Unit 12 - Tales from the Crypto

1. Sentiment Analysis

Use the newsapi to pull the latest news articles for Bitcoin and Ethereum and create a
DataFrame of sentiment scores for each coin.

Use descriptive statistics to answer the following questions:

1. Which coin had the highest mean positive score?
2. Which coin had the highest negative score?
3. Which coin had the highest positive score?

In [2]:
```python
# Initial imports
import os
import pandas as pd
from dotenv import load_dotenv
import nltk as nltk
nltk.download('vader_lexicon')
from nltk.sentiment.vader import SentimentIntensityAnalyzer
analyzer = SentimentIntensityAnalyzer()

%matplotlib inline
```

```
[nltk_data] Downloading package vader_lexicon to C:\Users\Joanne
[nltk_data]     M\AppData\Roaming\nltk_data...
[nltk_data]   Package vader_lexicon is already up-to-date!
```

In [3]:
```python
# Read your api key environment variable
load_dotenv()

api_key = os.getenv("api_key")
```

In [3]:
```python
# Create a newsapi client
from newsapi import NewsApiClient
newsapi = NewsApiClient(api_key=api_key)
```

In [4]:
```python
# Fetch the Bitcoin news articles
btc_articles = newsapi.get_everything(q="bitcoin",  language="en", sort_by="relevancy"
```

In [5]:
```python
# Fetch the Ethereum news articles
eth_articles = newsapi.get_everything(q="ethereum",  language="en", sort_by="relevancy
```

In [8]:
```python
def get_sentiment_score(article, based_on):
    sentiments = []

    for article in article["articles"]:
        try:
            text = article[based_on]
```

```python
            date = article["publishedAt"][:10]
            sentiment = analyzer.polarity_scores(text)
            compound = sentiment["compound"]
            pos = sentiment["pos"]
            neu = sentiment["neu"]
            neg = sentiment["neg"]
            sentiments.append({
                "Compound": compound,
                "Negative": neg,
                "Neutral": neu,
                "Positive": pos,
                based_on : text
            })

        except AttributeError:
            pass

    # Create DataFrame
    df = pd.DataFrame(sentiments)
    return df
```

In [10]:
```python
# Create the Bitcoin sentiment scores DataFrame
btc_sentiment_df = get_sentiment_score(btc_articles, 'content')
btc_sentiment_df.head()
```

Out[10]:

	Compound	Negative	Neutral	Positive	content
0	-0.5574	0.098	0.902	0.000	New York lawmakers have passed a bill\r\n that...
1	0.4404	0.000	0.923	0.077	Rapper and entrepreneur Shawn Carter, better k...
2	0.5267	0.000	0.876	0.124	A new study on bitcoin calls into question whe...
3	0.5106	0.000	0.836	0.164	Image caption, President Faustin-Archange Toua...
4	-0.1027	0.040	0.960	0.000	You can now reportedly pay for your burritos a...

In [12]:
```python
# Create the Ethereum sentiment scores DataFrame
eth_sentiment_df = get_sentiment_score(eth_articles, 'content')
eth_sentiment_df.head()
```

Out[12]:

	Compound	Negative	Neutral	Positive	content
0	-0.1027	0.040	0.960	0.000	GameStop has officially thrown itself headlong...
1	0.1280	0.000	0.954	0.046	GameStop is going all-in on crypto. The video ...
2	0.3182	0.000	0.941	0.059	The ability to conduct external transfers on P...
3	0.5859	0.000	0.866	0.134	A decentralized autonomous organization, or DA...
4	0.3612	0.044	0.875	0.081	Crypto Winter It May Be, But Ethereum Looks Li...

In [13]:
```python
# Describe the Bitcoin Sentiment
btc_sentiment_df.describe()
```

Out[13]:

	Compound	Negative	Neutral	Positive
count	20.000000	20.000000	20.000000	20.000000
mean	-0.030635	0.059100	0.884300	0.056650
std	0.406566	0.069485	0.090514	0.060573
min	-0.859300	0.000000	0.646000	0.000000
25%	-0.322475	0.000000	0.837500	0.000000
50%	0.000000	0.053000	0.894000	0.043000
75%	0.334100	0.087500	0.948500	0.087750
max	0.526700	0.300000	1.000000	0.187000

In [14]:
```
# Describe the Ethereum Sentiment
eth_sentiment_df.describe()
```

Out[14]:

	Compound	Negative	Neutral	Positive
count	20.000000	20.000000	20.000000	20.000000
mean	-0.017460	0.056200	0.892150	0.051800
std	0.435734	0.087082	0.085361	0.047295
min	-0.948500	0.000000	0.628000	0.000000
25%	-0.396450	0.000000	0.861250	0.000000
50%	0.012900	0.039500	0.909500	0.052500
75%	0.376275	0.088250	0.955000	0.081500
max	0.585900	0.372000	1.000000	0.135000

Questions:

Q: Which coin had the highest mean positive score?

