

2-conditional-and-control-flows

February 2, 2024

1 Python Programming (Basic-Intermediate)

1.1 Module 2 - Conditional and Control Flow Statements

1.2 Conditional Statements

```
[1]: import requests
resp = requests.get('https://api.coingecko.com/api/v3/coins/markets/?
    ↪vs_currency=usd')
crypto_data = resp.json()
print(crypto_data)
```

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'https://assets.coingecko.com/coins/images/12493/large/GALA-
COINGECKO.png?1696512310', 'current_price': 0.02211876, 'market_cap': 717958250,
'market_cap_rank': 97, 'fully_diluted_valuation': 717952064, 'total_volume':
56994807, 'high_24h': 0.02337767, 'low_24h': 0.02189959, 'price_change_24h':
-0.001210186766504289, 'price_change_percentage_24h': -5.18749,
'market_cap_change_24h': -42658545.75875366, 'market_cap_change_percentage_24h':
-5.60841, 'circulating_supply': 32575957048.8699, 'total_supply':
32575957048.8699, 'max_supply': 50000000000.0, 'ath': 0.824837,
'ath_change_percentage': -97.29944, 'ath_date': '2021-11-26T01:03:48.731Z',
'atl': 0.00013475, 'atl_change_percentage': 16430.82246, 'atl_date':
'2020-12-28T08:46:48.367Z', 'roi': None, 'last_updated':
'2024-01-31T20:19:36.392Z'}, {'id': 'klay-token', 'symbol': 'klay', 'name':
'Klaytn', 'image':
'https://assets.coingecko.com/coins/images/9672/large/klaytn.png?1696509742',
'current_price': 0.194632, 'market_cap': 681636372, 'market_cap_rank': 100,
'fully_diluted_valuation': 1151502183, 'total_volume': 12475901, 'high_24h':
0.206912, 'low_24h': 0.190882, 'price_change_24h': -0.011982153937803525,
'price_change_percentage_24h': -5.79929, 'market_cap_change_24h':
-38353291.28922975, 'market_cap_change_percentage_24h': -5.32692,
'circulating_supply': 3486649424.22865, 'total_supply': 5890067764.91025,
'max_supply': None, 'ath': 4.34, 'ath_change_percentage': -95.49115, 'ath_date':
'2021-03-30T03:44:28.828Z', 'atl': 0.06044, 'atl_change_percentage': 223.68668,
'atl_date': '2020-04-29T08:19:34.574Z', 'roi': None, 'last_updated':
'2024-01-31T20:19:45.044Z'}]

```

```
[2]: btc = crypto_data[0]
```

```
[3]: btc
```

```

[3]: {'id': 'bitcoin',
'symbol': 'btc',
'name': 'Bitcoin',
'image':
'https://assets.coingecko.com/coins/images/1/large/bitcoin.png?1696501400',
'current_price': 42907,
'market_cap': 838368145426,

```

```
'market_cap_rank': 1,  
'fully_diluted_valuation': 897595286525,  
'total_volume': 21899910592,  
'high_24h': 43717,  
'low_24h': 42410,  
'price_change_24h': -663.3445540015236,  
'price_change_percentage_24h': -1.52247,  
'market_cap_change_24h': -15717311355.644043,  
'market_cap_change_percentage_24h': -1.84025,  
'circulating_supply': 19614331.0,  
'total_supply': 21000000.0,  
'max_supply': 21000000.0,  
'ath': 69045,  
'ath_change_percentage': -37.24682,  
'ath_date': '2021-11-10T14:24:11.849Z',  
'atl': 67.81,  
'atl_change_percentage': 63796.81043,  
'atl_date': '2013-07-06T00:00:00.000Z',  
'roi': None,  
'last_updated': '2024-01-31T20:19:42.140Z'}
```

```
[4]: btc['symbol'] == 'btc'
```

```
[4]: True
```

```
[5]: btc['id'] == 'ethereum'
```

```
[5]: False
```

```
[6]: btc['name']
```

```
[6]: 'Bitcoin'
```

```
[7]: btc['name'] == 'bitcoin'
```

```
[7]: False
```

```
[8]: btc['name'].lower() == 'bitcoin'
```

```
[8]: True
```

```
[9]: btc['current_price'] < 20000
```

```
[9]: False
```

```
[10]: btc['ath'] <= 69045
```

[10]: True

```
[11]: (btc['current_price'] < 20000) and (btc['ath'] <= 69045)
```

[11]: False

