In [11]:

```
#Usingh Crypto Public API with Python
#https://coinmarketcap.com/api/


from requests import Request, Session
from requests.exceptions import ConnectionError, Timeout, TooManyRedirects
import json

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': '4ad220fb-fc44-472e-86f0-0733d25713ca',
}

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)
```


```
{'status': {'timestamp': '2022-08-27T07:30:44.745Z', 'error_code': 0,
'error_message': None, 'elapsed': 499, 'credit_count': 1, 'notice': Non
e, 'total_count': 9618}, 'data': [{'id': 1, 'name': 'Bitcoin', 'symbo
l': 'BTC', 'slug': 'bitcoin', 'num_market_pairs': 9706, 'date_added':
'2013-04-28T00:00:00.000Z', 'tags': ['mineable', 'pow', 'sha-256', 'sto
re-of-value', 'state-channel', 'coinbase-ventures-portfolio', 'three-ar
rows-capital-portfolio', 'polychain-capital-portfolio', 'binance-labs-p
ortfolio', 'blockchain-capital-portfolio', 'boostvc-portfolio', 'cms-ho
ldings-portfolio', 'dcg-portfolio', 'dragonfly-capital-portfolio', 'ele
ctric-capital-portfolio', 'fabric-ventures-portfolio', 'framework-ventu
res-portfolio', 'galaxy-digital-portfolio', 'huobi-capital-portfolio',
'alameda-research-portfolio', 'a16z-portfolio', '1confirmation-portfoli
o', 'winklevoss-capital-portfolio', 'usv-portfolio', 'placeholder-ventu
res-portfolio', 'pantera-capital-portfolio', 'multicoin-capital-portfol
io', 'paradigm-portfolio'], 'max_supply': 21000000, 'circulating_suppl
y': 19133375, 'total_supply': 19133375, 'platform': None, 'cmc_rank':
1, 'self_reported_circulating_supply': None, 'self_reported_market_ca
p': None, 'tvl_ratio': None, 'last_updated': '2022-08-27T07:28:00.000
Z', 'quote': {'USD': {'price': 20197.95529374492, 'volume_24h': 4387843
```


In [12]:

```
type(data)
```

Out[12]:

```
dict
```

In [13]:

```
import pandas as pd

pd.set_option('display.max_columns',None)
```

In [14]:

```
df = pd.json_normalize(data['data'])
df['timestamp'] = pd.to_datetime('now')
df
```

Out[14]:

	id	name	symbol	slug	num_market_pairs	date_added	tags
0	1	Bitcoin	BTC	bitcoin	9706	2013-04-28T00:00:00.000Z	[mineable, pow, sha-256, store-of-value, state...
1	1027	Ethereum	ETH	ethereum	6049	2015-08-07T00:00:00.000Z	[mineable, pow, smart-contracts, ethereum-ecos...
2	825	Tether	USDT	tether	38923	2015-02-25T00:00:00.000Z	[payments, stablecoin, asset-backed-stablecoin...
3	3408	USD Coin	USDC	usd-coin	5977	2018-10-08T00:00:00.000Z	[medium-of-exchange, stablecoin, asset-backed-...
4	1839	BNB	BNB	bnb	1088	2017-07-25T00:00:00.000Z	[marketplace, centralized-exchange, payments, ...
5	4687	Binance USD	BUSD	binance-usd	4904	2019-09-20T00:00:00.000Z	[stablecoin, asset-backed-stablecoin, binance-...
6	52	XRP	XRP	xrp	807	2013-08-04T00:00:00.000Z	[medium-of-exchange, enterprise-solutions, bin...
7	2010	Cardano	ADA	cardano	561	2017-10-01T00:00:00.000Z	[mineable, dpos, pos, platform, research, smar...
8	5426	Solana	SOL	solana	371	2020-04-10T00:00:00.000Z	[pos, platform, solana-ecosystem, cms-holdings...

	id	name	symbol	slug	num_market_pairs	date_added	tags
9	74	Dogecoin	DOGE	dogecoin	554	2013-12-15T00:00:00.000Z	[mineable, pow, scrypt, medium-of-exchange, me...
10	6636	Polkadot	DOT	polkadot-new	402	2020-08-19T00:00:00.000Z	[substrate, polkadot, binance-chain, polkadot-...
11	4943	Dai	DAI	multi-collateral-dai	1278	2019-11-22T00:00:00.000Z	[defi, stablecoin, ethereum-ecosystem, avalanc...
12	5994	Shiba Inu	SHIB	shiba-inu	407	2020-08-01T00:00:00.000Z	[memes, ethereum-ecosystem, doggone-doggerel]
13	3890	Polygon	MATIC	polygon	471	2019-04-28T00:00:00.000Z	[platform, enterprise-solutions, scaling, stat...
14	5805	Avalanche	AVAX	avalanche	307	2020-07-13T00:00:00.000Z	[defi, smart-contracts, three-arrows-capital-p...