A: **Bitcoin 0.056650**

Q: Which coin had the highest compound score?

A: **Ethereum 0.585900**

Q. Which coin had the highest positive score?

A: **Bitcoin 0.187000**

---

2. Natural Language Processing

Tokenizer

In this section, you will use NLTK and Python to tokenize the text for each coin. Be sure to:

1. Lowercase each word.
2. Remove Punctuation.
3. Remove Stopwords.

```
In [16]:  from nltk.tokenize import word_tokenize, sent_tokenize
          from nltk.corpus import stopwords
          from nltk.stem import WordNetLemmatizer, PorterStemmer
          from string import punctuation
          import re
```

```
In [17]:  # Instantiate the lemmatizer
          lemmatizer = WordNetLemmatizer()



          # Create a list of stopwords
          stop_words = set(stopwords.words('english'))

          # Expand the default stopwords list if necessary
          # YOUR CODE HERE!
```

```
In [34]:  # Complete the tokenizer function
          def tokenizer(text):
              """Tokenizes text."""

              # Remove the punctuation from text
              regex = re.compile("[^a-zA-Z0-9 ]")
              re_clean = regex.sub('', text)


              # Create a tokenized list of the words
              words = word_tokenize(re_clean.lower())


              # Convert the words to lowercase and Remove the stop words
              words = [word for word in words if word not in stop_words]


              # Lemmatize words into root words
              tokens = [lemmatizer.lemmatize(word) for word in words]








              return tokens
```

```
In [35]:  # Create a new tokens column for Bitcoin
          btc_sentiment_df['tokens'] = btc_sentiment_df['content'].apply(tokenizer)
          btc_sentiment_df.head()
```

Out[35]:

	Compound	Negative	Neutral	Positive	content	tokens
0	-0.5574	0.098	0.902	0.000	New York lawmakers have passed a bill\r\n that...	[new, york, lawmaker, passed, bill, would, tem...
1	0.4404	0.000	0.923	0.077	Rapper and entrepreneur Shawn Carter, better k...	[rapper, entrepreneur, shawn, carter, better, ...
2	0.5267	0.000	0.876	0.124	A new study on bitcoin calls into question whe...	[new, study, bitcoin, call, question, whether,...
3	0.5106	0.000	0.836	0.164	Image caption, President Faustin-Archange Toua...	[image, caption, president, faustinarchange, t...
4	-0.1027	0.040	0.960	0.000	You can now reportedly pay for your burritos a...	[reportedly, pay, burrito, taco, bitcoin, digi...

In [36]:
```python
# Create a new tokens column for Ethereum
eth_sentiment_df['tokens'] = eth_sentiment_df['content'].apply(tokenizer)
eth_sentiment_df.head()
```

Out[36]:

	Compound	Negative	Neutral	Positive	content	tokens
0	-0.1027	0.040	0.960	0.000	GameStop has officially thrown itself headlong...	[gamestop, officially, thrown, headlong, web3,...
1	0.1280	0.000	0.954	0.046	GameStop is going all-in on crypto. The video ...	[gamestop, going, allin, crypto, video, game, ...
2	0.3182	0.000	0.941	0.059	The ability to conduct external transfers on P...	[ability, conduct, external, transfer, paypals...
3	0.5859	0.000	0.866	0.134	A decentralized autonomous organization, or DA...	[decentralized, autonomous, organization, dao,...
4	0.3612	0.044	0.875	0.081	Crypto Winter It May Be, But Ethereum Looks Li...	[crypto, winter, may, ethereum, look, like, bu...

NGrams and Frequency Analysis

In this section you will look at the ngrams and word frequency for each coin.

1. Use NLTK to produce the n-grams for N = 2.
2. List the top 10 words for each coin.

In [37]:
```python
from collections import Counter
from nltk import ngrams
```

In [38]:
```python
def get_tokens(df):
    tokens = []
    for token in df['tokens']:
        tokens.extend(token)
    return tokens
```

```
btc_tokens = get_tokens(btc_sentiment_df)
eth_tokens = get_tokens(eth_sentiment_df)
```

In [39]:
```python
def bigram_counter(tokens, N=2):
    words_count = dict(Counter(ngrams(tokens, n=N)))
    return words_count
```

In [40]:
```python
# Generate the Bitcoin N-grams where N=2
bigram_btc = bigram_counter(btc_tokens, 2)
```

In [41]:
```python
# Generate the Ethereum N-grams where N=2
bigram_eth = bigram_counter(eth_tokens, 2)
```

In [42]:
```python
# Function token_count generates the top 10 words for a given coin
def token_count(tokens, N=10):
    """Returns the top N tokens from the frequency count"""
    return Counter(tokens).most_common(N)
```

In [43]:
```python
# Use token_count to get the top 10 words for Bitcoin
top_10_token_btc = token_count(btc_tokens)
top_10_token_btc
```

