



Automating Crypto Website API Pull Using Python (Tutorial)

What is CoinMarketCap?

CoinMarketCap.com is a website that gives us data about cryptocurrencies such as prices, trade volumes, market capitalization, and so much more.

Cryptocurrencies									
Categories Bitcoin Ecosystem Telegram Bot FTX Bankruptcy Estate Real World Assets									
#	Name	Price	1h %	24h %	7d %	Market Cap	Volume(24h)	Circulating Supply	Last 7 Days
1	Bitcoin BTC	\$35,308.80	▼ 0.07%	▲ 1.49%	▲ 2.43%	\$689,807,815,816	\$18,456,173,925 522,668 BTC	19,536,425 BTC	
2	Ethereum ETH	\$1,885.15	▲ 0.30%	▲ 0.41%	▲ 4.44%	\$226,723,211,580	\$7,977,149,872 4,232,612 ETH	120,267,721 ETH	
3	Tether USDt USDT	\$1.00	▼ 0.01%	▼ 0.02%	▲ 0.02%	\$86,117,302,048	\$34,641,924,536 34,631,862,329 USDT	86,087,083,167 USDT	
4	BNB BNB	\$246.50	▲ 0.40%	▼ 0.81%	▲ 9.63%	\$37,394,189,030	\$511,104,177 2,072,799 BNB	151,702,475 BNB	
5	XRP XRP	\$0.6806	▲ 0.36%	▼ 0.32%	▲ 12.83%	\$36,491,220,929	\$2,102,572,942 3,090,136,803 XRP	53,615,837,759 XRP	

Project Overview

In this small project/tutorial, I will be trying to automate an API pull every hour from CoinMarketCap.com and see if we can find any insights into the data.

Checking if We Can Connect to The API and Pull Data

In order to pull data from the API and connect to it, we must first register for a free account on CoinMarketCap. After registering, we will be given an unique API Key that allows us to submit up to 333 API Pull requests. We will only be working with the top 15 cryptocurrencies for this project.

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In [1]: from requests import Request, Session
from requests.exceptions import ConnectionError, Timeout, TooManyRedirects
import json
```

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url = 'https://pro-api.coinmarketcap.com/v1/cryptocurrency/listings/latest'
parameters = {
    'start': '1',
    'limit': '15',
    'convert': 'USD'
}
headers = {
    'Accepts': 'application/json',
    'X-CMC_PRO_API_KEY': 'eba70f04-84d6-4bcd-885a-0b9a65cb45af',
}

session = Session()
session.headers.update(headers)

try:
    response = session.get(url, params=parameters)
    data = json.loads(response.text)
    print(data)
except (ConnectionError, Timeout, TooManyRedirects) as e:
    print(e)
```

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773908.621437, 'volume_change_24h': -21.2412, 'percent_change_1h': -0.8935575
2, 'percent_change_24h': 1.46158361, 'percent_change_7d': 13.28627578, 'percen
t_change_30d': 42.61077284, 'percent_change_60d': 29.97912388, 'percent_change
_90d': 4.59259423, 'market_cap': 6544601036.719243, 'market_cap_dominance': 0.
4645, 'fully_diluted_market_cap': 7240365221.21, 'tv': None, 'last_updated':
'2023-11-11T11:55:00.000Z'}}}, {'id': 3717, 'name': 'Wrapped Bitcoin', 'symbo
l': 'WBTC', 'slug': 'wrapped-bitcoin', 'num_market_pairs': 1495, 'date_added':
'2019-01-30T00:00:00.000Z', 'tags': ['medium-of-exchange', 'defi', 'wrapped-to
kens', 'fantom-ecosystem', 'arbitrum-ecosystem', 'moonriver-ecosystem', 'optimi
sm-ecosystem', 'bitcoin-ecosystem', 'ftx-bankruptcy-estate'], 'max_supply': No
ne, 'circulating_supply': 163841.87097067, 'total_supply': 163841.87097067, 'p
latform': {'id': 1027, 'name': 'Ethereum', 'symbol': 'ETH', 'slug': 'etherreu
m', 'token_address': '0x2260fac5e5542a773aa44fbcfedf7c193bc2c599'}, 'infinite_
supply': False, 'cmc_rank': 15, 'self_reported_circulating_supply': None, 'sel

```

```
f_reported_market_cap': None, 'tv_l_ratio': None, 'last_updated': '2023-11-11T11:56:00.000Z', 'quote': {'USD': {'price': 36982.02123181671, 'volume_24h': 199566201.9585031, 'volume_change_24h': -61.0299, 'percent_change_1h': -0.05242986, 'percent_change_24h': -0.06200115, 'percent_change_7d': 6.30457191, 'percent_change_30d': 38.06022164, 'percent_change_60d': 41.75843844, 'percent_change_90d': 25.80846444, 'market_cap': 6059203550.897891, 'market_cap_dominance': 0.4301, 'fully_diluted_market_cap': 6059203550.9, 'tv_l': None, 'last_updated': '2023-11-11T11:56:00.000Z'}}}]}
```

Import Necessary Libraries

```
In [3]: #Import Necessary Libraries
import pandas as pd
import os
from time import time #give us the ability to track time
from time import sleep
```

Normalize the Data

The code below normalizes the data to make it fit nicely into a pandas dataframe. We will create a global variable so that it can be accessed in all code blocks. We would also like to create a new column that gives us the current time for sending an API pull request.

```
In [4]: #This normalizes the data and makes it all pretty in a dataframe
global df
#This allows you to see all the columns, not just like 15
pd.set_option('display.max_columns', None)
pd.set_option('display.max_rows', None)

df = pd.json_normalize(data['data'])
df['Timestamp'] = pd.to_datetime('now') #give us the current time of pulling the data
type(df)
```

```
Out[4]: pandas.core.frame.DataFrame
```

Create Function to Automate API Call

We will be creating a function called api_runner() to automate an API Call to the coinmarketcap website to generate data every time period. We will use the above code and formally put it into a method and append data to the original dataframe.

```
In [7]: def api_runner():
    url = 'https://pro-api.coinmarketcap.com/v1/cryptocurrency/listings/latest'
    parameters = {
        'start': '1',
        'limit': '15',
        'convert': 'USD'
    }
    headers = {
        'Accepts': 'application/json',
        'X-CMC_PRO_API_KEY': 'eba70f04-84d6-4bcd-885a-0b9a65cb45af',
    }
```

```

session = Session()
session.headers.update(headers)

try:
    response = session.get(url, params=parameters)
    data = json.loads(response.text)
    #print(data)
except (ConnectionError, Timeout, TooManyRedirects) as e:
    print(e)

df2 = pd.json_normalize(data['data']) #create dataframe
df2['Timestamp'] = pd.to_datetime('now') #give us the current time of pull

return df2
df_append = pd.DataFrame(df2) #append to original dataframe
df = pd.concat([df2, df_append], ignore_index=True)

```

Run the Function

We will now call the function above through a for loop. Remember! We can only use 333 requests per day! I have also attached optional code that can allow us to add the data from the API into a csv file. You may change the following code to suit your personal needs. For tutorial purposes, we will pull data every minute (4 minutes).

```

In [8]: #running max number 333
for i in range(333):
    df_append = api_runner()
    df = pd.concat([df, df_append], ignore_index=True)

    #Code below to add data to a CSV file
    ...

    if not os.path.isfile(r'/Users/praveenmanimaran/Desktop/Python_API/API.csv'):
        df.to_csv(r'/Users/praveenmanimaran/Desktop/Python_API/API.csv', header=True)
    else: #if file already exists
        df.to_csv(r'/Users/praveenmanimaran/Desktop/Python_API/API.csv', mode='a')
    ...

    print('API Runner completed.') #tell us it ran successfully
    sleep(60) #sleep for 1 minute
exit()

```

API Runner completed.

