	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?  # 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() from newsapi import NewsApiclient  *matplotlib inline  [nltk data] Downloading package vader lexicon to
In [24]: In [25]: In [26]:	<pre>[nltk_data] /Users/moniqueferguson/nltk_data [nltk_data] Package vader_lexicon is already up-to-date!  # Read your api key environment variable api_key = os.getenv('news_api')  # Create a newsapi client newsapi = NewsApiClient(api_key='b2elb8523bc34e4da53270d9e3c48757')  # Fetch the Bitcoin news articles</pre>
Out[26]:	<pre>bitcoin_headlines = newsapi.get_everything(     q="Bitcoin",     language="en",     sort_by="relevancy" ) # Print total articles print(f"Total articles about Bitcoin news articles: {bitcoin_headlines['totalResults']}")  # Show sample article bitcoin_headlines["articles"][0]  Total articles about Bitcoin news articles: 8774 {'source': {'id': 'the-verge', 'name': 'The Verge'},     'author': 'Richard Lawler',</pre>
In [27]:	<pre>'title': 'A fake press release claiming Kroger accepts crypto reached the retailer's own webpage', 'description': 'A crypto hoax claimed Kroger is accepting Bitcoin Cash. The fake press release was similar to one targeting Walmart earlier this year. The retailer quickly confirmed it's fake, but not before the cryptocur rency's price spiked by \$30.', 'url': 'https://www.theverge.com/2021/11/5/22765098/kroger-bitcoin-cash-cryptocurrency-hoax-pump-dump', 'urlToImage': 'https://cdn.vox-cdn.com/thumbor/CKpOYjnwF88mWg1kfPmspvfzY=/0x358:5000x2976/fit-in/1200x630/cd n.vox-cdn.com/uploads/chorus_asset/file/22988084/1234440443.jpg', 'publishedAt': '2021-11-05T13:32:14Z', 'content': 'A similar hoax earlier this year tied Walmart to Litecoin\r\nIf you buy something from a Verge lin k, Vox Media may earn a commission. See our ethics statement.\r\nPhoto Illustration by Thiago Prudencio/S [+19 00 chars]')  # Fetch the Ethereum news articles ethereum headlines = newsapi.get_everything(     q="Ethereum",     language="en" ) # Print total articles</pre>
Out[27]:	<pre>print(f"Total articles about Ethereum news articles: {ethereum_headlines['totalResults']}")  # Show sample article ethereum_headlines["articles"][0] # ethereum_headlines  Total articles about Ethereum news articles: 3230 {'source': {'id': None, 'name': 'Entrepreneur'}, 'author': 'Entrepreneur Staff', 'title': 'AMC Begins Accepting Crypto', 'description': 'Bitcoin, Ethereum, Bitcoin Cash and Litecoin are accepted.', 'url': 'https://www.entrepreneur.com/article/396981', 'urlToImage': 'https://assets.entrepreneur.com/content/3x2/2000/1636738243-GettyImages-1307671673.jpg', 'publishedAt': '2021-11-12T17:31:23Z', 'content': 'In keeping with a previous announcement, AMC theaters now accept cryptocurrencies as payment for o nline purchases.\xa0\r\nBitcoin, Ethereum, Bitcoin Cash and Litecoin are accepted.\xa0\r\nPreviously, the comp a [+1036 chars]'}</pre>
In [28]:	<pre># Create the Bitcoin sentiment scores DataFrame bitcoin_sentiments = []  for article in bitcoin_headlines["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"]  bitcoin_sentiments.append({             "text": text,             "date": date,</pre>
	<pre>"date": date,     "compound": compound,     "positive": pos,     "negative": neg,     "neutral": neu  })  except AttributeError:     pass  # Create DataFrame bitcoin_df = pd.DataFrame(bitcoin_sentiments)  # Reorder DataFrame columns cols = ["date", "compound", "positive", "negative", "neutral", "text"] bitcoin_df = bitcoin_df[cols]</pre>
Out[28]: In [29]:	date compound positive negative neutral         text           0 2021-11-05         -0.2732         0.000         0.063         0.937         A similar hoax earlier this year tied Walmart           1 2021-10-28         0.3612         0.096         0.000         0.904         Theres a big new presence slurping up power fr           2 2021-10-26         0.0000         0.000         1.000         For all the talk of democratizing finance, the           3 2021-11-12         0.5719         0.153         0.000         0.847         In keeping with a previous announcement, AMC t           4 2021-10-21         0.0000         0.000         1.000         Representation of cryptocurrency Bitcoin is pl
