Natural Language Processing to Analyse Cryptocurrencies

> Using the Twitter API and Python to extract tweets related to cryptocurrencies in order to find if there is a correlationship between user's opinion (using NLP) and cryptocurrencies prices.

The steps to follow are:

- Create a Twitter Developer account
- Install tweepy
- Extract tweets
- Use NLP to analyse the tweet's polarity (sentiment analysis - positive or negative opinion)
- Extract cryptocurrencies prices
- Compare polarity with crypto prices
- Profit?

Authenticate in the Developer platform and call the required libraries

```python
In [1]:  import tweepy
         import json
         import numpy as np
         import pandas as pd
         import datetime
         import yfinance as yf
         import preprocessor as prep
         from textblob import TextBlob
         from matplotlib import pyplot as plt
         import matplotlib.dates as mdates
         plt.rcParams.update({'font.size': 20})

         # Defining authentication variables
         consumer_key = 'Y41qrPlT9wlSK3jvM6vVXMG78';
         consumer_secret = '*************************';
         token = '*************************';
         token_secret = '*************************';

         # Authentication and disabling the break if tweet limit is reached.
         auth = tweepy.OAuthHandler(consumer_key, consumer_secret);
         auth.set_access_token(token, token_secret);
         api = tweepy.API(auth, wait_on_rate_limit = True);

         try:
             api.verify_credentials()
```

```
        print("Twitter Developer authentication successful")
except:
        print("Error during authentication")

# Test to extract my info and followers and see that the authentication was successful
# me = api.me();
# print(json.dumps(me._json, indent = 2));
# data = api.followers();
# for user in data:
#       print(json.dumps(user._json['screen_name'], indent = 2));
# api.update_status('Hello World - Trying the Tweepy library for Twitter API in Python.
```

```
Twitter Developer authentication successful
```

Extracting financial data from Yahoo Finance

For this we may require to first install the yfinance library called in the previous section. We can
install it from the terminal using pip:

```
$ pip install yfinance
```

Seems to be an outage due to a JSON error, if that's the case, install instead: `pip install`
`yfinance --upgrade --no-cache-dir`

In [2]:
```python
# stablishing a period of time to analyse
end = datetime.date.today();
start = end-datetime.timedelta(days=7); # seems like with the basic Twitter Developer a

# Extracting data from yahoo finance. For this we need to have installed finance (pip i
# https://pypi.org/project/yfinance/
BTC = yf.Ticker('BTC-USD');
BTC_close = BTC.history(start=start, end=end)['Close'];
# BTC_open = BTC.history(start=start, end=end)['Open']
ETH = yf.Ticker('ETH-USD');
ETH_close = ETH.history(start=start, end=end)['Close'];

figure_1, ax1 = plt.subplots(figsize = (15, 8));
figure_1.suptitle('Cryptocurrency Prices')
plot1 = ax1.plot(BTC_close, color='orange', label='Bitcoin');
plt.ylabel('BTC US$', color='orange');
plt.xlabel('Date');
plt.xticks(rotation=45);
plt.grid();
plt.minorticks_on();
plt.grid(b=True, which='minor', color='#999999', linestyle='-', alpha=0.5);

ax2 = ax1.twinx();
plot2 = ax2.plot(ETH_close, color='r', label='Ethereum');
plt.ylabel('ETH US$', color='r');
legends = plot1+plot2;
labels = [l.get_label() for l in legends]
ax1.legend(legends, labels)
ax2.grid(False)
```
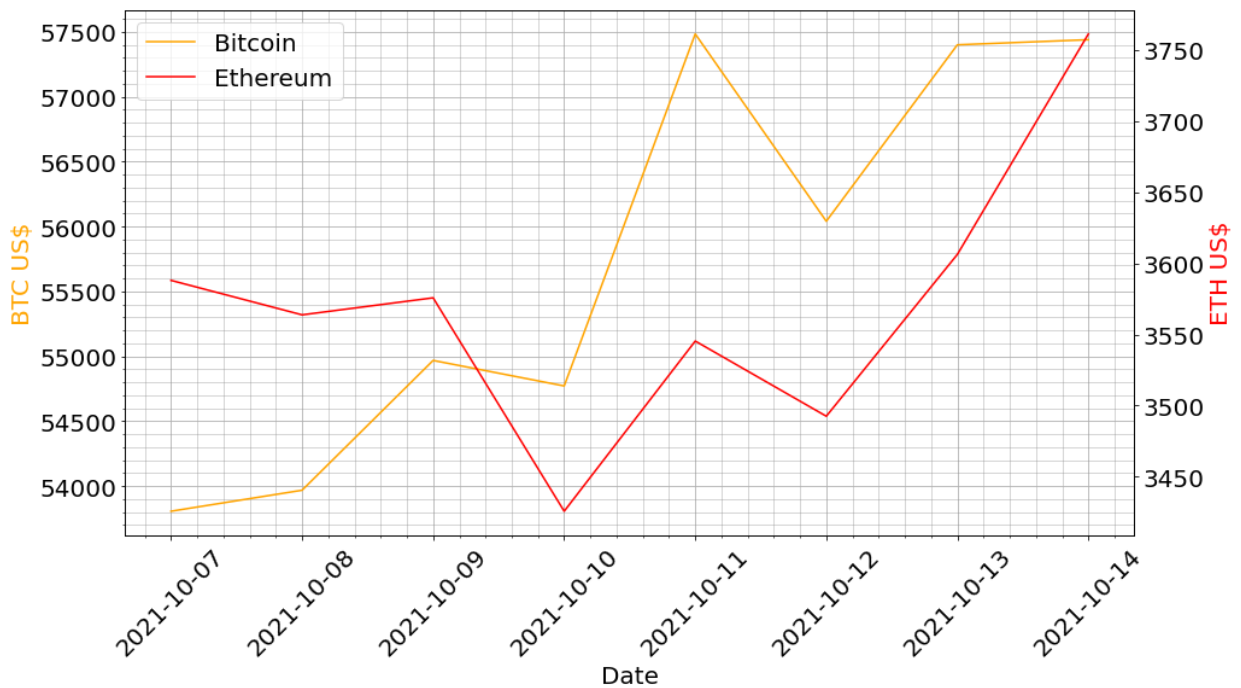
Extracting tweets of interest

For this we need to consider the following:

- We can use the tweepy.Cursor() method in order to paginate large result sets, or only use the api.search() method to get the tweets of the first page only.
- Define the query keywords and hashtags, for example:
  - Bitcoin or BTC
  - Ethereum or ETH
  - Cryptocurrencies or crypto

  See query logical operators and query basic search operators.

Preprocessing

We are gonna clean up the tweets, as these come with emojis, mentions and other text. For this we need to install a preprocessor as this will make it easier and more generic (instead of defining each emoji utf-8 code or html code). For this we can use the tweet-preprocessor library.

To install the tweet-preprocessor run the following command in terminal:

```
$ pip install tweet-preprocessor
```

Processing (NLP)

Sentiment Analysis consists in mining text in order to extract the subjective information. Sentiment Analysis uses Natural Language Processing (NLP) to identify the text polarity or text

tone (positive, neutral or negative). You can read more about how to **clean the data and use NLP in Python** here! To analyse the tweet polarity we are gonna use the TextBlob library.

```
In [3]: prep.set_options(prep.OPT.URL, prep.OPT.EMOJI, prep.OPT.MENTION) #We won't clean the has
        polarities = [];
        unclean_pol = [];
        date_tweet = [];
        for date_lim in range(0,7):
            queries = '(BTC OR Bitcoin OR bitcoin OR ETHEREUM OR btc OR #btc OR #BTC OR ETH OR E
            # extracting tweets and setting them as extended to see the whole tweet (otherwise t
            tweets2 = api.search(queries, lang='en', result_type='popular') #for using the free
            tweets2.sort(key=lambda tweet: tweet.created_at)
            for n, tweet in enumerate(tweets2):
                if 'bot' not in tweet.user.screen_name.lower(): #excluding the user names that o
                    followers = tweet.user.followers_count;
                    date_tweet.append(tweet.created_at)
                    print(f'{n} | User: {tweet.user.screen_name} | Followers: {followers} | Not
                    print(f'Polarity: {TextBlob(tweet.text).sentiment.polarity} Date: {tweet.cre
                    unclean_pol.append(TextBlob(tweet.text).sentiment.polarity) #As we are looki
                    #cleaning the tweet and recalculating the polarity
                    cleanTweet = prep.clean(tweet.text);
                    polarity = TextBlob(cleanTweet).sentiment.polarity;
                    polarities.append(polarity)
                    print(f'{n} | Cleaned:\n{cleanTweet}\nPolarity: {polarity} Date: {tweet.crea
                else:
                    print(f'{n} | Possible Bot!! User: {tweet.user.screen_name} | Followers: {fo


        #     queries = '(BTC OR Bitcoin OR bitcoin OR ETHEREUM OR btc OR #btc OR #BTC OR ETH OF
        #     tweets = tweepy.Cursor(api.search, q=queries, lang='en', tweet_mode='extended').it
        #     polarities2 = [];
        #     unclean_pol2 = [];
        #     date_tweet2 = [];
        #     for n, tweet in enumerate(tweets):
        #         if not any(x in tweet.user.screen_name.lower() for x in ['bot', 'bitcoin', 'cr
        #             followers = tweet.user.followers_count;
        #             #print(f'{n} | User: {tweet.user.screen_name} | Followers: {followers} | N
        #             #print(f'Polarity: {TextBlob(tweet.full_text).sentiment.polarity} Date: {t
        #             unclean_pol2.append(TextBlob(tweet.full_text).sentiment.polarity);
        #             #cleaning the tweet and recalculating the polarity
        #             cleanTweet = prep.clean(tweet.full_text);
        #             polarity2 = TextBlob(cleanTweet).sentiment.polarity;
        #             #print(f'{n} | Cleaned:\n{cleanTweet}\nPolarity: {polarity} Date: {tweet.c
        #             polarities2.append(polarity);
        #             date_tweet2.append(tweet.created_at)
```

0 | User: APompliano | Followers: 1190468 | Not cleaned
Approximately 85% of bitcoin in circulation has not moved in the last 90 days.