```
[12]: btc['current_price'] > 20000 and btc['ath'] <= 69045
```

[12]: True

```
[13]: btc['current_price'] < 20000 or btc['ath'] <= 69045
```

[13]: True

1.3 if, else and elif

```
[15]: x = 10
      y = 5

      if x > y:
          print("x is greater than y")
          print(x)
```

x is greater than y
10

```
[16]: x = []
      if x:
          print("x is greater than y")
```

```
[17]: y = 25
      x = 10

      if x > y:
          print("x is greater than y")
      else:
          print("y is greater than x")
          print(x)

      print(y)
```

y is greater than x
10
25

```
[18]: x = 10
      y = 10
```

```

if x > y:
    print("x is greater than y")
elif x == y:
    print("x and y are equal!")
else:
    print("y is greater than x")

```

x and y are equal!

```

[19]: if btc['current_price'] < 10000:
        print('Bitcoin price is less than 10k USD')
    elif btc['current_price'] < 20000:
        print('Bitcoin price is between 10k - 20k USD')
    elif btc['current_price'] < 40000:
        print('Bitcoin price is between 20k - 40k USD')
    else:
        print('Bitcoin price is more than 40k USD... but wen?')

```

Bitcoin price is more than 40k USD... but wen?

```

[20]: base_price = 50 #
    requested_toppings = ['fried egg', 'extra rice']

    total_price = base_price

    if 'fried egg' in requested_toppings:
        print('Adding a fried egg')
        total_price += 10
    if 'extra chicken' in requested_toppings:
        print('Adding extra chicken')
        total_price += 20
    if 'extra rice' in requested_toppings:
        print('Adding extra rice')
        total_price += 10

    print(f'Total price is {total_price}')

```

Adding a fried egg

Adding extra rice

Total price is 70

```

[21]: requested_toppings = []

    if requested_toppings:
        if 'fried egg' in requested_toppings:
            print('Adding a fried egg')

```

```

    if 'extra chicken' in requested_toppings:
        print('Adding extra chicken')
    if 'extra rice' in requested_toppings:
        print('Adding extra rice')
    else:
        print('It is a plain Kao Pad Kra Pow')

```

It is a plain Kao Pad Kra Pow

1.4 for

```

[22]: my_sequence = list(range(0,101,10))
      #my_sequence = [0, 10, [20], [30, 40]]

      for number in my_sequence:
          print(number)

```

0
10
20
30
40
50
60
70
80
90
100

```

[23]: my_sequence

```

```

[23]: [0, 10, 20, 30, 40, 50, 60, 70, 80, 90, 100]

```

```

[24]: for number in my_sequence:
      if number < 80:
          continue
      print(number)

```

80
90
100

```

[25]: for number in my_sequence:
      if number > 50:
          break
      print(number)

```

0

10
20
30
40
50

```
[26]: crypto_data[:10]
```

```
[26]: [{ 'id': 'bitcoin',
        'symbol': 'btc',
        'name': 'Bitcoin',
        'image':
        'https://assets.coingecko.com/coins/images/1/large/bitcoin.png?1696501400',
        'current_price': 42907,
        'market_cap': 838368145426,
        'market_cap_rank': 1,
        'fully_diluted_valuation': 897595286525,
        'total_volume': 21899910592,
        'high_24h': 43717,
        'low_24h': 42410,
        'price_change_24h': -663.3445540015236,
        'price_change_percentage_24h': -1.52247,
        'market_cap_change_24h': -15717311355.644043,
        'market_cap_change_percentage_24h': -1.84025,
        'circulating_supply': 19614331.0,
        'total_supply': 21000000.0,
        'max_supply': 21000000.0,
        'ath': 69045,
        'ath_change_percentage': -37.24682,
        'ath_date': '2021-11-10T14:24:11.849Z',
        'atl': 67.81,
        'atl_change_percentage': 63796.81043,
        'atl_date': '2013-07-06T00:00:00.000Z',
        'roi': None,
        'last_updated': '2024-01-31T20:19:42.140Z'},
        { 'id': 'ethereum',
          'symbol': 'eth',
          'name': 'Ethereum',
          'image':
          'https://assets.coingecko.com/coins/images/279/large/ethereum.png?1696501628',
          'current_price': 2303.04,
          'market_cap': 275903905958,
          'market_cap_rank': 2,
          'fully_diluted_valuation': 275903905958,
          'total_volume': 10690006168,
          'high_24h': 2385.34,
          'low_24h': 2282.14,
```