```

-----
KeyboardInterrupt                                Traceback (most recent call last)
Cell In[8], line 20
     16         df.to_csv(r'/Users/praveenmanimaran/Desktop/Python_API/API.csv', mode='a', header = False) #appends to existing csv file
--> 19         print('API Runner completed.') #tell us it ran successfully
     20         sleep(60) #sleep for 1 minute
     21 exit()

KeyboardInterrupt:

```

In []:

In [7]:

Out [7]:

	id	name	symbol	slug	num_market_pairs	date_added	tags	n
0	1	Bitcoin	BTC	bitcoin	10540	2010-07-13T00:00:00.000Z	[mineable, pow, sha-256, store-of-value, state...	2.1
1	1027	Ethereum	ETH	ethereum	7731	2015-08-07T00:00:00.000Z	[pos, smart-contracts, ethereum-ecosystem, coi...	
2	825	Tether USDt	USDT	tether	65281	2015-02-25T00:00:00.000Z	[payments, stablecoin, asset-backed-stablecoin...	
3	1839	BNB	BNB	bnb	1746	2017-07-25T00:00:00.000Z	[marketplace, centralized-exchange, payments, ...	
4	52	XRP	XRP	xrp	1136	2013-08-04T00:00:00.000Z	[medium-of-exchange, enterprise-solutions, arr...	1.0
5	3408	USDC	USDC	usd-coin	14820	2018-10-08T00:00:00.000Z	[medium-of-exchange, stablecoin, asset-backed-...	
6	5426	Solana	SOL	solana	544	2020-04-10T00:00:00.000Z	[pos, platform, solana-ecosystem, cms-holdings...	
7	2010	Cardano	ADA	cardano	967	2017-10-01T00:00:00.000Z	[dpos, pos, platform, research, smart-contract...	4.5
8	74	Dogecoin	DOGE	dogecoin	821	2013-12-15T00:00:00.000Z	[mineable, pow, scrypt, medium-of-exchange, me...	
9	11419	Toncoin	TON	toncoin	170	2021-08-26T13:40:22.000Z	[pos, ftx-bankruptcy-estate, dwf-labs-portfolio...	
10	1958	TRON	TRX	tron	862	2017-09-13T00:00:00.000Z	[media, payments, tron-ecosystem,	

	id	name	symbol	slug	num_market_pairs	date_added	tags	n
							dwf-labs-por...	
11	1975	Chainlink	LINK	chainlink	1410	2017-09-20T00:00:00.000Z	[platform, defi, oracles, smart-contracts, sub...	1.0
12	3890	Polygon	MATIC	polygon	1048	2019-04-28T00:00:00.000Z	[pos, platform, enterprise-solutions, zero-kno...	1.0
13	6636	Polkadot	DOT	polkadot-new	607	2020-08-19T00:00:00.000Z	[substrate, polkadot, binance-chain, polkadot-...	
14	3717	Wrapped Bitcoin	WBTC	wrapped-bitcoin	1479	2019-01-30T00:00:00.000Z	[medium-of-exchange, defi, wrapped-tokens, fan...	
15	1	Bitcoin	BTC	bitcoin	10540	2010-07-13T00:00:00.000Z	[mineable, pow, sha-256, store-of-value, state...	2.1
16	1027	Ethereum	ETH	ethereum	7731	2015-08-07T00:00:00.000Z	[pos, smart-contracts, ethereum-ecosystem, coi...	
17	825	Tether USDt	USDT	tether	65281	2015-02-25T00:00:00.000Z	[payments, stablecoin, asset-backed-stablecoin...	
18	1839	BNB	BNB	bnb	1746	2017-07-25T00:00:00.000Z	[marketplace, centralized-exchange, payments, ...	
19	52	XRP	XRP	xrp	1136	2013-08-04T00:00:00.000Z	[medium-of-exchange, enterprise-solutions, arr...	1.0
20	3408	USDC	USDC	usd-coin	14820	2018-10-08T00:00:00.000Z	[medium-of-exchange, stablecoin, asset-backed-...	
21	5426	Solana	SOL	solana	544	2020-04-10T00:00:00.000Z	[pos, platform, solana-	

	id	name	symbol	slug	num_market_pairs	date_added	tags	n
							ecosystem, cms-holdings...	
22	2010	Cardano	ADA	cardano	967	2017-10-01T00:00:00.000Z	[dpos, pos, platform, research, smart-contract...	4.5
23	74	Dogecoin	DOGE	dogecoin	821	2013-12-15T00:00:00.000Z	[mineable, pow, script, medium-of-exchange, me...	
24	11419	Toncoin	TON	toncoin	170	2021-08-26T13:40:22.000Z	[pos, ftx-bankruptcy-estate, dwf-labs-portfolio...	
25	1958	TRON	TRX	tron	862	2017-09-13T00:00:00.000Z	[media, payments, tron-ecosystem, dwf-labs-por...	
26	1975	Chainlink	LINK	chainlink	1410	2017-09-20T00:00:00.000Z	[platform, defi, oracles, smart-contracts, sub...	1.0
27	3890	Polygon	MATIC	polygon	1048	2019-04-28T00:00:00.000Z	[pos, platform, enterprise-solutions, zero-kno...	1.0
28	6636	Polkadot	DOT	polkadot-new	607	2020-08-19T00:00:00.000Z	[substrate, polkadot, binance-chain, polkadot-...	
29	3717	Wrapped Bitcoin	WBTC	wrapped-bitcoin	1479	2019-01-30T00:00:00.000Z	[medium-of-exchange, defi, wrapped-tokens, fan...	
30	1	Bitcoin	BTC	bitcoin	10540	2010-07-13T00:00:00.000Z	[mineable, pow, sha-256, store-of-value, state...	2.1
31	1027	Ethereum	ETH	ethereum	7731	2015-08-07T00:00:00.000Z	[pos, smart-contracts, ethereum-ecosystem, coi...	

	id	name	symbol	slug	num_market_pairs	date_added	tags	n
32	825	Tether USDt	USDT	tether	65281	2015-02-25T00:00:00.000Z	[payments, stablecoin, asset-backed-stablecoin...	
33	1839	BNB	BNB	bnb	1746	2017-07-25T00:00:00.000Z	[marketplace, centralized-exchange, payments, ...	
34	52	XRP	XRP	xrp	1136	2013-08-04T00:00:00.000Z	[medium-of-exchange, enterprise-solutions, arr...	1.0
35	3408	USDC	USDC	usd-coin	14820	2018-10-08T00:00:00.000Z	[medium-of-exchange, stablecoin, asset-backed-...	
36	5426	Solana	SOL	solana	544	2020-04-10T00:00:00.000Z	[pos, platform, solana-ecosystem, cms-holdings...	
37	2010	Cardano	ADA	cardano	967	2017-10-01T00:00:00.000Z	[dpos, pos, platform, research, smart-contract...	4.5
38	74	Dogecoin	DOGE	dogecoin	821	2013-12-15T00:00:00.000Z	[mineable, pow, scrypt, medium-of-exchange, me...	
39	11419	Toncoin	TON	toncoin	170	2021-08-26T13:40:22.000Z	[pos, ftx-bankruptcy-estate, dwf-labs-portfolio...	
40	1958	TRON	TRX	tron	862	2017-09-13T00:00:00.000Z	[media, payments, tron-ecosystem, dwf-labs-por...	
41	1975	Chainlink	LINK	chainlink	1410	2017-09-20T00:00:00.000Z	[platform, defi, oracles, smart-contracts, sub...	1.0
42	3890	Polygon	MATIC	polygon	1048	2019-04-28T00:00:00.000Z	[pos, platform, enterprise-	1.0

	id	name	symbol	slug	num_market_pairs	date_added	tags	n
							solutions, zero-kno...	
43	6636	Polkadot	DOT	polkadot-new	607	2020-08-19T00:00:00.000Z	[substrate, polkadot, binance-chain, polkadot-...	
44	3717	Wrapped Bitcoin	WBTC	wrapped-bitcoin	1479	2019-01-30T00:00:00.000Z	[medium-of-exchange, defi, wrapped-tokens, fan...	
45	1	Bitcoin	BTC	bitcoin	10540	2010-07-13T00:00:00.000Z	[mineable, pow, sha-256, store-of-value, state...	2.1
46	1027	Ethereum	ETH	ethereum	7731	2015-08-07T00:00:00.000Z	[pos, smart-contracts, ethereum-ecosystem, coi...	
47	825	Tether USDt	USDT	tether	65281	2015-02-25T00:00:00.000Z	[payments, stablecoin, asset-backed-stablecoin...	
48	1839	BNB	BNB	bnb	1746	2017-07-25T00:00:00.000Z	[marketplace, centralized-exchange, payments, ...	
49	52	XRP	XRP	xrp	1136	2013-08-04T00:00:00.000Z	[medium-of-exchange, enterprise-solutions, arr...	1.0
50	3408	USDC	USDC	usd-coin	14820	2018-10-08T00:00:00.000Z	[medium-of-exchange, stablecoin, asset-backed-...	
51	5426	Solana	SOL	solana	544	2020-04-10T00:00:00.000Z	[pos, platform, solana-ecosystem, cms-holdings...	
52	2010	Cardano	ADA	cardano	967	2017-10-01T00:00:00.000Z	[dpos, pos, platform, research, smart-contract...	4.5
53	74	Dogecoin	DOGE	dogecoin	821	2013-12-15T00:00:00.000Z	[mineable, pow, script,	

	id	name	symbol	slug	num_market_pairs	date_added	tags	n
							medium-of-exchange, me...	
54	11419	Toncoin	TON	toncoin	170	2021-08-26T13:40:22.000Z	[pos, ftx-bankruptcy-estate, dwf-labs-portfolio...	
55	1958	TRON	TRX	tron	862	2017-09-13T00:00:00.000Z	[media, payments, tron-ecosystem, dwf-labs-por...	
56	1975	Chainlink	LINK	chainlink	1410	2017-09-20T00:00:00.000Z	[platform, defi, oracles, smart-contracts, sub...	1.0
57	3890	Polygon	MATIC	polygon	1048	2019-04-28T00:00:00.000Z	[pos, platform, enterprise-solutions, zero-kno...	1.0
58	6636	Polkadot	DOT	polkadot-new	607	2020-08-19T00:00:00.000Z	[substrate, polkadot, binance-chain, polkadot-...	
59	3717	Wrapped Bitcoin	WBTC	wrapped-bitcoin	1479	2019-01-30T00:00:00.000Z	[medium-of-exchange, defi, wrapped-tokens, fan...	
60	1	Bitcoin	BTC	bitcoin	10540	2010-07-13T00:00:00.000Z	[mineable, pow, sha-256, store-of-value, state...	2.1
61	1027	Ethereum	ETH	ethereum	7731	2015-08-07T00:00:00.000Z	[pos, smart-contracts, ethereum-ecosystem, coi...	
62	825	Tether USDt	USDT	tether	65281	2015-02-25T00:00:00.000Z	[payments, stablecoin, asset-backed-stablecoin...	
63	1839	BNB	BNB	bnb	1746	2017-07-25T00:00:00.000Z	[marketplace, centralized-exchange, payments, ...	

	id	name	symbol	slug	num_market_pairs	date_added	tags	n
64	52	XRP	XRP	xrp	1136	2013-08-04T00:00:00.000Z	[medium-of-exchange, enterprise-solutions, arr...	1.0
65	3408	USDC	USDC	usd-coin	14820	2018-10-08T00:00:00.000Z	[medium-of-exchange, stablecoin, asset-backed-...	
66	5426	Solana	SOL	solana	544	2020-04-10T00:00:00.000Z	[pos, platform, solana-ecosystem, cms-holdings...	
67	2010	Cardano	ADA	cardano	967	2017-10-01T00:00:00.000Z	[dpos, pos, platform, research, smart-contract...	4.5
68	74	Dogecoin	DOGE	dogecoin	821	2013-12-15T00:00:00.000Z	[mineable, pow, scrypt, medium-of-exchange, me...	
69	11419	Toncoin	TON	toncoin	170	2021-08-26T13:40:22.000Z	[pos, ftx-bankruptcy-estate, dwf-labs-portfolio...	
70	1958	TRON	TRX	tron	862	2017-09-13T00:00:00.000Z	[media, payments, tron-ecosystem, dwf-labs-por...	
71	1975	Chainlink	LINK	chainlink	1410	2017-09-20T00:00:00.000Z	[platform, defi, oracles, smart-contracts, sub...	1.0
72	3890	Polygon	MATIC	polygon	1048	2019-04-28T00:00:00.000Z	[pos, platform, enterprise-solutions, zero-kno...	1.0
73	6636	Polkadot	DOT	polkadot-new	607	2020-08-19T00:00:00.000Z	[substrate, polkadot, binance-chain, polkadot-...	
74	3717	Wrapped Bitcoin	WBTC	wrapped-bitcoin	1479	2019-01-30T00:00:00.000Z	[medium-of-exchange, defi,	

id	name	symbol	slug	num_market_pairs	date_added	tags	n
wrapped-tokens, fan...							

Cleaning up the Data