Out[43]:
```
[('char', 20),
 ('bitcoin', 14),
 ('new', 8),
 ('blockchain', 6),
 ('cryptocurrency', 6),
 ('digital', 4),
 ('world', 4),
 ('luna', 4),
 ('token', 4),
 ('would', 3)]
```

In [44]:
```python
# Use token_count to get the top 10 words for Ethereum
top_10_token_eth = token_count(eth_tokens)
top_10_token_eth
```

Out[44]:
```
[('char', 20),
 ('cryptocurrency', 8),
 ('ethereum', 5),
 ('new', 4),
 ('crypto', 4),
 ('market', 4),
 ('year', 4),
 ('nft', 4),
 ('web3', 3),
 ('video', 3)]
```
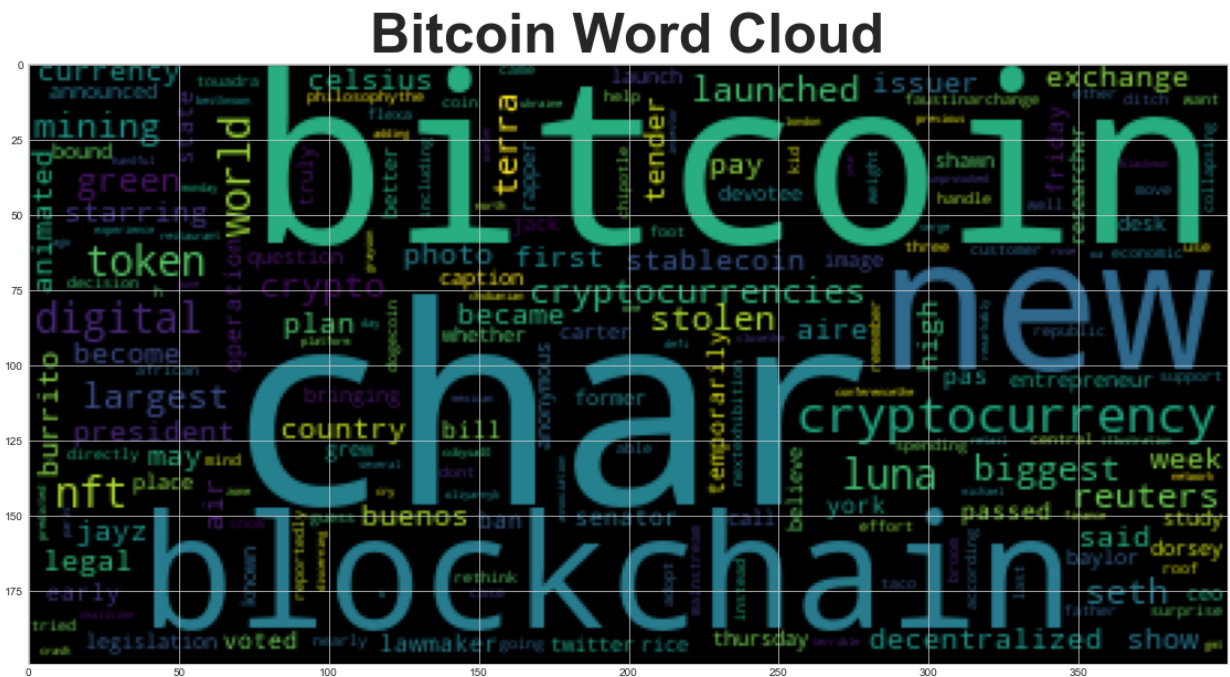
Word Clouds

In this section, you will generate word clouds for each coin to summarize the news for each coin