	<pre>ethereum_sentiments = []  for article in ethereum_headlines["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"]          ethereum_sentiments.append({             "text": text,             "date": date,             "compound": compound,             "positive": pos,</pre>
	<pre>"negative": neg,</pre>
Out[29]: In [30]:	date         compound         positive         negative         neutral         text           0         2021-11-12         0.5719         0.153         0.0         0.847         In keeping with a previous announcement, AMC t           1         2021-11-05         0.4588         0.094         0.0         0.906         Ethereum and bitcoin are the two biggest crypt           2         2021-11-01         0.5267         0.093         0.0         0.907         Elon Musk\r\npicture alliance / Getty Images\r           3         2021-11-01         0.4588         0.097         0.0         0.903         Cryptocurrency and business continuity line im           4         2021-11-09         0.4019         0.076         0.0         0.924         Apple CEO Tim Cook said he owns cryptocurrency
Out[30]:	compound         positive         negative         neutral           count         20.000000         20.000000         20.000000         20.000000           mean         0.166550         0.045700         0.005300         0.949000           std         0.288800         0.067315         0.016633         0.065559           min         -0.273200         0.000000         0.000000         0.801000           25%         0.000000         0.000000         0.000000         1.000000           75%         0.463275         0.103500         0.000000         1.000000
In [31]: Out[31]:	max         0.755800         0.199000         0.063000         1.000000           # Describe the Ethereum Sentiment ethereum_df.describe()           compound positive negative neutral           count         20.000000         20.000000         20.0 20.000000           mean         0.305170         0.069100         0.0         0.930900           std         0.304142         0.074103         0.0         0.074103           min         0.000000         0.000000         0.0         0.779000           25%         0.000000         0.074000         0.0         0.926000
	75% 0.530600 0.104000 0.0 1.000000  max 0.822500 0.221000 0.0 1.000000  Questions:  Q: Which coin had the highest mean positive score?  A: Ethereum had the highest mean positive score with 0.063150 compared to Bitcoin with 0.054550  Q: Which coin had the highest compound score?  A: Ethereum had the highest compound score?
	Q. Which coin had the highest positive score?  A: Ethereum had the highest positive score with 0.221000 compared to Bitcoin with 0.199000  2. Natural Language Processing  Tokenizer  In this section, you will use NLTK and Python to tokenize the text for each coin. Be sure to:
In [32]: In [33]:	<pre>1. Lowercase each word. 2. Remove Punctuation. 3. Remove Stopwords.  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  # Instantiate the lemmatizer lemmatizer = WordNetLemmatizer()</pre>
In [88]:	<pre>def tokenizer(text):     """Tokenizes text."""     # Create a list of the words     words_tokened = word_tokenize(text)  # Convert the words to lowercase     words_lowered = [word.lower() for word in words_tokened]  # Remove the punctuation     regex = re.compile('[^a-zA-Z]')     words_regexed = [regex.sub('', word) for word in words_lowered]  # Remove the stop words     sw = set(stopwords.words('english'))</pre>
In [89]:	<pre>sw_add_ons = ['', 'char', 'chars', 'getty', 'rahul', 'rai', 'u', 'oct', 'taken', 'representation', 'octobe:     stopwords_removed = [word.lower() for word in words_regexed if word not in sw.union(sw_add_ons)]  # Lemmatize Words into root words lemmatizer = WordNetLemmatizer() tokens = [lemmatizer.lemmatize(word) for word in stopwords_removed]  return tokens  # Create a new tokens column for bitcoin bitcoin_tokens = [tokenizer(words) for words in bitcoin_df['text']] bitcoin_df['tokens'] = bitcoin_tokens bitcoin_df.head()</pre>
Out[89]:	datecompoundpositivenegativeneutraltexttokens02021-11- 05-0.27320.0000.0630.937A similar hoax earlier this year tied Walmart[similar, hoax, earlier, year, tied, walmart, walmart, walmart12021-10- 280.36120.0960.0000.904Theres a big new presence slurping up power fr[there, big, new, presence, slurping, power, u22021-10- 260.00000.0001.000For all the talk of democratizing finance, the[talk, democratizing, finance, vast, majority,32021-11- 120.57190.1530.0000.847In keeping with a previous announcement, AMC t[keeping, previous, announcement, amc, theater42021-10- 210.00000.0001.000Representation of cryptocurrency Bitcoin is pl[cryptocurrency, bitcoin, placed, pc, motherbo