```

'price_change_24h': -78.13349086839798,
'price_change_percentage_24h': -3.28131,
'market_cap_change_24h': -10154839948.63623,
'market_cap_change_percentage_24h': -3.54991,
'circulating_supply': 120182821.049024,
'total_supply': 120182821.049024,
'max_supply': None,
'ath': 4878.26,
'ath_change_percentage': -52.37031,
'ath_date': '2021-11-10T14:24:19.604Z',
'atl': 0.432979,
'atl_change_percentage': 536531.3751,
'atl_date': '2015-10-20T00:00:00.000Z',
'roi': {'times': 70.75210959638481,
'currency': 'btc',
'percentage': 7075.210959638482},
'last_updated': '2024-01-31T20:19:44.156Z'},
{'id': 'tether',
'symbol': 'usdt',
'name': 'Tether',
'image':
'https://assets.coingecko.com/coins/images/325/large/Tether.png?1696501661',
'current_price': 0.998104,
'market_cap': 95723781277,
'market_cap_rank': 3,
'fully_diluted_valuation': 95723781277,
'total_volume': 40193651300,
'high_24h': 1.002,
'low_24h': 0.99485,
'price_change_24h': -0.002473295713631418,
'price_change_percentage_24h': -0.24719,
'market_cap_change_24h': -385474498.14645386,
'market_cap_change_percentage_24h': -0.40108,
'circulating_supply': 96219281549.4949,
'total_supply': 96219281549.4949,
'max_supply': None,
'ath': 1.32,
'ath_change_percentage': -24.48271,
'ath_date': '2018-07-24T00:00:00.000Z',
'atl': 0.572521,
'atl_change_percentage': 74.52037,
'atl_date': '2015-03-02T00:00:00.000Z',
'roi': None,
'last_updated': '2024-01-31T20:15:17.050Z'},
{'id': 'binancecoin',
'symbol': 'bnb',
'name': 'BNB',

```



```

    'image': 'https://assets.coingecko.com/coins/images/825/large/bnb-
icon2_2x.png?1696501970',
    'current_price': 302.54,
    'market_cap': 46361104492,
    'market_cap_rank': 4,
    'fully_diluted_valuation': 46361104492,
    'total_volume': 654341154,
    'high_24h': 310.56,
    'low_24h': 300.59,
    'price_change_24h': -7.634258629889928,
    'price_change_percentage_24h': -2.46125,
    'market_cap_change_24h': -1347776852.1702728,
    'market_cap_change_percentage_24h': -2.825,
    'circulating_supply': 153856150.0,
    'total_supply': 153856150.0,
    'max_supply': 200000000.0,
    'ath': 686.31,
    'ath_change_percentage': -55.58551,
    'ath_date': '2021-05-10T07:24:17.097Z',
    'atl': 0.0398177,
    'atl_change_percentage': 765437.95283,
    'atl_date': '2017-10-19T00:00:00.000Z',
    'roi': None,
    'last_updated': '2024-01-31T20:19:35.030Z'},
{'id': 'solana',
 'symbol': 'sol',
 'name': 'Solana',
 'image':
'https://assets.coingecko.com/coins/images/4128/large/solana.png?1696504756',
 'current_price': 99.28,
 'market_cap': 43266814955,
 'market_cap_rank': 5,
 'fully_diluted_valuation': 56436560955,
 'total_volume': 3942804391,
 'high_24h': 105.45,
 'low_24h': 97.8,
 'price_change_24h': -5.885803979735016,
 'price_change_percentage_24h': -5.59694,
 'market_cap_change_24h': -2611757669.3631363,
 'market_cap_change_percentage_24h': -5.69276,
 'circulating_supply': 435747756.743262,
 'total_supply': 568382449.24628,
 'max_supply': None,
 'ath': 259.96,
 'ath_change_percentage': -61.18572,
 'ath_date': '2021-11-06T21:54:35.825Z',
 'atl': 0.500801,

```