In [46]:
```python
from wordcloud import WordCloud
import matplotlib.pyplot as plt
plt.style.use('seaborn-whitegrid')
```

```
import matplotlib as mpl
mpl.rcParams['figure.figsize'] = [20.0, 10.0]
```
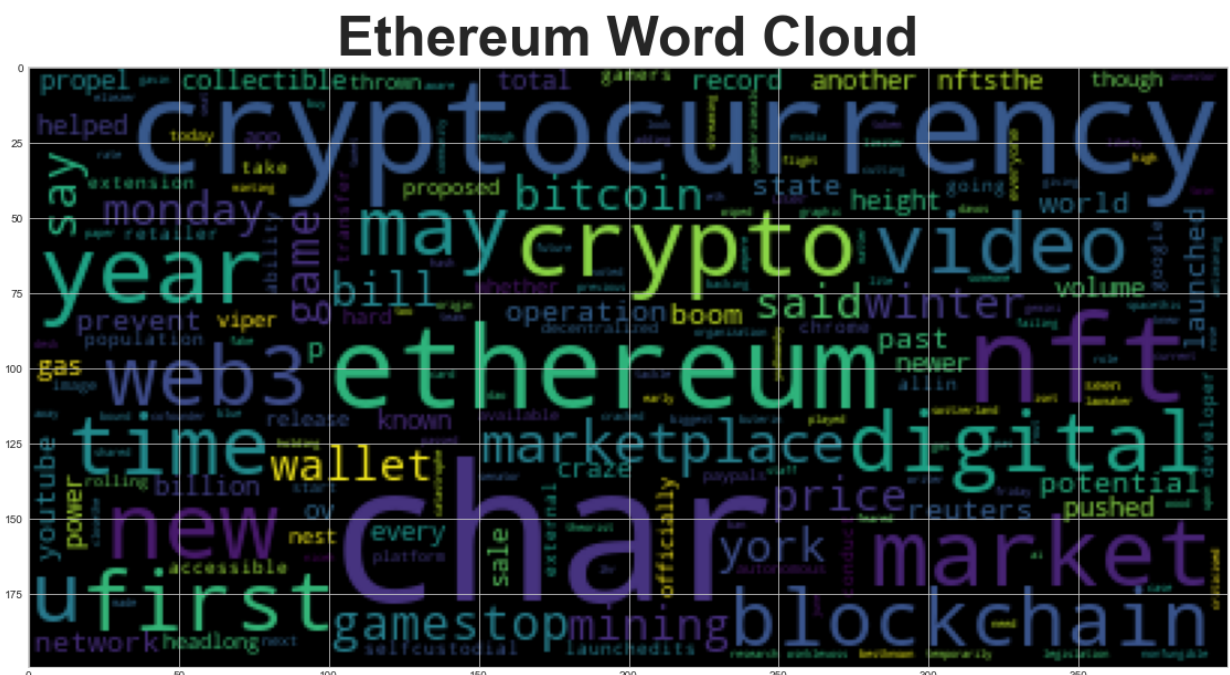
In [47]:
```
# Generate the Bitcoin word cloud
wc = WordCloud(collocations=False).generate(' '.join(btc_tokens))
plt.imshow(wc)
plt.title(label='Bitcoin Word Cloud', fontdict={'fontsize': 50, 'fontweight':'bold'})
```

Out[47]: Text(0.5, 1.0, 'Bitcoin Word Cloud')

In [48]:
```
# Generate the Ethereum word cloud
wc = WordCloud().generate(' '.join(eth_tokens))
plt.imshow(wc)
plt.title(label='Ethereum Word Cloud', fontdict={'fontsize': 50, 'fontweight':'bold'})
```

Out[48]: Text(0.5, 1.0, 'Ethereum Word Cloud')