<pre>In [90]: Out[90]:</pre>	text tokens  O A similar hoax earlier this year tied Walmart [similar, hoax, earlier, year, tied, walmart,  1 Theres a big new presence slurping up power fr [there, big, new, presence, slurping, power, u  2 For all the talk of democratizing finance, the [talk, democratizing, finance, vast, majority,  3 In keeping with a previous announcement, AMC t [keeping, previous, announcement, amc, theater  4 Representation of cryptocurrency Bitcoin is pl [cryptocurrency, bitcoin, placed, pc, motherbo  5 A representation of the virtual cryptocurrency [virtual, cryptocurrency, bitcoin, sulondon, b
	A representation of the virtual cryptocurrency [virtual, cryptocurrency, bitcoin, suhong, kon  Posted \r\nBitcoin climbed to a record high on [bitcoin, climbed, record, high, wednesday, am  A representation of the virtual cryptocurrency [virtual, cryptocurrency, bitcoin, susingapore  By Reuters Staff\r\nSINGAPORE (Reuters) - Bitc [staff, singapore, bitcoin, hit, sixmonth, hig  STR/NurPhoto via Getty Images\r\nThe first-eve [firstever, bitcoinlinked, exchangetraded, fun  Bitcoin artwork displayed at the Bitcoin 2021 [bitcoin, artwork, displayed, bitcoin, convent  * Cryotocurrency gets boost from ETF bitcoin f [cryotocurrency, get, boost, etf, bitcoin, fut  the cryotocurrency gets boost from ETF bitcoin f [approval, bitcoin, futuresbased, etf, mean, s  [bitcoin, display, bitcoin, extending, recent,
In [92]:	15 Bitcoin was trading over 7% higher on Monday m [bitcoin, trading, higher, monday, morning, pr] 16 Australian Baseball League club Perth Heat wil [australian, baseball, league, club, perth, he] 17 A passenger (R) talks to an airline employee o [passenger, talk, airline, employee, mexican,] 18 * Bitcoin breaks past 68,000; Ethernears5k [bitcoin, break, past, nears, k, pull, back, l] 19 Representations of the virtual currency Bitcoi [representation, virtual, currency, bitcoin, s]  # Create a new tokens column for ethereum ethereum_tokens = [tokenizer(words) for words in ethereum_df['text']] ethereum_df['tokens'] = ethereum_tokens ethereum_df.head()
Out[92]:	datecompoundpositivenegativeneutraltexttokens02021-11- 120.57190.1530.00.847In keeping with a previous announcement, AMC t[keeping, previous, announcement, amc, theater12021-11- 050.45880.0940.00.906Ethereum and bitcoin are the two biggest crypt[ethereum, bitcoin, two, biggest, cryptocurren22021-11- 010.52670.0930.00.907Elon Musk\r\npicture alliance / Getty lmages\r[elon, musk, alliance, cryptocurrency, named,32021-11- 010.45880.0970.00.903Cryptocurrency and business continuity, line im[cryptocurrency, business, continuity, line, b42021-11- 090.40190.0760.00.924Apple CEO Tim Cook said he owns cryptocurrency[apple, ceo, tim, cook, owns, cryptocurrency,
	whereum_df[['text', 'tokens']]  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 [94]:  In []:	<pre>from collections import Counter from nltk import ngrams  # Generate the Bitcoin N-grams where N=2 bitcoin_text = ' '.join(bitcoin_df["text"]) bitcoin_processed = tokenizer(bitcoin_text) bitcoin_ngrams = Counter(ngrams(bitcoin_processed, n=2)) print(dict(bitcoin_ngrams.most_common(10)))  # Generate the Bitcoin N-grams where N=2 bitcoin_text = ' '.join(bitcoin_df["text"]) bitcoin_processed = tokenizer(bitcoin_text) bitcoin_processed = tokenizer(bitcoin_text) bitcoin_ngrams = Counter(ngrams(bitcoin_processed, n=2))</pre>
In [97]:	<pre>print(dict(bitcoin_ngrams.most_common(10)))  {('cryptocurrency', 'bitcoin'): 4, ('virtual', 'cryptocurrency'): 3, ('motherboard', 'reutersdado'): 2, ('kon g', 'bitcoin'): 2, ('bitcoin', 'futuresbased'): 2, ('exchangetraded', 'fund'): 2, ('bitcoin', 'hit'): 2, ('hit', 'sixmonth'): 2, ('sixmonth', 'high'): 2}  # Generate the Ethereum N-grams where N=2 ethereum_text = ' '.join(ethereum_df["text"]) ethereum_processed = tokenizer(ethereum_text) ethereum_ngrams = Counter(ngrams(ethereum_processed, n=2)) print(dict(ethereum_ngrams.most_common(10)))  {('bitcoin', 'ethereum'): 5, ('representation', 'cryptocurrencies'): 4, ('ethereum', 'dogecoin'): 3, ('ethereum', 'bitcoin'): 2, ('elon', 'musk'): 2, ('new', 'time'): 2, ('cryptocurrencies', 'bitcoin'): 2, ('dogecoin', 'ripple'): 2, ('ripple', 'litecoin'): 2, ('litecoin', 'placed'): 2}</pre>
