PYTHON PROJECT

Project Exploring the Bitcoin Cryptocurrency Market

1.Bitcoin and Cryptocurrencies: Full dataset, filtering, and reproducibility

```
# importing pandas
import pandas as pd

#importing matplotlib

import matplotlib.pyplot as plt

# Reading datasets cryptocurrency.csv into pandaas
bitcoin=pd.read_csv("cryptocurrency.csv")

bitcoin
```

```
            24h_volume_usd  available_supply                 id
last_updated  \
0        0    9.007640e+09      1.672352e+07            bitcoin
1512549554
1        1    1.551330e+09      9.616537e+07           ethereum
1512549553
2        2    1.111350e+09      1.684044e+07       bitcoin-cash
1512549578
3        3    2.936090e+09      2.779530e+09               iota
1512549571
4        4    2.315050e+08      3.873915e+10             ripple
1512549541
...    ...             ...               ...                ...
...
1321  1321             NaN               NaN          turbocoin
1512368664
1322  1322             NaN               NaN              birds
1512535772
1323  1323             NaN               NaN  bitcoincashscrypt
1512548078
1324  1324             NaN               NaN          swisscoin
1512540278
1325  1325             NaN               NaN          faceblock
1512435283

      market_cap_usd    max_supply               name
percent_change_1h  \
0       2.130493e+11  2.100000e+07            Bitcoin
0.12
1       4.352945e+10           NaN           Ethereum              -
0.18
2       2.529585e+10  2.100000e+07       Bitcoin Cash
```

```
1.65
3       1.475225e+10  2.779530e+09               IOTA              -
2.38
4       9.365343e+09  1.000000e+11             Ripple
0.56
...              ...           ...                ...               .
..
1321             NaN           NaN          TurboCoin
NaN
1322             NaN           NaN              Birds
NaN
1323             NaN           NaN  BitcoinCashScrypt              -
0.37
1324             NaN           NaN          Swisscoin
NaN
1325             NaN           NaN          Faceblock
NaN

      percent_change_24h  percent_change_7d     price_btc
price_usd  rank  \
0                   7.33              17.45  1.000000e+00
12739.500000     1
1                  -3.93              -7.33  3.617670e-02
452.652000     2
2                  -5.51              -4.75  1.200500e-01
1502.090000     3
3                  83.35             255.82  4.241800e-04
5.307460     4
4                  -3.70             -14.79  1.932000e-05
0.241754     5
...                  ...                ...           ...           ..
.   ...
1321                 NaN               8.12  1.000000e-08
0.000114  1322
1322               10.62             -42.10  1.000000e-08
0.000122  1323
1323              -37.39             -27.69  5.000000e-07
0.006202  1324
1324                4.39             -22.84  1.000000e-08
0.000123  1325
1325                 NaN              -6.83  1.400000e-07
0.001654  1326

     symbol  total_supply
0       BTC  1.672352e+07
1       ETH  9.616537e+07
2       BCH  1.684044e+07
3     MIOTA  2.779530e+09
4       XRP  9.999309e+10
...     ...           ...
```

```
1321  TURBO           NaN
1322  BIRDS           NaN
1323   BCCS  2.502380e+06
1324    SIC  1.020000e+10
1325    FBL  1.000000e+07

[1326 rows x 16 columns]
```

```
# Selecting the 'id' and 'market_cap_usd' columns
b1=bitcoin[['id','market_cap_usd']]
print(b1)
```

```
                     id  market_cap_usd
0               bitcoin    2.130493e+11
1              ethereum    4.352945e+10
2          bitcoin-cash    2.529585e+10
3                  iota    1.475225e+10
4                ripple    9.365343e+09
...                 ...             ...
1321          turbocoin             NaN
1322              birds             NaN
1323  bitcoincashscrypt             NaN
1324          swisscoin             NaN
1325          faceblock             NaN

[1326 rows x 2 columns]
```

```
# Counting number of values
print(f"id_count: {b1['id'].count()}\nmarket_cap_usd_count:
{b1['market_cap_usd'].count()}")
```

```
id_count: 1326
market_cap_usd_count: 1031
```