3. Named Entity Recognition

In this section, you will build a named entity recognition model for both Bitcoin and Ethereum, then visualize the tags using SpaCy.

```
In [53]:  import spacy
          from spacy import displacy
```

```
In [54]:  # Download the language model for SpaCy
          !python -m spacy download en_core_web_sm
```

```
Collecting en-core-web-sm==3.3.0
  Using cached https://github.com/explosion/spacy-models/releases/download/en_core_we
b_sm-3.3.0/en_core_web_sm-3.3.0-py3-none-any.whl (12.8 MB)
Requirement already satisfied: spacy<3.4.0,>=3.3.0.dev0 in c:\users\joanne m\anaconda
3\lib\site-packages (from en-core-web-sm==3.3.0) (3.3.0)
Requirement already satisfied: langcodes<4.0.0,>=3.2.0 in c:\users\joanne m\anaconda3
\lib\site-packages (from spacy<3.4.0,>=3.3.0.dev0->en-core-web-sm==3.3.0) (3.3.0)
Requirement already satisfied: wasabi<1.1.0,>=0.9.1 in c:\users\joanne m\anaconda3\li
b\site-packages (from spacy<3.4.0,>=3.3.0.dev0->en-core-web-sm==3.3.0) (0.9.1)
Requirement already satisfied: jinja2 in c:\users\joanne m\anaconda3\lib\site-package
s (from spacy<3.4.0,>=3.3.0.dev0->en-core-web-sm==3.3.0) (2.11.3)
Requirement already satisfied: pydantic!=1.8,!=1.8.1,<1.9.0,>=1.7.4 in c:\users\joann
e m\anaconda3\lib\site-packages (from spacy<3.4.0,>=3.3.0.dev0->en-core-web-sm==3.3.
0) (1.8.2)
Requirement already satisfied: srsly<3.0.0,>=2.4.3 in c:\users\joanne m\anaconda3\lib
\site-packages (from spacy<3.4.0,>=3.3.0.dev0->en-core-web-sm==3.3.0) (2.4.3)
Requirement already satisfied: murmurhash<1.1.0,>=0.28.0 in c:\users\joanne m\anacond
a3\lib\site-packages (from spacy<3.4.0,>=3.3.0.dev0->en-core-web-sm==3.3.0) (1.0.7)
Requirement already satisfied: packaging>=20.0 in c:\users\joanne m\anaconda3\lib\sit
e-packages (from spacy<3.4.0,>=3.3.0.dev0->en-core-web-sm==3.3.0) (21.3)
Requirement already satisfied: cymem<2.1.0,>=2.0.2 in c:\users\joanne m\anaconda3\lib
\site-packages (from spacy<3.4.0,>=3.3.0.dev0->en-core-web-sm==3.3.0) (2.0.6)
Requirement already satisfied: requests<3.0.0,>=2.13.0 in c:\users\joanne m\anaconda3
\lib\site-packages (from spacy<3.4.0,>=3.3.0.dev0->en-core-web-sm==3.3.0) (2.21.0)
Requirement already satisfied: setuptools in c:\users\joanne m\anaconda3\lib\site-pac
kages (from spacy<3.4.0,>=3.3.0.dev0->en-core-web-sm==3.3.0) (61.2.0)
Requirement already satisfied: spacy-loggers<2.0.0,>=1.0.0 in c:\users\joanne m\anaco
nda3\lib\site-packages (from spacy<3.4.0,>=3.3.0.dev0->en-core-web-sm==3.3.0) (1.0.2)
Requirement already satisfied: numpy>=1.15.0 in c:\users\joanne m\anaconda3\lib\site-
packages (from spacy<3.4.0,>=3.3.0.dev0->en-core-web-sm==3.3.0) (1.21.5)
Requirement already satisfied: tqdm<5.0.0,>=4.38.0 in c:\users\joanne m\anaconda3\lib
\site-packages (from spacy<3.4.0,>=3.3.0.dev0->en-core-web-sm==3.3.0) (4.64.0)
Requirement already satisfied: preshed<3.1.0,>=3.0.2 in c:\users\joanne m\anaconda3\l
ib\site-packages (from spacy<3.4.0,>=3.3.0.dev0->en-core-web-sm==3.3.0) (3.0.6)
Requirement already satisfied: catalogue<2.1.0,>=2.0.6 in c:\users\joanne m\anaconda3
\lib\site-packages (from spacy<3.4.0,>=3.3.0.dev0->en-core-web-sm==3.3.0) (2.0.6)
Requirement already satisfied: thinc<8.1.0,>=8.0.14 in c:\users\joanne m\anaconda3\li
b\site-packages (from spacy<3.4.0,>=3.3.0.dev0->en-core-web-sm==3.3.0) (8.0.17)
Requirement already satisfied: spacy-legacy<3.1.0,>=3.0.9 in c:\users\joanne m\anacon
da3\lib\site-packages (from spacy<3.4.0,>=3.3.0.dev0->en-core-web-sm==3.3.0) (3.0.9)
Requirement already satisfied: typer<0.5.0,>=0.3.0 in c:\users\joanne m\anaconda3\lib
\site-packages (from spacy<3.4.0,>=3.3.0.dev0->en-core-web-sm==3.3.0) (0.4.1)
Requirement already satisfied: blis<0.8.0,>=0.4.0 in c:\users\joanne m\anaconda3\lib
\site-packages (from spacy<3.4.0,>=3.3.0.dev0->en-core-web-sm==3.3.0) (0.7.7)
Requirement already satisfied: pathy>=0.3.5 in c:\users\joanne m\anaconda3\lib\site-p
ackages (from spacy<3.4.0,>=3.3.0.dev0->en-core-web-sm==3.3.0) (0.6.1)
Requirement already satisfied: pyparsing!=3.0.5,>=2.0.2 in c:\users\joanne m\anaconda
3\lib\site-packages (from packaging>=20.0->spacy<3.4.0,>=3.3.0.dev0->en-core-web-sm==
3.3.0) (3.0.4)
Requirement already satisfied: smart-open<6.0.0,>=5.0.0 in c:\users\joanne m\anaconda
3\lib\site-packages (from pathy>=0.3.5->spacy<3.4.0,>=3.3.0.dev0->en-core-web-sm==3.
3.0) (5.2.1)
Requirement already satisfied: typing-extensions>=3.7.4.3 in c:\users\joanne m\anacon
da3\lib\site-packages (from pydantic!=1.8,!=1.8.1,<1.9.0,>=1.7.4->spacy<3.4.0,>=3.3.
0.dev0->en-core-web-sm==3.3.0) (4.1.1)
Requirement already satisfied: certifi>=2017.4.17 in c:\users\joanne m\anaconda3\lib
\site-packages (from requests<3.0.0,>=2.13.0->spacy<3.4.0,>=3.3.0.dev0->en-core-web-s
m==3.3.0) (2022.5.18.1)
Requirement already satisfied: chardet<3.1.0,>=3.0.2 in c:\users\joanne m\anaconda3\l
ib\site-packages (from requests<3.0.0,>=2.13.0->spacy<3.4.0,>=3.3.0.dev0->en-core-web
```

```
-sm==3.3.0) (3.0.4)
Requirement already satisfied: urllib3<1.25,>=1.21.1 in c:\users\joanne m\anaconda3\l
ib\site-packages (from requests<3.0.0,>=2.13.0->spacy<3.4.0,>=3.3.0.dev0->en-core-web
-sm==3.3.0) (1.24.3)
Requirement already satisfied: idna<2.9,>=2.5 in c:\users\joanne m\anaconda3\lib\site
-packages (from requests<3.0.0,>=2.13.0->spacy<3.4.0,>=3.3.0.dev0->en-core-web-sm==3.
3.0) (2.8)
Requirement already satisfied: colorama in c:\users\joanne m\anaconda3\lib\site-packa
ges (from tqdm<5.0.0,>=4.38.0->spacy<3.4.0,>=3.3.0.dev0->en-core-web-sm==3.3.0) (0.4.
4)
Requirement already satisfied: click<9.0.0,>=7.1.1 in c:\users\joanne m\anaconda3\lib
\site-packages (from typer<0.5.0,>=0.3.0->spacy<3.4.0,>=3.3.0.dev0->en-core-web-sm==
3.3.0) (8.0.4)
Requirement already satisfied: MarkupSafe>=0.23 in c:\users\joanne m\anaconda3\lib\si
te-packages (from jinja2->spacy<3.4.0,>=3.3.0.dev0->en-core-web-sm==3.3.0) (2.0.1)
[+] Download and installation successful
You can now load the package via spacy.load('en_core_web_sm')
```