```

    'atl_change_percentage': 20047.97524,
    'atl_date': '2020-05-11T19:35:23.449Z',
    'roi': None,
    'last_updated': '2024-01-31T20:19:37.882Z'},
  {'id': 'ripple',
    'symbol': 'xrp',
    'name': 'XRP',
    'image': 'https://assets.coingecko.com/coins/images/44/large/xrp-symbol-white-128.png?1696501442',
    'current_price': 0.508138,
    'market_cap': 27536942536,
    'market_cap_rank': 6,
    'fully_diluted_valuation': 50637007829,
    'total_volume': 1661741316,
    'high_24h': 0.514684,
    'low_24h': 0.498261,
    'price_change_24h': -0.006545074086875325,
    'price_change_percentage_24h': -1.27167,
    'market_cap_change_24h': -427533255.660759,
    'market_cap_change_percentage_24h': -1.52884,
    'circulating_supply': 54374512255.0,
    'total_supply': 99987956150.0,
    'max_supply': 100000000000.0,
    'ath': 3.4,
    'ath_change_percentage': -84.96847,
    'ath_date': '2018-01-07T00:00:00.000Z',
    'atl': 0.00268621,
    'atl_change_percentage': 18917.121,
    'atl_date': '2014-05-22T00:00:00.000Z',
    'roi': None,
    'last_updated': '2024-01-31T20:19:39.032Z'},
  {'id': 'usd-coin',
    'symbol': 'usdc',
    'name': 'USDC',
    'image': 'https://assets.coingecko.com/coins/images/6319/large/usdc.png?1696506694',
    'current_price': 0.999747,
    'market_cap': 26766583031,
    'market_cap_rank': 7,
    'fully_diluted_valuation': 25365322676,
    'total_volume': 7527094676,
    'high_24h': 1.004,
    'low_24h': 0.994008,
    'price_change_24h': -0.001270117122142311,
    'price_change_percentage_24h': -0.12688,
    'market_cap_change_24h': 262822552,
    'market_cap_change_percentage_24h': 0.99164,

```

```

'circulating_supply': 26877872464.183,
'total_supply': 25470785983.8999,
'max_supply': None,
'ath': 1.17,
'ath_change_percentage': -14.65554,
'ath_date': '2019-05-08T00:40:28.300Z',
'atl': 0.877647,
'atl_change_percentage': 14.03675,
'atl_date': '2023-03-11T08:02:13.981Z',
'roi': None,
'last_updated': '2024-01-31T20:19:40.305Z'},
{'id': 'staked-ether',
 'symbol': 'steth',
 'name': 'Lido Staked Ether',
 'image': 'https://assets.coingecko.com/coins/images/13442/large/steth_logo.png?1696513206',
 'current_price': 2301.56,
 'market_cap': 21615952642,
 'market_cap_rank': 8,
 'fully_diluted_valuation': 21615983099,
 'total_volume': 15543586,
 'high_24h': 2388.25,
 'low_24h': 2282.2,
 'price_change_24h': -78.13973972609665,
 'price_change_percentage_24h': -3.28359,
 'market_cap_change_24h': -771314688.6999855,
 'market_cap_change_percentage_24h': -3.44533,
 'circulating_supply': 9413448.85718321,
 'total_supply': 9413462.12072922,
 'max_supply': 9413448.85718321,
 'ath': 4829.57,
 'ath_change_percentage': -52.00204,
 'ath_date': '2021-11-10T14:40:47.256Z',
 'atl': 482.9,
 'atl_change_percentage': 380.04005,
 'atl_date': '2020-12-22T04:08:21.854Z',
 'roi': None,
 'last_updated': '2024-01-31T20:19:45.361Z'},
{'id': 'cardano',
 'symbol': 'ada',
 'name': 'Cardano',
 'image':
'https://assets.coingecko.com/coins/images/975/large/cardano.png?1696502090',
 'current_price': 0.50775,
 'market_cap': 17758193556,
 'market_cap_rank': 9,
 'fully_diluted_valuation': 22766708338,

```