```
In [9]: #Clean Up scientific notation
pd.set_option('display.float_format', lambda x: '%.5f' % x)

In [10]: df
```

Out[10]:

	id	name	symbol	slug	num_market_pairs	date_added	tags	
0	1	Bitcoin	BTC	bitcoin	10540	2010-07-13T00:00:00.000Z	[mineable, pow, sha-256, store-of-value, state...	
1	1027	Ethereum	ETH	ethereum	7731	2015-08-07T00:00:00.000Z	[pos, smart-contracts, ethereum-ecosystem, coi...	
2	825	Tether USDt	USDT	tether	65281	2015-02-25T00:00:00.000Z	[payments, stablecoin, asset-backed-stablecoin...	
3	1839	BNB	BNB	bnb	1746	2017-07-25T00:00:00.000Z	[marketplace, centralized-exchange, payments, ...	
4	52	XRP	XRP	xrp	1136	2013-08-04T00:00:00.000Z	[medium-of-exchange, enterprise-solutions, arr...	100
5	3408	USDC	USDC	usd-coin	14820	2018-10-08T00:00:00.000Z	[medium-of-exchange, stablecoin, asset-backed-...	
6	5426	Solana	SOL	solana	544	2020-04-10T00:00:00.000Z	[pos, platform, solana-ecosystem, cms-holdings...	
7	2010	Cardano	ADA	cardano	967	2017-10-01T00:00:00.000Z	[dpos, pos, platform, research, smart-contract...	45
8	74	Dogecoin	DOGE	dogecoin	821	2013-12-15T00:00:00.000Z	[mineable, pow, scrypt, medium-of-exchange, me...	
9	11419	Toncoin	TON	toncoin	170	2021-08-26T13:40:22.000Z	[pos, ftx-bankruptcy-estate, dwf-labs-portfolio...	
10	1958	TRON	TRX	tron	862	2017-09-13T00:00:00.000Z	[media, payments, tron-ecosystem,	

	id	name	symbol	slug	num_market_pairs	date_added	tags	
							dwf-labs-por...	
11	1975	Chainlink	LINK	chainlink	1410	2017-09-20T00:00:00.000Z	[platform, defi, oracles, smart-contracts, sub...	
12	3890	Polygon	MATIC	polygon	1048	2019-04-28T00:00:00.000Z	[pos, platform, enterprise-solutions, zero-kno...	10
13	6636	Polkadot	DOT	polkadot-new	607	2020-08-19T00:00:00.000Z	[substrate, polkadot, binance-chain, polkadot-...	
14	3717	Wrapped Bitcoin	WBTC	wrapped-bitcoin	1479	2019-01-30T00:00:00.000Z	[medium-of-exchange, defi, wrapped-tokens, fan...	
15	1	Bitcoin	BTC	bitcoin	10540	2010-07-13T00:00:00.000Z	[mineable, pow, sha-256, store-of-value, state...	
16	1027	Ethereum	ETH	ethereum	7731	2015-08-07T00:00:00.000Z	[pos, smart-contracts, ethereum-ecosystem, coi...	
17	825	Tether USDt	USDT	tether	65281	2015-02-25T00:00:00.000Z	[payments, stablecoin, asset-backed-stablecoin...	
18	1839	BNB	BNB	bnb	1746	2017-07-25T00:00:00.000Z	[marketplace, centralized-exchange, payments, ...	
19	52	XRP	XRP	xrp	1136	2013-08-04T00:00:00.000Z	[medium-of-exchange, enterprise-solutions, arr...	100
20	3408	USDC	USDC	usd-coin	14820	2018-10-08T00:00:00.000Z	[medium-of-exchange, stablecoin, asset-backed-...	
21	5426	Solana	SOL	solana	544	2020-04-10T00:00:00.000Z	[pos, platform, solana-	

	id	name	symbol	slug	num_market_pairs	date_added	tags	
							ecosystem, cms-holdings...	
22	2010	Cardano	ADA	cardano	967	2017-10-01T00:00:00.000Z	[dpos, pos, platform, research, smart-contract...	45
23	74	Dogecoin	DOGE	dogecoin	821	2013-12-15T00:00:00.000Z	[mineable, pow, script, medium-of-exchange, me...	
24	11419	Toncoin	TON	toncoin	170	2021-08-26T13:40:22.000Z	[pos, ftx-bankruptcy-estate, dwf-labs-portfolio...	
25	1958	TRON	TRX	tron	862	2017-09-13T00:00:00.000Z	[media, payments, tron-ecosystem, dwf-labs-por...	
26	1975	Chainlink	LINK	chainlink	1410	2017-09-20T00:00:00.000Z	[platform, defi, oracles, smart-contracts, sub...	
27	3890	Polygon	MATIC	polygon	1048	2019-04-28T00:00:00.000Z	[pos, platform, enterprise-solutions, zero-kno...	10
28	6636	Polkadot	DOT	polkadot-new	607	2020-08-19T00:00:00.000Z	[substrate, polkadot, binance-chain, polkadot-...	
29	3717	Wrapped Bitcoin	WBTC	wrapped-bitcoin	1479	2019-01-30T00:00:00.000Z	[medium-of-exchange, defi, wrapped-tokens, fan...	
30	1	Bitcoin	BTC	bitcoin	10540	2010-07-13T00:00:00.000Z	[mineable, pow, sha-256, store-of-value, state...	
31	1027	Ethereum	ETH	ethereum	7731	2015-08-07T00:00:00.000Z	[pos, smart-contracts, ethereum-ecosystem, coi...	

	id	name	symbol	slug	num_market_pairs	date_added	tags	
32	825	Tether USDt	USDT	tether	65281	2015-02-25T00:00:00.000Z	[payments, stablecoin, asset-backed-stablecoin...	
33	1839	BNB	BNB	bnb	1746	2017-07-25T00:00:00.000Z	[marketplace, centralized-exchange, payments, ...	
34	52	XRP	XRP	xrp	1136	2013-08-04T00:00:00.000Z	[medium-of-exchange, enterprise-solutions, arr...	100
35	3408	USDC	USDC	usd-coin	14820	2018-10-08T00:00:00.000Z	[medium-of-exchange, stablecoin, asset-backed-...	
36	5426	Solana	SOL	solana	544	2020-04-10T00:00:00.000Z	[pos, platform, solana-ecosystem, cms-holdings...	
37	2010	Cardano	ADA	cardano	967	2017-10-01T00:00:00.000Z	[dpos, pos, platform, research, smart-contract...	45
38	74	Dogecoin	DOGE	dogecoin	821	2013-12-15T00:00:00.000Z	[mineable, pow, scrypt, medium-of-exchange, me...	
39	11419	Toncoin	TON	toncoin	170	2021-08-26T13:40:22.000Z	[pos, ftx-bankruptcy-estate, dwf-labs-portfolio...	
40	1958	TRON	TRX	tron	862	2017-09-13T00:00:00.000Z	[media, payments, tron-ecosystem, dwf-labs-por...	
41	1975	Chainlink	LINK	chainlink	1410	2017-09-20T00:00:00.000Z	[platform, defi, oracles, smart-contracts, sub...	
42	3890	Polygon	MATIC	polygon	1048	2019-04-28T00:00:00.000Z	[pos, platform, enterprise-	100

	id	name	symbol	slug	num_market_pairs	date_added	tags
							solutions, zero-kno...
43	6636	Polkadot	DOT	polkadot-new	607	2020-08-19T00:00:00.000Z	[substrate, polkadot, binance-chain, polkadot-...