Insane 🤯

Polarity: -0.4666666666666666 Date: 2021-10-07 01:04:51

0 | Cleaned:
Approximately 85% of bitcoin in circulation has not moved in the last 90 days. Insane
Polarity: -0.4666666666666666 Date: 2021-10-07 01:04:51

1 | User: nayibbukele | Followers: 3029350 | Not cleaned
Since yesterday, Salvadorans are inserting more cash (to buy #bitcoin) than what they a
re withdrawing from the… https://t.co/KJXxxnIBgp

Polarity: 0.5 Date: 2021-10-07 01:26:38

1 | Cleaned:
Since yesterday, Salvadorans are inserting more cash (to buy #bitcoin) than what they a
re withdrawing from the
Polarity: 0.5 Date: 2021-10-07 01:26:38

2 | User: CoinMarketCap | Followers: 2987828 | Not cleaned
SHIBA INU has surged by 348% in one week 🚨

At one point, its market cap meant it was bigger than the likes of Lite… https://t.co/z
LYJwyn8eE

Polarity: 0.0 Date: 2021-10-07 06:45:48

2 | Cleaned:
SHIBA INU has surged by 348% in one week At one point, its market cap meant it was bigg
er than the likes of Lite
Polarity: 0.0 Date: 2021-10-07 06:45:48

3 | User: TheCryptoLark | Followers: 568967 | Not cleaned
You guys remember when China banned #bitcoin a few weeks ago? 😂😂😂😂😂

Polarity: -0.2 Date: 2021-10-07 08:00:34

3 | Cleaned:
You guys remember when China banned #bitcoin a few weeks ago?
Polarity: -0.2 Date: 2021-10-07 08:00:34

4 | User: FabriLemus7 | Followers: 523295 | Not cleaned
#Bitcoin and #altcoins are PUMPING! What coin should I buy right now??

Polarity: 0.2857142857142857 Date: 2021-10-07 10:08:46

4 | Cleaned:
#Bitcoin and #altcoins are PUMPING! What coin should I buy right now??
Polarity: 0.2857142857142857 Date: 2021-10-07 10:08:46

5 | User: saylor | Followers: 1657911 | Not cleaned
There is no end to up. #Bitcoin

Polarity: 0.0 Date: 2021-10-07 12:00:56

5 | Cleaned:
There is no end to up. #Bitcoin
Polarity: 0.0 Date: 2021-10-07 12:00:56

6 | User: BitcoinMagazine | Followers: 1432106 | Not cleaned
OFFICIAL: Soros Fund Management owns #Bitcoin https://t.co/VHGJ5bz38t

Polarity: 0.0 Date: 2021-10-07 14:25:49

6 | Cleaned:
OFFICIAL: Soros Fund Management owns #Bitcoin
Polarity: 0.0 Date: 2021-10-07 14:25:49

7 | User: BitcoinMagazine | Followers: 1432106 | Not cleaned
Andrew Yang's new political party to support #Bitcoin: I'm a "big proponent." https://
t.co/o8NpjqDKcC

Polarity: 0.04545454545454545 Date: 2021-10-07 15:03:10

7 | Cleaned:
Andrew Yang's new political party to support #Bitcoin: I'm a big proponent."
Polarity: 0.04545454545454545 Date: 2021-10-07 15:03:10

8 | User: BitcoinMagazine | Followers: 1432106 | Not cleaned
JP Morgan report: Institutional investors see #Bitcoin as "better inflation hedge" than
gold. https://t.co/SzVaGOCDze

Polarity: 0.5 Date: 2021-10-07 15:41:42

8 | Cleaned:
JP Morgan report: Institutional investors see #Bitcoin as "better inflation hedge" than
gold.
Polarity: 0.5 Date: 2021-10-07 15:41:42

9 | User: danheld | Followers: 401893 | Not cleaned
98% of retirement accounts in the US can't access #Bitcoin.

That's $36,800,000,000,000.

What happens when they do?

Polarity: 0.0 Date: 2021-10-07 16:06:21

9 | Cleaned:
98% of retirement accounts in the US cant access #Bitcoin. Thats $36,800,000,000,000. W
hat happens when they do?
Polarity: 0.0 Date: 2021-10-07 16:06:21

10 | User: saylor | Followers: 1657911 | Not cleaned
The implicit endorsement of Bitcoin by major banks and regulators is going to accelerat
e the collapse of #Gold and… https://t.co/GENaRd0946

Polarity: 0.0625 Date: 2021-10-07 19:47:07

10 | Cleaned:
The implicit endorsement of Bitcoin by major banks and regulators is going to accelerat

e the collapse of #Gold and
Polarity: 0.0625 Date: 2021-10-07 19:47:07

11 | User: Excellion | Followers: 160406 | Not cleaned
#Bitcoin moves $2.9 million dollars in value around the globe each and every second. No
intermediaries or permissio… https://t.co/2tUPKnysz1

Polarity: 0.0 Date: 2021-10-07 23:28:46

11 | Cleaned:
#Bitcoin moves $2.9 million dollars in value around the globe each and every second. No
intermediaries or permissio
Polarity: 0.0 Date: 2021-10-07 23:28:46

0 | User: APompliano | Followers: 1190469 | Not cleaned
This is incredible.

MiamiCoin has now generated over $10 million for the City of Miami, all built on top of
bitcoi… https://t.co/XoERn2Nr2U

Polarity: 0.7 Date: 2021-10-08 00:16:20

0 | Cleaned:
This is incredible. MiamiCoin has now generated over $10 million for the City of Miami,
all built on top of bitcoi
Polarity: 0.7 Date: 2021-10-08 00:16:20

1 | User: TheCryptoLark | Followers: 568967 | Not cleaned
JP Morgan says that big money prefers #bitcoin over gold, they also say that they prefe
r #ethereum over BTC.

So I… https://t.co/kmbY1YC3iC

Polarity: 0.0 Date: 2021-10-08 03:15:55

1 | Cleaned:
JP Morgan says that big money prefers #bitcoin over gold, they also say that they prefe
r #ethereum over BTC. So I
Polarity: 0.0 Date: 2021-10-08 03:15:55

2 | User: theRealKiyosaki | Followers: 1777076 | Not cleaned
Fox News: "Polls show Biden has united America...against him." Sad. Who is really runn
ing America? Today 10 Republ… https://t.co/gYFHLGmsDf

Polarity: -0.15 Date: 2021-10-08 05:19:00

2 | Cleaned:
Fox News: Polls show Biden has united America...against him. Sad. Who is really running
America? Today 10 Republ
Polarity: -0.15 Date: 2021-10-08 05:19:00

3 | User: saylor | Followers: 1657911 | Not cleaned
There is no second best. #Bitcoin

Polarity: 0.5 Date: 2021-10-08 11:45:33

3 | Cleaned:

There is no second best. #Bitcoin
Polarity: 0.5 Date: 2021-10-08 11:45:33

4 | User: BitcoinMagazine | Followers: 1432106 | Not cleaned
Largest public #bitcoin mining firms now hold over 20,000 BTC.

That's $1.1 billion ⚡ https://t.co/Iloef2hvLw

Polarity: 0.0 Date: 2021-10-08 11:45:48

4 | Cleaned:
Largest public #bitcoin mining firms now hold over 20,000 BTC. Thats $1.1 billion
Polarity: 0.0 Date: 2021-10-08 11:45:48

5 | User: BitcoinMagazine | Followers: 1432106 | Not cleaned
"At least five countries" will accept #Bitcoin as legal tender by 2022. - BitMEX CEO ht
tps://t.co/d69AfPUoIT

Polarity: -0.04999999999999999 Date: 2021-10-08 14:44:33

5 | Cleaned:
"At least five countries" will accept #Bitcoin as legal tender by 2022. - BitMEX CEO
Polarity: -0.04999999999999999 Date: 2021-10-08 14:44:33

6 | User: FabriLemus7 | Followers: 523295 | Not cleaned
#REKT TOKEN 🔥
📊 Tokenomics 📊

🚀 Total Supply: 5 Quad
🚀 Stealth Launch
🚀 5% Marketing Wallet

🦄 Uniswap (ETH)
📈 De… https://t.co/ribNP05uIq

Polarity: 0.0 Date: 2021-10-08 14:46:01

6 | Cleaned:
#REKT TOKEN Tokenomics Total Supply: 5 Quad Stealth Launch 5% Marketing Wallet Uniswap
(ETH) De
Polarity: 0.0 Date: 2021-10-08 14:46:01

7 | User: balajis | Followers: 476182 | Not cleaned
The US government has already named its replacements. By sending manufacturing oversea
s, the future of hard power i… https://t.co/ivywunNqz7

Polarity: -0.14583333333333334 Date: 2021-10-08 15:41:07

7 | Cleaned:
The US government has already named its replacements. By sending manufacturing oversea
s, the future of hard power i
Polarity: -0.14583333333333334 Date: 2021-10-08 15:41:07

8 | User: Benzinga | Followers: 199270 | Not cleaned
Today on Moon or Bust... Shiba Inu SPECIAL!

