Unit 12 - Tales from the Crypto

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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?

Ethereum (mean: 0.117450)

1. Which coin had the highest negative score?

Ethereum (max: 0.179000)

1. Which coin had the highest positive score?

Ethereum (max: 0.285000)

```
In [91]:  # Initial imports
          import os
          import pandas as pd
          from dotenv import load_dotenv
          import nltk as nltk
          from tabulate import tabulate
          nltk.download('vader_lexicon')
          from nltk.sentiment.vader import SentimentIntensityAnalyzer
          analyzer = SentimentIntensityAnalyzer()
          from newsapi import NewsApiClient
          %matplotlib inline
```

```
[nltk_data] Downloading package vader_lexicon to
[nltk_data]     /Users/satishsurath/nltk_data...
[nltk_data]   Package vader_lexicon is already up-to-date!
```

In [92]:
```python
# Read your api key environment variable
# Load environment variables and read the News API key enviroment variable
load_dotenv()
api_key = os.getenv("NEWSAPI")
```

In [93]:
```python
# Create a newsapi client
newsapi = NewsApiClient(api_key=api_key)
```

In [94]:
```python
# Fetch the Bitcoin news articles
# Fetch news about Canada and Blockchain in the English language
q="blockchain AND canada"
blockchain_news_en = newsapi.get_everything(
    q=q,
    language="en"
)

# Show the total number of news
print(f'The total number of news articles for \nthe query "{q}" \nis {blockchain_news_en["totalResults"]}')
```

```
The total number of news articles for
the query "blockchain AND canada"
is 375
```

In [95]:
```python
# Fetch the Ethereum news articles
q="ethereum AND canada"
ethereum_news_en = newsapi.get_everything(
    q=q,
    language="en"
)

# Show the total number of news
ethereum_news_en["totalResults"]

print(f'The total number of news articles for \nthe query "{q}" \nis {ethereum_news_en["totalResults"]}')
```

```
The total number of news articles for
the query "ethereum AND canada"
is 119
```

Calculating VADER Sentiment Score for News Titles and Text

As you know the `compound` score could be used to get a normalized score for a sentiment, in this section you have to create a function called `get_sentiment(score)` that will return a normalized value of sentiment for the `score` parameter based on

the rules you learn. This function should return `1` for positive sentiment, `−1` for negative sentiment, and `0` for neutral sentiment.

```
In [96]:   # Sentiment calculation based on compound score
           def get_sentiment(score):
               """
               Calculates the sentiment based on the compound score.
               """
               result = 0  # Neutral by default
               if score >= 0.05:  # Positive
                   result = 1
               elif score <= -0.05:  # Negative
                   result = -1

               return result
```

```
In [97]:   # Create the Bitcoin sentiment scores DataFrame
           btc_sentiments = []

           for article in blockchain_news_en["articles"]:
               try:
                   text = article["content"]
                   date = article["publishedAt"][:10]
                   sentiment = analyzer.polarity_scores(text)
                   compound = sentiment["compound"]
                   pos = sentiment["pos"]
                   neu = sentiment["neu"]
                   neg = sentiment["neg"]

                   btc_sentiments.append({
                       "text": text,
                       "date": date,
                       "compound": compound,
                       "positive": pos,
                       "negative": neg,
                       "neutral": neu

                   })

               except AttributeError:
                   pass


           # Creating DataFrame
```

```python
btc_sentiments_df = pd.DataFrame(btc_sentiments)

# Reordering DataFrame columns
cols = ["date", "text", "compound", "positive", "negative", "neutral"]
btc_sentiments_df = btc_df[cols]

btc_sentiments_df.head()
```

Out[97]:

	date	text	compound	positive	negative	neutral
0	2022-04-25	OTTAWA, April 25 (Reuters) - The Canadian doll...	0.0000	0.000	0.000	1.000
1	2022-04-28	OTTAWA, April 28 (Reuters) - The front-runner ...	-0.5574	0.000	0.101	0.899
2	2022-05-04	Six candidates are officially on the ballot to...	0.4019	0.083	0.000	0.917
3	2022-05-12	Did you miss a session from GamesBeat Summit 2...	-0.1531	0.000	0.048	0.952
4	2022-05-04	May 4 (Reuters) - So far, at least, "Nickel Ki...	0.6486	0.142	0.000	0.858

In [98]:
```python
# Create the Ethereum sentiment scores DataFrame
eth_sentiments = []

for article in ethereum_news_en["articles"]:
    try:
        text = article["content"]
        date = article["publishedAt"][:10]
        sentiment = analyzer.polarity_scores(text)
        compound = sentiment["compound"]
        pos = sentiment["pos"]
        neu = sentiment["neu"]
        neg = sentiment["neg"]

        eth_sentiments.append({
            "text": text,
            "date": date,
            "compound": compound,
            "positive": pos,
            "negative": neg,
            "neutral": neu

        })

    except AttributeError:
        pass
```

```python
# Creating DataFrame
eth_sentiments_df = pd.DataFrame(eth_sentiments)

# Reordering DataFrame columns
cols = ["date", "text", "compound", "positive", "negative", "neutral"]
eth_sentiments_df = eth_df[cols]

eth_sentiments_df.head()
```

