

```
In [14]: import requests
import json
from requests.exceptions import ConnectionError, Timeout, TooManyRedirects

url = 'https://pro-api.coinmarketcap.com/v1/cryptocurrency/listings/latest'

parameters = {
    'start': '1',
    'limit': '100',
    'convert': 'USD'
}

headers = {
    'Accepts': 'application/json',
    'X-CMC_PRO_API_KEY': 'cf47f1f3-5841-4f58-8802-8b167c08e3e1' # Replace this
}

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

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

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In [15]: type(data)
```

```
Out[15]: dict
```

```
In [29]: import pandas as pd
pd.set_option('display.max_columns', None)
```

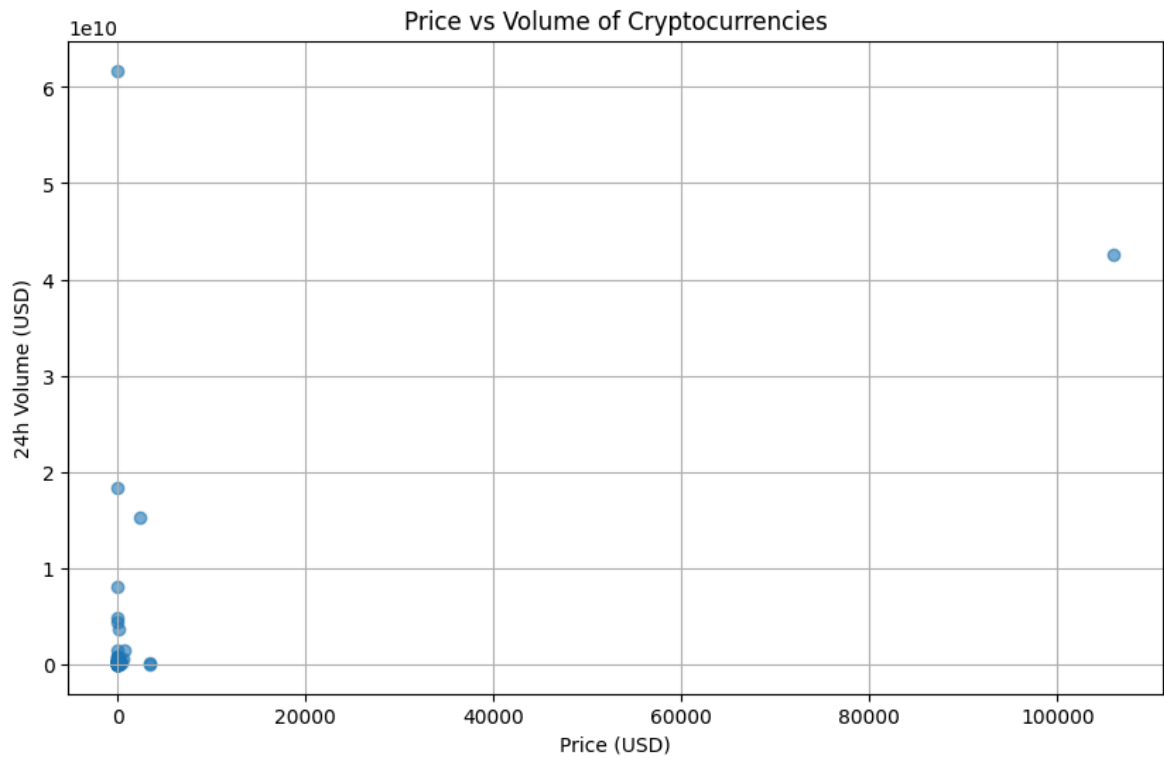
```
In [30]: df = pd.json_normalize(data['data'])
df['pulled_at'] = pd.to_datetime('now')
df.head()
```

Out[30]:

	id	name	symbol	slug	num_market_pairs	date_added	tags
0	1	Bitcoin	BTC	bitcoin	12231	2010-07-13T00:00:00.000Z	[mineable, pow, sha-256, store-of-value, state...
1	1027	Ethereum	ETH	ethereum	10359	2015-08-07T00:00:00.000Z	[pos, smart-contracts, ethereum-ecosystem, coi...
2	825	Tether USDt	USDT	tether	134452	2015-02-25T00:00:00.000Z	[stablecoin, asset-backed-stablecoin, usd-stab...
3	52	XRP	XRP	xrp	1635	2013-08-04T00:00:00.000Z	[medium-of-exchange, enterprise-solutions, xrp...
4	1839	BNB	BNB	bnb	2597	2017-07-25T00:00:00.000Z	[marketplace, centralized-exchange, payments, ...

