Conversation buffer window memory

`ConversationBufferWindowMemory` keeps a list of the interactions of the conversation over time. It only uses the last K interactions. This can be useful for keeping a sliding window of the most recent interactions, so the buffer does not get too large

Let's first explore the basic functionality of this type of memory.

```
from langchain.memory import ConversationBufferWindowMemory
```

```
memory = ConversationBufferWindowMemory( k=1)
memory.save_context({"input": "hi"}, {"output": "whats up"})
memory.save_context({"input": "not much you"}, {"output": "not much"})
```

```
memory.load_memory_variables({})
```

```
    {'history': 'Human: not much you\nAI: not much'}
```

We can also get the history as a list of messages (this is useful if you are using this with a chat model).

```
memory = ConversationBufferWindowMemory( k=1, return_messages=True)
memory.save_context({"input": "hi"}, {"output": "whats up"})
```

```
memory.save_context({"input": "not much you"}, {"output": "not much"})
```

```
memory.load_memory_variables({})
```

```
{'history': [HumanMessage(content='not much you', additional_kwargs={}),
  AIMessage(content='not much', additional_kwargs={})]}
```

Using in a chain

Let's walk through an example, again setting `verbose=True` so we can see the prompt.

```
from langchain.llms import OpenAI
from langchain.chains import ConversationChain
conversation_with_summary = ConversationChain(
    llm=OpenAI(temperature=0),
    # We set a low k=2, to only keep the last 2 interactions in memory
    memory=ConversationBufferWindowMemory(k=2),
    verbose=True
)
conversation_with_summary.predict(input="Hi, what's up?")
```

```


    > Entering new ConversationChain chain...
    Prompt after formatting:
```

```
    The following is a friendly conversation between a human and an AI. The AI is talkative and provides lots of specific details from its context. If the AI does not know the answer to a question, it truthfully says it does not know.

    Current conversation:

    Human: Hi, what's up?
    AI:

    > Finished chain.
```

```
" Hi there! I'm doing great. I'm currently helping a customer with a technical issue. How about you?"
```

```
conversation_with_summary.predict(input="What's their issues?")
```

```
    > Entering new ConversationChain chain...
    Prompt after formatting:
    The following is a friendly conversation between a human and an AI. The AI is talkative and provides lots of specific details from its context. If the AI does not know the answer to a question, it truthfully says it does not know.

    Current conversation:
    Human: Hi, what's up?
    AI:  Hi there! I'm doing great. I'm currently helping a customer with a technical issue. How about you?
    Human: What's their issues?
```

```
    AI:

    > Finished chain.
```

```
    " The customer is having trouble connecting to their Wi-Fi network. I'm helping them troubleshoot the
issue and get them connected."
```

```
conversation_with_summary.predict(input="Is it going well?")
```

```
    > Entering new ConversationChain chain...
    Prompt after formatting:
    The following is a friendly conversation between a human and an AI. The AI is talkative and provides lots
of specific details from its context. If the AI does not know the answer to a question, it truthfully says it
does not know.

    Current conversation:
    Human: Hi, what's up?
    AI:  Hi there! I'm doing great. I'm currently helping a customer with a technical issue. How about you?
    Human: What's their issues?
    AI:  The customer is having trouble connecting to their Wi-Fi network. I'm helping them troubleshoot the
issue and get them connected.
    Human: Is it going well?
    AI:

    > Finished chain.
```

```
" Yes, it's going well so far. We've already identified the problem and are now working on a solution."
```

```
# Notice here that the first interaction does not appear.
conversation_with_summary.predict(input="What's the solution?")
```

```
> Entering new ConversationChain chain...
Prompt after formatting:
The following is a friendly conversation between a human and an AI. The AI is talkative and provides lots of specific details from its context. If the AI does not know the answer to a question, it truthfully says it does not know.

Current conversation:
Human: What's their issues?
AI:  The customer is having trouble connecting to their Wi-Fi network. I'm helping them troubleshoot the issue and get them connected.
Human: Is it going well?
AI:  Yes, it's going well so far. We've already identified the problem and are now working on a solution.
Human: What's the solution?
AI:

> Finished chain.
```

```
    " The solution is to reset the router and reconfigure the settings. We're currently in the process of doing that."
```