Out[98]:

	date	text	compound	positive	negative	neutral
0	2022-04-22	Bdice on his recording studio\r\nBdice\r\nCryp...	0.7003	0.162	0.000	0.838
1	2022-04-19	There are many different crypto exchanges you ...	0.6297	0.106	0.000	0.894
2	2022-04-18	You're reading The Dose newsletter.You're read...	0.3612	0.082	0.000	0.918
3	2022-04-26	Good morning. Heres whats happening:\r\nPrices...	0.1027	0.060	0.048	0.892
4	2022-04-19	NEW YORK, April 19, 2022 /PRNewswire/ -- 21Sha...	0.4019	0.113	0.000	0.887

In [99]:

```python
# Describe the Bitcoin Sentiment
btc_sentiments_df.describe()
```

Out[99]:

	compound	positive	negative	neutral
count	20.000000	20.000000	20.000000	20.000000
mean	0.280810	0.082350	0.014750	0.902900
std	0.382144	0.070056	0.032494	0.060907
min	-0.557400	0.000000	0.000000	0.765000
25%	0.077025	0.041250	0.000000	0.895750
50%	0.376700	0.078500	0.000000	0.909000
75%	0.505750	0.099250	0.000000	0.932750
max	0.783100	0.235000	0.101000	1.000000

In [100…

```python
# Describe the Ethereum Sentiment
eth_sentiments_df.describe()
```

Out[100]:

	compound	positive	negative	neutral
count	20.000000	20.000000	20.000000	20.000000
mean	0.342460	0.117450	0.027500	0.855050
std	0.445392	0.093453	0.055786	0.096672
min	-0.526700	0.000000	0.000000	0.692000
25%	0.000000	0.053250	0.000000	0.780000
50%	0.381550	0.102000	0.000000	0.871000
75%	0.710975	0.184250	0.012000	0.906000
max	0.897900	0.285000	0.179000	1.000000

DataFrame Manipulation to answer the below questions

```python
#mean positive scores
print(f'\n\npositive mean score for Bitcoin: \t{btc_sentiments_df.sort_values(by=["positive"], ascending=False
print(f'positive mean score for Ethereum: \t{eth_sentiments_df.sort_values(by=["positive"], ascending=False)['

#hightest compound score
print(f'\n\nhighest compound score for Bitcoin: \t{float(btc_sentiments_df.sort_values(by=["compound"], ascend
print(f'highest compound score for Ethereum: \t{float(eth_sentiments_df.sort_values(by=["compound"], ascending

#hightest positive score
print(f'\n\nhighest positive score for Bitcoin: \t{float(btc_sentiments_df.sort_values(by=["positive"], ascend
print(f'highest positive score for Ethereum: \t{float(eth_sentiments_df.sort_values(by=["positive"], ascending
```

```
positive mean score for Bitcoin:          0.08235
positive mean score for Ethereum:         0.11745


highest compound score for Bitcoin:       0.78310
highest compound score for Ethereum:      0.89790


highest positive score for Bitcoin:       0.23500
highest positive score for Ethereum:      0.28500
```

Questions:

Q: Which coin had the highest mean positive score?

A: Ethereum

Q: Which coin had the highest compound score?

A: Ethereum

Q. Which coin had the highest positive score?

A: Ethereum

---

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.

```python
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
```

```python
# Instantiate the lemmatizer
lemmatizer = WordNetLemmatizer()
# Create a list of stopwords
sw = set(stopwords.words('english'))
# Expand the default stopwords list if necessary
sw_addons = ['taken', 'in', 'are', 'of', 'on', 'pc', 'this', 'make', 'seen', 'picture', 'virtual', 'new', 'il
             'ha', 'said', 'york', 'wa', 'us','char']
```

In [130…
```python
# Complete the tokenizer function
def tokenizer(text):
    """Tokenizes text."""
    # Remove the punctuation from text
    regex = re.compile("[^a-zA-Z ]")
    re_clean = regex.sub('', text)
    # Create a tokenized list of the words
    words = word_tokenize(re_clean)
    # Lemmatize words into root words
    lemm = [lemmatizer.lemmatize(word) for word in words]
    # Convert the words to lowercase
    # AND
    # Remove the stop words
    tokens = [word.lower() for word in lemm if word.lower() not in sw.union(sw_addons)]
    return tokens
```

In [131…
```python
# Create a new tokens column for Bitcoin
btc_sentiments_df["tokens"] = btc_sentiments_df['text'].apply(tokenizer)
btc_sentiments_df.head()
```