44	3717	Wrapped Bitcoin	WBTC	wrapped-bitcoin	1479	2019-01-30T00:00:00.000Z	[medium-of-exchange, defi, wrapped-tokens, fan...
45	1	Bitcoin	BTC	bitcoin	10540	2010-07-13T00:00:00.000Z	[mineable, pow, sha-256, store-of-value, state...
46	1027	Ethereum	ETH	ethereum	7731	2015-08-07T00:00:00.000Z	[pos, smart-contracts, ethereum-ecosystem, coi...
47	825	Tether USDt	USDT	tether	65281	2015-02-25T00:00:00.000Z	[payments, stablecoin, asset-backed-stablecoin...
48	1839	BNB	BNB	bnb	1746	2017-07-25T00:00:00.000Z	[marketplace, centralized-exchange, payments, ...
49	52	XRP	XRP	xrp	1136	2013-08-04T00:00:00.000Z	[medium-of-exchange, enterprise-solutions, arr... 100
50	3408	USDC	USDC	usd-coin	14820	2018-10-08T00:00:00.000Z	[medium-of-exchange, stablecoin, asset-backed-...
51	5426	Solana	SOL	solana	544	2020-04-10T00:00:00.000Z	[pos, platform, solana-ecosystem, cms-holdings...
52	2010	Cardano	ADA	cardano	967	2017-10-01T00:00:00.000Z	[dpos, pos, platform, research, smart-contract... 45
53	74	Dogecoin	DOGE	dogecoin	821	2013-12-15T00:00:00.000Z	[mineable, pow, script,

	id	name	symbol	slug	num_market_pairs	date_added	tags
							medium-of-exchange, me...
54	11419	Toncoin	TON	toncoin	170	2021-08-26T13:40:22.000Z	[pos, ftx-bankruptcy-estate, dwf-labs-portfolio...
55	1958	TRON	TRX	tron	862	2017-09-13T00:00:00.000Z	[media, payments, tron-ecosystem, dwf-labs-por...
56	1975	Chainlink	LINK	chainlink	1410	2017-09-20T00:00:00.000Z	[platform, defi, oracles, smart-contracts, sub...
57	3890	Polygon	MATIC	polygon	1048	2019-04-28T00:00:00.000Z	[pos, platform, enterprise-solutions, zero-kno...
58	6636	Polkadot	DOT	polkadot-new	607	2020-08-19T00:00:00.000Z	[substrate, polkadot, binance-chain, polkadot-...
59	3717	Wrapped Bitcoin	WBTC	wrapped-bitcoin	1479	2019-01-30T00:00:00.000Z	[medium-of-exchange, defi, wrapped-tokens, fan...
60	1	Bitcoin	BTC	bitcoin	10540	2010-07-13T00:00:00.000Z	[mineable, pow, sha-256, store-of-value, state...
61	1027	Ethereum	ETH	ethereum	7731	2015-08-07T00:00:00.000Z	[pos, smart-contracts, ethereum-ecosystem, coi...
62	825	Tether USDt	USDT	tether	65281	2015-02-25T00:00:00.000Z	[payments, stablecoin, asset-backed-stablecoin...
63	1839	BNB	BNB	bnb	1746	2017-07-25T00:00:00.000Z	[marketplace, centralized-exchange, payments, ...

	id	name	symbol	slug	num_market_pairs	date_added	tags	
64	52	XRP	XRP	xrp	1136	2013-08-04T00:00:00.000Z	[medium-of-exchange, enterprise-solutions, arr...	100
65	3408	USDC	USDC	usd-coin	14820	2018-10-08T00:00:00.000Z	[medium-of-exchange, stablecoin, asset-backed-...	
66	5426	Solana	SOL	solana	544	2020-04-10T00:00:00.000Z	[pos, platform, solana-ecosystem, cms-holdings...	
67	2010	Cardano	ADA	cardano	967	2017-10-01T00:00:00.000Z	[dpos, pos, platform, research, smart-contract...	45
68	74	Dogecoin	DOGE	dogecoin	821	2013-12-15T00:00:00.000Z	[mineable, pow, scrypt, medium-of-exchange, me...	
69	11419	Toncoin	TON	toncoin	170	2021-08-26T13:40:22.000Z	[pos, ftx-bankruptcy-estate, dwf-labs-portfolio...	
70	1958	TRON	TRX	tron	862	2017-09-13T00:00:00.000Z	[media, payments, tron-ecosystem, dwf-labs-por...	
71	1975	Chainlink	LINK	chainlink	1410	2017-09-20T00:00:00.000Z	[platform, defi, oracles, smart-contracts, sub...	
72	3890	Polygon	MATIC	polygon	1048	2019-04-28T00:00:00.000Z	[pos, platform, enterprise-solutions, zero-kno...	10
73	6636	Polkadot	DOT	polkadot-new	607	2020-08-19T00:00:00.000Z	[substrate, polkadot, binance-chain, polkadot-...	
74	3717	Wrapped Bitcoin	WBTC	wrapped-bitcoin	1479	2019-01-30T00:00:00.000Z	[medium-of-exchange, defi,	

id	name	symbol	slug	num_market_pairs	date_added	tags
						wrapped-tokens, fan...
75	1	Bitcoin	BTC	bitcoin	10540	2010-07-13T00:00:00.000Z [mineable, pow, sha-256, store-of-value, state...
76	1027	Ethereum	ETH	ethereum	7731	2015-08-07T00:00:00.000Z [pos, smart-contracts, ethereum-ecosystem, coi...
77	825	Tether USDt	USDT	tether	65281	2015-02-25T00:00:00.000Z [payments, stablecoin, asset-backed-stablecoin...
78	1839	BNB	BNB	bnb	1746	2017-07-25T00:00:00.000Z [marketplace, centralized-exchange, payments, ...
79	52	XRP	XRP	xrp	1136	2013-08-04T00:00:00.000Z [medium-of-exchange, enterprise-solutions, arr... 100
80	3408	USDC	USDC	usd-coin	14820	2018-10-08T00:00:00.000Z [medium-of-exchange, stablecoin, asset-backed-...
81	5426	Solana	SOL	solana	544	2020-04-10T00:00:00.000Z [pos, platform, solana-ecosystem, cms-holdings...
82	2010	Cardano	ADA	cardano	967	2017-10-01T00:00:00.000Z [dpos, pos, platform, research, smart-contract... 45
83	74	Dogecoin	DOGE	dogecoin	821	2013-12-15T00:00:00.000Z [mineable, pow, scrypt, medium-of-exchange, me...
84	11419	Toncoin	TON	toncoin	170	2021-08-26T13:40:22.000Z [pos, ftx-bankruptcy-estate, dwf-labs-portfolio...
85	1958	TRON	TRX	tron	862	2017-09-13T00:00:00.000Z [media, payments,

	id	name	symbol	slug	num_market_pairs	date_added	tags
							tron-ecosystem, dwf-labs-por...
86	1975	Chainlink	LINK	chainlink	1410	2017-09-20T00:00:00.000Z	[platform, defi, oracles, smart-contracts, sub...
87	3890	Polygon	MATIC	polygon	1048	2019-04-28T00:00:00.000Z	[pos, platform, enterprise-solutions, zero-kno...
88	6636	Polkadot	DOT	polkadot-new	607	2020-08-19T00:00:00.000Z	[substrate, polkadot, binance-chain, polkadot-...
89	3717	Wrapped Bitcoin	WBTC	wrapped-bitcoin	1479	2019-01-30T00:00:00.000Z	[medium-of-exchange, defi, wrapped-tokens, fan...

Check Percent Changes From 1 Hr to 90 Days