$SHIB vs $FLOKI

👉Price Analysis
👉What is #FLOKI?
👉ShibaSwap
👉+ Crypt… https://t.co/HhqSrZkbke

Polarity: 0.44642857142857145 Date: 2021-10-08 16:16:06

8 | Cleaned:
Today on Moon or Bust... Shiba Inu SPECIAL! $SHIB vs $FLOKI Price Analysis What is #FLO
KI? ShibaSwap + Crypt
Polarity: 0.44642857142857145 Date: 2021-10-08 16:16:06

9 | User: BitcoinMagazine | Followers: 1432106 | Not cleaned
"We are pretty bullish on approval" of a #Bitcoin futures ETF this month. - Bloomberg's
James Seyffart https://t.co/3UuTo8tBpg

Polarity: 0.25 Date: 2021-10-08 16:53:17

9 | Cleaned:
"We are pretty bullish on approval" of a #Bitcoin futures ETF this month. - Bloomberg's
James Seyffart
Polarity: 0.25 Date: 2021-10-08 16:53:17

10 | User: saylor | Followers: 1657911 | Not cleaned
#Bitcoin is the language of money. One day billions of people will speak it.
https://t.co/0MEvPXYtbm

Polarity: 0.0 Date: 2021-10-08 17:52:38

10 | Cleaned:
#Bitcoin is the language of money. One day billions of people will speak it.
Polarity: 0.0 Date: 2021-10-08 17:52:38

11 | User: scottbudman | Followers: 19289 | Not cleaned
#New: Thieves break into Silicon Valley liquor store .. not to steal the cash ATM, but
to steal the #Bitcoin ATM. https://t.co/eISIHokjED

Polarity: 0.13636363636363635 Date: 2021-10-08 18:19:41

11 | Cleaned:
#New: Thieves break into Silicon Valley liquor store .. not to steal the cash ATM, but
to steal the #Bitcoin ATM.
Polarity: 0.13636363636363635 Date: 2021-10-08 18:19:41

12 | User: elliotrades | Followers: 353661 | Not cleaned
Team the #Bitcoin supply shock is upon us

share and comment "APE" with your ETH address to enter for a sweet NFT… https://t.co/NC
pG3sV0Fb

Polarity: 0.35 Date: 2021-10-08 19:46:38

12 | Cleaned:
Team the #Bitcoin supply shock is upon us share and comment "APE" with your ETH address
to enter for a sweet NFT
Polarity: 0.35 Date: 2021-10-08 19:46:38

13 | User: JonErlichman | Followers: 231216 | Not cleaned
Value of $1,000 invested 10 years ago:

Bitcoin: $13,324,390
Tesla: $143,091
Nvidia: $56,640
Netflix:… https://t.co/pruCvemP88

Polarity: 0.0 Date: 2021-10-08 19:59:54

13 | Cleaned:
Value of $1,000 invested 10 years ago: Bitcoin: $13,324,390 Tesla: $143,091 Nvidia: $5
6,640 Netflix:
Polarity: 0.0 Date: 2021-10-08 19:59:54

0 | User: Cris__U | Followers: 615892 | Not cleaned
Shill me your x100 coin 👇

#BNB #trx #btc #Solana #BSCGem #BSCGems #100xCoin

Polarity: 0.0 Date: 2021-10-09 00:24:38

0 | Cleaned:
Shill me your x100 coin #BNB #trx #btc #Solana #BSCGem #BSCGems #100xCoin
Polarity: 0.0 Date: 2021-10-09 00:24:38

1 | User: saylor | Followers: 1657911 | Not cleaned
Institutional investors are using #Bitcoin as an inflation hedge and everybody is wonde
ring "what's the point of… https://t.co/RFmnCy2wun

Polarity: 0.0 Date: 2021-10-09 00:43:47

1 | Cleaned:
Institutional investors are using #Bitcoin as an inflation hedge and everybody is wonde
ring "what's the point of
Polarity: 0.0 Date: 2021-10-09 00:43:47

2 | User: Snowden | Followers: 4962000 | Not cleaned
On banking, bitcoin, and the future of money: a response to a governor of the Federal R
eserve, Christopher J. Walle… https://t.co/JdJMATrEuM

Polarity: 0.0 Date: 2021-10-09 01:01:07

2 | Cleaned:
On banking, bitcoin, and the future of money: a response to a governor of the Federal R
eserve, Christopher J. Walle
Polarity: 0.0 Date: 2021-10-09 01:01:07

3 | User: luciano_eltirri | Followers: 1252100 | Not cleaned
PARTICIPATE NOW! - https://t.co/PW1UpyhXFJ

Earn #Money Love-you gesture with #Manga now!!

Follow
@FomoChronicles… https://t.co/ty2vzFXJAk

Polarity: 0.0 Date: 2021-10-09 07:29:02

```
3 | Cleaned:
PARTICIPATE NOW! - Earn #Money Love-you gesture with #Manga now!! Follow
Polarity: 0.0 Date: 2021-10-09 07:29:02


4 | User: JeffBooth | Followers: 255697 | Not cleaned
Legend Hal Finney on January 11th, 2009 predicting #Bitcoin path.

I find it interesting that he divided the wealt… https://t.co/f83Ga73u9A

Polarity: 0.5 Date: 2021-10-09 11:25:59


4 | Cleaned:
Legend Hal Finney on January 11th, 2009 predicting #Bitcoin path. I find it interesting
that he divided the wealt
Polarity: 0.5 Date: 2021-10-09 11:25:59


5 | User: dougboneparth | Followers: 139188 | Not cleaned
I got 99 problems and basically all of them can be solved by bitcoin hitting $100,000.

Polarity: 0.0 Date: 2021-10-09 13:00:40


5 | Cleaned:
I got 99 problems and basically all of them can be solved by bitcoin hitting $100,000.
Polarity: 0.0 Date: 2021-10-09 13:00:40


6 | User: saylor | Followers: 1657911 | Not cleaned
Only invest what you can't afford to lose. #Bitcoin

Polarity: 0.0 Date: 2021-10-09 13:54:40


6 | Cleaned:
Only invest what you cant afford to lose. #Bitcoin
Polarity: 0.0 Date: 2021-10-09 13:54:40


7 | User: dypfinance | Followers: 70326 | Not cleaned
📢#DYP Stats &amp; Recap of the Week👇

💰8877 $ETH, 7641 #BNB &amp; 12568 #AVAX worth $36,003,100 paid to the farmers
♟KyberD… https://t.co/NHKDBCzDsT

Polarity: 0.3 Date: 2021-10-09 14:04:06


7 | Cleaned:
#DYP Stats &amp; Recap of the Week 8877 $ETH, 7641 #BNB &amp; 12568 #AVAX worth $36,00
3,100 paid to the farmers KyberD
Polarity: 0.3 Date: 2021-10-09 14:04:06


8 | User: danheld | Followers: 401893 | Not cleaned
Bitcoin = $1k. First they ignore you.
Bitcoin = $10k. Then they laugh at you.
Bitcoin = $100k. Then they fight you… https://t.co/BENwncd99Y

Polarity: 0.275 Date: 2021-10-09 14:55:40


8 | Cleaned:
Bitcoin = $1k. First they ignore you. Bitcoin = $10k. Then they laugh at you. Bitcoin =
```

$100k. Then they fight you
Polarity: 0.275 Date: 2021-10-09 14:55:40

9 | User: binance | Followers: 5347767 | Not cleaned
In 13 years 99% of #Bitcoin will be mined. https://t.co/4mGvNC4MqF

Polarity: 0.0 Date: 2021-10-09 15:30:11

9 | Cleaned:
In 13 years 99% of #Bitcoin will be mined.
Polarity: 0.0 Date: 2021-10-09 15:30:11

10 | User: charliebilello | Followers: 312878 | Not cleaned
Bitcoin returns since 2010...

$BTC https://t.co/Az7HepXGpp

Polarity: 0.0 Date: 2021-10-09 15:40:45

10 | Cleaned:
Bitcoin returns since 2010... $BTC
Polarity: 0.0 Date: 2021-10-09 15:40:45

11 | User: davidgokhshtein | Followers: 442172 | Not cleaned
And whether you like it or not — $SHIB would have made you this amount and you could ha
ve done whatever you wanted… https://t.co/9X1h85eBpr

Polarity: 0.0 Date: 2021-10-09 17:40:18

11 | Cleaned:
And whether you like it or not $SHIB would have made you this amount and you could have
done whatever you wanted
Polarity: 0.0 Date: 2021-10-09 17:40:18

12 | User: saylor | Followers: 1657911 | Not cleaned
#Bitcoin is the most disruptive technology of the decade. My comprehensive discussion o
f monetary dynamics includin… https://t.co/MHwht87UD7

Polarity: 0.5 Date: 2021-10-09 18:47:05

12 | Cleaned:
#Bitcoin is the most disruptive technology of the decade. My comprehensive discussion o
f monetary dynamics includin
Polarity: 0.5 Date: 2021-10-09 18:47:05

13 | User: elliotrades | Followers: 353661 | Not cleaned
Sharing a theory that will completely infuriate everyone at 2PM PST.