Out[131]:

	date	text	compound	positive	negative	neutral	tokens
0	2022-04-25	OTTAWA, April 25 (Reuters) - The Canadian doll...	0.0000	0.000	0.000	1.000	[ottawa, april, reuters, canadian, dollar, rem...
1	2022-04-28	OTTAWA, April 28 (Reuters) - The front-runner ...	-0.5574	0.000	0.101	0.899	[ottawa, april, reuters, frontrunner, become, ...
2	2022-05-04	Six candidates are officially on the ballot to...	0.4019	0.083	0.000	0.917	[six, candidate, officially, ballot, become, c...
3	2022-05-12	Did you miss a session from GamesBeat Summit 2...	-0.1531	0.000	0.048	0.952	[miss, session, gamesbeat, summit, session, av...
4	2022-05-04	May 4 (Reuters) - So far, at least, "Nickel Ki...	0.6486	0.142	0.000	0.858	[may, reuters, far, least, nickel, king, vladi...

In [132…
```python
# Create a new tokens column for Ethereum
eth_sentiments_df["tokens"] = eth_sentiments_df['text'].apply(tokenizer)
eth_sentiments_df.head()
```

Out[132]:

	date	text	compound	positive	negative	neutral	tokens
0	2022-04-22	Bdice on his recording studio\r\nBdice\r\nCryp...	0.7003	0.162	0.000	0.838	[bdice, recording, studiobdicecryptocurrencies...
1	2022-04-19	There are many different crypto exchanges you ...	0.6297	0.106	0.000	0.894	[many, different, crypto, exchange, use, handf...
2	2022-04-18	You're reading The Dose newsletter.You're read...	0.3612	0.082	0.000	0.918	[youre, reading, dose, newsletteryoure, readin...
3	2022-04-26	Good morning. Heres whats happening:\r\nPrices...	0.1027	0.060	0.048	0.892	[good, morning, heres, whats, happeningprices,...
4	2022-04-19	NEW YORK, April 19, 2022 /PRNewswire/ -- 21Sha...	0.4019	0.113	0.000	0.887	[april, prnewswire, shares, ag, shares, swissb...

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 [133…

```python
from collections import Counter
from nltk import ngrams
```

In [134…

```python
# Generate the Bitcoin N-grams where N=2
bitcoin_words = []
for word in btc_sentiments_df['tokens']:
    bitcoin_words.extend(word)
bitcoin_ngrams = Counter(ngrams(bitcoin_words, n=2))
dict(bitcoin_ngrams.most_common(10))
```

Out[134]:
```
{('central', 'bank'): 3,
 ('next', 'leader'): 3,
 ('reading', 'dose'): 3,
 ('ottawa', 'april'): 2,
 ('april', 'reuters'): 2,
 ('reuters', 'frontrunner'): 2,
 ('frontrunner', 'become'): 2,
 ('become', 'next'): 2,
 ('leader', 'canadas'): 2,
 ('canadas', 'opposition'): 2}
```

In [135…
```python
# Generate the Ethereum N-grams where N=2
ethereum_words = []
for word in eth_sentiments_df["tokens"]:
    ethereum_words.extend(word)
ethereum_ngrams = Counter(ngrams(ethereum_words, n=2))
dict(ethereum_ngrams.most_common(10))
```

Out[135]:
```
{('crypto', 'exchange'): 3,
 ('reading', 'dose'): 3,
 ('dose', 'newsletteryoure'): 2,
 ('newsletteryoure', 'reading'): 2,
 ('good', 'morning'): 2,
 ('morning', 'heres'): 2,
 ('heres', 'whats'): 2,
 ('whats', 'happeningprices'): 2,
 ('happeningprices', 'bitcoin'): 2,
 ('april', 'prnewswire'): 2}
```

In [136…
```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 [137…
```python
# Use token_count to get the top 10 words for Bitcoin
bitcoin_top_words = token_count(bitcoin_words, N=10)
bitcoin_top_words
```

```
Out[137]:   [('bank', 7),
             ('reuters', 4),
             ('digital', 4),
             ('dose', 4),
             ('blockchain', 4),
             ('april', 3),
             ('central', 3),
             ('become', 3),
             ('next', 3),
             ('leader', 3)]
```

```python
In [138…   # Use token_count to get the top 10 words for Ethereum
           # YOUR CODE HERE!
           ethereum_top_words = token_count(ethereum_words, N=10)
           ethereum_top_words
```