```
In [12]: df3 = df.groupby('name', sort=False)[['quote.USD.percent_change_1h', 'quote.USD.percent_change_90d']]
df3
```

Out [12]:

	quote.USD.percent_change_1h	quote.USD.percent_change_24h	quote.USD.percent_ch
name			
Bitcoin	-0.13749	1.94045	
Ethereum	-0.19491	0.34224	
Tether USDt	0.00956	-0.00772	
BNB	-0.00638	-0.33880	
XRP	-0.19489	1.59829	
USDC	-0.00570	-0.00520	
Solana	0.32062	5.33984	
Cardano	-0.27524	2.90054	
Dogecoin	-0.41579	1.09305	
Toncoin	-0.53472	9.15798	
TRON	-0.03185	1.21236	
Chainlink	-0.20457	5.74935	
Polygon	-0.02558	8.63392	
Polkadot	-0.22597	1.15511	
Wrapped Bitcoin	0.01047	1.84290	

Make the data easier to read

```
In [13]: df4 = df3.stack()  
df4
```

```

Out[13]:
name
Bitcoin
quote.USD.percent_change_1h      -0.13749
quote.USD.percent_change_24h      1.94045
quote.USD.percent_change_7d       2.70935
quote.USD.percent_change_30d      28.69465
quote.USD.percent_change_60d      36.68081
quote.USD.percent_change_90d      19.94239
Ethereum
quote.USD.percent_change_1h      -0.19491
quote.USD.percent_change_24h      0.34224
quote.USD.percent_change_7d       4.68613
quote.USD.percent_change_30d      18.50069
quote.USD.percent_change_60d      15.17125
quote.USD.percent_change_90d      1.81638
Tether USDt
quote.USD.percent_change_1h       0.00956
quote.USD.percent_change_24h     -0.00772
quote.USD.percent_change_7d       0.01063
quote.USD.percent_change_30d      0.03295
quote.USD.percent_change_60d      0.06242
quote.USD.percent_change_90d      0.14597
BNB
quote.USD.percent_change_1h      -0.00638
quote.USD.percent_change_24h     -0.33880
quote.USD.percent_change_7d      10.06358
quote.USD.percent_change_30d     19.19439
quote.USD.percent_change_60d     14.66717
quote.USD.percent_change_90d      2.07772
XRP
quote.USD.percent_change_1h      -0.19489
quote.USD.percent_change_24h      1.59829
quote.USD.percent_change_7d      15.51479
quote.USD.percent_change_30d     39.53637
quote.USD.percent_change_60d     38.01518
quote.USD.percent_change_90d     10.55761
USDC
quote.USD.percent_change_1h      -0.00570
quote.USD.percent_change_24h     -0.00520
quote.USD.percent_change_7d      -0.00734
quote.USD.percent_change_30d      0.01052
quote.USD.percent_change_60d     -0.01101
quote.USD.percent_change_90d      0.00940
Solana
quote.USD.percent_change_1h       0.32062
quote.USD.percent_change_24h      5.33984
quote.USD.percent_change_7d      10.99078
quote.USD.percent_change_30d     95.59648
quote.USD.percent_change_60d    121.74546
quote.USD.percent_change_90d     77.83131
Cardano
quote.USD.percent_change_1h      -0.27524
quote.USD.percent_change_24h      2.90054
quote.USD.percent_change_7d      23.88899
quote.USD.percent_change_30d     41.82287
quote.USD.percent_change_60d     39.74995
quote.USD.percent_change_90d     19.70908
Dogecoin
quote.USD.percent_change_1h      -0.41579
quote.USD.percent_change_24h      1.09305
quote.USD.percent_change_7d      11.72190
quote.USD.percent_change_30d     26.88296
quote.USD.percent_change_60d     17.07807
quote.USD.percent_change_90d     -0.97713
Toncoin
quote.USD.percent_change_1h      -0.53472
quote.USD.percent_change_24h      9.15798
quote.USD.percent_change_7d      22.14245
quote.USD.percent_change_30d     30.99377
quote.USD.percent_change_60d     45.65707

```

TRON	quote.USD.percent_change_90d	109.38300
	quote.USD.percent_change_1h	-0.03185
	quote.USD.percent_change_24h	1.21236
	quote.USD.percent_change_7d	-0.53928
	quote.USD.percent_change_30d	12.51685
Chainlink	quote.USD.percent_change_60d	23.77373
	quote.USD.percent_change_90d	26.34510
	quote.USD.percent_change_1h	-0.20457
	quote.USD.percent_change_24h	5.74935
	quote.USD.percent_change_7d	24.63025
Polygon	quote.USD.percent_change_30d	84.20710
	quote.USD.percent_change_60d	117.89542
	quote.USD.percent_change_90d	77.72046
	quote.USD.percent_change_1h	-0.02558
	quote.USD.percent_change_24h	8.63392
Polkadot	quote.USD.percent_change_7d	23.20393
	quote.USD.percent_change_30d	44.11659
	quote.USD.percent_change_60d	42.61788
	quote.USD.percent_change_90d	11.85674
	quote.USD.percent_change_1h	-0.22597
Wrapped Bitcoin	quote.USD.percent_change_24h	1.15511
	quote.USD.percent_change_7d	13.51530
	quote.USD.percent_change_30d	28.41072
	quote.USD.percent_change_60d	15.67170
	quote.USD.percent_change_90d	-1.22640
	quote.USD.percent_change_1h	0.01047
	quote.USD.percent_change_24h	1.84290
	quote.USD.percent_change_7d	2.78931
	quote.USD.percent_change_30d	28.61930
	quote.USD.percent_change_60d	36.53261
	quote.USD.percent_change_90d	19.84779

dtype: float64