In [20]:

```
plt.figure(figsize=(10,6))
plt.scatter(df['quote.USD.price'], df['quote.USD.volume_24h'], alpha=0.6)
plt.xlabel('Price (USD)')
plt.ylabel('24h Volume (USD)')
plt.title('Price vs Volume of Cryptocurrencies')
plt.grid(True)
plt.show()
```



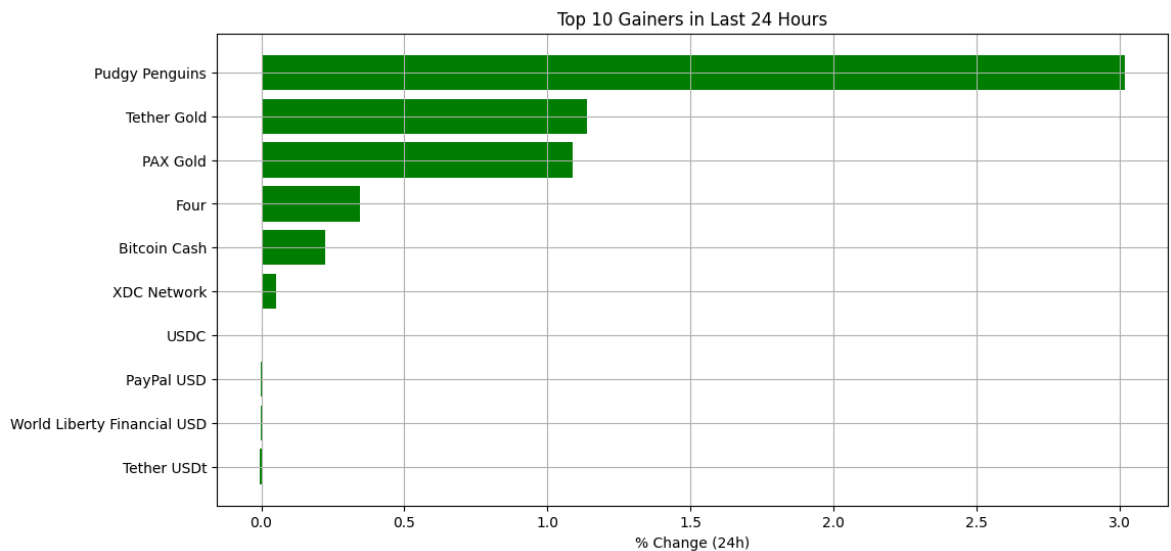
```
In [21]: top10 = df.nlargest(10, 'quote.USD.market_cap')
plt.figure(figsize=(12,6))
plt.barh(top10['name'], top10['quote.USD.market_cap'], color='darkblue')
plt.xlabel('Market Cap (USD)')
plt.title('Top 10 Cryptos by Market Cap')
plt.gca().invert_yaxis()
plt.grid(True)
plt.show()
```



```
In [22]: gainers = df.nlargest(10, 'quote.USD.percent_change_24h')

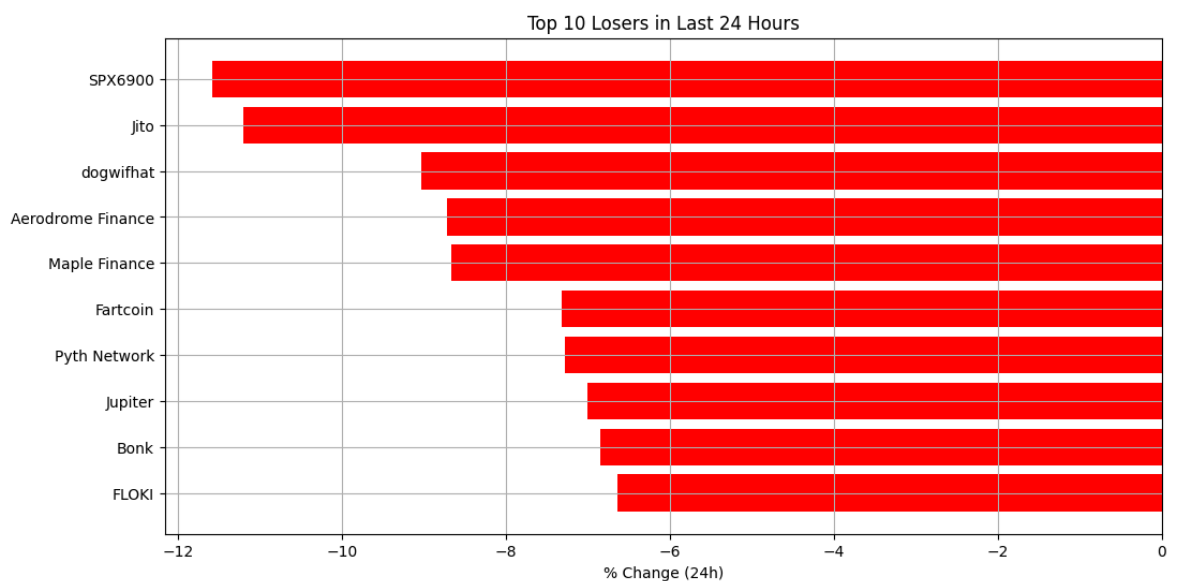
plt.figure(figsize=(12,6))
plt.barh(gainers['name'], gainers['quote.USD.percent_change_24h'], color='green')
plt.xlabel('% Change (24h)')
plt.title('Top 10 Gainers in Last 24 Hours')
plt.gca().invert_yaxis()
```

