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OpenAI Multi Functions Agent

This notebook showcases using an agent that uses the OpenAI functions ability to respond to the prompts of the user using a Large Language Model

Install openai,google-search-results packages which are required as the langchain packages call them internally

> pip install openai google-search-results

```
from langchain import SerpAPIWrapper
from langchain.agents import initialize_agent, Tool
from langchain.agents import AgentType
from langchain.chat_models import ChatOpenAI
```

The agent is given ability to perform search functionalities with the respective tool

SerpAPIWrapper:

> This initializes the SerpAPIWrapper for search functionality (search).

```
# Initialize the OpenAI language model
#Replace <your_api_key> in openai_api_key="<your_api_key>" with your actual OpenAI key.
llm = ChatOpenAI(temperature=0, model="gpt-3.5-turbo-0613")

# Initialize the SerpAPIWrapper for search functionality
#Replace <your_api_key> in openai_api_key="<your_api_key>" with your actual SerpAPI key.
```

```python
search = SerpAPIWrapper()

# Define a list of tools offered by the agent
tools = [
    Tool(
        name="Search",
        func=search.run,
        description="Useful when you need to answer questions about current events. You should ask targeted questions."
    ),
]
```

```python
mrkl = initialize_agent(tools, llm, agent=AgentType.OPENAI_MULTI_FUNCTIONS, verbose=True)
```

```python
# Do this so we can see exactly what's going on under the hood
import langchain
langchain.debug = True
```

```python
mrkl.run(
    "What is the weather in LA and SF?"
)
```

```
    [chain/start] [1:chain:AgentExecutor] Entering Chain run with input:
    {
      "input": "What is the weather in LA and SF?"
    }
    [llm/start] [1:chain:AgentExecutor > 2:llm:ChatOpenAI] Entering LLM run with input:
    {
```

```
        "prompts": [
          "System: You are a helpful AI assistant.\nHuman: What is the weather in LA and SF?"
        ]
      }
      [llm/end] [1:chain:AgentExecutor > 2:llm:ChatOpenAI] [2.91s] Exiting LLM run with output:
      {
        "generations": [
          [
            {
              "text": "",
              "generation_info": null,
              "message": {
                "content": "",
                "additional_kwargs": {
                  "function_call": {
                    "name": "tool_selection",
                    "arguments": "{\n  \"actions\": [\n    {\n      \"action_name\": \"Search\",\n
\"action\": {\n        \"tool_input\": \"weather in Los Angeles\"\n      }\n    },\n    {\n
\"action_name\": \"Search\",\n      \"action\": {\n        \"tool_input\": \"weather in San Francisco\"\n
}\n    }\n  ]\n}"
                  }
                },
                "example": false
              }
            }
          ]
        ],
        "llm_output": {
          "token_usage": {
            "prompt_tokens": 81,
            "completion_tokens": 75,
            "total_tokens": 156
          },
```

```
        "model_name": "gpt-3.5-turbo-0613"
      },
      "run": null
    }
    [tool/start] [1:chain:AgentExecutor > 3:tool:Search] Entering Tool run with input:
    "{'tool_input': 'weather in Los Angeles'}"
    [tool/end] [1:chain:AgentExecutor > 3:tool:Search] [608.693ms] Exiting Tool run with output:
    "Mostly cloudy early, then sunshine for the afternoon. High 76F. Winds SW at 5 to 10 mph. Humidity59%."
    [tool/start] [1:chain:AgentExecutor > 4:tool:Search] Entering Tool run with input:
    "{'tool_input': 'weather in San Francisco'}"
    [tool/end] [1:chain:AgentExecutor > 4:tool:Search] [517.475ms] Exiting Tool run with output:
    "Partly cloudy this evening, then becoming cloudy after midnight. Low 53F. Winds WSW at 10 to 20 mph.
Humidity83%."
    [llm/start] [1:chain:AgentExecutor > 5:llm:ChatOpenAI] Entering LLM run with input:
    {
      "prompts": [
        "System: You are a helpful AI assistant.\nHuman: What is the weather in LA and SF?\nAI: {'name':
'tool_selection', 'arguments': '{\\n  \"actions\": [\\n    {\\n      \"action_name\": \"Search\",\\n
\"action\": {\\n      \"tool_input\": \"weather in Los Angeles\"\\n      }\\n    },\\n    {\\n
\"action_name\": \"Search\",\\n      \"action\": {\\n        \"tool_input\": \"weather in San Francisco\"\\n
}\\n    }\\n  ]\\n}'}\nFunction: Mostly cloudy early, then sunshine for the afternoon. High 76F. Winds SW at
5 to 10 mph. Humidity59%.\nAI: {'name': 'tool_selection', 'arguments': '{\\n  \"actions\": [\\n    {\\n
\"action_name\": \"Search\",\\n      \"action\": {\\n        \"tool_input\": \"weather in Los Angeles\"\\n
}\\n    },\\n    {\\n      \"action_name\": \"Search\",\\n      \"action\": {\\n        \"tool_input\":
\"weather in San Francisco\"\\n      }\\n    }\\n  ]\\n}'}\nFunction: Partly cloudy this evening, then
becoming cloudy after midnight. Low 53F. Winds WSW at 10 to 20 mph. Humidity83%."
      ]
    }
    [llm/end] [1:chain:AgentExecutor > 5:llm:ChatOpenAI] [2.33s] Exiting LLM run with output:
    {
      "generations": [
        [
          {
```

```
          "text": "The weather in Los Angeles is mostly cloudy with a high of 76°F and a humidity of 59%.
  The weather in San Francisco is partly cloudy in the evening, becoming cloudy after midnight, with a low of
  53°F and a humidity of 83%.",
                "generation_info": null,
                "message": {
                  "content": "The weather in Los Angeles is mostly cloudy with a high of 76°F and a humidity of
  59%. The weather in San Francisco is partly cloudy in the evening, becoming cloudy after midnight, with a low
  of 53°F and a humidity of 83%.",
                  "additional_kwargs": {},
                  "example": false
                }
              }
            ]
          ],
          "llm_output": {
            "token_usage": {
              "prompt_tokens": 307,
              "completion_tokens": 54,
              "total_tokens": 361
            },
            "model_name": "gpt-3.5-turbo-0613"
          },
          "run": null
        }
        [chain/end] [1:chain:AgentExecutor] [6.37s] Exiting Chain run with output:
        {
          "output": "The weather in Los Angeles is mostly cloudy with a high of 76°F and a humidity of 59%. The
  weather in San Francisco is partly cloudy in the evening, becoming cloudy after midnight, with a low of 53°F
  and a humidity of 83%."
        }
```

'The weather in Los Angeles is mostly cloudy with a high of 76°F and a humidity of 59%. The weather in San Francisco is partly cloudy in the evening, becoming cloudy after midnight, with a low of 53°F and a humidity of 83%.'