Share and comment "i'm upset" with your ETH… https://t.co/jF8mL18uKK

Polarity: 0.1 Date: 2021-10-09 19:00:01

13 | Cleaned:
Sharing a theory that will completely infuriate everyone at 2PM PST. Share and comment
"i'm upset" with your ETH
Polarity: 0.1 Date: 2021-10-09 19:00:01

14 | User: scottmelker | Followers: 613932 | Not cleaned
$BTC

250K by March.

Possible.

Once the equilibrium (center line) of the channel is flipped to support, the targe… htt
ps://t.co/9MngWEzDHV

Polarity: -0.05 Date: 2021-10-09 21:31:22

14 | Cleaned:
$BTC 250K by March. Possible. Once the equilibrium (center line) of the channel is flip
ped to support, the targe
Polarity: -0.05 Date: 2021-10-09 21:31:22

0 | User: APompliano | Followers: 1190469 | Not cleaned
Satoshi Nakamoto revolutionized the financial industry by creating Bitcoin in 2008.

Now Bitcoin miners are in the… https://t.co/3xFFN35tsb

Polarity: 0.0 Date: 2021-10-10 00:14:08

0 | Cleaned:
Satoshi Nakamoto revolutionized the financial industry by creating Bitcoin in 2008. Now
Bitcoin miners are in the
Polarity: 0.0 Date: 2021-10-10 00:14:08

1 | User: florsbeny | Followers: 350004 | Not cleaned
Choose a Bear or a Bull at mint and win prizes when ETH is 📈📉

Bears Vs Bulls is coming soon Public Sale: 11/2 Pre… https://t.co/miuCobOtwq

Polarity: 0.4 Date: 2021-10-10 00:38:11

1 | Cleaned:
Choose a Bear or a Bull at mint and win prizes when ETH is Bears Vs Bulls is coming soo
n Public Sale: 11/2 Pre
Polarity: 0.4 Date: 2021-10-10 00:38:11

2 | User: nayibbukele | Followers: 3029350 | Not cleaned
We'll start building this pet hospital with our #BTC profits. https://t.co/ontf9xiZJT

Polarity: 0.0 Date: 2021-10-10 02:52:50

2 | Cleaned:
Well start building this pet hospital with our #BTC profits.
Polarity: 0.0 Date: 2021-10-10 02:52:50

3 | User: APompliano | Followers: 1190469 | Not cleaned
The President of El Salvador is reporting that the country is going to build this pet h
ospital with a portion of th… https://t.co/24Yvzadebg

Polarity: 0.0 Date: 2021-10-10 03:05:02

3 | Cleaned:

The President of El Salvador is reporting that the country is going to build this pet h
ospital with a portion of th
Polarity: 0.0 Date: 2021-10-10 03:05:02

4 | User: Swipeio | Followers: 20382 | Not cleaned
#Swipe is giving away $10,000 in #BTC at $1,000 each to 10 winners!🤑

To enter:
Follow @Swipeio
Retweet & Like
Tag… https://t.co/km3uLdEaB4

Polarity: 0.0 Date: 2021-10-10 03:58:13

4 | Cleaned:
#Swipe is giving away $10,000 in #BTC at $1,000 each to 10 winners! To enter: Follow Re
tweet & Like Tag
Polarity: 0.0 Date: 2021-10-10 03:58:13

5 | User: nayibbukele | Followers: 3029350 | Not cleaned
#Bitcoin is good for pets.

Polarity: 0.7 Date: 2021-10-10 04:28:42

5 | Cleaned:
#Bitcoin is good for pets.
Polarity: 0.7 Date: 2021-10-10 04:28:42

6 | User: saylor | Followers: 1657911 | Not cleaned
"If you don't have a plan, you become part of someone else's plan." - Terence McKenna o
n #Bitcoin

Polarity: 0.0 Date: 2021-10-10 12:35:59

6 | Cleaned:
If you dont have a plan, you become part of someone elses plan. - Terence McKenna on #B
itcoin
Polarity: 0.0 Date: 2021-10-10 12:35:59

7 | User: BitcoinMagazine | Followers: 1432105 | Not cleaned
NEW — El Salvador to invest national #Bitcoin gains in new veterinary hospital.

Fix the money, fix the world 🙌
https://t.co/twdGA3oJo6

Polarity: 0.13636363636363635 Date: 2021-10-10 13:57:46

7 | Cleaned:
NEW El Salvador to invest national #Bitcoin gains in new veterinary hospital. Fix the m
oney, fix the world
Polarity: 0.13636363636363635 Date: 2021-10-10 13:57:46

8 | User: danheld | Followers: 401893 | Not cleaned
More companies will buy Bitcoin.
More countries will buy Bitcoin.
More funds will buy Bitcoin.

We're still so early.

Polarity: 0.4 Date: 2021-10-10 15:46:30

8 | Cleaned:
More companies will buy Bitcoin. More countries will buy Bitcoin. More funds will buy B
itcoin. Were still so early.
Polarity: 0.4 Date: 2021-10-10 15:46:30

9 | User: BarrySilbert | Followers: 583615 | Not cleaned
Twitter is going to be so annoying when bitcoin hits an all time high

Polarity: -0.32 Date: 2021-10-10 15:49:54

9 | Cleaned:
Twitter is going to be so annoying when bitcoin hits an all time high
Polarity: -0.32 Date: 2021-10-10 15:49:54

10 | User: BitcoinMagazine | Followers: 1432105 | Not cleaned
US Senator: #Bitcoin should be part of "every investment portfolio." us https://t.co/K8
kKYwlXbw

Polarity: 0.0 Date: 2021-10-10 16:05:27

10 | Cleaned:
US Senator: #Bitcoin should be part of every investment portfolio.
Polarity: 0.0 Date: 2021-10-10 16:05:27

11 | User: saylor | Followers: 1657911 | Not cleaned
#Bitcoin is a bank in cyberspace run by incorruptible software. https://t.co/Uuj3RuExk
5

Polarity: 0.5 Date: 2021-10-10 17:56:38

11 | Cleaned:
#Bitcoin is a bank in cyberspace run by incorruptible software.
Polarity: 0.5 Date: 2021-10-10 17:56:38

12 | User: nic__carter | Followers: 258864 | Not cleaned
Transcribed Sen. Ted Cruz' comments on Bitcoin and energy from the Texas Blockchain Sum
mit this week. My jaw droppe… https://t.co/3JAEyH6emr

Polarity: 0.0 Date: 2021-10-10 18:14:04

12 | Cleaned:
Transcribed Sen. Ted Cruz' comments on Bitcoin and energy from the Texas Blockchain Sum
mit this week. My jaw droppe
Polarity: 0.0 Date: 2021-10-10 18:14:04

13 | User: saylor | Followers: 1657911 | Not cleaned
#Bitcoin is superior due to engineering, not tribalism. The protocol is better suited t
o organic growth of a decent… https://t.co/n7NWaecwK4

Polarity: 0.35833333333333334 Date: 2021-10-10 20:34:31

13 | Cleaned:
#Bitcoin is superior due to engineering, not tribalism. The protocol is better suited t

o organic growth of a decent
Polarity: 0.3104166666666667 Date: 2021-10-10 20:34:31

14 | User: Benaskren | Followers: 480736 | Not cleaned
Lebanon froze their citizens savings. This doesn't resonate bc you don't think it can
happen to you.   It can.… https://t.co/NTX49gsgXG

Polarity: 0.0 Date: 2021-10-10 22:06:02

14 | Cleaned:
Lebanon froze their citizens savings. This doesnt resonate bc you dont think it can hap
pen to you. It can.
Polarity: 0.0 Date: 2021-10-10 22:06:02

0 | User: WatcherGuru | Followers: 53733 | Not cleaned
Earlier this year, #Ethereum creator Vitalik Buterin donated $1,000,000,000 worth of $S
HIB to help India fight COVID-19

Polarity: 0.15 Date: 2021-10-11 02:57:54

0 | Cleaned:
Earlier this year, #Ethereum creator Vitalik Buterin donated $1,000,000,000 worth of $S
HIB to help India fight COVID-19
Polarity: 0.15 Date: 2021-10-11 02:57:54

1 | User: seankelly25 | Followers: 81767 | Not cleaned
0.1 ETH ($350) or CHIBI DINO NFT GIVEAWAY

To Enter:
1 Follow
@DinosChibi
2 RT
3 Tag a friend on this post

Win… https://t.co/kM1eB5uMYt

Polarity: 0.0 Date: 2021-10-11 05:13:25

1 | Cleaned:
0.1 ETH ($350) or CHIBI DINO NFT GIVEAWAY To Enter: 1Follow 2RT 3Tag a friend on this p
ost Win
Polarity: 0.8 Date: 2021-10-11 05:13:25

2 | User: BitcoinMagazine | Followers: 1432105 | Not cleaned
Billionaire investor Bill Miller: "Bitcoin is a lot less risky at $43,000 than it was a
t $300." https://t.co/u5Hib3S6tF

Polarity: -0.16666666666666666 Date: 2021-10-11 11:23:12

2 | Cleaned:
Billionaire investor Bill Miller: "Bitcoin is a lot less risky at $43,000 than it was a
t $300."
Polarity: -0.16666666666666666 Date: 2021-10-11 11:23:12