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plt.grid(True)
plt.show()
```

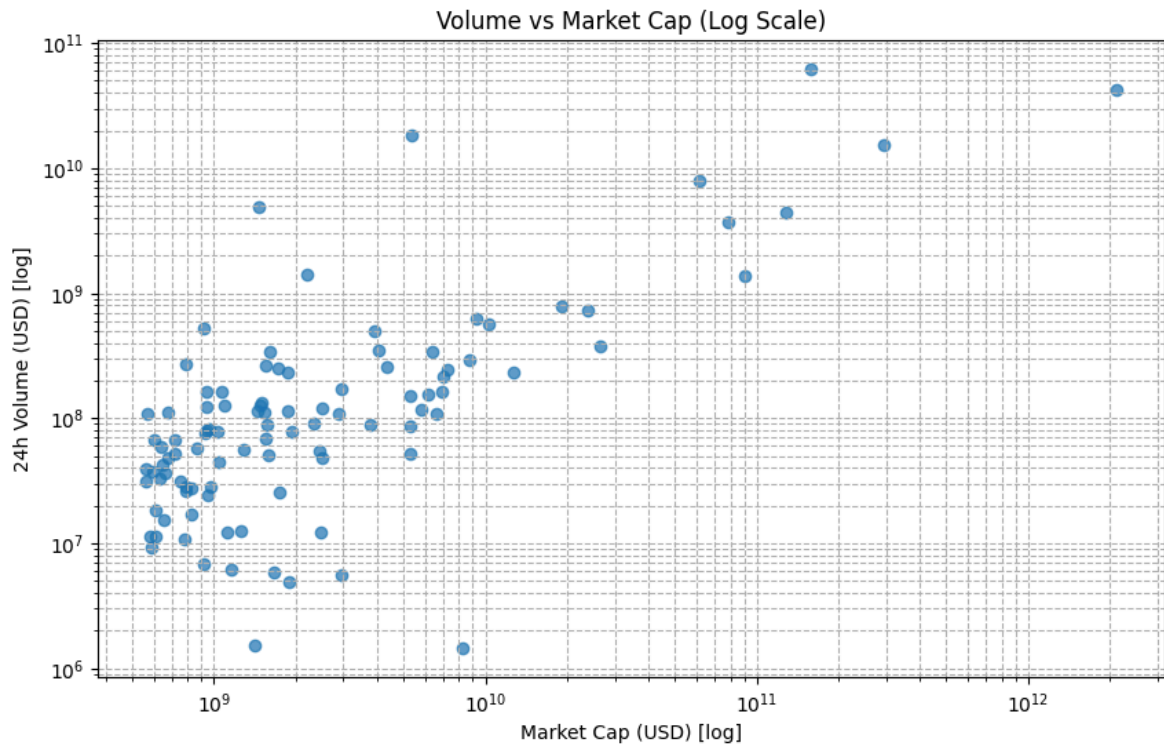