In [55]:
```python
# Load the spaCy model
nlp = spacy.load('en_core_web_sm')
```

Bitcoin NER

In [56]:
```python
# Concatenate all of the Bitcoin text together
btc_content = ' '.join(btc_sentiment_df['content'])
```

In [57]:
```python
# Run the NER processor on all of the text
doc= nlp(btc_content)
# Add a title to the document
doc.user_data["title"]="Bitcoin NER"
```

In [58]:
```python
# Render the visualization
displacy.render(doc, style='ent')
```

Bitcoin NER

New York `GPE` lawmakers have passed a bill that would temporarily ban new bitcoin mining operations. Early on Friday `DATE` , state senators voted 36-27 `CARDINAL` to pass the legislation. It's now bound for the desk of... [+2036 chars] Rapper `NORP` and entrepreneur Shawn Carter `PERSON` , better known as Jay-Z `PERSON` , is bringing Bitcoin to the place where he grew up. On Thursday `DATE` , Jay-Z `PERSON` and former Twitter CEO Jack Dorsey `PERSON` announced the launch of Bitcoin A... [+2920 chars] A new study on bitcoin calls into question whether the digital currency is truly as decentralized and anonymous as its biggest devotees would have you believe.

Researchers from Baylor, Rice, and t... [+7343 chars] Image caption, President Faustin-Archange Touadéra `LAW` wants to rethink his country's economic philosophy The Central African Republic's `ORG` decision to adopt Bitcoin `NORP` as legal tender came as a surprise to m... [+8881 chars] You can now reportedly pay for your burritos and tacos with Bitcoin and other digital currencies, in case you don't mind spending your coins directly instead of going through exchanges first `ORDINAL` . Flexa h... [+1428 chars] As a kid, I remember when my father tried to use a broom handle in a last ditch effort to support a roof that was collapsing from the weight of nearly three feet `QUANTITY` of snow. You can guess how well that ... [+3390 chars] Customers at Chipotle will now be able to pay for their burritos with cryptocurrencies, including bitcoin, ether, and dogecoin, in a move that could help crypto become more mainstream, according to t... [+3130 chars] Celsius has not said what it plans to do next

Exhibition And Experience Zones at The Paris NFT Day `EVENT` Conference The Celsius Network `PRODUCT` , a decentralized finance (DeFi `GPE`) platform and one of the largest cry... [+3737 chars] Photo Illustration `WORK_OF_ART` by Grayson Blackmon `PERSON` / The Verge; Photo by Oliyarnyk / CC-BY-SA-4.0 `ORG`

With **Michael Chobanian** **PERSON** , the president of **the Blockchain Association of Ukraine** **ORG** The terrible, unprovoked wa... [+52103 chars] June 6 (**Reuters** **ORG**) - Bitcoin rose **5.2%** **PERCENT** to $ **31,441.76** **MONEY** at 2000 **GMT** **WORK_OF_ART** on **Monday** **DATE** , adding $ **1,552.78** **MONEY** to its previous close.

The world's biggest and best-known cryptocurrency is down **34.8%** **PERCENT** from the **year** **DATE** 's high... [+335 chars] At a **Mexican** **NORP** restaurant in **North London** **LOC** **a few weeks ago** **DATE** , a handful of small-time but remarkably discerning retail cryptocurrency investors predicted that terra and luna would crash. Several of them w... [**+2779** **PERSON** chars] **May 24** **DATE** (**Reuters** **ORG**) - The crypto winter is into **its ninth week** **DATE** and bitcoin can't shake the chills.

