (GOOGL) is $118.33 USD and the
recent stock price of Meta (META) is $287.05 USD.'
```

```
agent.run(
    "In the past 3 months, which stock between Microsoft and Google has
performed the best?"
)
```

```
    > Entering new  chain...

    Invoking: `get_stock_performance` with `{'ticker': 'MSFT', 'days':
```

```
90}`


    {'percent_change': 18.043096235165596}
    Invoking: `get_stock_performance` with `{'ticker': 'GOOGL', 'days':
90}`


    {'percent_change': 17.286155760642853}In the past 3 months, Microsoft
(MSFT) has performed better than Google (GOOGL). Microsoft's stock price
has increased by 18.04% while Google's stock price has increased by
17.29%.

    > Finished chain.




    "In the past 3 months, Microsoft (MSFT) has performed better than
Google (GOOGL). Microsoft's stock price has increased by 18.04% while
Google's stock price has increased by 17.29%."
```