Multiple callback handlers

In the previous examples, we passed in callback handlers upon creation of an object by using `callbacks=`. In this case, the callbacks will be scoped to that particular object.

However, in many cases, it is advantageous to pass in handlers instead when running the object. When we pass through `CallbackHandlers` using the `callbacks` keyword arg when executing an run, those callbacks will be issued by all nested objects involved in the execution. For example, when a handler is passed through to an `Agent`, it will be used for all callbacks related to the agent and all the objects involved in the agent's execution, in this case, the `Tools`, `LLMChain`, and `LLM`.

This prevents us from having to manually attach the handlers to each individual nested object.

```
from typing import Dict, Union, Any, List

from langchain.callbacks.base import BaseCallbackHandler
from langchain.schema import AgentAction
from langchain.agents import AgentType, initialize_agent, load_tools
from langchain.callbacks import tracing_enabled
from langchain.llms import OpenAI


# First, define custom callback handler implementations
class MyCustomHandlerOne(BaseCallbackHandler):
    def on_llm_start(
        self, serialized: Dict[str, Any], prompts: List[str], **kwargs:
Any
    ) -> Any:
        print(f"on_llm_start {serialized['name']}")

    def on_llm_new_token(self, token: str, **kwargs: Any) -> Any:
        print(f"on_new_token {token}")

    def on_llm_error(
        self, error: Union[Exception, KeyboardInterrupt], **kwargs: Any
    ) -> Any:
        """Run when LLM errors."""

    def on_chain_start(
        self, serialized: Dict[str, Any], inputs: Dict[str, Any],
```

```
**kwargs: Any
    ) -> Any:
        print(f"on_chain_start {serialized['name']}")

    def on_tool_start(
        self, serialized: Dict[str, Any], input_str: str, **kwargs: Any
    ) -> Any:
        print(f"on_tool_start {serialized['name']}")

    def on_agent_action(self, action: AgentAction, **kwargs: Any) ->
Any:
        print(f"on_agent_action {action}")


class MyCustomHandlerTwo(BaseCallbackHandler):
    def on_llm_start(
        self, serialized: Dict[str, Any], prompts: List[str], **kwargs:
Any
    ) -> Any:
        print(f"on_llm_start (I'm the second handler!!)
{serialized['name']}")


# Instantiate the handlers
handler1 = MyCustomHandlerOne()
handler2 = MyCustomHandlerTwo()

# Setup the agent. Only the `llm` will issue callbacks for handler2
llm = OpenAI(temperature=0, streaming=True, callbacks=[handler2])
tools = load_tools(["llm-math"], llm=llm)
agent = initialize_agent(tools, llm,
agent=AgentType.ZERO_SHOT_REACT_DESCRIPTION)

# Callbacks for handler1 will be issued by every object involved in the
# Agent execution (llm, llmchain, tool, agent executor)
agent.run("What is 2 raised to the 0.235 power?", callbacks=[handler1])
```

API Reference:

- BaseCallbackHandler from `langchain.callbacks.base`
- AgentAction from `langchain.schema`
- AgentType from `langchain.agents`
- initialize_agent from `langchain.agents`
- load_tools from `langchain.agents`
- tracing_enabled from `langchain.callbacks`

- OpenAI from `langchain.llms`

```
    on_chain_start AgentExecutor
    on_chain_start LLMChain
    on_llm_start OpenAI
    on_llm_start (I'm the second handler!!) OpenAI
    on_new_token  I
    on_new_token  need
    on_new_token  to
    on_new_token  use
    on_new_token  a
    on_new_token  calculator
    on_new_token  to
    on_new_token  solve
    on_new_token  this
    on_new_token .
    on_new_token
    Action
    on_new_token :
    on_new_token  Calculator
    on_new_token
    Action
    on_new_token  Input
    on_new_token :
    on_new_token  2
    on_new_token ^
    on_new_token 0
    on_new_token .
    on_new_token 235
    on_new_token
    on_agent_action AgentAction(tool='Calculator',
tool_input='2^0.235', log=' I need to use a calculator to solve
this.\nAction: Calculator\nAction Input: 2^0.235')
    on_tool_start Calculator
    on_chain_start LLMMathChain
    on_chain_start LLMChain
    on_llm_start OpenAI
    on_llm_start (I'm the second handler!!) OpenAI
    on_new_token
    on_new_token ```text
    on_new_token

    on_new_token 2
    on_new_token **
    on_new_token 0
    on_new_token .
```

```
on_new_token 235
on_new_token

on_new_token ```

on_new_token ...
on_new_token num
on_new_token expr
on_new_token .
on_new_token evaluate
on_new_token ("
on_new_token 2
on_new_token **
on_new_token 0
on_new_token .
on_new_token 235
on_new_token ")
on_new_token ...
on_new_token

on_new_token
on_chain_start LLMChain
on_llm_start OpenAI
on_llm_start (I'm the second handler!!) OpenAI
on_new_token  I
on_new_token  now
on_new_token  know
on_new_token  the
on_new_token  final
on_new_token  answer
on_new_token .
on_new_token
Final
on_new_token  Answer
on_new_token :
on_new_token  1
on_new_token .
on_new_token 17
on_new_token 690
on_new_token 67
on_new_token 372
on_new_token 187
on_new_token 674
on_new_token
```

```
'1.1769067372187674'
```