From technicals to turnover, market indicators are flashing red or amber for the biggest cryptocurrenc... [+3967 chars] After **two** **CARDINAL** linked cryptocurrencies collapsed and became almost worthless, a plan emerged to create a new blockchain for the luna cryptocurrency. **Seth Green's** **PERSON** NFTs were stolen in a phishing scam. **Nike** **ORG** ... [+3932 chars] Terra launched a new blockchain with a new luna token, **today** **DATE** . **Seth Green's** **PERSON** animated show starring his stolen **NFT** **ORG** is up in the air. The largest stablecoin issuer in the world launched a token for the ... [+3854 chars] Terra is launching a new blockchain with a new luna token. **Seth Green's** **PERSON** animated show starring his stolen **NFT** **ORG** is up in the air. The largest stablecoin issuer in the world launched a token for the Mex... [+3792 chars] **Sam Bankman-Fried** **PERSON** , founder of **the digital asset exchange** **ORG** **FTX** **ORG** , said the proof of work system of validating blockchain transactions, which underpins bitcoin, was not capable of scaling up to cope with ... [+1063 chars] As cryptocurrencies have grown in value, Bitcoin mining has become a major industry. There are publicly traded crypto mining companies like **Riot Blockchain** **PERSON** and **Marathon Digital Holdings** **ORG** , worth hundre... [+2001 chars] To its evangelists, bitcoin is a frictionless, empowering form of money that liberates citizens of the world from the shackles of banks and

national governments. To sceptics, the cryptocurrency is a ... [+3587 chars] El Salvador **GPE**

which became the first **ORDINAL** country to make bitcoin legal tender in September **DATE**

has lost $36 million **MONEY** in cryptocurrency as bitcoin plummeted over 50% **PERCENT**

from its all-time high on Thursday **DATE** .

Preside... [+2209 chars] BUENOS AIRES, May 30 **DATE** (Reuters **ORG**) - In the

Crypstation **ORG** cafe in downtown Buenos Aires, trendy young Argentines order their lattes

and pastries surrounded by screens with real-time cryptocurrency price qu... [+3418 chars]

In [59]:
```python
# List all Entities
for ent in doc.ents:
    print('{} {}'.format(ent.text, ent.label_))
```

```
New York GPE
Friday DATE
36-27 CARDINAL
Rapper NORP
Shawn Carter PERSON
Jay-Z PERSON
Thursday DATE
Jay-Z PERSON
Jack Dorsey PERSON
Faustin-Archange Touadéra LAW
The Central African Republic's ORG
Bitcoin NORP
first ORDINAL
nearly three feet QUANTITY
The Paris NFT Day EVENT
The Celsius Network PRODUCT
DeFi GPE
] Photo Illustration WORK_OF_ART
Grayson Blackmon PERSON
Oliyarnyk / CC-BY-SA-4.0 ORG
Michael Chobanian PERSON
the Blockchain Association of Ukraine ORG
Reuters ORG
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Reuters ORG
its ninth week DATE
two CARDINAL
Seth Green's PERSON
Nike ORG
today DATE
Seth Green's PERSON
NFT ORG
Seth Green's PERSON
NFT ORG
Sam Bankman-Fried PERSON
the digital asset exchange ORG
FTX ORG
Riot Blockchain PERSON
Marathon Digital Holdings ORG
El Salvador GPE
first ORDINAL
September DATE
$36 million MONEY
over 50% PERCENT
Thursday DATE
May 30 DATE
Reuters ORG
Crypstation ORG
```

Ethereum NER

```
In [60]:   # Concatenate all of the Ethereum text together
           eth_content = ' '.join(eth_sentiment_df['content'])
```

```
In [61]:   # Run the NER processor on all of the text
           doc= nlp(eth_content)
           # Add a title to the document
           doc.user_data["title"]="Ethereum NER"
```

```
In [62]:   # Render the visualization
           displacy.render(doc, style='ent')
```

Ethereum NER

GameStop **ORG** has officially thrown itself headlong into the web3 **LOC** vipers nest with a new app release, though its hard to say whether its proposed population of gamers and game developers will take up the ... [+3255 chars] GameStop is going all-in on crypto. The video game retailer launched its own self-custodial Ethereum **ORG** digital wallet, it said Monday **DATE** . The wallet will be accessible through a Google Chrome **PRODUCT** extension an... [+1491 chars] The ability to conduct external transfers on PayPal **ORG** 's crypto platform, an image of which can be seen below, will start rolling out to users today **DATE** and be available to everyone in the U.S. **GPE** in the next ... [+687 chars] A decentralized autonomous organization, or DAO **ORG** , is giving away two **CARDINAL** seats on a Blue Origin **ORG** flight to space.