3 | User: BitcoinMagazine | Followers: 1432105 | Not cleaned
#Bitcoin holders in El Salvador are up 40% in just 21 days.🧡

Polarity: 0.0 Date: 2021-10-11 12:54:13

3 | Cleaned:
#Bitcoin holders in El Salvador are up 40% in just 21 days.
Polarity: 0.0 Date: 2021-10-11 12:54:13

4 | User: marenaltman | Followers: 140198 | Not cleaned
just was in a meeting w some elite emirati investors

didn't ask about bitcoin

didn't ask about eth

didn't ask… https://t.co/Wi1drMXjth

Polarity: 0.0 Date: 2021-10-11 14:17:49

4 | Cleaned:
just was in a meeting w some elite emirati investors didnt ask about bitcoin didnt ask
about eth didnt ask
Polarity: 0.0 Date: 2021-10-11 14:17:49

5 | User: tedcruz | Followers: 4584485 | Not cleaned
Cruz Says Texas Should Use Wasted Natural Gas to Mine BTC #bitcoin https://t.co/Pe3P0vF
LX2

Polarity: -0.05 Date: 2021-10-11 15:53:49

5 | Cleaned:
Cruz Says Texas Should Use Wasted Natural Gas to Mine BTC #bitcoin
Polarity: -0.05 Date: 2021-10-11 15:53:49

6 | User: BitcoinMagazine | Followers: 1432105 | Not cleaned
Google has partnered with Bakkt to provide #Bitcoin payment solutions. https://t.co/bUq
GB4yPln

Polarity: 0.0 Date: 2021-10-11 16:38:23

6 | Cleaned:
Google has partnered with Bakkt to provide #Bitcoin payment solutions.
Polarity: 0.0 Date: 2021-10-11 16:38:23

7 | User: APompliano | Followers: 1190469 | Not cleaned
We just had @100trillionUSD on YouTube to discuss bitcoin and our channel was deleted.

We have no strikes and didn… https://t.co/Z8jSeznMQL

Polarity: 0.0 Date: 2021-10-11 17:01:35

7 | Cleaned:
We just had on YouTube to discuss bitcoin and our channel was deleted. We have no strik
es and didn
Polarity: 0.0 Date: 2021-10-11 17:01:35

8 | User: APompliano | Followers: 1190469 | Not cleaned
YouTube has officially attempted to de-platform me from their platform.

They are claiming that we "encourage illeg… https://t.co/UYa9STFkyx

Polarity: 0.0 Date: 2021-10-11 18:27:29

8 | Cleaned:
YouTube has officially attempted to de-platform me from their platform. They are claimi
ng that we "encourage illeg
Polarity: 0.0 Date: 2021-10-11 18:27:29

9 | User: APompliano | Followers: 1190469 | Not cleaned
Our YouTube channel was just reinstated with zero explanation from the company.

Here is the interview with… https://t.co/QzHrvF2Msp

Polarity: 0.0 Date: 2021-10-11 20:18:56

9 | Cleaned:
Our YouTube channel was just reinstated with zero explanation from the company. Here is
the interview with
Polarity: 0.0 Date: 2021-10-11 20:18:56

10 | User: RicardoBSalinas | Followers: 938395 | Not cleaned
In 8 days it's my birthday, should I GIVEAWAY $1,000,000 pesos or 1 #bitcoin to whoever
I want? 🤔

RULES:

1. Downl… https://t.co/bVOi068zro

Polarity: 0.0 Date: 2021-10-11 20:42:11

10 | Cleaned:
In 8 days it's my birthday, should I GIVEAWAY $1,000,000 pesos or 1 #bitcoin to whoever
I want? RULES: 1. Downl
Polarity: 0.0 Date: 2021-10-11 20:42:11

11 | User: VinnyLingham | Followers: 202435 | Not cleaned
This is why Ethereum is broken...I just tried to mint an NFT on a new drop. https://t.c
o/zg8hwMQb61

Polarity: 0.13636363636363635 Date: 2021-10-11 21:46:24

11 | Cleaned:
This is why Ethereum is broken...I just tried to mint an NFT on a new drop.
Polarity: 0.13636363636363635 Date: 2021-10-11 21:46:24

12 | User: saylor | Followers: 1657911 | Not cleaned
The critical question faced by bankers and investors worldwide is "Do you understand #B
itcoin?" https://t.co/FdQcqXoZ02

Polarity: 0.0 Date: 2021-10-11 22:08:09

12 | Cleaned:
The critical question faced by bankers and investors worldwide is Do you understand #Bi
tcoin?
Polarity: 0.0 Date: 2021-10-11 22:08:09

0 | User: danheld | Followers: 401893 | Not cleaned
Each red dot represents a time when journalists declared Bitcoin dead.

When will they realize that Bitcoin is unst… https://t.co/fB0WuSIefZ

Polarity: -0.1 Date: 2021-10-12 17:15:28

0 | Cleaned:
Each red dot represents a time when journalists declared Bitcoin dead. When will they r
ealize that Bitcoin is unst
Polarity: -0.1 Date: 2021-10-12 17:15:28

1 | User: FEGtoken | Followers: 265112 | Not cleaned
Did you know that https://t.co/QpjoeJGerO offers an option to buy feg eth with multiple
types of crypto? 🦘💪🔥 https://t.co/tIso6CKssV

Polarity: 0.05 Date: 2021-10-12 19:31:49

1 | Cleaned:
Did you know that offers an option to buy feg eth with multiple types of crypto?
Polarity: 0.05 Date: 2021-10-12 19:31:49

2 | User: elliotrades | Followers: 353661 | Not cleaned
The Games are just beginning. If you think this is over, you've already lost.

Share and comment "winner" with you… https://t.co/hFkNs703vt

Polarity: 0.0 Date: 2021-10-12 19:40:52

2 | Cleaned:
The Games are just beginning. If you think this is over, you've already lost. Share and
comment "winner" with you
Polarity: 0.0 Date: 2021-10-12 19:40:52

3 | User: raphschoen | Followers: 2084 | Not cleaned
Boring is better:

1. Focus on Bitcoin
2. Buy 25, 50 or 100 Euro a month
3. Don't time the market
4. Wait

Polarity: -0.25 Date: 2021-10-12 19:47:01

3 | Cleaned:
Boring is better: 1. Focus on Bitcoin 2. Buy 25, 50 or 100 Euro a month 3. Don't time t
he market 4. Wait
Polarity: -0.25 Date: 2021-10-12 19:47:01

4 | User: APompliano | Followers: 1190469 | Not cleaned
Yesterday we were erroneously kicked off YouTube.

We should be very, very worried about the fact that a single em… https://t.co/XvVfpm2og
j

Polarity: -0.1038095238095238 Date: 2021-10-12 20:01:19

4 | Cleaned:
Yesterday we were erroneously kicked off YouTube. We should be very, very worried about the fact that a single em
Polarity: -0.1038095238095238 Date: 2021-10-12 20:01:19

5 | User: BitcoinMagazine | Followers: 1432105 | Not cleaned
"The best strategy is to buy #bitcoin and wait." - @saylor https://t.co/norpacfCjK

Polarity: 1.0 Date: 2021-10-12 21:02:00

5 | Cleaned:
"The best strategy is to buy #bitcoin and wait." -
Polarity: 1.0 Date: 2021-10-12 21:02:00

6 | User: davidgokhshtein | Followers: 442172 | Not cleaned
Asia, I ask you not to drop the ball and send the entire market 🚀

#bitcoin and all the inu's 😂

Polarity: 0.0 Date: 2021-10-12 21:46:50

6 | Cleaned:
Asia, I ask you not to drop the ball and send the entire market #bitcoin and all the in us
Polarity: 0.0 Date: 2021-10-12 21:46:50

7 | User: BitcoinMagazine | Followers: 1432105 | Not cleaned
IMF: We don't recommend Bitcoin as a national currency.

#Bitcoin: We don't care.

Polarity: 0.0 Date: 2021-10-12 22:12:07

7 | Cleaned:
IMF: We don't recommend Bitcoin as a national currency. #Bitcoin: We don't care.
Polarity: 0.0 Date: 2021-10-12 22:12:07

8 | User: MoneyMan | Followers: 437649 | Not cleaned
Bitcoin is king rn most alts will have there time a lil later

Polarity: 0.25 Date: 2021-10-12 22:53:10

8 | Cleaned:
Bitcoin is king rn most alts will have there time a lil later
Polarity: 0.25 Date: 2021-10-12 22:53:10

9 | User: TheCryptoLark | Followers: 568967 | Not cleaned
Yo! That daily candle on #bitcoin was crazy! Nice to see buyers stepping up in a serious way. https://t.co/zkrleB01is

Polarity: -0.12083333333333333 Date: 2021-10-12 23:03:10

9 | Cleaned:
Yo! That daily candle on #bitcoin was crazy! Nice to see buyers stepping up in a serious way.
Polarity: -0.12083333333333333 Date: 2021-10-12 23:03:10

10 | User: APompliano | Followers: 1190469 | Not cleaned
There are only 900 new bitcoin that come into the circulating supply every day.