```
In [28]: losers = df.nsmallest(10, 'quote.USD.percent_change_24h')

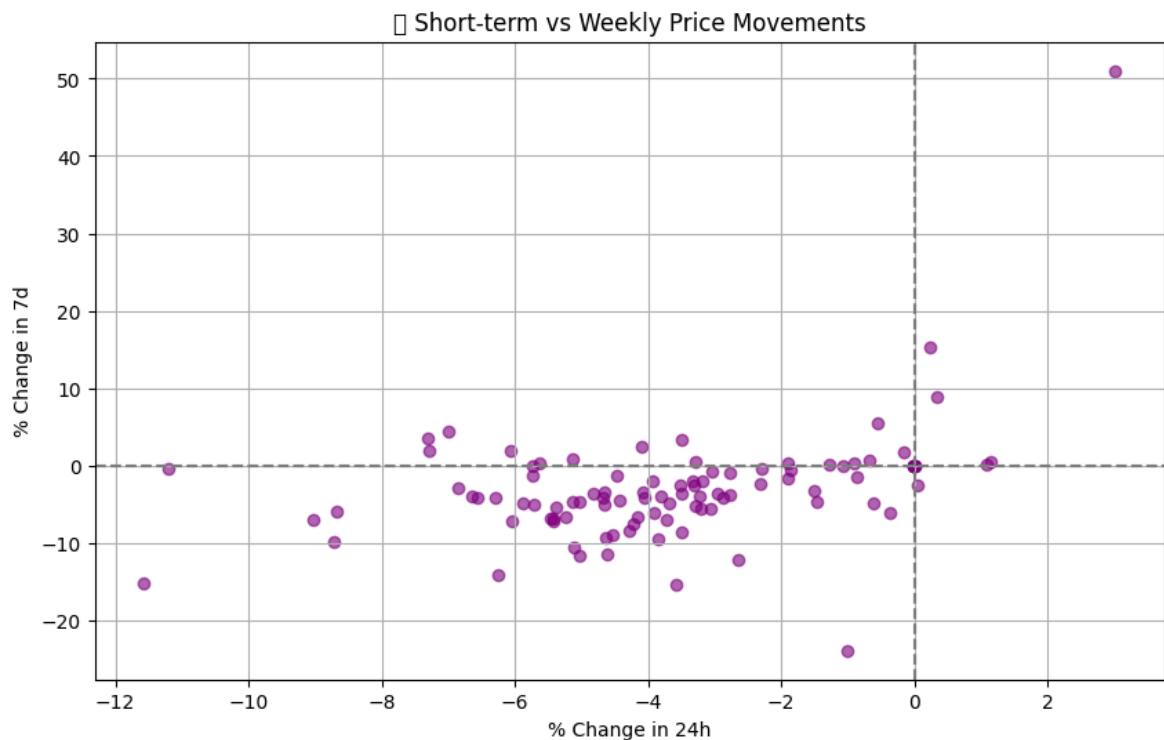
plt.figure(figsize=(12,6))
plt.barh(losers['name'], losers['quote.USD.percent_change_24h'], color='red')
plt.xlabel('% Change (24h)')
plt.title('Top 10 Losers in Last 24 Hours')
plt.gca().invert_yaxis()
plt.grid(True)
plt.show()
```



```
In [24]: plt.figure(figsize=(10,6))
plt.scatter(df['quote.USD.market_cap'], df['quote.USD.volume_24h'], alpha=0.7)
plt.xscale('log')
plt.yscale('log')
plt.xlabel('Market Cap (USD) [log]')
plt.ylabel('24h Volume (USD) [log]')
plt.title('Volume vs Market Cap (Log Scale)')
plt.grid(True, which="both", ls="--")
plt.show()
```