This is likely the first **ORDINAL** time non-fungible tokens, or NFTs, have played a role in minting ... [+4509 chars] Crypto Winter It May Be, But Ethereum Looks Like A Buy

The Winklevoss twins are cutting the staff at Gemini **ORG** and say crypto winter is upon us. With the price of Ethereum (Cryptocurrency **ORG** : ETH) down m... [+3614 **NORP** chars] New York **GPE** lawmakers have passed a bill

that would temporarily ban new bitcoin

mining operations. Early on Friday **DATE** , state senators voted 36-27 **CARDINAL** to pass the legislation. It's now bound for the desk of... [+2036 chars] DAVOS, Switzerland **GPE** , May 25 **DATE** (Reuters **ORG**) - Ethereum's co-founder Gavin Wood **PERSON** said cryptocurrency investors need to be more aware of what is backing their holdings after a market rout which wiped more than... [+1744 chars] When Nvidia **PERSON** launched its Ampere Lite Hash Rate **WORK_OF_ART** (LHR **ORG**) graphics card with the feared Ethereum **ORG** anti-mining limiter, the world knew it was only a matter of time before someone or a team cracked it. NiceH... [+1230 chars] June 6 (Reuters **ORG**) - Bitcoin rose 5.2% **PERCENT** to $ 31,441.76 **MONEY** at 2000 GMT **WORK_OF_ART** on Monday **DATE** , adding $ 1,552.78 **MONEY** to its previous close.

The world's biggest and best-known cryptocurrency is down 34.8% **PERCENT** from the year

DATE 's high... [+335 chars] [In a tweet] **Buterin** **PERSON** shared a paper by **AI** **ORG** theorist and writer **Eliezer Yudkowsky** **PERSON** that made a case for why the current research community isn't doing enough to prevent a potential future catastrophe at... [+409 chars]

YouTube **ORG** is being criticised for failing to tackle a network of cyber-criminals streaming fake **Elon Musk** **PERSON** videos to scam viewers.

The criminals are hijacking **YouTube** **ORG** accounts and using the videos to p... [+3851 chars]

The cryptocurrency boom over **the past few years** **DATE** has helped propel a newer market to record heights: digital collectibles known as NFTs.

The craze has pushed total **NFT** **ORG** sales volume to **$29 billion** **MONEY** ov... [+2866 chars] We first heard about the potential of blockchain in supply chains **several years ago** **DATE** , and almost immediately were thrust into a cycle of hype and hope of what they could do for us, followed by a "trou... [+4785 chars] NFT marketplaces are becoming the trend, and each and every one of them has started to build their own **NFT** **ORG** marketplaces.

However, few people require a marketplace that could be launched in the mark... [+5873 chars] Every time you turn around, it seems another celebrity is hawking cryptocurrency or NFTs. Influencer **Kim Kardashian** **PERSON** , boxer **Floyd Mayweather** **PERSON** , and former **NBA** **ORG** athlete **Paul Pierce** **PERSON** have all promoted **Ether** **PERSON** ... [+2773 chars] **Solana** **PERSON** , the **third** **ORDINAL** largest cryptocurrency by market capitalization, fell **10%** **PERCENT** **Wednesday** **DATE** following reports of its blockchain network suffering another outage.

The blockchain had not produced new block... [+566 chars] The cryptocurrency boom over **the past few years** **DATE** has helped propel a newer market to record heights: digital collectibles known as NFTs.

The craze has pushed total **NFT** **ORG** sales volume to **$29 billion** **MONEY** ov... [+2830 chars] **6** **CARDINAL** with **6** **CARDINAL** posters participating **New York's** **GPE** state legislature approved a bill that would prevent fossil fuel power plants from being revived to power cryptocurrency mining operations. If signed by Gov... [+3200 chars] Hey, folks. Were deadlocked on gun safety, the **Ukraine** **GPE** war still grinds on, and a gallon

of gas is approaching the price of an   Ethereum **ORG**   gas fee. At least we dont have to deal

with   Johnny **PERSON**   Depp for ano... [+4167 chars] If you're inexperienced with NFTS, some

terms may be confusing.

I'm a full-time   YouTuber **ORG**   focused on demystifying all things Web3, but when I was

first **ORDINAL**   learning about the Web3 space, it seemed like p... [+8587 chars]

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GameStop ORG
web3 LOC
Ethereum ORG
Monday DATE
Google Chrome PRODUCT
PayPal ORG
today DATE
U.S. GPE
DAO ORG
two CARDINAL
Blue Origin ORG
first ORDINAL
Gemini ORG
Ethereum (Cryptocurrency ORG
+3614 NORP
New York GPE
Friday DATE
36-27 CARDINAL
Switzerland GPE
May 25 DATE
Reuters ORG
Gavin Wood PERSON
Nvidia PERSON
Ampere Lite Hash Rate WORK_OF_ART
LHR ORG
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NBA ORG
Paul Pierce PERSON
Ether PERSON
Solana PERSON
third ORDINAL
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Wednesday DATE
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$29 billion MONEY
6 CARDINAL
6 CARDINAL
New York's GPE

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Ukraine GPE
Ethereum ORG
Johnny PERSON
YouTuber ORG
first ORDINAL
```

```
Ukraine GPE
Ethereum ORG
Johnny PERSON
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