```
In [14]: type(df4)
```

```
Out[14]: pandas.core.series.Series
```

```
In [17]: df5 = df4.to_frame(name = 'values')
df5.count()
```

```
Out[17]: values      90
dtype: int64
```

Convert Back to DataFrame

```
In [19]: index = pd.Index(range(90))
```

```
df6 = df5.reset_index()
df6
```

Out[19]:

	name	level_1	values
0	Bitcoin	quote.USD.percent_change_1h	-0.13749
1	Bitcoin	quote.USD.percent_change_24h	1.94045
2	Bitcoin	quote.USD.percent_change_7d	2.70935
3	Bitcoin	quote.USD.percent_change_30d	28.69465
4	Bitcoin	quote.USD.percent_change_60d	36.68081
5	Bitcoin	quote.USD.percent_change_90d	19.94239
6	Ethereum	quote.USD.percent_change_1h	-0.19491
7	Ethereum	quote.USD.percent_change_24h	0.34224
8	Ethereum	quote.USD.percent_change_7d	4.68613
9	Ethereum	quote.USD.percent_change_30d	18.50069
10	Ethereum	quote.USD.percent_change_60d	15.17125
11	Ethereum	quote.USD.percent_change_90d	1.81638
12	Tether USDt	quote.USD.percent_change_1h	0.00956
13	Tether USDt	quote.USD.percent_change_24h	-0.00772
14	Tether USDt	quote.USD.percent_change_7d	0.01063
15	Tether USDt	quote.USD.percent_change_30d	0.03295
16	Tether USDt	quote.USD.percent_change_60d	0.06242
17	Tether USDt	quote.USD.percent_change_90d	0.14597
18	BNB	quote.USD.percent_change_1h	-0.00638
19	BNB	quote.USD.percent_change_24h	-0.33880
20	BNB	quote.USD.percent_change_7d	10.06358
21	BNB	quote.USD.percent_change_30d	19.19439
22	BNB	quote.USD.percent_change_60d	14.66717
23	BNB	quote.USD.percent_change_90d	2.07772
24	XRP	quote.USD.percent_change_1h	-0.19489
25	XRP	quote.USD.percent_change_24h	1.59829
26	XRP	quote.USD.percent_change_7d	15.51479
27	XRP	quote.USD.percent_change_30d	39.53637
28	XRP	quote.USD.percent_change_60d	38.01518
29	XRP	quote.USD.percent_change_90d	10.55761
30	USDC	quote.USD.percent_change_1h	-0.00570
31	USDC	quote.USD.percent_change_24h	-0.00520
32	USDC	quote.USD.percent_change_7d	-0.00734
33	USDC	quote.USD.percent_change_30d	0.01052
34	USDC	quote.USD.percent_change_60d	-0.01101

	name	level_1	values
35	USDC	quote.USD.percent_change_90d	0.00940
36	Solana	quote.USD.percent_change_1h	0.32062
37	Solana	quote.USD.percent_change_24h	5.33984
38	Solana	quote.USD.percent_change_7d	10.99078
39	Solana	quote.USD.percent_change_30d	95.59648
40	Solana	quote.USD.percent_change_60d	121.74546
41	Solana	quote.USD.percent_change_90d	77.83131
42	Cardano	quote.USD.percent_change_1h	-0.27524
43	Cardano	quote.USD.percent_change_24h	2.90054
44	Cardano	quote.USD.percent_change_7d	23.88899
45	Cardano	quote.USD.percent_change_30d	41.82287
46	Cardano	quote.USD.percent_change_60d	39.74995
47	Cardano	quote.USD.percent_change_90d	19.70908
48	Dogecoin	quote.USD.percent_change_1h	-0.41579
49	Dogecoin	quote.USD.percent_change_24h	1.09305
50	Dogecoin	quote.USD.percent_change_7d	11.72190
51	Dogecoin	quote.USD.percent_change_30d	26.88296
52	Dogecoin	quote.USD.percent_change_60d	17.07807
53	Dogecoin	quote.USD.percent_change_90d	-0.97713
54	Toncoin	quote.USD.percent_change_1h	-0.53472
55	Toncoin	quote.USD.percent_change_24h	9.15798
56	Toncoin	quote.USD.percent_change_7d	22.14245
57	Toncoin	quote.USD.percent_change_30d	30.99377
58	Toncoin	quote.USD.percent_change_60d	45.65707
59	Toncoin	quote.USD.percent_change_90d	109.38300
60	TRON	quote.USD.percent_change_1h	-0.03185
61	TRON	quote.USD.percent_change_24h	1.21236
62	TRON	quote.USD.percent_change_7d	-0.53928
63	TRON	quote.USD.percent_change_30d	12.51685
64	TRON	quote.USD.percent_change_60d	23.77373
65	TRON	quote.USD.percent_change_90d	26.34510
66	Chainlink	quote.USD.percent_change_1h	-0.20457
67	Chainlink	quote.USD.percent_change_24h	5.74935
68	Chainlink	quote.USD.percent_change_7d	24.63025
69	Chainlink	quote.USD.percent_change_30d	84.20710

	name	level_1	values
70	Chainlink	quote.USD.percent_change_60d	117.89542
71	Chainlink	quote.USD.percent_change_90d	77.72046
72	Polygon	quote.USD.percent_change_1h	-0.02558
73	Polygon	quote.USD.percent_change_24h	8.63392
74	Polygon	quote.USD.percent_change_7d	23.20393
75	Polygon	quote.USD.percent_change_30d	44.11659
76	Polygon	quote.USD.percent_change_60d	42.61788
77	Polygon	quote.USD.percent_change_90d	11.85674
78	Polkadot	quote.USD.percent_change_1h	-0.22597
79	Polkadot	quote.USD.percent_change_24h	1.15511
80	Polkadot	quote.USD.percent_change_7d	13.51530
81	Polkadot	quote.USD.percent_change_30d	28.41072
82	Polkadot	quote.USD.percent_change_60d	15.67170
83	Polkadot	quote.USD.percent_change_90d	-1.22640
84	Wrapped Bitcoin	quote.USD.percent_change_1h	0.01047
85	Wrapped Bitcoin	quote.USD.percent_change_24h	1.84290
86	Wrapped Bitcoin	quote.USD.percent_change_7d	2.78931
87	Wrapped Bitcoin	quote.USD.percent_change_30d	28.61930
88	Wrapped Bitcoin	quote.USD.percent_change_60d	36.53261
89	Wrapped Bitcoin	quote.USD.percent_change_90d	19.84779