```
In [25]: plt.figure(figsize=(10,6))
plt.scatter(df['quote.USD.percent_change_24h'], df['quote.USD.percent_change_7d'])
plt.xlabel('% Change in 24h')
plt.ylabel('% Change in 7d')
plt.title('📉 Short-term vs Weekly Price Movements')
plt.axhline(0, color='gray', linestyle='--')
plt.axvline(0, color='gray', linestyle='--')
plt.grid(True)
plt.show()
```



```
In [26]: summary = df[['name', 'symbol', 'quote.USD.price', 'quote.USD.volume_24h', 'quote.USD.market_cap']]
summary_sorted = summary.sort_values(by='quote.USD.market_cap', ascending=False)
display(summary_sorted)
```

	name	symbol	quote.USD.price	quote.USD.volume_24h	quote.USD.market_cap	qu
0	Bitcoin	BTC	105965.658998	4.259705e+10	2.107244e+12	
1	Ethereum	ETH	2423.685734	1.526190e+10	2.925814e+11	
2	Tether USDt	USDT	1.000292	6.172193e+10	1.577613e+11	
3	XRP	XRP	2.180961	4.396543e+09	1.286888e+11	
4	BNB	BNB	645.366525	1.385840e+09	9.092272e+10	
5	Solana	SOL	147.074636	3.672150e+09	7.862754e+10	
6	USDC	USDC	1.000045	8.016655e+09	6.165202e+10	
7	TRON	TRX	0.278759	3.791196e+08	2.642469e+10	
8	Dogecoin	DOGE	0.158464	7.237788e+08	2.375654e+10	
9	Cardano	ADA	0.542163	7.937215e+08	1.917964e+10	



```
In [48]: import matplotlib.pyplot as plt

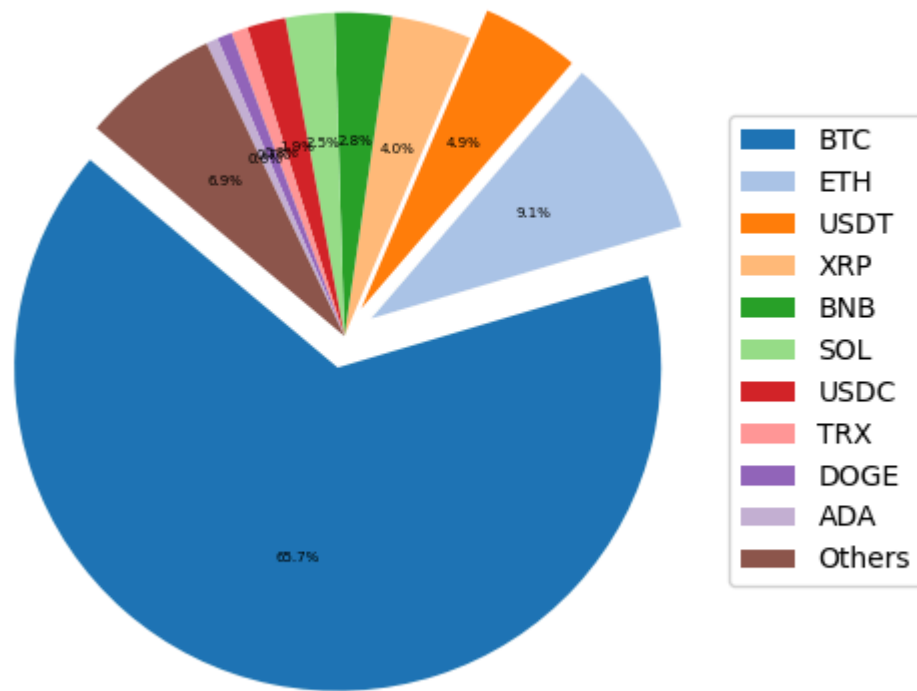
top10_dominance = df.nlargest(10, 'quote.USD.market_cap')
others = df['quote.USD.market_cap'].sum() - top10_dominance['quote.USD.market_ca