In []: In [98]: In [100	<pre># Use the token_count function to generate the top 10 words from each coin def token_count(tokens, N=10):     """Returns the top N tokens from the frequency count"""     return Counter(tokens).most_common(N)  # Use the token_count function to generate the top 10 words from each coin def token_count(tokens, N=10):     """Returns the top N tokens from the frequency count"""     return Counter(tokens).most_common(N)</pre> # Use token count to get the top 10 words for Bitcoin
Out[100 In [22]:	<pre>bitcoin_top_10 = token_count(bitcoin_processed) bitcoin_top_10  [('bitcoin', 27),     ('new', 5),     ('cryptocurrency', 5),     ('etf', 5),     ('u', 4),     ('virtual', 4),     ('record', 4),     ('futuresbased', 4),     ('trading', 4),     ('high', 3)]</pre> # Use token_count to get the top 10 words for Ethereum
Out[22]:	<pre>ethereum_top_10 = token_count(ethereum_processed) ethereum_top_10  [('ethereum', 12),     ('bitcoin', 11),     ('cryptocurrency', 8),     ('cryptocurrencies', 6),     ('image', 4),     ('representation', 4),     ('june', 4),     ('market', 4),     ('litecoin', 3),     ('crypto', 3)]</pre> # Use token_count to get the top 10 words for Ethereum ethereum top 10 = token count(ethereum processed)
	<pre>ethereum_top_10  [('ethereum', 12),     ('bitcoin', 11),     ('cryptocurrency', 8),     ('cryptocurrencies', 6),     ('representation', 4),     ('market', 4),     ('litecoin', 3),     ('crypto', 3),     ('virtual', 3),     ('virtual', 3)]</pre> Word Clouds
In [102 In [117	<pre>In this section, you will generate word clouds for each coin to summarize the news for each coin  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]  # Generate the Bitcoin word cloud bitcoin_words_joined = ' '.join(bitcoin_processed) wc = WordCloud(width=1200, height=400).generate(bitcoin_words_joined) plt.imshow(wc) plt.title('Bitcoin word cloud', fontdict={'fontsize':50}, loc='Center')</pre>
Out[117	Bitcoin word cloud  announcement striking presence previously transported to the standard provider previously provider provider provider thic and data and decept the standard provider this something buying link research world global a company provider this something buying link research world global a company provider provider this something buying link research world global a company provider this something buying link research world global a company provider provider this something buying link research world global a company provider provider this something buying link research world global a company provider provider this something buying link research world global a company provider provider provider this something buying link research world global a company provider provider provider this something buying link research world global a company provider
In [118	# Generate the Ethereum word cloud ethereum_words_joined = ' '.join(ethereum_processed) wc = WordCloud(width=1200, height=400).generate(ethereum_words_joined) plt.imshow(wc) plt.title('Ethereum word cloud', fontdict={'fontsize':50}, loc='Center')
Out[118	Ethereum word cloud  "manager announdement though rebranding among accepted partnership cryptocurrencies cashdogelon coinamer can bought rebranding among accepted partnership cryptocurrencies cashdogelon rebranding partnership coinamer cash and partnership cash accepted partnership cryptocurrencies cashdogelon reputation speed accepted partnership cryptocurrencies cashdogelon papple instead and respirate speed address purchase reutersdade investor recent lax mother board apayment in the partnership coinamer cash accept past accept business business business per consulter accept business
	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 [106 In [107	# Download the language model for SpaCy # !python -m spacy download en_core_web_sm  # Load the spaCy model nlp = spacy.load('en_core_web_sm')  Bitcoin NER
	# Run the NER processor on all of the text bitcoin_ner = nlp(bitcoin_text)  # Add a title to the document bitcoin_ner.user_data['title'] = 'Bitcoin NER'  # Render the visualization displacy.render(bitcoin_ner, style='ent')  Bitcoin NER  A similar hoax earlier this year DATE tied Walmart to Litecoin  If you buy something from a Verge LAW link, Vox Media ORG may earn a commission. See our ethics statement.