```
In [23]: df7 = df6.rename(columns = {'level_1':'percent_change'})
df7
```


Out [23]:

	name	percent_change	values
0	Bitcoin	quote.USD.percent_change_1h	-0.13749
1	Bitcoin	quote.USD.percent_change_24h	1.94045
2	Bitcoin	quote.USD.percent_change_7d	2.70935
3	Bitcoin	quote.USD.percent_change_30d	28.69465
4	Bitcoin	quote.USD.percent_change_60d	36.68081
5	Bitcoin	quote.USD.percent_change_90d	19.94239
6	Ethereum	quote.USD.percent_change_1h	-0.19491
7	Ethereum	quote.USD.percent_change_24h	0.34224
8	Ethereum	quote.USD.percent_change_7d	4.68613
9	Ethereum	quote.USD.percent_change_30d	18.50069
10	Ethereum	quote.USD.percent_change_60d	15.17125
11	Ethereum	quote.USD.percent_change_90d	1.81638
12	Tether USDt	quote.USD.percent_change_1h	0.00956
13	Tether USDt	quote.USD.percent_change_24h	-0.00772
14	Tether USDt	quote.USD.percent_change_7d	0.01063
15	Tether USDt	quote.USD.percent_change_30d	0.03295
16	Tether USDt	quote.USD.percent_change_60d	0.06242
17	Tether USDt	quote.USD.percent_change_90d	0.14597
18	BNB	quote.USD.percent_change_1h	-0.00638
19	BNB	quote.USD.percent_change_24h	-0.33880
20	BNB	quote.USD.percent_change_7d	10.06358
21	BNB	quote.USD.percent_change_30d	19.19439
22	BNB	quote.USD.percent_change_60d	14.66717
23	BNB	quote.USD.percent_change_90d	2.07772
24	XRP	quote.USD.percent_change_1h	-0.19489
25	XRP	quote.USD.percent_change_24h	1.59829
26	XRP	quote.USD.percent_change_7d	15.51479
27	XRP	quote.USD.percent_change_30d	39.53637
28	XRP	quote.USD.percent_change_60d	38.01518
29	XRP	quote.USD.percent_change_90d	10.55761
30	USDC	quote.USD.percent_change_1h	-0.00570
31	USDC	quote.USD.percent_change_24h	-0.00520
32	USDC	quote.USD.percent_change_7d	-0.00734
33	USDC	quote.USD.percent_change_30d	0.01052
34	USDC	quote.USD.percent_change_60d	-0.01101

	name	percent_change	values
35	USDC	quote.USD.percent_change_90d	0.00940
36	Solana	quote.USD.percent_change_1h	0.32062
37	Solana	quote.USD.percent_change_24h	5.33984
38	Solana	quote.USD.percent_change_7d	10.99078
39	Solana	quote.USD.percent_change_30d	95.59648
40	Solana	quote.USD.percent_change_60d	121.74546
41	Solana	quote.USD.percent_change_90d	77.83131
42	Cardano	quote.USD.percent_change_1h	-0.27524
43	Cardano	quote.USD.percent_change_24h	2.90054
44	Cardano	quote.USD.percent_change_7d	23.88899
45	Cardano	quote.USD.percent_change_30d	41.82287
46	Cardano	quote.USD.percent_change_60d	39.74995
47	Cardano	quote.USD.percent_change_90d	19.70908
48	Dogecoin	quote.USD.percent_change_1h	-0.41579
49	Dogecoin	quote.USD.percent_change_24h	1.09305
50	Dogecoin	quote.USD.percent_change_7d	11.72190
51	Dogecoin	quote.USD.percent_change_30d	26.88296
52	Dogecoin	quote.USD.percent_change_60d	17.07807
53	Dogecoin	quote.USD.percent_change_90d	-0.97713
54	Toncoin	quote.USD.percent_change_1h	-0.53472
55	Toncoin	quote.USD.percent_change_24h	9.15798
56	Toncoin	quote.USD.percent_change_7d	22.14245
57	Toncoin	quote.USD.percent_change_30d	30.99377
58	Toncoin	quote.USD.percent_change_60d	45.65707
59	Toncoin	quote.USD.percent_change_90d	109.38300
60	TRON	quote.USD.percent_change_1h	-0.03185
61	TRON	quote.USD.percent_change_24h	1.21236
62	TRON	quote.USD.percent_change_7d	-0.53928
63	TRON	quote.USD.percent_change_30d	12.51685
64	TRON	quote.USD.percent_change_60d	23.77373
65	TRON	quote.USD.percent_change_90d	26.34510
66	Chainlink	quote.USD.percent_change_1h	-0.20457
67	Chainlink	quote.USD.percent_change_24h	5.74935
68	Chainlink	quote.USD.percent_change_7d	24.63025
69	Chainlink	quote.USD.percent_change_30d	84.20710

	name	percent_change	values
70	Chainlink	quote.USD.percent_change_60d	117.89542
71	Chainlink	quote.USD.percent_change_90d	77.72046
72	Polygon	quote.USD.percent_change_1h	-0.02558
73	Polygon	quote.USD.percent_change_24h	8.63392
74	Polygon	quote.USD.percent_change_7d	23.20393
75	Polygon	quote.USD.percent_change_30d	44.11659
76	Polygon	quote.USD.percent_change_60d	42.61788
77	Polygon	quote.USD.percent_change_90d	11.85674
78	Polkadot	quote.USD.percent_change_1h	-0.22597
79	Polkadot	quote.USD.percent_change_24h	1.15511
80	Polkadot	quote.USD.percent_change_7d	13.51530
81	Polkadot	quote.USD.percent_change_30d	28.41072
82	Polkadot	quote.USD.percent_change_60d	15.67170
83	Polkadot	quote.USD.percent_change_90d	-1.22640
84	Wrapped Bitcoin	quote.USD.percent_change_1h	0.01047
85	Wrapped Bitcoin	quote.USD.percent_change_24h	1.84290
86	Wrapped Bitcoin	quote.USD.percent_change_7d	2.78931
87	Wrapped Bitcoin	quote.USD.percent_change_30d	28.61930
88	Wrapped Bitcoin	quote.USD.percent_change_60d	36.53261
89	Wrapped Bitcoin	quote.USD.percent_change_90d	19.84779

Rename Values

```
In [26]: df7['percent_change'] = df7['percent_change'].replace(['quote.USD.percent_change_60d', 'quote.USD.percent_change_90d', 'quote.USD.percent_change_1h', 'quote.USD.percent_change_24h', 'quote.USD.percent_change_7d', 'quote.USD.percent_change_30d'], [0, 1, 2, 3, 4, 5])
```

Out [26]:

	name	percent_change	values
0	Bitcoin	1h	-0.13749
1	Bitcoin	24h	1.94045
2	Bitcoin	7d	2.70935
3	Bitcoin	30d	28.69465
4	Bitcoin	60d	36.68081
5	Bitcoin	90d	19.94239
6	Ethereum	1h	-0.19491
7	Ethereum	24h	0.34224
8	Ethereum	7d	4.68613
9	Ethereum	30d	18.50069
10	Ethereum	60d	15.17125
11	Ethereum	90d	1.81638
12	Tether USDt	1h	0.00956
13	Tether USDt	24h	-0.00772
14	Tether USDt	7d	0.01063
15	Tether USDt	30d	0.03295
16	Tether USDt	60d	0.06242
17	Tether USDt	90d	0.14597
18	BNB	1h	-0.00638
19	BNB	24h	-0.33880
20	BNB	7d	10.06358
21	BNB	30d	19.19439
22	BNB	60d	14.66717
23	BNB	90d	2.07772
24	XRP	1h	-0.19489
25	XRP	24h	1.59829
26	XRP	7d	15.51479
27	XRP	30d	39.53637
28	XRP	60d	38.01518
29	XRP	90d	10.55761
30	USDC	1h	-0.00570
31	USDC	24h	-0.00520
32	USDC	7d	-0.00734
33	USDC	30d	0.01052
34	USDC	60d	-0.01101

	name	percent_change	values
35	USDC	90d	0.00940
36	Solana	1h	0.32062
37	Solana	24h	5.33984
38	Solana	7d	10.99078
39	Solana	30d	95.59648
40	Solana	60d	121.74546
41	Solana	90d	77.83131
42	Cardano	1h	-0.27524
43	Cardano	24h	2.90054
44	Cardano	7d	23.88899
45	Cardano	30d	41.82287
46	Cardano	60d	39.74995
47	Cardano	90d	19.70908
48	Dogecoin	1h	-0.41579
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52	Dogecoin	60d	17.07807
53	Dogecoin	90d	-0.97713
54	Toncoin	1h	-0.53472
55	Toncoin	24h	9.15798
56	Toncoin	7d	22.14245
57	Toncoin	30d	30.99377
58	Toncoin	60d	45.65707
59	Toncoin	90d	109.38300
60	TRON	1h	-0.03185
61	TRON	24h	1.21236
62	TRON	7d	-0.53928
63	TRON	30d	12.51685
64	TRON	60d	23.77373
65	TRON	90d	26.34510
66	Chainlink	1h	-0.20457
67	Chainlink	24h	5.74935
68	Chainlink	7d	24.63025
69	Chainlink	30d	84.20710

	name	percent_change	values
70	Chainlink	60d	117.89542
71	Chainlink	90d	77.72046
72	Polygon	1h	-0.02558
73	Polygon	24h	8.63392
74	Polygon	7d	23.20393
75	Polygon	30d	44.11659
76	Polygon	60d	42.61788
77	Polygon	90d	11.85674
78	Polkadot	1h	-0.22597
79	Polkadot	24h	1.15511
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81	Polkadot	30d	28.41072
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86	Wrapped Bitcoin	7d	2.78931
87	Wrapped Bitcoin	30d	28.61930
88	Wrapped Bitcoin	60d	36.53261
89	Wrapped Bitcoin	90d	19.84779

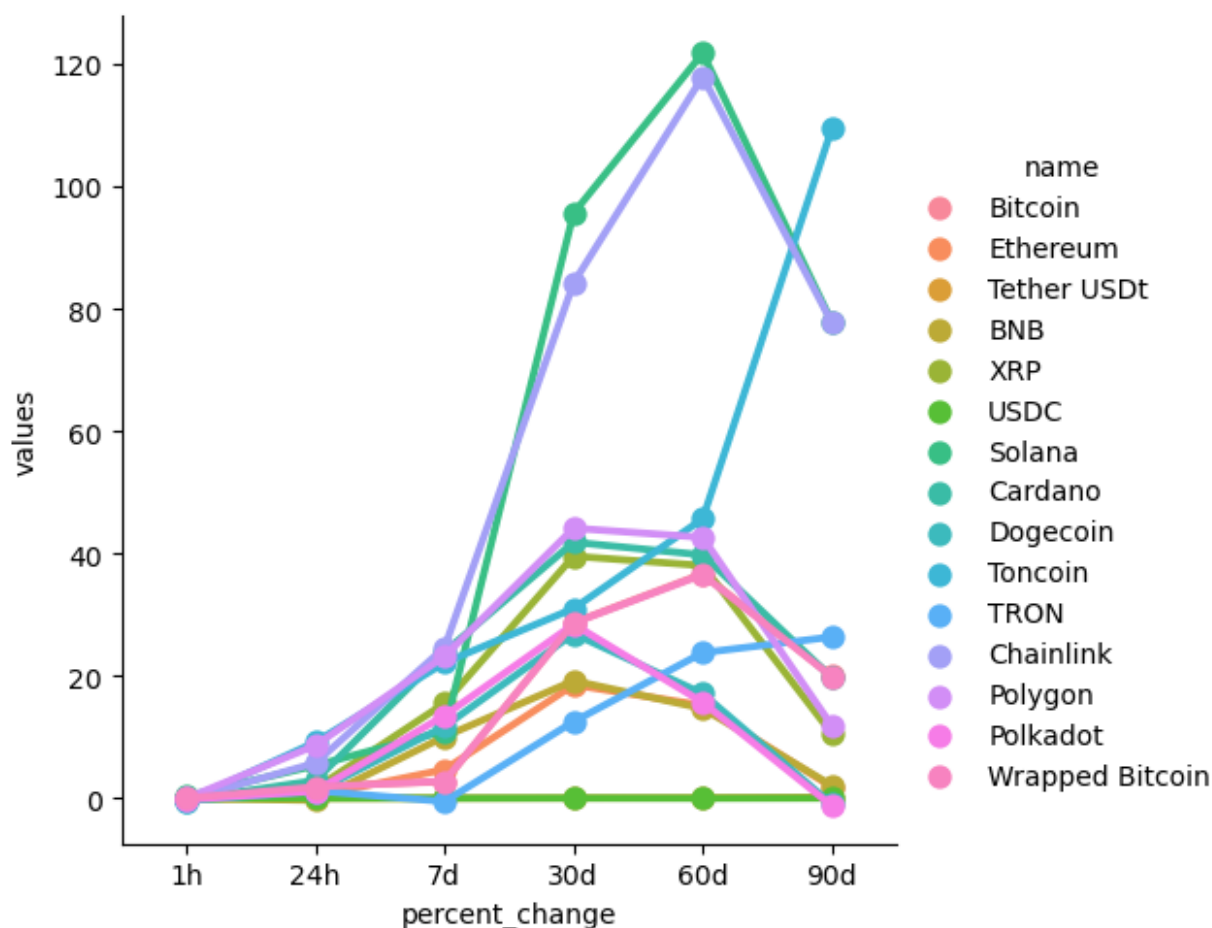
Create Graphs to Track Growth