In [24]:

```
def api_runner():
    global df

    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': '4ad220fb-fc44-472e-86f0-0733d25713ca',
    }

    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)




    df = pd.json_normalize(data['data'])
    df['timestamp'] = pd.to_datetime('now')
    df

    if not os.path.isfile(r'D:\Project\Python\API.csv'):
        df.to_csv(r'D:\Project\Python\API.csv',header='column_names')
    else:
        df.to_csv(r'D:\Project\Python\API.csv', mode='a', header=False)
```

In [25]:

```
import os
from time import time
from time import sleep
for i in range(333):
    api_runner()
    print('API Runner Completed')
    sleep(60) #sleep for 1 min
exit()
```


```
ange_60d': -11.1927543, 'percent_change_90d': -21.44221876, 'market_ca
p': 8456520348.217251, 'market_cap_dominance': 0.8671, 'fully_diluted_m

arket_cap': 8456520348.22, 'tvl': None, 'last_updated': '2022-08-27T08:
07:00.000Z'}}}, {'id': 6636, 'name': 'Polkadot', 'symbol': 'DOT', 'slu
g': 'polkadot-new', 'num_market_pairs': 402, 'date_added': '2020-08-19T
00:00:00.000Z', 'tags': ['substrate', 'polkadot', 'binance-chain', 'pol
kadot-ecosystem', 'three-arrows-capital-portfolio', 'polychain-capital-
portfolio', 'arrington-xrp-capital-portfolio', 'blockchain-capital-port
folio', 'boostvc-portfolio', 'cms-holdings-portfolio', 'coinfund-portfo
lio', 'fabric-ventures-portfolio', 'fenbushi-capital-portfolio', 'hashk
ey-capital-portfolio', 'kenetic-capital-portfolio', '1confirmation-port
folio', 'placeholder-ventures-portfolio', 'pantera-capital-portfolio',
'exnetwork-capital-portfolio', 'web3', 'spartan-group', 'injective-ecos
ystem', 'bnb-chain'], 'max_supply': None, 'circulating_supply': 1110838
831.9527931, 'total_supply': 1226062502.277973, 'platform': None, 'cmc_
rank': 11, 'self_reported_circulating_supply': 904869778, 'self_reporte
d_market_cap': 6350724097.150912, 'tvl_ratio': None, 'last_updated': '2
022-08-27T08:07:00.000Z', 'quote': {'USD': {'price': 7.018384580362139,
'volume_24h': 444696445.27914673, 'volume_change_24h': 77.3782, 'percen
```


In [26]:

```
df72= pd.read_csv(r'D:\Project\Python\API.csv')
df72
```

Out[26]:

	Unnamed: 0	id	name	symbol	slug	num_market_pairs	date_added	tags	ma
0	0	1	Bitcoin	BTC	bitcoin	9706	2013-04-28T00:00:00.000Z	['mineable', 'pow', 'sha-256', 'store-of-value...	2.10(
1	1	1027	Ethereum	ETH	ethereum	6049	2015-08-07T00:00:00.000Z	['mineable', 'pow', 'smart-contracts', 'ethere...	
2	2	825	Tether	USDT	tether	38925	2015-02-25T00:00:00.000Z	['payments', 'stablecoin', 'asset-backed-stabl...	

In [22]:

```
df
```

Out[22]:

	id	name	symbol	slug	num_market_pairs	date_added	tags	max_supply	c
0	1	Bitcoin	BTC	bitcoin	9706	2013-04-28T00:00:00.000Z	[mineable, pow, sha-256, store-of-value, state...	2.100000e+07	
1	1027	Ethereum	ETH	ethereum	6049	2015-08-07T00:00:00.000Z	[mineable, pow, smart-contracts, ethereum-ecos...	NaN	
2	825	Tether	USDT	tether	38923	2015-02-25T00:00:00.000Z	[payments, stablecoin, asset-backed-stablecoin...	NaN	

In [27]:

```
pd.set_option('display.float_format', lambda x: '%.5f' % x)
```

In [28]:

```
df
```

Out[28]:

	id	name	symbol	slug	num_market_pairs	date_added	tags
0	1	Bitcoin	BTC	bitcoin	9706	2013-04-28T00:00:00.000Z	[mineable, pow, sha-256, store-of-value, state...
1	1027	Ethereum	ETH	ethereum	6049	2015-08-07T00:00:00.000Z	[mineable, pow, smart-contracts, ethereum-ecos...
2	825	Tether	USDT	tether	38925	2015-02-25T00:00:00.000Z	[payments, stablecoin, asset-backed-stablecoin...
3	3408	USD Coin	USDC	usd-coin	5978	2018-10-08T00:00:00.000Z	[medium-of-exchange, stablecoin, asset-backed-...
4	1839	BNB	BNB	bnb	1088	2017-07-25T00:00:00.000Z	[marketplace, centralized-exchange, payments, ...
5	4687	Binance USD	BUSD	binance-usd	4904	2019-09-20T00:00:00.000Z	[stablecoin, asset-backed-stablecoin, binance-...
6	52	XRP	XRP	xrp	807	2013-08-04T00:00:00.000Z	[medium-of-exchange, enterprise-solutions, bin...
7	2010	Cardano	ADA	cardano	561	2017-10-01T00:00:00.000Z	[mineable, dpos, pos, platform, research, smar...
8	5426	Solana	SOL	solana	371	2020-04-10T00:00:00.000Z	[pos, platform, solana-ecosystem, cms-holdings...
9	74	Dogecoin	DOGE	dogecoin	554	2013-12-15T00:00:00.000Z	[mineable, pow, scrypt, medium-of-exchange, me...

	id	name	symbol	slug	num_market_pairs	date_added	tags
10	6636	Polkadot	DOT	polkadot-new	402	2020-08-19T00:00:00.000Z	[substrate, polkadot, binance-chain, polkadot-...
11	4943	Dai	DAI	multi-collateral-dai	1278	2019-11-22T00:00:00.000Z	[defi, stablecoin, ethereum-ecosystem, avalanc...
12	5994	Shiba Inu	SHIB	shiba-inu	407	2020-08-01T00:00:00.000Z	[memes, ethereum-ecosystem, doggone-doggerel]
13	3890	Polygon	MATIC	polygon	471	2019-04-28T00:00:00.000Z	[platform, enterprise-solutions, scaling, stat...
14	5805	Avalanche	AVAX	avalanche	307	2020-07-	[defi, smart-contracts,

In [31]:

```
df3 = df.groupby('name', sort=False)[['quote.USD.percent_change_1h','quote.USD.percent_c
df3
```

Out[31]:

name	quote.USD.percent_change_1h	quote.USD.percent_change_24h	quote.USD.percent_chan
Bitcoin	0.44092	-5.48459	-4.
Ethereum	0.47161	-9.25670	-8.
Tether	0.00072	-0.00137	-0.
USD Coin	0.01003	0.00961	0.
BNB	0.43813	-4.78678	-2.
Binance USD	0.02538	0.01351	0.
XRP	0.33535	-4.02707	-1.
Cardano	0.90141	-8.56412	-4.
Solana	0.97407	-7.37053	-13.
Dogecoin	0.46205	-6.17924	-9.
Polkadot	0.75795	-5.65909	-6.
Dai	0.00557	0.06087	0.
Shiba Inu	1.23203	-6.82164	-8.
Polygon	1.06762	-3.27833	-3.
Avalanche	0.91273	-8.14999	-9.

In [32]:

```
df4 = df3.stack()
df4
```

Out[32]:

```
name
Bitcoin    quote.USD.percent_change_1h      0.44092
           quote.USD.percent_change_24h    -5.48459
           quote.USD.percent_change_7d     -4.81011
           quote.USD.percent_change_30d   -11.55101
           quote.USD.percent_change_60d    -2.94704
                                             ...
Avalanche  quote.USD.percent_change_24h    -8.14999
           quote.USD.percent_change_7d     -9.87527
           quote.USD.percent_change_30d    -9.18989
           quote.USD.percent_change_60d     5.47472
           quote.USD.percent_change_90d   -16.23040
Length: 90, dtype: float64
```

In [34]:

```
type(df4)
```

Out[34]:

```
pandas.core.series.Series
```

In [37]:

```
df5 = df4.to_frame(name = 'values')
df5
```

Out[37]:

		values
name		
Bitcoin	**quote.USD.percent_change_1h**	0.44092
	quote.USD.percent_change_24h	-5.48459
	quote.USD.percent_change_7d	-4.81011
	quote.USD.percent_change_30d	-11.55101
	quote.USD.percent_change_60d	-2.94704
...	**...**	...
Avalanche	**quote.USD.percent_change_24h**	-8.14999
	quote.USD.percent_change_7d	-9.87527
	quote.USD.percent_change_30d	-9.18989
	quote.USD.percent_change_60d	5.47472
	quote.USD.percent_change_90d	-16.23040