labels = list(top10_dominance['symbol']) + ['Others']
sizes = list(top10_dominance['quote.USD.market_cap']) + [others]

explode = [0.1 if i < 3 else 0 for i in range(len(labels))]

colors = plt.cm.tab20.colors[:len(labels)]
plt.figure(figsize=(5, 5))
patches, texts, autotexts = plt.pie(
    sizes,
    labels=None,
    autopct='%1.1f%%',
    startangle=140,
    explode=explode,
    colors=colors,
    textprops={'fontsize': 5}
)
plt.legend(patches, labels, loc='center left', bbox_to_anchor=(1, 0.5))
plt.title("Market Cap Dominance by Top 10 Cryptos", fontsize=14)
plt.axis('equal')
plt.tight_layout()
plt.show()
```

## Market Cap Dominance by Top 10 Cryptos

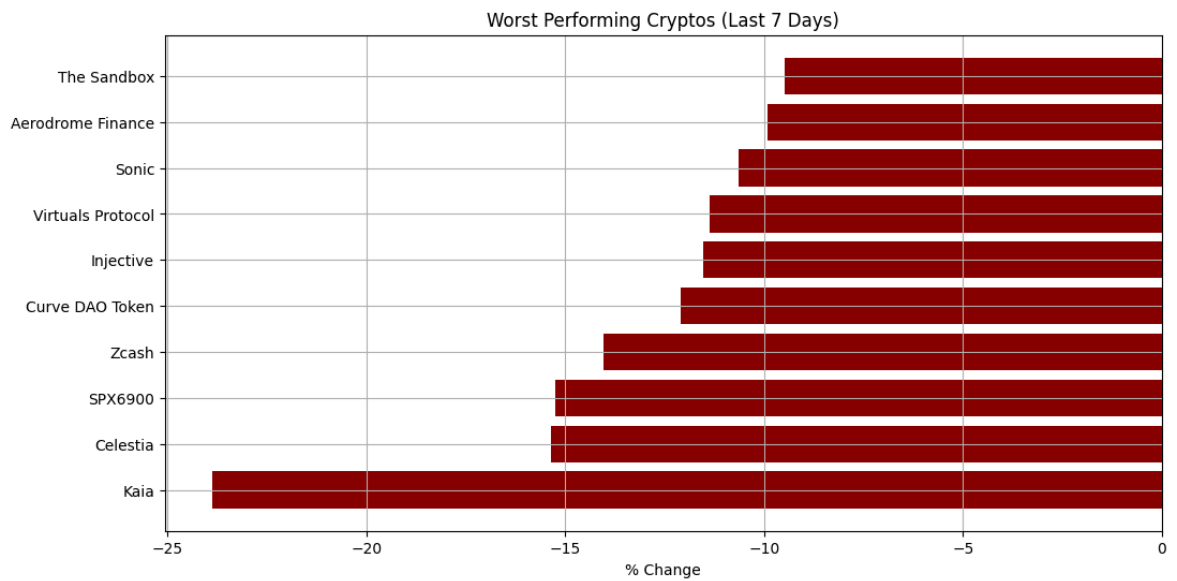