	Photo Illustration ORG by Thiago Prudencio/S PERSON [+1900 chars] Theres a big new presence slurping up power from the U.S. GPE grid, and its growing: bitcoin miners. New research shows that the U.S. GPE has overtaken China GPE as the top global destination for bitcoin mining [+3088 chars] For all the talk of democratizing finance, the vast majority of Bitcoin continues to be owned by a relative handful of investors.  As flagged by Bloomberg ORG , newly released data by the National Bureau ORG [+4274 chars] In keeping with a previous announcement, AMC ORG theaters now accept cryptocurrencies as payment for online purchases.  Bitcoin, Ethereum, Bitcoin Cash and Litecoin are accepted.
	Previously, the compa [+1036 chars] Representation of cryptocurrency  Bitcoin Person is placed on PC motherboard in this illustration taken, June 29, 2021 DATE . REUTERS ORG / Dado Ruvic/ PERSON IllustrationHONG KONG GPE , Oct 21 DATE ( Reuters ORG ) - Bitcoin fell slightly in A [+1642 chars] A representation of the virtual cryptocurrency Bitcoin is seen in this picture illustration taken  October 19, 2021 DATE . REUTERS ORG /Edgar SuLONDON, Oct 20 ( Reuters ORG ) - Bitcoin is on the cusp of an all-time hi [+3260 chars] A representation of the virtual cryptocurrency Bitcoin is seen in this picture illustration taken  October 19, 2021 DATE . REUTERS ORG / Edgar SuHONG KONG PERSON , Oct 20 ( Reuters ORG ) - Bitcoin hovered below record levels o [+1954 chars] Posted
	Bitcoin climbed to a record high on Wednesday DATE amid new interest as the first ORDINAL U.S. GPE bitcoin futures-based exchange-traded funds come to market. Conway G. Gittens PERSON has more. A representation of the virtual cryptocurrency Bitcoin PERSON is seen in this picture illustration taken October 18, 2021 DATE . REUTERS ORG /Edgar SusINGAPORE, Oct 19 DATE ( Reuters ORG ) - Bitcoin hit a six-month DATE high and was [ +2332 PERSON chars]  By Reuters ORG Staff  SINGAPORE GPE ( Reuters ORG ) - Bitcoin hit a six-month DATE high and was within striking distance of a record on Tuesday DATE as traders bet an anticipated listing of a futures-based U.S. GPE exchange tra [+2206 chars] STR ORG / NurPhoto ORG via Getty Images ORG
	The first ORDINAL -ever bitcoin-linked exchange-traded fund will begin trading on Tuesday DATE, the provider ProShares  ORG said in a statement. The launch will mark another milestone in [+1567 chars] Bitcoin artwork displayed at the Bitcoin  2021 DATE convention.  Marco Bello/ PERSON Getty Images  The Securities and Exchange Commission ORG will not make a decision on alternative asset management firm Valkyrie  PERSON 's pr [+1492 chars] * Cryotocurrency gets boost from ETF ORG bitcoin futures launch  * ETF ORG bitcoins may have higher costs Vs buying of actual cryptos
	* But benefits of owning ETFs lauded by many despite some risks  * Tuesd [+4583 chars] Ether.  NurPhoto org <ul> <li><ul> <li>I) Org means a similar offering for ether is imminent.</li> <li>I) I Solomberg analysts believe the first ordinal ether futures-based ETF org could launch [+1931 chars] Bitcoin seen on display.</li> <li>Rafael Henrique/SOPA Images/LightRocket person via Getty Images org</li> </ul> Bitcoin is extending its recent ascent to test a new price record as crypto "hodlers" cheer a futures exchange-trad [+2812 chars]</li></ul>