```

'total_volume': 481526376,
'high_24h': 0.527035,
'low_24h': 0.497703,
'price_change_24h': -0.01203695253956294,
'price_change_percentage_24h': -2.31575,
'market_cap_change_24h': -501923537.3990059,
'market_cap_change_percentage_24h': -2.74874,
'circulating_supply': 35100318330.6778,
'total_supply': 45000000000.0,
'max_supply': 45000000000.0,
'ath': 3.09,
'ath_change_percentage': -83.40436,
'ath_date': '2021-09-02T06:00:10.474Z',
'atl': 0.01925275,
'atl_change_percentage': 2560.88116,
'atl_date': '2020-03-13T02:22:55.044Z',
'roi': None,
'last_updated': '2024-01-31T20:19:44.455Z'},
{'id': 'avalanche-2',
'symbol': 'avax',
'name': 'Avalanche',
'image': 'https://assets.coingecko.com/coins/images/12559/large/Avalanche_Circle_RedWhite_Trans.png?1696512369',
'current_price': 34.85,
'market_cap': 12746055973,
'market_cap_rank': 10,
'fully_diluted_valuation': 15108313103,
'total_volume': 598769717,
'high_24h': 36.28,
'low_24h': 34.08,
'price_change_24h': -1.402398844165539,
'price_change_percentage_24h': -3.86895,
'market_cap_change_24h': -549272885.7637234,
'market_cap_change_percentage_24h': -4.13132,
'circulating_supply': 367084026.783708,
'total_supply': 435116909.331076,
'max_supply': 720000000.0,
'ath': 144.96,
'ath_change_percentage': -75.75443,
'ath_date': '2021-11-21T14:18:56.538Z',
'atl': 2.8,
'atl_change_percentage': 1154.76122,
'atl_date': '2020-12-31T13:15:21.540Z',
'roi': None,
'last_updated': '2024-01-31T20:19:42.191Z'}]]

```

```
[27]: for coin in crypto_data[:10]:  
       print(coin['symbol'] + "\tUSD " + str(coin['current_price']))
```

```
btc      USD 42907  
eth      USD 2303.04  
usdt     USD 0.998104  
bnb      USD 302.54  
sol      USD 99.28  
xrp      USD 0.508138  
usdc     USD 0.999747  
steth    USD 2301.56  
ada      USD 0.50775  
avax     USD 34.85
```

```
[28]: btc
```

```
[28]: {'id': 'bitcoin',  
      'symbol': 'btc',  
      'name': 'Bitcoin',  
      'image':  
      'https://assets.coingecko.com/coins/images/1/large/bitcoin.png?1696501400',  
      'current_price': 42907,  
      'market_cap': 838368145426,  
      'market_cap_rank': 1,  
      'fully_diluted_valuation': 897595286525,  
      'total_volume': 21899910592,  
      'high_24h': 43717,  
      'low_24h': 42410,  
      'price_change_24h': -663.3445540015236,  
      'price_change_percentage_24h': -1.52247,  
      'market_cap_change_24h': -15717311355.644043,  
      'market_cap_change_percentage_24h': -1.84025,  
      'circulating_supply': 19614331.0,  
      'total_supply': 21000000.0,  
      'max_supply': 21000000.0,  
      'ath': 69045,  
      'ath_change_percentage': -37.24682,  
      'ath_date': '2021-11-10T14:24:11.849Z',  
      'atl': 67.81,  
      'atl_change_percentage': 63796.81043,  
      'atl_date': '2013-07-06T00:00:00.000Z',  
      'roi': None,  
      'last_updated': '2024-01-31T20:19:42.140Z'}
```

```
[29]: for t in btc:  
       print(t)
```

```
id
```

```
symbol
name
image
current_price
market_cap
market_cap_rank
fully_diluted_valuation
total_volume
high_24h
low_24h
price_change_24h
price_change_percentage_24h
market_cap_change_24h
market_cap_change_percentage_24h
circulating_supply
total_supply
max_supply
ath
ath_change_percentage
ath_date
atl
atl_change_percentage
atl_date
roi
last_updated
```

```
[30]: for t in btc.items():
      print(t)
```

```
('id', 'bitcoin')
('symbol', 'btc')
('name', 'Bitcoin')
('image',
'https://assets.coingecko.com/coins/images/1/large/bitcoin.png?1696501400')
('current_price', 42907)
('market_cap', 838368145426)
('market_cap_rank', 1)
('fully_diluted_valuation', 897595286525)
('total_volume', 21899910592)
('high_24h', 43717)
('low_24h', 42410)
('price_change_24h', -663.3445540015236)
('price_change_percentage_24h', -1.52247)
('market_cap_change_24h', -15717311355.644043)
('market_cap_change_percentage_24h', -1.84025)
('circulating_supply', 19614331.0)
('total_supply', 21000000.0)
('max_supply', 21000000.0)
```