The apex predator becomes harder… https://t.co/zCwyVEqnvm

Polarity: 0.06818181818181818 Date: 2021-10-12 23:31:00

10 | Cleaned:
There are only 900 new bitcoin that come into the circulating supply every day. The ape
x predator becomes harder
Polarity: 0.012121212121212116 Date: 2021-10-12 23:31:00

11 | User: davidgokhshtein | Followers: 442172 | Not cleaned
$SHIB Gets More Mentions on Twitter Than #Bitcoin, #Ethereum, $DOGE https://t.co/HtzCTf
dJXk

This is good for the s… https://t.co/Jtrs30yYFN

Polarity: 0.6 Date: 2021-10-12 23:34:18

11 | Cleaned:
$SHIB Gets More Mentions on Twitter Than #Bitcoin, #Ethereum, $DOGE This is good for th
e s
Polarity: 0.6 Date: 2021-10-12 23:34:18

12 | User: BitcoinMagazine | Followers: 1432105 | Not cleaned
#Bitcoin market cap is now 2x Visa

Polarity: 0.0 Date: 2021-10-12 23:59:14

12 | Cleaned:
#Bitcoin market cap is now 2x Visa
Polarity: 0.0 Date: 2021-10-12 23:59:14

0 | User: BitcoinMagazine | Followers: 1432105 | Not cleaned
BREAKING - U.S. now has 35.4% of global #Bitcoin mining power. https://t.co/Vhjqm7By1S

Polarity: 0.0 Date: 2021-10-13 11:00:45

0 | Cleaned:
BREAKING - U.S. now has 35.4% of global #Bitcoin mining power.
Polarity: 0.0 Date: 2021-10-13 11:00:45

1 | User: BitcoinMagazine | Followers: 1432105 | Not cleaned
JUST IN – Canada's largest #Bitcoin ETF to open to mutual fund investors CA https://t.c
o/V8dvnkZUPf

Polarity: 0.0 Date: 2021-10-13 12:44:53

1 | Cleaned:
JUST IN Canada's largest #Bitcoin ETF to open to mutual fund investors
Polarity: 0.0 Date: 2021-10-13 12:44:53

2 | User: saylor | Followers: 1657911 | Not cleaned
"The future is already here, it's just not evenly distributed." - William Gibson on #Bi
tcoin

Polarity: 0.0 Date: 2021-10-13 12:45:13

2 | Cleaned:
The future is already here, its just not evenly distributed. - William Gibson on #Bitco
in
Polarity: 0.0 Date: 2021-10-13 12:45:13

3 | User: ftchina | Followers: 1084002 | Not cleaned
The US overtook China as the world's biggest source of bitcoin mining two months after
Beijing banned crypto mining… https://t.co/UUMyuadYRK

Polarity: 0.0 Date: 2021-10-13 13:00:16

3 | Cleaned:
The US overtook China as the worlds biggest source of bitcoin mining two months after B
eijing banned crypto mining
Polarity: 0.0 Date: 2021-10-13 13:00:16

4 | User: saylor | Followers: 1657911 | Not cleaned
My handle has changed to @saylor, but the song remains the same. #Bitcoin

Polarity: 0.0 Date: 2021-10-13 13:12:33

4 | Cleaned:
My handle has changed to , but the song remains the same. #Bitcoin
Polarity: 0.0 Date: 2021-10-13 13:12:33

5 | User: danheld | Followers: 401893 | Not cleaned
Nothing makes me more bullish about Bitcoin than listening to a bunch of old politician
s.

Polarity: 0.3 Date: 2021-10-13 15:47:04

5 | Cleaned:
Nothing makes me more bullish about Bitcoin than listening to a bunch of old politician
s.
Polarity: 0.3 Date: 2021-10-13 15:47:04

6 | User: gladstein | Followers: 106593 | Not cleaned
1/ My new essay "The Quest for Digital Cash" follows the evolution of eCash to Bitcoin,
the career of @adam3us, and… https://t.co/Q5egi7OBda

Polarity: 0.06818181818181818 Date: 2021-10-13 15:58:55

6 | Cleaned:
1/ My new essay "The Quest for Digital Cash" follows the evolution of eCash to Bitcoin,
the career of , and
Polarity: 0.06818181818181818 Date: 2021-10-13 15:58:55

7 | User: BitcoinMagazine | Followers: 1432105 | Not cleaned
Miami just needs state approval to put "#Bitcoin on balance sheet." - Mayor Suarez http
s://t.co/CXvDdGmYaW

Polarity: 0.0 Date: 2021-10-13 15:59:27

7 | Cleaned:
Miami just needs state approval to put "#Bitcoin on balance sheet." - Mayor Suarez

Polarity: 0.0 Date: 2021-10-13 15:59:27

8 | User: CoinMarketCap | Followers: 2987829 | Not cleaned
The 2020 new comers diving into the crypto rabbit hole

Dogecoin
👇
Safemoon
👇
Shiba Inu
👇
Memecoins
👇
Ethereum
👇
C… https://t.co/Bf0DPqEFBK

Polarity: 0.13636363636363635 Date: 2021-10-13 16:00:03

8 | Cleaned:
The 2020 new comers diving into the crypto rabbit hole Dogecoin Safemoon Shiba Inu Meme
coins Ethereum C
Polarity: 0.13636363636363635 Date: 2021-10-13 16:00:03

9 | User: luciano_eltirri | Followers: 1252100 | Not cleaned
✨@FomoChronicles IDO from 11th-14th October include Poolz+NFTPAD+TruePNL+Synapse! ✨
🔥I'm super excited! Are you?🔥… https://t.co/HdqqG2ryRx

Polarity: 0.40104166666666663 Date: 2021-10-13 17:18:42

9 | Cleaned:
IDO from 11th-14th October include Poolz+NFTPAD+TruePNL+Synapse! I'm super excited! Are
you?
Polarity: 0.40104166666666663 Date: 2021-10-13 17:18:42

10 | User: DjPrestigeUk | Followers: 99845 | Not cleaned
Hidden Gem alert right here
@defidotoken 30 days old, discount price right now #NFA

◆Just listed on Hotbit
◆Their… https://t.co/eoQOEt5vfX

Polarity: 0.1261904761904762 Date: 2021-10-13 19:40:25

10 | Cleaned:
Hidden Gem alert right here 30 days old, discount price right now #NFA Just listed on H
otbit Their
Polarity: 0.1261904761904762 Date: 2021-10-13 19:40:25

11 | User: charliebilello | Followers: 312878 | Not cleaned
Bitcoin Market Cap...
Oct 2011: $30 million
Oct 2012: $122 million
Oct 2013: $1.6 billion
Oct 2014: $5.4 billion
Oc… https://t.co/6PK2ztWOz8

```
Polarity: 0.0 Date: 2021-10-13 20:10:50

11 | Cleaned:
Bitcoin Market Cap... Oct 2011: $30 million Oct 2012: $122 million Oct 2013: $1.6 billi
on Oct 2014: $5.4 billion Oc
Polarity: 0.0 Date: 2021-10-13 20:10:50
```
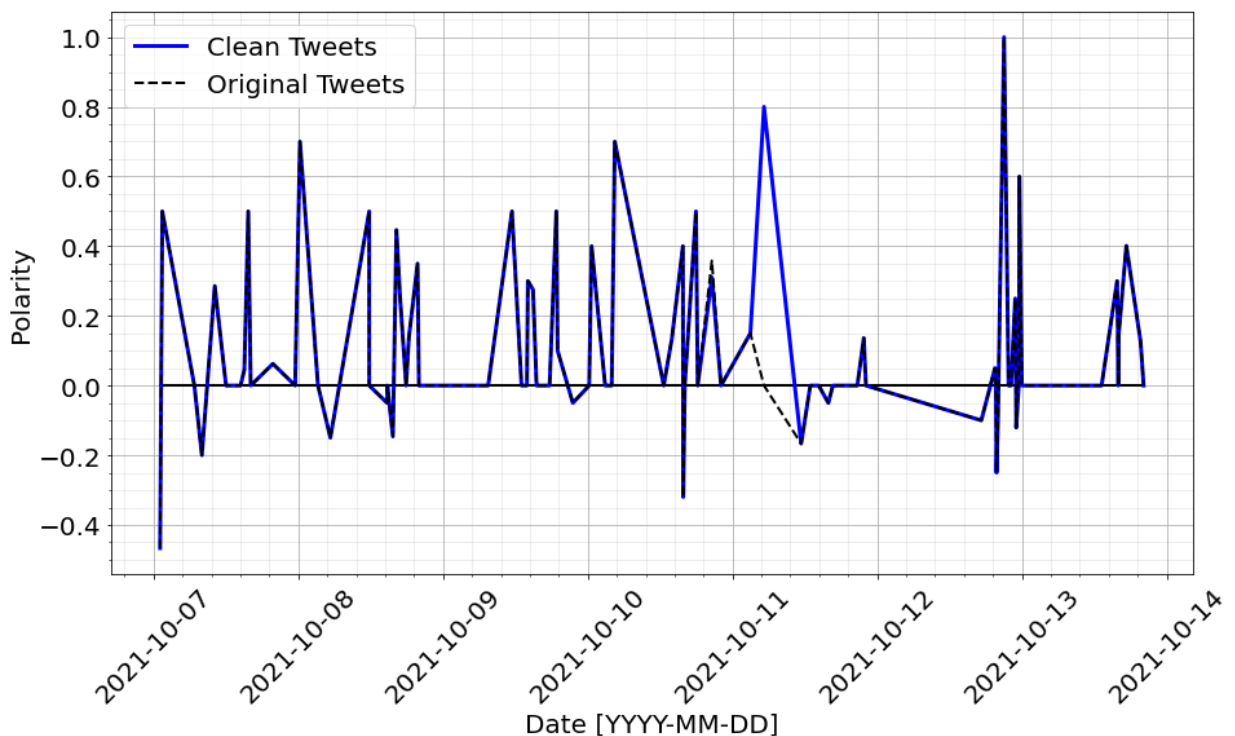
In [4]:
```python
fig, ax = plt.subplots(figsize=(15,8))
fig.suptitle('Tweets Polarity')
ax.plot(date_tweet, list(0 for i in range(len(date_tweet))), color='k', linewidth=2)
ax.plot(date_tweet, polarities, color='b', linewidth=3, label='Clean Tweets')
ax.plot(date_tweet, unclean_pol, '--', color='k', linewidth=2, label='Original Tweets')
plt.ylabel('Polarity');
plt.xlabel('Date [YYYY-MM-DD]');
plt.xticks(rotation=45)
plt.grid();
plt.minorticks_on();
plt.grid(b=True, which='minor', color='#999999', linestyle='-', alpha=0.2);
ax.xaxis.set_major_formatter(mdates.DateFormatter('%Y-%m-%d'));
ax.legend();
```


In [5]:
```python
data = list(zip(date_tweet,polarities)); #joining the data to create a data frame
df = pd.DataFrame(data, columns=['date', 'polarity'])
display(df);

fig, axs = plt.subplots(1, 1, figsize=(15, 8))
axs.plot(date_tweet, list(0 for i in range(len(date_tweet))), color='k', linewidth=2)
axs.plot(date_tweet, polarities, color='b');
axs.grid();
plt.xticks(rotation=45)
axs.minorticks_on();
```
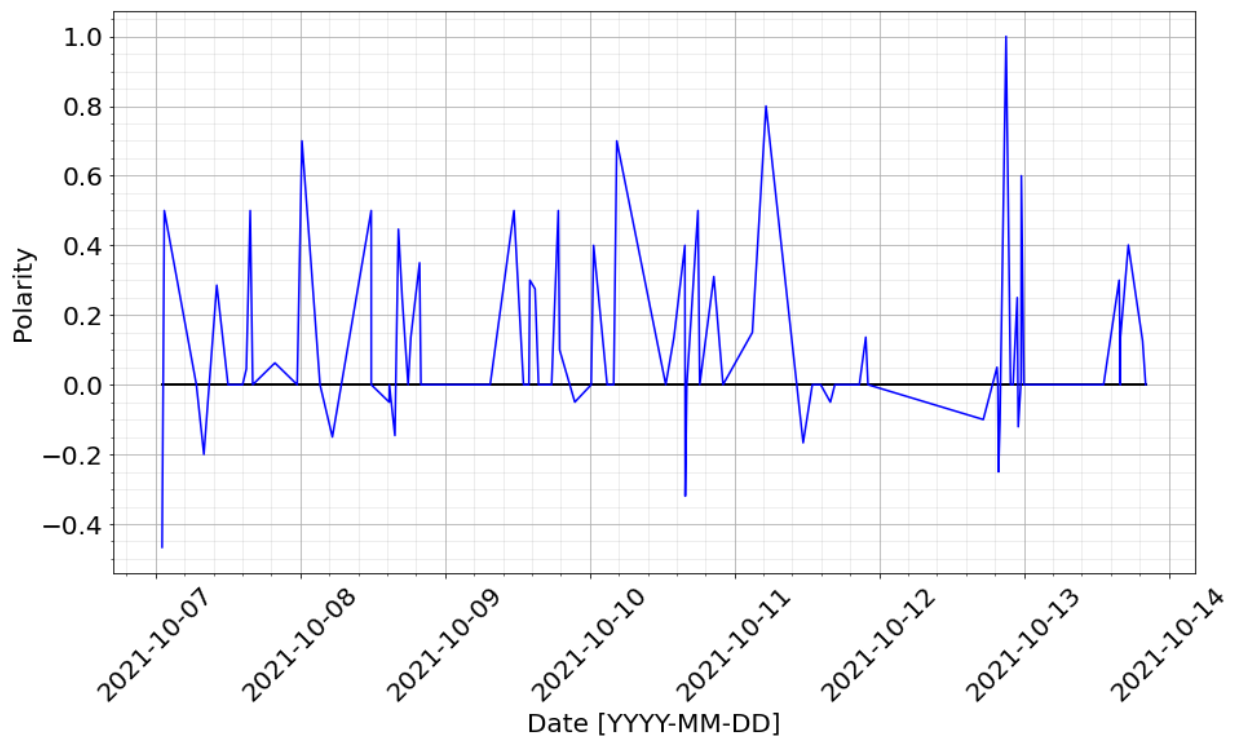
```python
axs.grid(b=True, which='minor', color='#999999', linestyle='-', alpha=0.2);
plt.ylabel('Polarity');
plt.xlabel('Date [YYYY-MM-DD]');
```

	date	polarity
0	2021-10-07 01:04:51	-0.466667
1	2021-10-07 01:26:38	0.500000
2	2021-10-07 06:45:48	0.000000
3	2021-10-07 08:00:34	-0.200000
4	2021-10-07 10:08:46	0.285714
...	...	...
89	2021-10-13 15:59:27	0.000000
90	2021-10-13 16:00:03	0.136364
91	2021-10-13 17:18:42	0.401042
92	2021-10-13 19:40:25	0.126190
93	2021-10-13 20:10:50	0.000000

94 rows × 2 columns


```python
In [6]:  import scipy #smoothing the graph
         x_new = np.linspace(0, len(date_tweet), 1000)
         smooth = scipy.interpolate.make_interp_spline(
             [i for i in range(0, len(date_tweet))],
             polarities,
             k=3,
         );
         pol_new = smooth(x_new)
```

```python
#To ensure we don't have outliers after interpolating
for n, p in enumerate(pol_new):
    if p > 1:
        pol_new[n] = 1;
    elif p < -1:
        pol_new[n] = -1;


data2 = list(zip(pol_new,x_new)); #joining the data to create a data frame
df2 = pd.DataFrame(data2, columns=['polarity', 'date'])
display(df2);

plt.figure(figsize = (15, 8))
plt.plot(x_new, list(0 for i in range(len(x_new))), color='k', linewidth=2)
plt.plot(x_new, pol_new, color='b');
plt.xticks(rotation=45);
plt.grid();
plt.minorticks_on();
plt.grid(b=True, which='minor', color='#999999', linestyle='-', alpha=0.2);
plt.ylabel('Polarity');
plt.xlabel('Date');
```
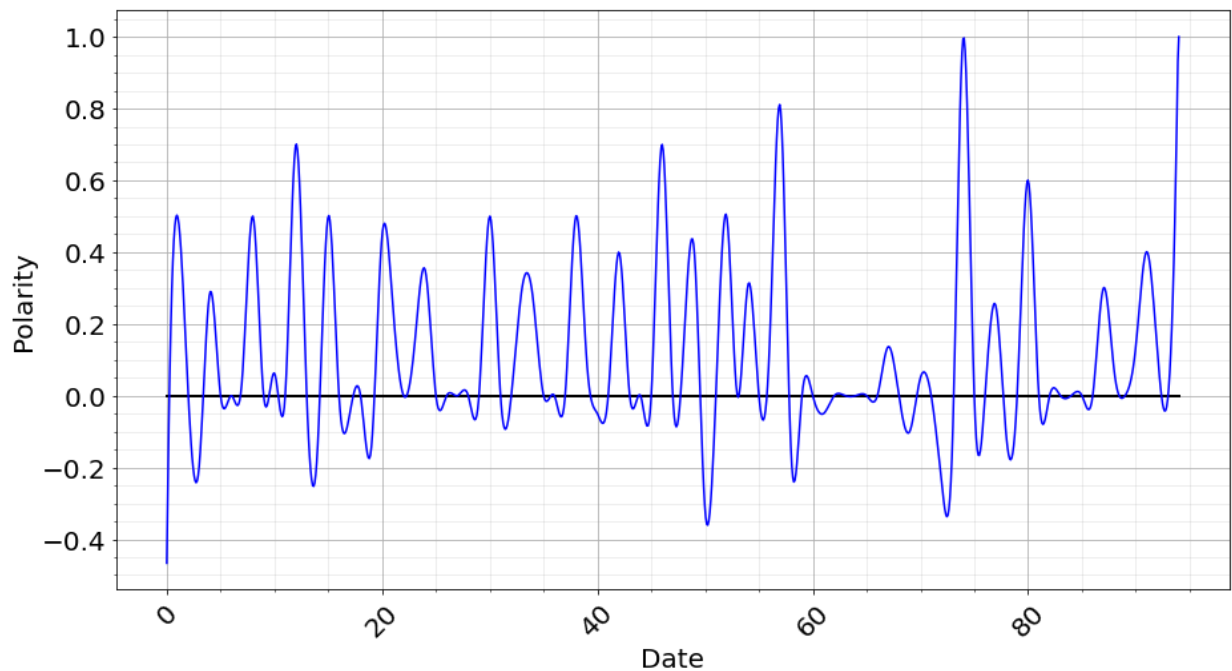
	polarity	date
0	-0.466667	0.000000
1	-0.260468	0.094094
2	-0.082875	0.188188
3	0.067736	0.282282
4	0.192985	0.376376
...	...	...
995	0.482568	93.623624
996	0.614036	93.717718
997	0.763515	93.811812
998	0.931918	93.905906
999	1.000000	94.000000

1000 rows × 2 columns

Extracting tweets from the well known celebrities/influencers in the cryptocurrency world. These are:

- Elon Musk @elonmusk
- Vitalik Buterin @VitalikButerin
- Michael Saylor @michael_saylor
- Mark Cuban @mcuban
- Roger Ver @rogerkver
- Charlie Lee @SatoshiLite
- Mike Novogratz @novogratz
- Michael Sonnenshein @Sonnenshein

```
In [11]:  df2 = df.set_index('date').resample('8H').fillna('pad');
          df_zeros = df2.applymap(lambda x: 0) #this df is only for visualization
          influencers = ['elonmusk', 'VitalikButerin', 'michael_saylor', 'mcuban', 'rogerkver', 'S
          def get_tweets(user):
              queries = 'from:'+user+ ' (BTC OR Bitcoin OR bitcoin OR ETHEREUM OR btc OR #btc OR #
              tweets = api.search(queries, lang='en', result_type='popular') #for using the free A
              tweets.sort(key=lambda tweet: tweet.created_at)
              polarities = [];
              date_tweet = [];
              if len(tweets) > 0:
                  for n, tweet in enumerate(tweets):
                      #followers = tweet.user.followers_count;
                      #print(f'{n} | User: {tweet.user.screen_name} | Followers: {followers} | Not
                      #print(f'Polarity: {TextBlob(tweet.full_text).sentiment.polarity} Date: {twe
                      cleanTweet = prep.clean(tweet.text);
                      polarity = TextBlob(cleanTweet).sentiment.polarity;
                      #print(f'{n} | Cleaned:\n{cleanTweet}\nPolarity: {polarity} Date: {tweet.cre
                      polarities.append(polarity);
                      date_tweet.append(tweet.created_at)
              return polarities, date_tweet
```
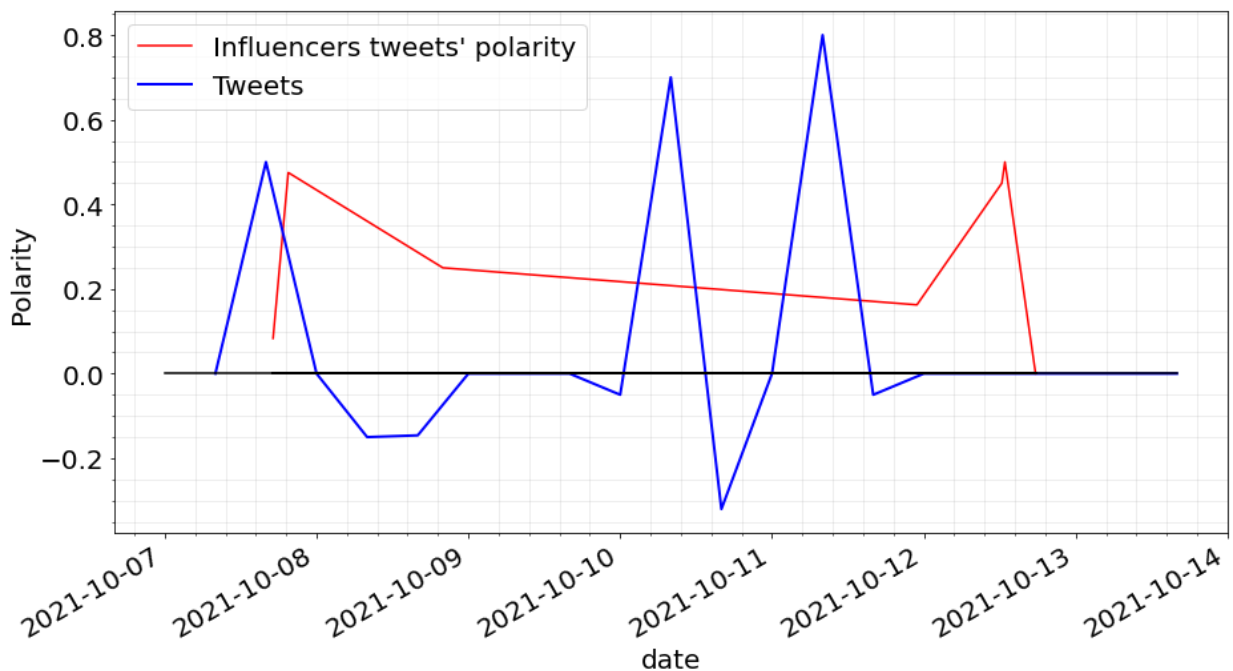
```python
result = list(map(get_tweets, influencers));
inf_pol = [];
inf_date = [];
for i in range(len(result)):
    if result[i] != None:
        for polarity in result[i][0]:
            inf_pol.append(polarity);
        for dates in result[i][1]:
            inf_date.append(dates);

inf_dates, inf_polarities = (list(t) for t in zip(*sorted(zip(inf_date, inf_pol)))); #hi
# we are zipping the lists, giving tuples of (date1, polarity1), (date2, polarity2),...
# when sorting it generates a list of tuples. So we unpack it with *
# As we have (date1, polarity1), (date2, polarity2),... sorted tuples, if we zip them we
# So we are just transformin each of these tuples into a list

fig, axs = plt.subplots(1, 1, figsize=(15, 8))
axs.plot(inf_dates, inf_polarities, color='r', label='Influencers tweets polarity');
axs.grid();
plt.xticks(rotation=45);
axs.minorticks_on();
axs.grid(b=True, which='minor', color='#999999', linestyle='-', alpha=0.2);
plt.ylabel('Polarity');
plt.xlabel('Date [YYYY-MM-DD]');

pl = df2.plot(ax=axs,figsize=(15, 8), linewidth=2, color='b', legend=False);
axs.legend(['Influencers tweets\' polarity','Tweets']);
df_zeros.plot(ax=pl,color='k', legend=False);
axs.plot(inf_dates, list(0 for i in range(len(inf_dates))), color='k', linewidth=2);
```



```python
In [12]:  figure_1, ax1 = plt.subplots(figsize = (15, 8));
          figure_1.suptitle('Cryptocurrency Prices vs User Opinion (Polarity)')
          plot1 = ax1.plot(BTC_close, color='orange', label='Bitcoin');
          plt.ylabel('US$', color='orange');
          plt.xlabel('Date');
```
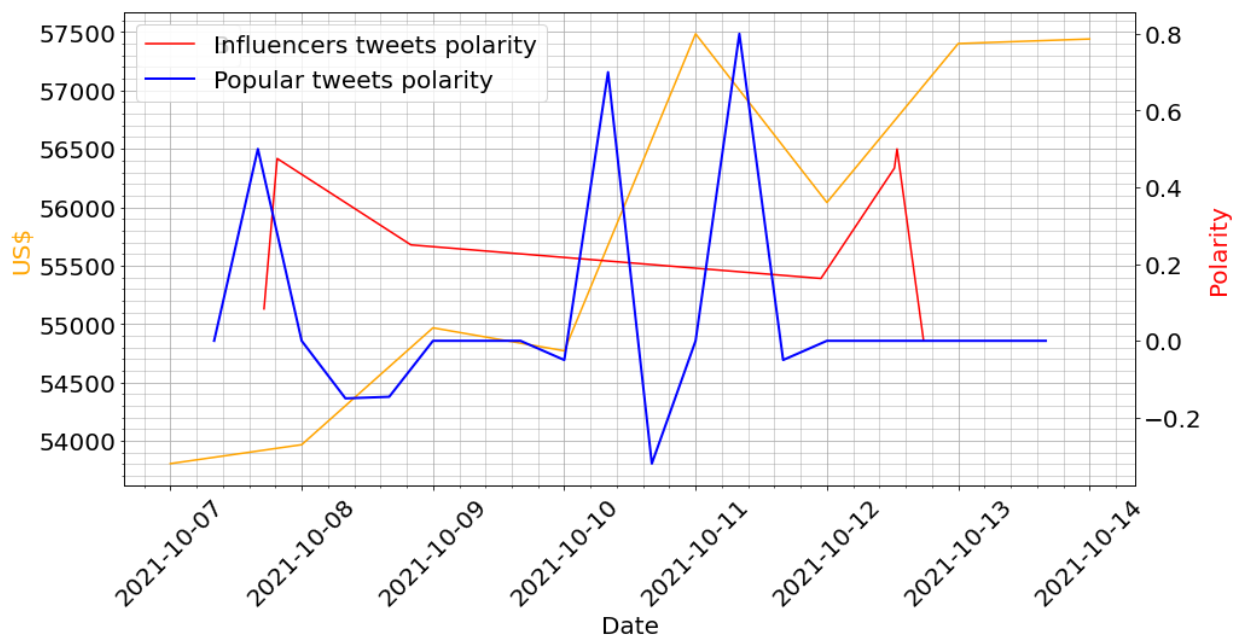
```python
plt.xticks(rotation=45);
plt.grid();
plt.minorticks_on();
plt.grid(b=True, which='minor', color='#999999', linestyle='-', alpha=0.5);

ax2 = ax1.twinx();
plot2 = ax2.plot(inf_dates, inf_polarities, color='r', label='Influencers tweets polarit
plt.ylabel('Polarity', color='r');
plot3 = df2.plot(ax=ax2,figsize=(15, 8), linewidth=2, color='b', legend=False);
ax1.legend('BTC')
ax2.legend(['Influencers tweets polarity','Popular tweets polarity']);
ax2.grid(False)
```


Cryptocurrency Prices vs User Opinion (Polarity)