90 rows × 1 columns

In [38]:

```
df5.count()
```

Out[38]:

```
values    90
dtype: int64
```

In [39]:

```
pd.Index(range(90))

df6 = df5.reset_index()
df6
```

Out[39]:

	name	level_1	values
0	Bitcoin	quote.USD.percent_change_1h	0.44092
1	Bitcoin	quote.USD.percent_change_24h	-5.48459
2	Bitcoin	quote.USD.percent_change_7d	-4.81011
3	Bitcoin	quote.USD.percent_change_30d	-11.55101
4	Bitcoin	quote.USD.percent_change_60d	-2.94704
...	...	...	...
85	Avalanche	quote.USD.percent_change_24h	-8.14999
86	Avalanche	quote.USD.percent_change_7d	-9.87527
87	Avalanche	quote.USD.percent_change_30d	-9.18989
88	Avalanche	quote.USD.percent_change_60d	5.47472
89	Avalanche	quote.USD.percent_change_90d	-16.23040

90 rows × 3 columns

In [42]:

```
df7 = df6.rename(columns={'level_1': 'Percent_change'})
df7
```

Out[42]:

	name	Percent_change	values
0	Bitcoin	quote.USD.percent_change_1h	0.44092
1	Bitcoin	quote.USD.percent_change_24h	-5.48459
2	Bitcoin	quote.USD.percent_change_7d	-4.81011
3	Bitcoin	quote.USD.percent_change_30d	-11.55101
4	Bitcoin	quote.USD.percent_change_60d	-2.94704
...	...	...	...
85	Avalanche	quote.USD.percent_change_24h	-8.14999
86	Avalanche	quote.USD.percent_change_7d	-9.87527
87	Avalanche	quote.USD.percent_change_30d	-9.18989
88	Avalanche	quote.USD.percent_change_60d	5.47472
89	Avalanche	quote.USD.percent_change_90d	-16.23040

90 rows × 3 columns

In [52]:

```
df7['Percent_change'] = df7['Percent_change'].replace(['quote.USD.percent_change_1h','qu
df7
```

Out[52]:

	name	Percent_change	values
0	Bitcoin	1h	0.44092
1	Bitcoin	24h	-5.48459
2	Bitcoin	7d	-4.81011
3	Bitcoin	30d	-11.55101
4	Bitcoin	60d	-2.94704
...	...	...	...
85	Avalanche	24h	-8.14999
86	Avalanche	7d	-9.87527
87	Avalanche	30d	-9.18989
88	Avalanche	60d	5.47472
89	Avalanche	90d	-16.23040

90 rows × 3 columns

In [53]:

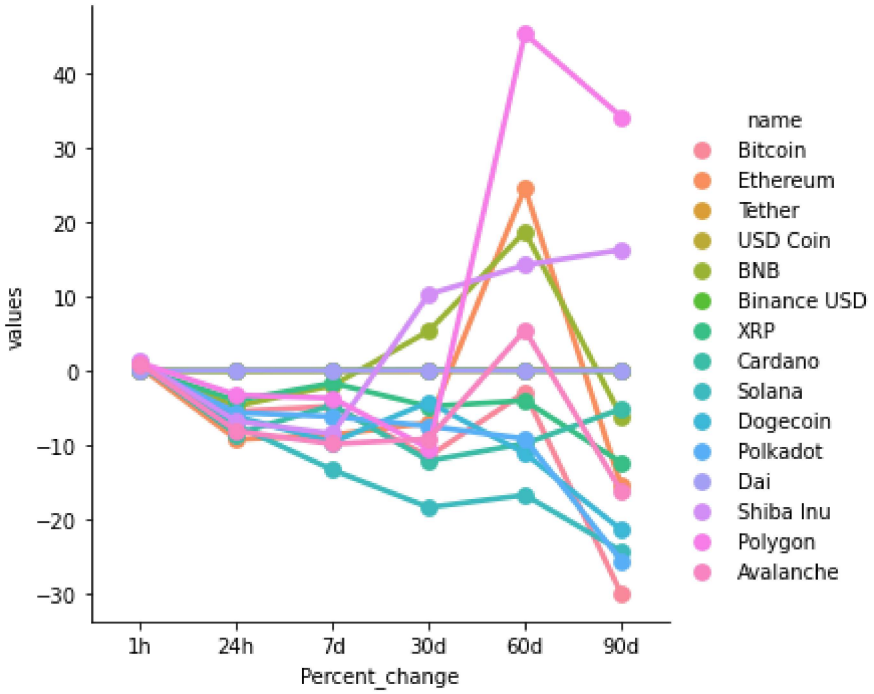
```
import seaborn as sns
import matplotlib.pyplot as plt
```

In [54]:

```
sns.catplot(x = 'Percent_change', y = 'values', hue = 'name', data = df7, kind='point')
```

Out[54]:

```
<seaborn.axisgrid.FacetGrid at 0x1a17ff327c0>
```



In [56]:

```
df10 = df[['name','quote.USD.price','timestamp']]
df10 = df10.query("name == 'Bitcoin'")
df10
```

Out[56]:

	name	quote.USD.price	timestamp
0	Bitcoin	20275.84221	2022-08-27 08:11:15.249777