```
In [36]: plt.figure(figsize=(10,6))
plt.scatter(df['quote.USD.price'], df['quote.USD.volume_24h'], alpha=0.6, color=
plt.title("Price vs 24h Volume (Are expensive coins traded more?)")
plt.xlabel("Price (USD)")
plt.ylabel("24h Volume (USD)")
plt.grid(True)
plt.show()
```



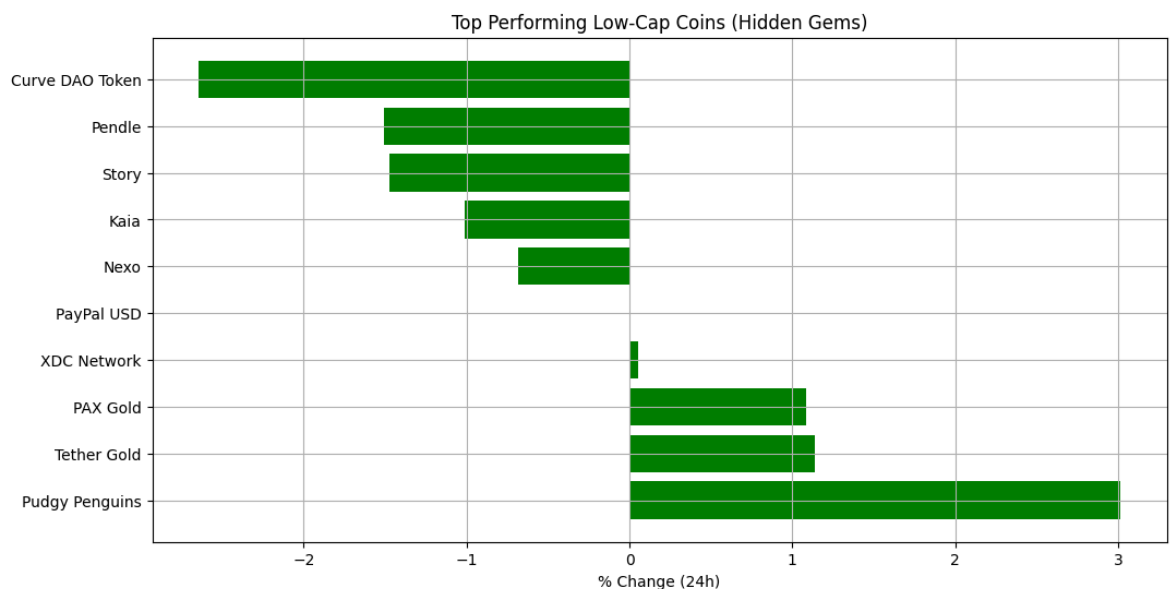


```
plt.title("Worst Performing Cryptos (Last 7 Days)")
plt.xlabel("% Change")
plt.grid(True)
plt.show()
```



```
In [41]: lowcap = df[df['quote.USD.market_cap'] < 1_000_000_000] # < $1B market cap
top_lowcap = lowcap.nlargest(10, 'quote.USD.percent_change_24h')

plt.figure(figsize=(12,6))
plt.barh(top_lowcap['name'], top_lowcap['quote.USD.percent_change_24h'], color='green')
plt.title("Top Performing Low-Cap Coins (Hidden Gems)")
plt.xlabel("% Change (24h)")
plt.grid(True)
plt.show()
```