2.Discard the cryptocurrencies without a market capitalization

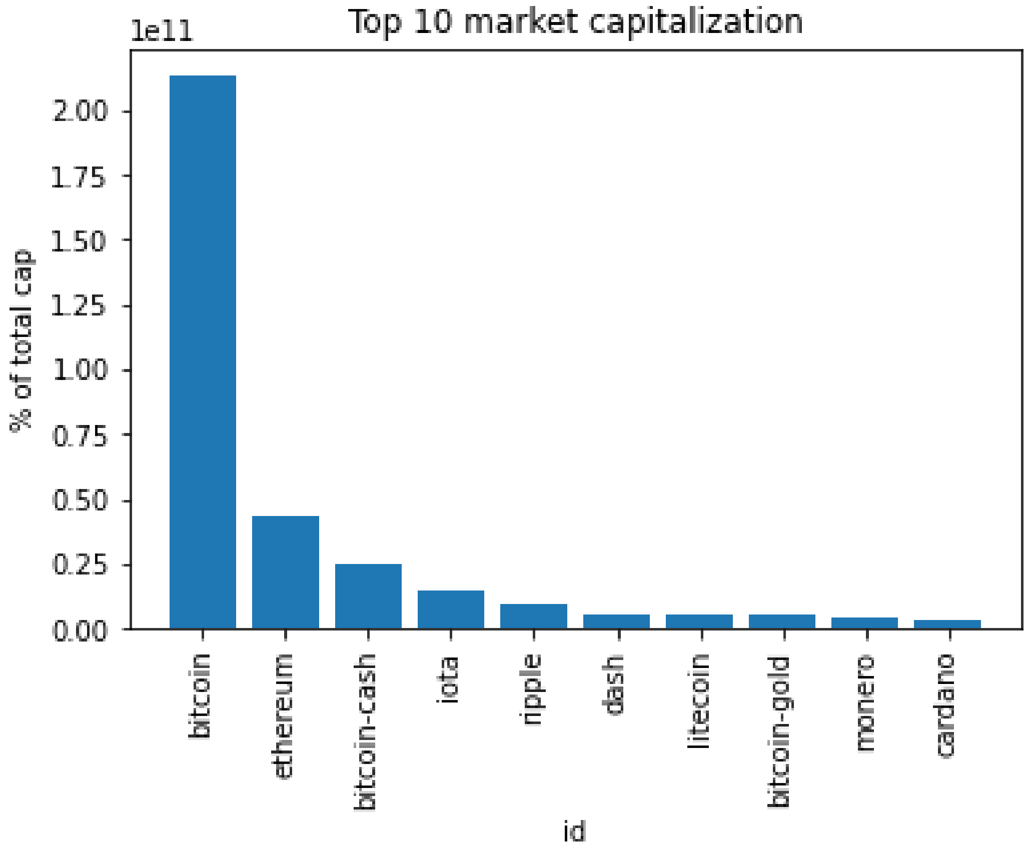
```
# Filtering out rows without  a market capitalization
b1=bitcoin.dropna(subset=['market_cap_usd'])
print('id_count: ',b1['id'].count(),'\n','market_cap-usd_count:
',b1['market_cap_usd'].count(),sep='')
```

```
id_count: 1031
market_cap-usd_count: 1031
```

3.How big is Bitcoin compared with the rest of the cryptocurrencies?

```
TOP_CAP_TITLE = 'Top 10 market capitalization'
TOP_CAP_YLABEL = '% of total cap'
#  Selecting the first 10 rows and setting the index
rows10=bitcoin.iloc[0:10].set_index('id')

# Calculating market_cap_perc
rows10=rows10.assign(market_cap_perc=lambda x:
```

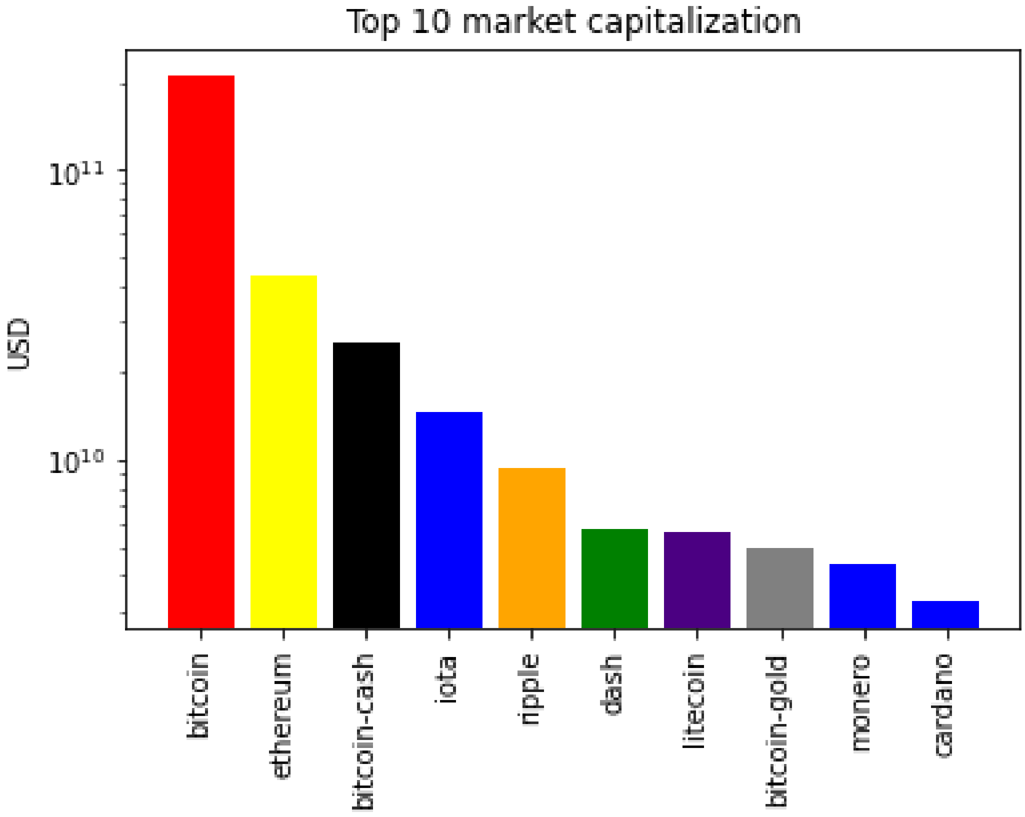
```
(x.market_cap_usd/bitcoin.market_cap_usd.sum()*100))
# Plotting the barplot with the title defined above
plt.bar(rows10.index.values,rows10['market_cap_usd'])
plt.xticks(rotation=90)
plt.title('Top 10 market capitalization')
plt.xlabel('id')

# Annotating the y axis with the label defined above
plt.ylabel(TOP_CAP_YLABEL)
plt.show()
```



4. Making the plot easier to read and more informative

```
col = ['red', 'yellow', 'black', 'blue',
'orange','green','indigo','grey','blue','blue']
#Plotting market_cap_usd as before but adding the colors
plt.bar(first10.index.values,first10['market_cap_usd'],color=col )
plt.xticks(rotation=90)
plt.title('Top 10 market capitalization')
#scaling the y-axis
plt.yscale('log')
plt.xlabel('id')

# Annotating the y axis with 'USD'
```

```
plt.ylabel('USD')
# Final touch! Removing the xlabel as it is not very informative
plt.xlabel('')
plt.show()
```



5.What is going on?! Volatility in cryptocurrencies

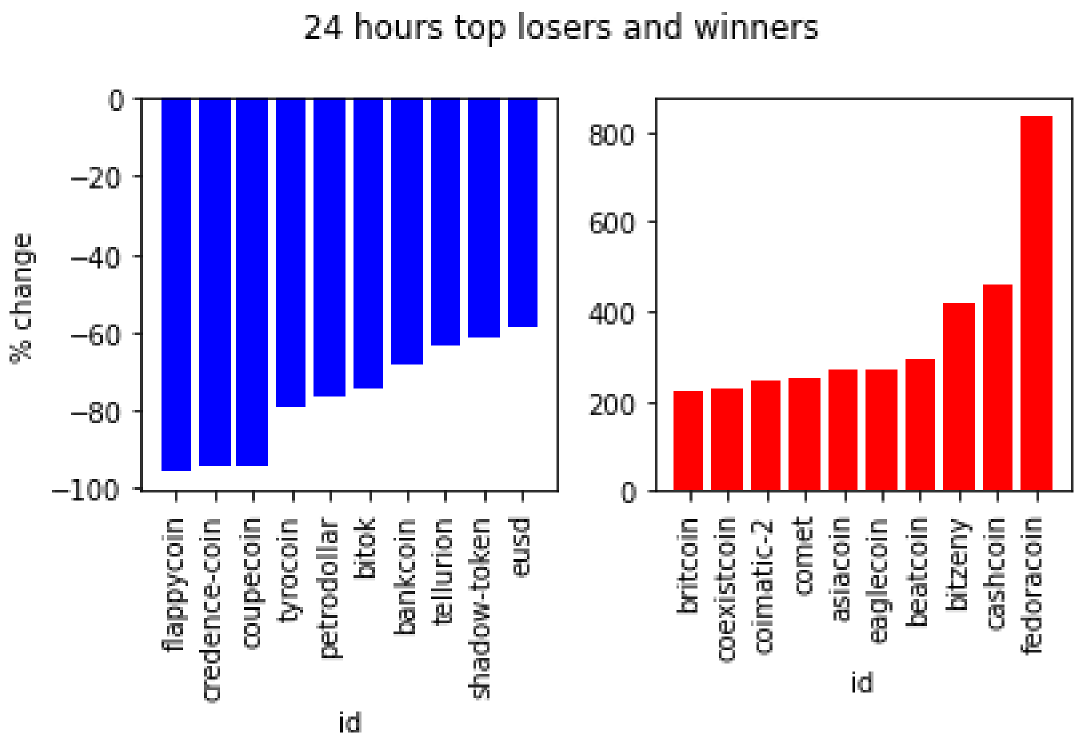
```
volatility = bitcoin[['id', 'percent_change_24h',
'percent_change_7d']]
## Setting the index to 'id' and dropping all NaN rows
volatility=volatility.set_index('id').dropna()
# Sorting the DataFrame by percent_change_24h in ascending order
volatility=volatility.sort_values(by='percent_change_24h',ascending=Tr
ue)

#checking the first few rows
volatility.head(10)
```

```
               percent_change_24h  percent_change_7d
id
flappycoin                 -95.85             -96.61
credence-coin              -94.22             -95.31
coupecoin                  -93.93             -61.24
tyrocoin                   -79.02             -87.43
petrodollar                -76.55             542.96
```

```
bitok                          -74.37              -71.67
bankcoin                       -68.56               50.14
tellurion                      -63.75              -52.59
shadow-token                   -61.40              -59.05
eusd                           -58.89              -25.50
```

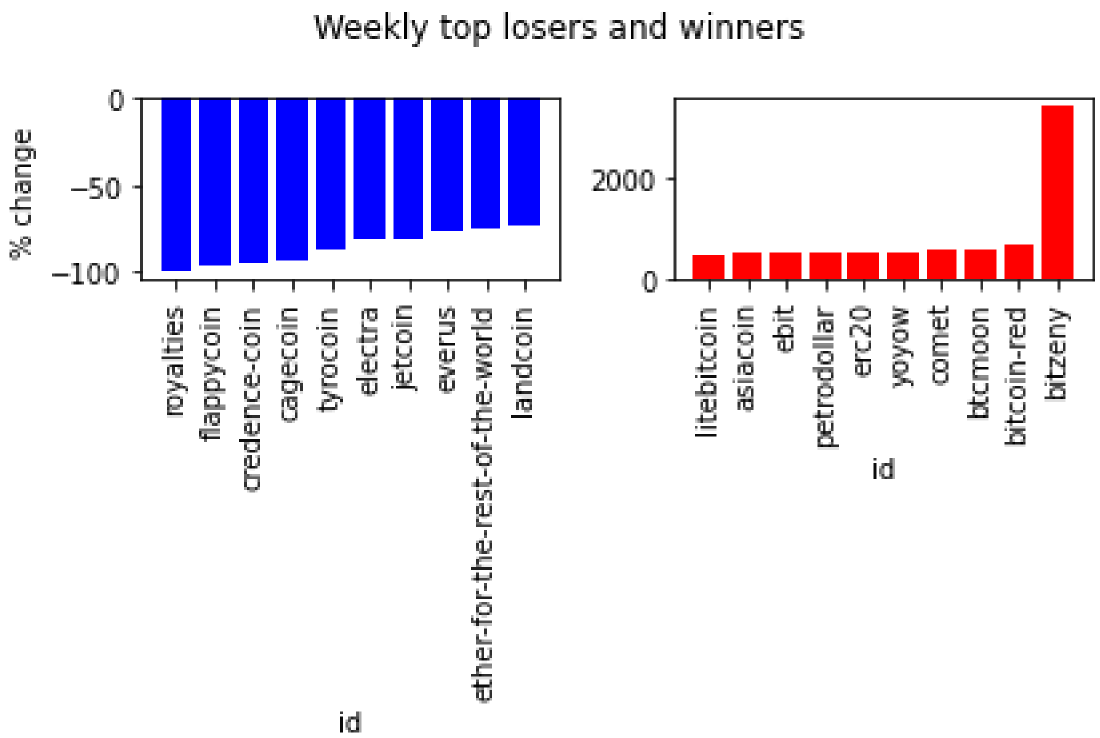
6.Well, we can already see that things are a bit crazy

```
#Defining a function with 2 parameters, the series to plot and the
title
def top10_member_plot(input_dataset,title):
# Making the subplot and the figure for two side by side plots
    plt.subplot(1,2,1)

plt.bar(input_dataset[0:10].index.values,input_dataset[0:10],color='bl
ue')
    plt.xticks(rotation=90)
# Setting the figure's main title to the text passed as parameter
    plt.suptitle(title)
# Setting the ylabel to '% change'
    plt.ylabel('% change')
    plt.xlabel("id")
# Same as above, but for the top 10 winners
    plt.subplot(1,2,2)
    plt.bar(input_dataset[-10:].index.values,input_dataset[-
10:],color='red')
    plt.tight_layout()
    plt.xticks(rotation=90)
    plt.xlabel("id")
    plt.show()

DTITLE='24 hours top losers and winners'
# Calling the function above with the 24 hours period series and title
DTITLE
top10_member_plot(volatility.percent_change_24h,DTITLE)
```



7.Ok, those are... interesting. Let's check the weekly Series too

```
volatility_weekly= volatility.sort_values(by='percent_change_7d',
ascending=True)
WTITLE = "Weekly top losers and winners"
# Calling the top10_subplot function
top10_member_plot(volatility_weekly.percent_change_7d,WTITLE)
```



8. How small is small?

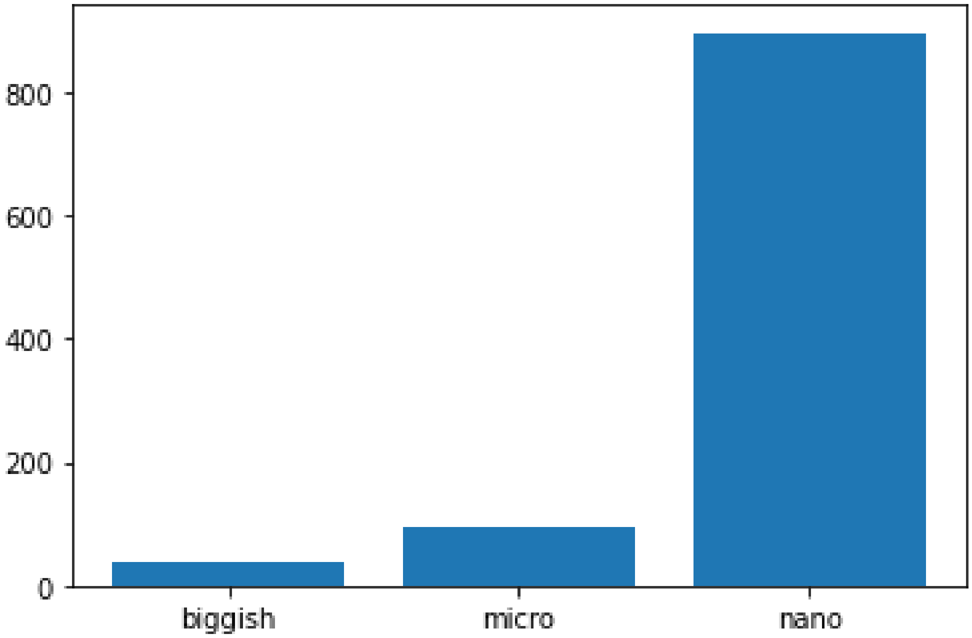
```
# Selecting everything bigger than 10 billion
largecaps=bitcoin[bitcoin['market_cap_usd'] >= 10000000000]
[['id','market_cap_usd']]
# printing out largecaps
print(largecaps)
```

```
             id  market_cap_usd
0       bitcoin    2.130493e+11
1      ethereum    4.352945e+10
2  bitcoin-cash    2.529585e+10
3          iota    1.475225e+10
```

9. Most coins are tiny

```
cap=pd.read_csv('cryptocurrency.csv')
# Making a nice function for counting different marketcaps from the
# "cap" DataFrame. Returns an int.
def capcount(query_string):
    return cap.query(query_string).count().id

# Labels for the plot
LABELS = ["biggish", "micro", "nano"]

# Using capcount count the biggish cryptos
big = capcount('market_cap_usd > 3E+8')

# Same as above for micro ...
```

```
micro = capcount('market_cap_usd > 50000000 and market_cap_usd <
300000000')

# ... and for nano
nano =  capcount('market_cap_usd < 50000000')

# Making a list with the 3 counts
values = [big, micro, nano]

# Plotting them with matplotlib
plt.bar(height=values, x=LABELS);
```


biggish
micro
nano