	Bitcoin was trading over 7% PERCENT higher on Monday DATE morning TIME, priced around \$66,105 MONEY per coin.  Ether, was trading over 3% PERCENT higher, priced at \$ 4,722 MONEY.  Dogecoin, meanwhile, was up over 9% PERCENT, trading at a little o [+756 chars] Australian Baseball League org club  Perth Heat PERSON will pay its players in bitcoin, after partnering with a cryptocurrency payment company in a deal it claims to be a world first Ordinal for professional sport.  Hea PERSON [+2695 chars] A passenger (R) talks to an airline employee of the Mexican NORP low-cost air carrier
	Volaris PERSON at Benito Juarez International Airport FAC in Mexico City GPE , Mexico GPE January 10, 2018 DATE  Picture taken January 10, 2018 DATE [+1209 chars] * Bitcoin breaks past \$ 68,000 MONEY ; Ether ORG nears \$ 5k  MONEY  * Both pull back later  * CoinGecko ORG puts crypto market cap at more than \$3 trillion MONEY  * Flows surge as momentum runs hot (Adds new comment, updates pric [+3162 chars] Representations of the virtual currency  Bitcoin stand on a motherboard in this picture illustration taken May 20, 2021 DATE . REUTERS ORG / Dado Ruvic/File
In [110	PhotoLONDON person , Nov 16 ( Reuters org ) - Bitcoin fell below \$ 60 Money , [+629 chars]  # List all Entities for ent in bitcoin_ner.ents:     print(ent.text, ent.label_)  earlier this year DATE  Verge LAW  Vox Media ORG Photo Illustration ORG Thiago Prudencio/S PERSON U.S. GPE U.S. GPE China GPE Bloomberg ORG
	the National Bureau ORG AMC ORG Bitcoin PERSON June 29, 2021 DATE REUTERS ORG Dado Ruvic/ PERSON IllustrationHONG KONG GPE Oct 21 DATE Reuters ORG Bitcoin PERSON October 19, 2021 DATE REUTERS ORG Reuters ORG Bitcoin PERSON October 19, 2021 DATE REUTERS ORG Reuters ORG Bitcoin PERSON October 19, 2021 DATE REUTERS ORG Reuters ORG Bitcoin PERSON October 19, 2021 DATE
	Reuters ORG Wednesday DATE first ORDINAL U.S. GPE Conway G. Gittens PERSON Bitcoin PERSON October 18, 2021 DATE REUTERS ORG Oct 19 DATE Reuters ORG six-month DATE +2332 PERSON Reuters ORG SINGAPORE GPE Reuters ORG six-month DATE
	Tuesday DATE U.S. GPE STR ORG NurPhoto ORG Getty Images ORG first ORDINAL Tuesday DATE ProShares ORG Bitcoin 2021 DATE Marco Bello/ PERSON The Securities and Exchange Commission ORG Valkyrie PERSON ETF ORG ETF ORG NurPhoto ORG ETF ORG first ORDINAL
	ETF ORG Rafael Henrique/SOPA Images/LightRocket PERSON Getty Images ORG 7% PERCENT Monday DATE morning TIME around \$66,105 MONEY 3% PERCENT 4,722 MONEY over 9% PERCENT Australian Baseball League ORG Perth Heat PERSON first ORDINAL Hea PERSON Mexican NORP Volaris PERSON Benito Juarez International Airport FAC
	Benito Juarez International Airport FAC Mexico City GPE Mexico GPE January 10, 2018 DATE January 10, 2018 DATE January 10, 2018 DATE 68,000 MONEY Ether ORG 5k MONEY CoinGecko ORG more than \$3 trillion MONEY May 20, 2021 DATE REUTERS ORG Dado Ruvic/File PhotoLONDON PERSON Reuters ORG 60 MONEY
In [111 In [112	<pre># Run the NER processor on all of the text ethereum_ner = nlp(ethereum_text)  # Add a title to the document ethereum_ner.user_data['title'] = 'Ethereum NER'  # Render the visualization displacy.render(ethereum_ner, style='ent')</pre>