```
In [42]: def classify_market_cap(cap):
    if cap >= 10_000_000_000:
        return 'Mega Cap ($10B+)'
    elif cap >= 1_000_000_000:
        return 'Large Cap ($1B-$10B)'
    elif cap >= 100_000_000:
        return 'Mid Cap ($100M-$1B)'
    else:
        return 'Small Cap (<$100M)'
```

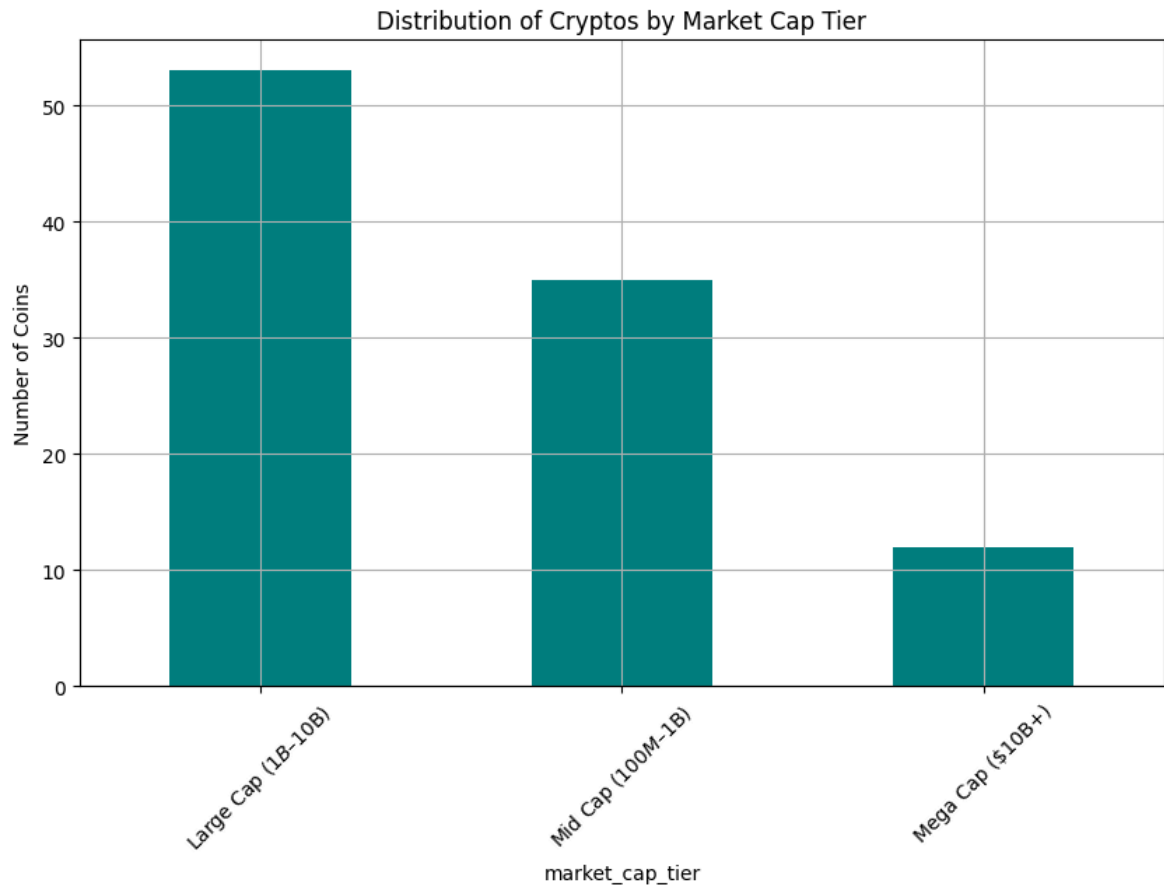
```

df['market_cap_tier'] = df['quote.USD.market_cap'].apply(classify_market_cap)

tier_counts = df['market_cap_tier'].value_counts()

tier_counts.plot(kind='bar', figsize=(10,6), color='teal')
plt.title("Distribution of Cryptos by Market Cap Tier")
plt.ylabel("Number of Coins")
plt.xticks(rotation=45)
plt.grid(True)
plt.show()

```



```

In [43]: print("Average Price of All Coins:", round(df['quote.USD.price'].mean(), 2))
print("Average Market Cap (USD):", round(df['quote.USD.market_cap'].mean(), 2))
print("Average 24h Volume (USD):", round(df['quote.USD.volume_24h'].mean(), 2))
print("Average % Change 24h:", round(df['quote.USD.percent_change_24h'].mean(), 2))
print("Average % Change 7d:", round(df['quote.USD.percent_change_7d'].mean(), 2))

```

```

Average Price of All Coins: 1178.03
Average Market Cap (USD): 32073064651.74
Average 24h Volume (USD): 1735302428.03
Average % Change 24h: -3.61
Average % Change 7d: -2.95

```

```

In [44]: btc = df[df['symbol'] == 'BTC']
eth = df[df['symbol'] == 'ETH']

btc_price = btc['quote.USD.price'].values[0]
eth_price = eth['quote.USD.price'].values[0]
btc_market_cap = btc['quote.USD.market_cap'].values[0]
eth_market_cap = eth['quote.USD.market_cap'].values[0]

```

```
print(f"BTC Price: ${btc_price:,.2f} | Market Cap: ${btc_market_cap/1e9:.2f}B")  
print(f"ETH Price: ${eth_price:,.2f} | Market Cap: ${eth_market_cap/1e9:.2f}B")
```

BTC Price: \$105,965.66 | Market Cap: \$2107.24B

ETH Price: \$2,423.69 | Market Cap: \$292.58B

```
In [49]: df.to_csv('crypto_data.csv', index=False)  
print("Data saved to crypto_data.csv")
```

Data saved to crypto\_data.csv

In [ ]: