# 4.2.1 LLM 链

LLMChain 将是一个非常简单的 Chains 。这绝对是您最常见到的 Chains 。基本上只是将一个大型语言模型与提示（Prompt）链在一起。然后使用提示模板来提供输入,并将一些内容输入到其中。

以下是文章的事实提取场景下，使用通用LLM链的示例代码：

安装库:

!pip -q install openai langchain huggingface\_hub

设置密钥:

import os  
  
os.environ['OPENAI\_API\_KEY'] = ''  
os.environ['HUGGINGFACEHUB\_API\_TOKEN'] = ''

from langchain.prompts import PromptTemplate  
from langchain.llms import OpenAI  
from langchain.chains import LLMChain

在这里，您可以看到我正在设置OpenAI text-davinci-003 模型，我们将将温度设置为零，只需设置最大令牌。如果您知道这是一个默认的标准模型的话，你肯定知道其中许多将根据默认值进行设置。

llm = OpenAI(model\_name='text-davinci-003',   
 temperature=0,   
 max\_tokens = 256)

我在这里有一篇小文章，所以我将要做的实际上是事实提取。因此，在这里，我基本上提取了一篇关于Coinbase的文章。所以这是一篇相当长的文章，如果我们看一下，它有3500个字符。

我们要做的就是从中提取出关键事实。然后我们将对此进行调整。并尝试将这些事实改写成一种新的内容。首先，我们需要我们的Prompts（提示）模板，所以我们的Prompts（提示）模板基本上接受输入，这是我们在这里得到的。

article = '''Coinbase, the second-largest crypto exchange by trading volume, released its Q4 2022 earnings on Tuesday, giving shareholders and market players alike an updated look into its financials. In response to the report, the company's shares are down modestly in early after-hours trading.In the fourth quarter of 2022, Coinbase generated $605 million in total revenue, down sharply from $2.49 billion in the year-ago quarter. Coinbase's top line was not enough to cover its expenses: The company lost $557 million in the three-month period on a GAAP basis (net income) worth -$2.46 per share, and an adjusted EBITDA deficit of $124 million.Wall Street expected Coinbase to report $581.2 million in revenue and earnings per share of -$2.44 with adjusted EBITDA of -$201.8 million driven by 8.4 million monthly transaction users (MTUs), according to data provided by Yahoo Finance.Before its Q4 earnings were released, Coinbase's stock had risen 86% year-to-date. Even with that rally, the value of Coinbase when measured on a per-share basis is still down significantly from its 52-week high of $206.79.That Coinbase beat revenue expectations is notable in that it came with declines in trading volume; Coinbase historically generated the bulk of its revenues from trading fees, making Q4 2022 notable. Consumer trading volumes fell from $26 billion in the third quarter of last year to $20 billion in Q4, while institutional volumes across the same timeframe fell from $133 billion to $125 billion.The overall crypto market capitalization fell about 64%, or $1.5 trillion during 2022, which resulted in Coinbase's total trading volumes and transaction revenues to fall 50% and 66% year-over-year, respectively, the company reported.As you would expect with declines in trading volume, trading revenue at Coinbase fell in Q4 compared to the third quarter of last year, dipping from $365.9 million to $322.1 million. (TechCrunch is comparing Coinbase's Q4 2022 results to Q3 2022 instead of Q4 2021, as the latter comparison would be less useful given how much the crypto market has changed in the last year; we're all aware that overall crypto activity has fallen from the final months of 2021.)There were bits of good news in the Coinbase report. While Coinbase's trading revenues were less than exuberant, the company's other revenues posted gains. What Coinbase calls its "subscription and services revenue" rose from $210.5 million in Q3 2022 to $282.8 million in Q4 of the same year, a gain of just over 34% in a single quarter.And even as the crypto industry faced a number of catastrophic events, including the Terra/LUNA and FTX collapses to name a few, there was still growth in other areas. The monthly active developers in crypto have more than doubled since 2020 to over 20,000, while major brands like Starbucks, Nike and Adidas have dived into the space alongside social media platforms like Instagram and Reddit.With big players getting into crypto, industry players are hoping this move results in greater adoption both for product use cases and trading volumes. Although there was a lot of movement from traditional retail markets and Web 2.0 businesses, trading volume for both consumer and institutional users fell quarter-over-quarter for Coinbase.Looking forward, it'll be interesting to see if these pieces pick back up and trading interest reemerges in 2023, or if platforms like Coinbase will have to keep looking elsewhere for revenue (like its subscription service) if users continue to shy away from the market.  
'''

然后我们需要实际的Prompts（提示），这里的Prompts（提示）是从这段文本中提取关键事实，不包括观点，给每个事实编号，并保持它们的句子简短。

fact\_extraction\_prompt = PromptTemplate(  
 input\_variables=["text\_input"],  
 template="Extract the key facts out of this text. Don't include opinions. Give each fact a number and keep them short sentences. :\n\n {text\_input}"  
)

然后我将基本上将输入设置为这个文本输入。好吧，制作 Chains 实际上非常简单，我们只需说我们将使用 LLMChain ，我们传入 LLMChain。然后我们传入我们将要使用的提示模板，所以这里我有事实提取提示。然后我们将其传入。然后我们可以运行它。

fact\_extraction\_chain = LLMChain(llm=llm, prompt=fact\_extraction\_prompt)  
  
facts = fact\_extraction\_chain.run(article)  
  
print(facts)

您可以看到，在运行它之后，确实发生了变化。

1. Coinbase released its Q4 2022 earnings on Tuesday.  
2. Coinbase generated $605 million in total revenue in Q4 2022.  
3. Coinbase lost $557 million in the three-month period on a GAAP basis.  
4. Coinbase's stock had risen 86% year-to-date before its Q4 earnings were released.  
5. Consumer trading volumes fell from $26 billion in Q3 2022 to $20 billion in Q4 2022.  
6. Institutional volumes across the same timeframe fell from $133 billion to $125 billion.  
7. The overall crypto market capitalization fell about 64%, or $1.5 trillion during 2022.  
8. Trading revenue at Coinbase fell from $365.9 million in Q3 2022 to $322.1 million in Q4 2022.  
9. Coinbase's "subscription and services revenue" rose from $210.5 million in Q3 2022 to $282.8 million in Q4 2022.  
10. Monthly active developers in crypto have more than doubled since 2020 to over 20,000.

它很好地从我们的文章中获取了事实。它做得相当不错，我们从这篇文章中得到了10个事实。