```
In [21]: import seaborn as sns
import matplotlib.pyplot as plt
```

```
In [27]: sns.catplot(x='percent_change', y = 'values', hue = 'name', data=df7, kind = 'point')

/Users/praveenmanimaran/anaconda3/lib/python3.11/site-packages/seaborn/axisgrid.py:118: UserWarning: The figure layout has changed to tight
  self._figure.tight_layout(*args, **kwargs)

Out[27]: <seaborn.axisgrid.FacetGrid at 0x175864890>
```



Lets Track Bitcoin!

Let us track bitcoins growth over the past few minutes. Not much has changed in terms of price but we can still graph it. We are only tracking for a few minutes for this simple tutorial, because it would take a long time to get data for each hour.

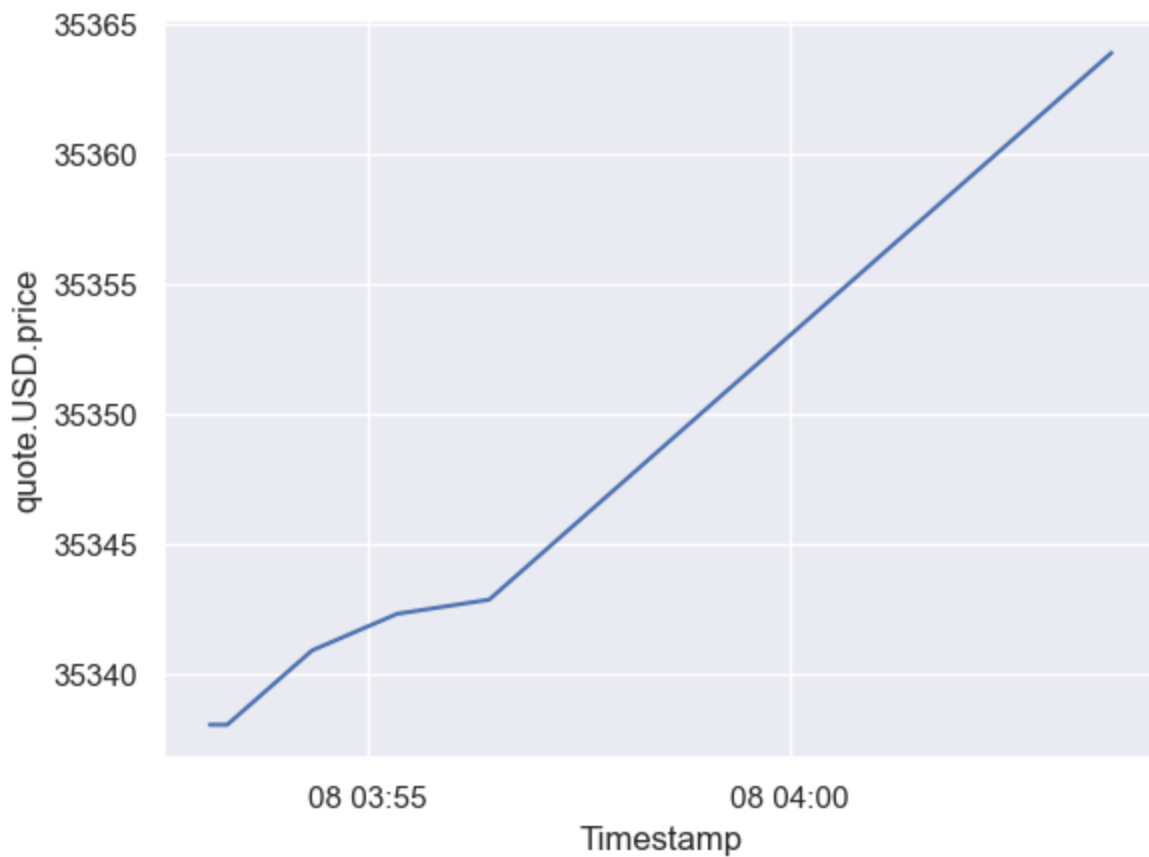
```
In [32]: df8 = df[['name', 'quote.USD.price', 'Timestamp']]
df8 = df8[df8['name'] == 'Bitcoin']
df8
```

```
Out[32]:
```

	name	quote.USD.price	Timestamp
0	Bitcoin	35338.03900	2023-11-08 03:53:07.503703
15	Bitcoin	35338.03900	2023-11-08 03:53:19.904664
30	Bitcoin	35340.89775	2023-11-08 03:54:20.269661
45	Bitcoin	35342.30392	2023-11-08 03:55:20.641289
60	Bitcoin	35342.84893	2023-11-08 03:56:26.068367
75	Bitcoin	35363.88712	2023-11-08 04:03:48.401003

```
In [35]: sns.set_theme(style = "darkgrid")
sns.lineplot(x='Timestamp', y='quote.USD.price', data = df8)
```

```
Out[35]: <Axes: xlabel='Timestamp', ylabel='quote.USD.price'>
```



Summary

I hope you have learned how simple it is to pull data from the API using python! We can modify this code slightly to pull data from any API, not just CoinMarketCap. We can then use the data to perform deep data exploration and use software such as Tableau to create interesting data visualizations.