```
Out[138]:   [('crypto', 7),
             ('exchange', 7),
             ('bitcoin', 5),
             ('blockchain', 4),
             ('stock', 3),
             ('reading', 3),
             ('dose', 3),
             ('prnewswire', 3),
             ('announced', 3),
             ('first', 3)]
```
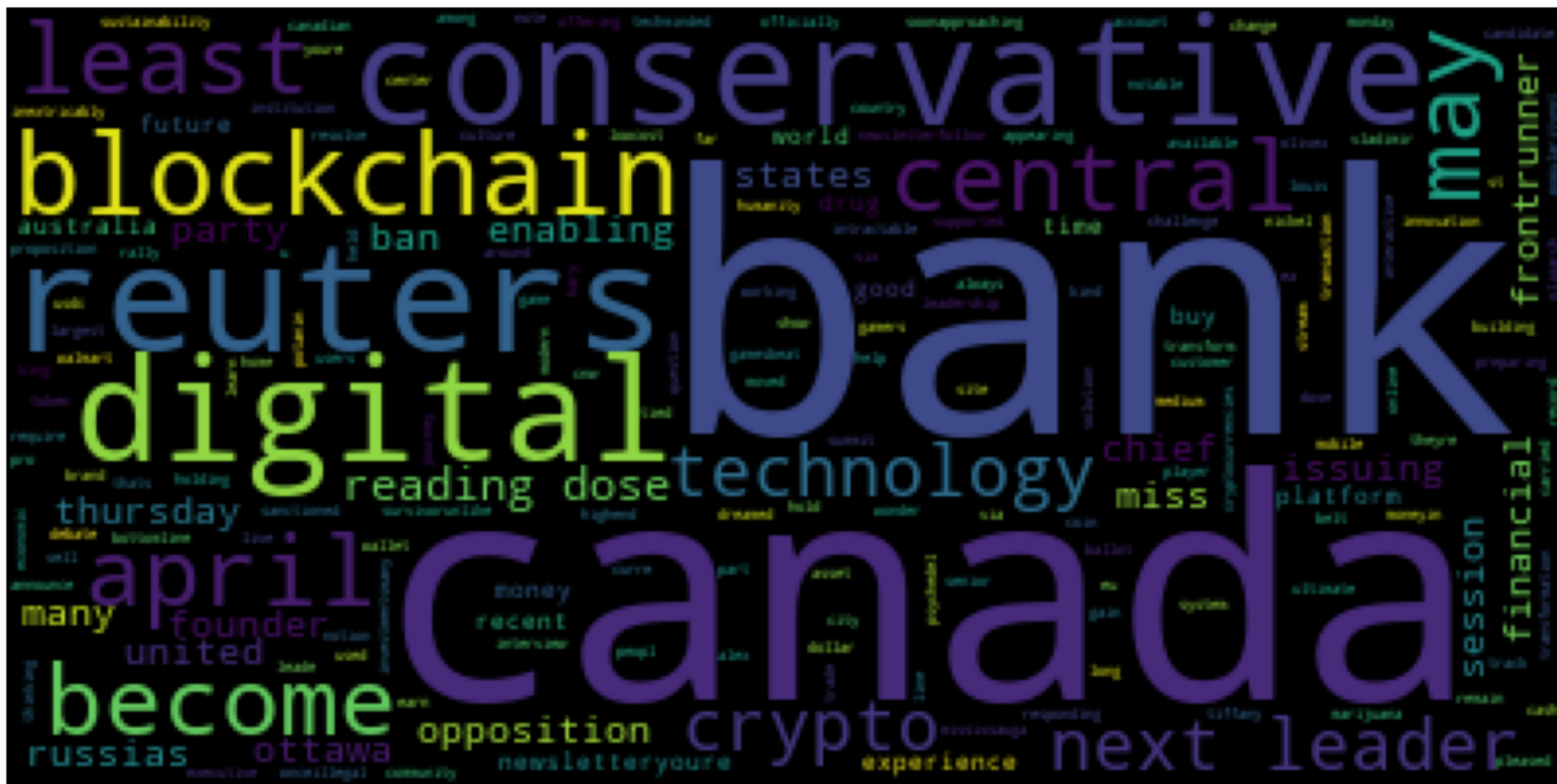
Word Clouds

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

```python
In [139…   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]
```

```python
In [140…   # Generate the Bitcoin word cloud
           wc = WordCloud()
           bitcoin_string = ' '.join(bitcoin_words)
           bitcoin_wordcloud = wc.generate(bitcoin_string)
           plt.imshow(bitcoin_wordcloud);
```

```
plt.title(label="Bitcoin Word Cloud", size=35)
plt.axis("off");
```

Bitcoin Word Cloud


```
In [142…   # Generate the Ethereum word cloud
           # Generate the Ethereum word cloud
           ethereum_string = ' '.join(ethereum_words)
           ethereum_wordcloud = wc.generate(ethereum_string)
           plt.imshow(ethereum_wordcloud);
           plt.axis("off");
           plt.title(label="Ethereum Word Cloud", size=35)
           plt.tight_layout(pad=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 [143…   import spacy
           from spacy import displacy
```

```
In [144…   # Download the language model for SpaCy
           # !python -m spacy download en_core_web_sm
```

In [145…
```python
# Load the spaCy model
nlp = spacy.load('en_core_web_sm')
```

Bitcoin NER

In [146…
```python
# Concatenate all of the Bitcoin text together
bitcoin_text = ''.join(btc_sentiments_df['text'])
bitcoin_text
```

Out[146]:

'OTTAWA, April 25 (Reuters) - The Canadian dollar will remain at the center of the country\'s financial syst
em, the central bank chief said on Monday, responding to questions about a Conservative leade… [+2728 chars]
OTTAWA, April 28 (Reuters) - The front-runner to become the next leader of Canada\'s opposition Conservative
s said on Thursday he would ban the Bank of Canada from issuing a central bank digital curre… [+2416 chars]S
ix candidates are officially on the ballot to become the Conservative Party\'s next leader. In holding ralli
es, appearing in media interviews, and preparing for the soon-approaching party debates, ea… [+14808 chars]D
id you miss a session from GamesBeat Summit 2022? All sessions are available to stream now. Learn more.\xa0
\r\nAlex St. Louis, the founder of Wonder Interactive, has always dreamed of enabling high-end … [+13077 cha
rs]May 4 (Reuters) - So far, at least, "Nickel King" Vladimir Potanin is Russia\'s ultimate survivor.\r\nUnl
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nges has a long track record, not least among tech-minded brands. Many solutions just require a … [+7433 cha
rs]You\'re reading The Dose newsletter.You\'re reading The Dose newsletter.You\'re reading The Dose newslett
er.Follow the money as Tiffany Kary shows you how once-illegal drugs like marijuana and psychedel… [+5570 ch
ars]The future of cities is inextricably tied to the future of humanity. They're sites of innovation, cultur
e, community building — and, at the same time, home to some of the world's most intractable pro… [+9247 char
s]We are used to thinking of money as notes and coins, the kind most of us hold in our wallets. But most mon
eyin Australia it\'s 96.3%is digital, held by financial institutions and moved around via bank… [+6015 char
s]MISSISSAUGA, ON, May 11, 2022 /CNW/ - Walmart Canada is pleased to announce recent senior executive leader
ship changes as part of its transformation journey to transform the customer experience for m… [+5876 chars]
We live in a digital world where more and more economic transactions are carried out online. As cryptocurren
cies gain popularity—not only to buy or sell assets but also to make investments—many peopl… [+8217 chars]Wo
rking out can be good for your belt line and your bottom-line at the same time. Thats the proposition OliveX
is offering to the players of its mobile blockchain games. \r\nGamers can earn DOSE tokens… [+7218 chars]Use
rs in the United States can now cash in to USDC from their bank account, enabling low-cost trades into 13 su
pported assets.\r\nSINGAPORE, April 14, 2022 /PRNewswire/ -- Telcoin, a decentralized fina… [+3396 chars]Don
\'t miss CoinDesk\'s Consensus 2022, the must-attend crypto & blockchain festival experience of the year
in Austin, TX this June 9-12.\r\nCrypto platform WonderFi Technologies intends to buy Canad… [+1676 chars]Dr
Lee Harland, Founder and Chief Scientific Officer, SciBite (an Elsevier company).\r\ngetty\r\nIn the last de
cade, technology has revolutionized life sciences. Across every stage of the drug discovery … [+5836 chars]G
ood morning. Heres whats happening:\r\nPrices: Bitcoin, ether and other major cryptos plummeted as investors
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There has been a widespread assumption that central bank digital currencies (CBDCs) would be built on blockc
hain or at least the distributed-ledger technology (DLT) its based on.\r\nHowever, a growing … [+4604 chars]
This week on Finovate Global we're taking a look at some recent fintech developments in Canada.\r\nOn the fu
ndraising front, embedded wealth management platform OneVest announced a $3.9 million (CAD $5… [+4129 chars]
Shark Tank star and OShares Investment Advisers Chairman Kevin OLeary predicts that one day blockchain and c
ryptocurrency will represent the 12th sector of the S&P 500 and is "very confident" sen… [+2634 chars]By
Steve Scherer and Julie Gordon\r\nOTTAWA (Reuters) - The front-runner to become the next leader of Canada\'s
opposition Conservatives said on Thursday he would ban the Bank of Canada from issuing a c… [+2257 chars]'

In [147…

```
# Run the NER processor on all of the text
bitcoin_ner = nlp(bitcoin_text)
```

```python
# Add a title to the document
bitcoin_ner.user_data["title"] = "Bitcoin Named Entity Recognition (NER)"
```

In [148…
```python
# Render the visualization
displacy.render(bitcoin_ner, style='ent')
```

Bitcoin Named Entity Recognition (NER)

OTTAWA `ORG` , April 25 `DATE` (Reuters `ORG`) - The Canadian `NORP` dollar will remain at the center of the country's financial system, the central bank chief said on Monday `DATE` , responding to questions about a Conservative `NORP` leade... [+2728 chars]OTTAWA, April 28 `DATE` (Reuters `ORG`) - The front-runner to become the next leader of Canada `GPE` 's opposition Conservatives `NORP` said on Thursday `DATE` he would ban the Bank of Canada `ORG` from issuing a central bank digital curre... [+2416 chars]Six candidates are officially on the ballot to become the Conservative Party's `ORG` next leader. In holding rallies, appearing in media interviews, and preparing for the soon-approaching party debates, ea... [+14808 chars]Did you miss a session from GamesBeat Summit 2022 `ORG` ? All sessions are available to stream now. Learn more.

Alex St. Louis `PERSON` , the founder of Wonder Interactive `ORG` , has always dreamed of enabling high-end ... [+13077 chars]May 4 `CARDINAL` (Reuters `ORG`) - So far, at least, " Nickel King `WORK_OF_ART` " Vladimir Potanin `PERSON` is Russia `GPE` 's ultimate survivor.

Unlike many of Russia `GPE` 's notable oligarchs, he has not been sanctioned by the United States `GPE` or the Eu `ORG` ... [+3873 chars]May 11 `CARDINAL` - The notion that modern technologies can help resolve some of the largest sustainability challenges has a long track record, not least among tech-minded brands. Many solutions just require a ... [+7433 chars]You're reading The Dose `PERSON` newsletter.You're reading The Dose `PERSON` newsletter.You're reading The Dose `PERSON` newsletter.Follow the money as Tiffany Kary `PERSON` shows you how once-illegal drugs like marijuana `ORG` and psychedel... [+5570 chars]The future of cities is inextricably tied to the future of humanity. They're sites of innovation, culture, community building — and, at the same time, home to some of the world's most intractable pro... [+9247 chars]We are used to thinking of money as notes and coins, the kind most of us hold in our wallets. But most moneyin Australia `GPE` it's 96.3%is `CARDINAL` digital, held by financial institutions and moved around via bank... [+6015 chars]MISSISSAUGA `ORG` , ON `ORG`

, May 11, 2022 **DATE** /CNW/ - Walmart Canada **ORG** is pleased to announce recent senior executive leadership changes as part of its transformation journey to transform the customer experience for m… [+5876 chars]We live in a digital world where more and more economic transactions are carried out online. As cryptocurrencies gain popularity—not only to buy or sell assets but also to make investments—many peopl… [+8217 chars]Working out can be good for your belt line and your bottom-line at the same time. Thats the proposition OliveX is offering to the players of its mobile blockchain games.

Gamers can earn DOSE **ORG** tokens… [+7218 chars]Users in the United States **GPE** can now cash in to USDC **ORG** from their bank account, enabling low-cost trades into 13 **CARDINAL** supported assets.

SINGAPORE, April 14, 2022 **DATE** /PRNewswire/ -- Telcoin **ORG** , a decentralized fina… [+3396 chars]Don't miss CoinDesk **PRODUCT** 's Consensus 2022 **ORG** , the must-attend crypto & blockchain festival experience of the year **DATE** in Austin **GPE** , TX **ORG** this June 9-12 **DATE** .

Crypto **PERSON** platform WonderFi Technologies **ORG** intends to buy Canad **ORG** … [+1676 chars]Dr Lee Harland **PERSON** , Founder **NORP** and Chief Scientific Officer, SciBite **ORG** (an Elsevier company).

getty

In the last decade **DATE** , technology has revolutionized life sciences. Across every stage of the drug discovery … [+5836 chars]Good morning **TIME** . Heres **ORG** whats happening:

Prices: Bitcoin, ether and other major cryptos plummeted as investors remained averse to risk.

Insights: Spot BTC ETFs launch in Australia **GPE** . But elsewhere, they … [+9949 chars]There has been a widespread assumption that central bank digital currencies (CBDCs) would be built on blockchain or at least the distributed-ledger technology (DLT **ORG**) its based on.

However, a growing … [+4604 chars]This week **DATE** on Finovate Global **WORK_OF_ART** we're taking a look at some recent fintech developments in Canada **GPE** .

On the fundraising front, embedded wealth management platform OneVest `ORG` announced a $3.9 million `MONEY` (CAD $

5 `MONEY` ... [+4129 chars]Shark Tank `ORG` star and OShares Investment Advisers `ORG` Chairman Kevin OLeary

`PERSON` predicts that one day `DATE` blockchain and cryptocurrency will represent the 12th sector of the S&P 500 and

is "very confident" sen... [+2634 chars]By Steve Scherer `PERSON` and Julie Gordon `PERSON` OTTAWA (Reuters `ORG`)

- The front-runner to become the next leader of Canada `GPE` 's opposition Conservatives `NORP` said on Thursday `DATE`

he would ban the Bank of Canada `ORG` from issuing a c... [+2257 chars]

```
In [149…
from tabulate import tabulate

# List all Entities
tabulate_bitcoin = []
for ent in bitcoin_ner.ents:
#    print(ent.text, ent.label_)
    tabulate_bitcoin.append([ent.text, ent.label_])
print(tabulate(tabulate_bitcoin, headers=['Bitcoin', 'Named Entity Recognition (NER)']))
```

```
Bitcoin                           Named Entity Recognition (NER)
--------------------------        --------------------------------
OTTAWA                            ORG
April 25                          DATE
Reuters                           ORG
Canadian                          NORP
Monday                            DATE
Conservative                      NORP
April 28                          DATE
Reuters                           ORG
Canada                            GPE
Conservatives                     NORP
Thursday                          DATE
the Bank of Canada                ORG
the Conservative Party's          ORG
GamesBeat Summit 2022             ORG
Alex St. Louis                    PERSON
Wonder Interactive                ORG
4                                 CARDINAL
Reuters                           ORG
Nickel King                       WORK_OF_ART
Vladimir Potanin                  PERSON
Russia                            GPE
Russia                            GPE
the United States                 GPE
Eu                                ORG
11                                CARDINAL
Dose                              PERSON
Dose                              PERSON
Dose                              PERSON
Tiffany Kary                      PERSON
marijuana                         ORG
Australia                         GPE
96.3%is                           CARDINAL
+6015 chars]MISSISSAUGA           ORG
ON                                ORG
May 11, 2022                      DATE
Walmart Canada                    ORG
DOSE                              ORG
the United States                 GPE
USDC                              ORG
13                                CARDINAL
April 14, 2022                    DATE
Telcoin                           ORG
CoinDesk                          PRODUCT
```

```
Consensus 2022              ORG
the year                    DATE
Austin                      GPE
TX                          ORG
June 9-12                   DATE
Crypto                      PERSON
WonderFi Technologies       ORG
Canad                       ORG
Lee Harland                 PERSON
Founder                     NORP
SciBite                     ORG
the last decade             DATE
morning                     TIME
Heres                       ORG
Australia                   GPE
DLT                         ORG
chars]This week             DATE
Finovate Global             WORK_OF_ART
Canada                      GPE
OneVest                     ORG
$3.9 million                MONEY
5                           MONEY
chars]Shark Tank            ORG
OShares Investment Advisers ORG
Kevin OLeary                PERSON
one day                     DATE
Steve Scherer               PERSON
Julie Gordon                PERSON
Reuters                     ORG
Canada                      GPE
Conservatives               NORP
Thursday                    DATE
the Bank of Canada          ORG
```

Ethereum NER

```python
# Concatenate all of the Ethereum text together
ethereum_text = ''.join(eth_sentiments_df['text'])
ethereum_text
```

Out[150]: 'Bdice on his recording studio\r\nBdice\r\nCryptocurrencies can truly change lives, and depending on where y
ou look, a lot of lives have already been changed by such innovative technology.\r\nBrandon Bdice … [+2957 c
hars]There are many different crypto exchanges you can use, but only a handful of these are big enough to be
listed on a stock exchange. One such exchange, Coinbase, is incredibly popular and is the large… [+6491 char
s]You\'re reading The Dose newsletter.You\'re reading The Dose newsletter.You\'re reading The Dose newslette
r.Follow the money as Tiffany Kary shows you how once-illegal drugs like marijuana and psychedel… [+5570 cha
rs]Good morning. Heres whats happening:\r\nPrices: Bitcoin, ether and other major cryptos plummeted as inves
tors remained averse to risk.\r\nInsights: Spot BTC ETFs launch in Australia. But elsewhere, they … [+9949 c
hars]NEW YORK, April 19, 2022 /PRNewswire/ -- 21Shares AG ("21Shares"), a Swiss-based issuer of crypto Excha
nge Traded Products (ETPs), and the leading ETF provider, ETF Securities have launched two funds… [+11692 ch
ars]Hi Quartz members,\r\nThe Forecast is now on Sundays. That way you can enjoy the deep dive over the week
end.\r\nAnd, in case you missed it, we dropped our paywall!\xa0Quartz is on a mission to make the glob… [+65
04 chars]Opera has announced that its Web3-focused Crypto Browser is now available for iOS, making the jump
from the desktop for the first time.\r\nIn a new blog post announcing the news, Opera explains that th… [+17
96 chars]Don\'t miss CoinDesk\'s Consensus 2022, the must-attend crypto & blockchain festival experience
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[+1308 chars]Cryptagende Verse, an innovative decentralized gaming startup announced the first of its kind f
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e… [+5138 chars]This week the crypto market endured a sharp drop in valuation after Coinbase, the leading U.
S. exchange, reported a $430 million quarterly net loss\xa0and South Korea announced plans to introduce a 2
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[+3396 chars]Shark Tank star and OShares Investment Advisers Chairman Kevin OLeary predicts that one day blo
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[+13628 chars]In this article, we discuss 10 bitcoin mining stocks to buy now. If you want to read about som
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[+10436 chars]Since its inception, cryptocurrency has grown in popularity day by day. Nowadays, we see crypt
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he launch ofits new 1GCX centralized crypto exchange. 1GCX combines the power of blockchain with sustain… [+
3889 chars]This lifetime offer allows the first million purchasers of the Exchange\'s token, QuakeCoin, to t
rade up to $100,000 USD annually while paying zero trading fees.\r\nNEW YORK, May 2, 2022 /PRNewswire/ --…
[+5647 chars]'

In [151… # Run the NER processor on all of the text
         ethereum_ner = nlp(ethereum_text)

```python
# Add a title to the document
ethereum_ner.user_data["title"] = "Ethereum Named Entity Recognition (NER)"
```

In [152…
```python
# Render the visualization
displacy.render(ethereum_ner, style="ent")
```

Ethereum Named Entity Recognition (NER)

Bdice on his recording studio

Bdice Cryptocurrencies `ORG` can truly change lives, and depending on where you look, a lot of lives have already been changed by such innovative technology.

Brandon Bdice … [+2957 chars]There are many different crypto exchanges you can use, but only a handful of these are big enough to be listed on a stock exchange. **One** `CARDINAL` such exchange, **Coinbase** `PRODUCT`, is incredibly popular and is the large… [+6491 **chars]You're reading** `PERSON` The **Dose** `PERSON` newsletter.You're reading The **Dose** `PERSON` newsletter.You're reading The **Dose** `PERSON` newsletter.Follow the money as **Tiffany Kary** `PERSON` shows you how once-illegal drugs like **marijuana** `ORG` and psychedel… [+5570 chars]Good **morning** `TIME` . **Heres** `ORG` whats happening:

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Insights: Spot BTC ETFs launch in **Australia** `GPE` . But elsewhere, they … [+9949 **chars]NEW YORK** `GPE` , **April 19, 2022** `DATE` /PRNewswire/ -- 21Shares **AG** `ORG` (" **21Shares** `WORK_OF_ART` "), a **Swiss** `NORP` -based issuer of crypto **Exchange Traded Products** `ORG` (ETPs), and the leading **ETF** `ORG` provider, **ETF Securities** `ORG` have launched **two** `CARDINAL` funds… [+11692 chars]Hi **Quartz** `ORG` members,

The **Forecast** `ORG` is now on **Sundays** `DATE` . That way you can enjoy the deep dive over **the weekend** `DATE` .

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Cryptagende

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 NEW YORK **GPE** , May 2, 2022 **DATE** /PRNewswire/ --... [+5647 **GPE** chars]

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print(tabulate(tabulate_ethereum, headers=['Ethereum', 'Named Entity Recognition (NER)']))
```

```
Ethereum                     Named Entity Recognition (NER)
-------------------------    --------------------------------
Bdice                        ORG
Cryptocurrencies
One                          CARDINAL
Coinbase                     PRODUCT
chars]You're reading         PERSON
Dose                         PERSON
Dose                         PERSON
Dose                         PERSON
Tiffany Kary                 PERSON
marijuana                    ORG
morning                      TIME
Heres                        ORG
Australia                    GPE
chars]NEW YORK               GPE
April 19, 2022               DATE
AG                           ORG
21Shares                     WORK_OF_ART
Swiss                        NORP
Exchange Traded Products     ORG
ETF                          ORG
ETF Securities               ORG
two                          CARDINAL
Quartz                       ORG
Forecast                     ORG
Sundays                      DATE
the weekend                  DATE
Crypto Browser               PERSON
first                        ORDINAL
Opera                        ORG
CoinDesk                     PRODUCT
Consensus 2022               ORG
the year                     DATE
Austin                       GPE
TX                           ORG
June 9-12                    DATE
morning                      TIME
Heres                        ORG
CoinDesk                     PRODUCT
Consensus 2022               ORG
the year                     DATE
Austin                       GPE
TX                           ORG
June 9-12.Dubai              DATE
```

DAMAC	ORG
Verse	ORG
first	ORDINAL
NFT	ORG
Metaverse	ORG
Coinbase	PRODUCT
U.S.	GPE
$430 million	MONEY
quarterly	DATE
South Korea	GPE
20%	PERCENT
840,361	CARDINAL
the AML Platform	WORK_OF_ART
the United States	GPE
USDC	ORG
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Bloomberg	ORG
Cryptocurrencies	
Thursday	DATE
Bitcoin	NORP
recent years	DATE
10	CARDINAL
day	DATE
day	DATE
Switzerland--(BUSINESS	CARDINAL
today	DATE
1GCX	CARDINAL
1GCX	CARDINAL
first	ORDINAL
million	CARDINAL
Exchange	ORG
QuakeCoin	ORG
up to $100,000 USD	MONEY
zero	CARDINAL
NEW YORK	GPE
May 2, 2022	DATE
+5647	GPE

In [ ]:

In [ ]:

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