```
(
    'ath', 69045
    'ath_change_percentage', -37.24682
    'ath_date', '2021-11-10T14:24:11.849Z'
    'atl', 67.81
    'atl_change_percentage', 63796.81043
    'atl_date', '2013-07-06T00:00:00.000Z'
    'roi', None
    'last_updated', '2024-01-31T20:19:42.140Z'
)
```

```
[31]: for key, value in btc.items():
        print(key, '\t', value)
```

```
id      bitcoin
symbol  btc
name     Bitcoin
image
https://assets.coingecko.com/coins/images/1/large/bitcoin.png?1696501400
current_price    42907
market_cap       838368145426
market_cap_rank   1
fully_diluted_valuation    897595286525
total_volume     21899910592
high_24h         43717
low_24h          42410
price_change_24h    -663.3445540015236
price_change_percentage_24h    -1.52247
market_cap_change_24h    -15717311355.644043
market_cap_change_percentage_24h    -1.84025
circulating_supply    19614331.0
total_supply         21000000.0
max_supply          21000000.0
ath      69045
ath_change_percentage    -37.24682
ath_date    2021-11-10T14:24:11.849Z
atl      67.81
atl_change_percentage    63796.81043
atl_date    2013-07-06T00:00:00.000Z
roi      None
last_updated    2024-01-31T20:19:42.140Z
```

```
[32]: for idx, coin in enumerate(crypto_data[:10]):
        print(idx+1, " ", coin['name'])
        for key, value in coin.items():
            print("\t", key, "\t", value)
```

```
1  Bitcoin
    id      bitcoin
    symbol   btc
```

```

name      Bitcoin
image
https://assets.coingecko.com/coins/images/1/large/bitcoin.png?1696501400
current_price  42907
market_cap     838368145426
market_cap_rank      1
fully_diluted_valuation      897595286525
total_volume    21899910592
high_24h        43717
low_24h         42410
price_change_24h      -663.3445540015236
price_change_percentage_24h      -1.52247
market_cap_change_24h      -15717311355.644043
market_cap_change_percentage_24h      -1.84025
circulating_supply    19614331.0
total_supply    21000000.0
max_supply    21000000.0
ath         69045
ath_change_percentage      -37.24682
ath_date    2021-11-10T14:24:11.849Z
atl         67.81
atl_change_percentage    63796.81043
atl_date    2013-07-06T00:00:00.000Z
roi         None
last_updated    2024-01-31T20:19:42.140Z

```

2 Ethereum

```

id      ethereum
symbol    eth
name     Ethereum
image
https://assets.coingecko.com/coins/images/279/large/ethereum.png?1696501628
current_price  2303.04
market_cap     275903905958
market_cap_rank      2
fully_diluted_valuation      275903905958
total_volume    10690006168
high_24h        2385.34
low_24h         2282.14
price_change_24h      -78.13349086839798
price_change_percentage_24h      -3.28131
market_cap_change_24h      -10154839948.63623
market_cap_change_percentage_24h      -3.54991
circulating_supply    120182821.049024
total_supply    120182821.049024
max_supply    None
ath         4878.26
ath_change_percentage      -52.37031
ath_date    2021-11-10T14:24:19.604Z

```



```

        atl      0.432979
        atl_change_percentage  536531.3751
        atl_date      2015-10-20T00:00:00.000Z
        roi      {'times': 70.75210959638481, 'currency': 'btc', 'percentage':
7075.210959638482}
        last_updated      2024-01-31T20:19:44.156Z
3    Tether
        id      tether
        symbol      usdt
        name      Tether
        image
https://assets.coingecko.com/coins/images/325/large/Tether.png?1696501661
        current_price      0.998104
        market_cap      95723781277
        market_cap_rank      3
        fully_diluted_valuation      95723781277
        total_volume      40193651300
        high_24h      1.002
        low_24h      0.99485
        price_change_24h      -0.002473295713631418
        price_change_percentage_24h      -0.24719
        market_cap_change_24h      -385474498.14645386
        market_cap_change_percentage_24h      -0.40108
        circulating_supply      96219281549.4949
        total_supply      96219281549.4949
        max_supply      None
        ath      1.32
        ath_change_percentage      -24.48271
        ath_date      2018-07-24T00:00:00.000Z
        atl      0.572521
        atl_change_percentage      74.52037
        atl_date      2015-03-02T00:00:00.000Z
        roi      None
        last_updated      2024-01-31T20:15:17.050Z
4    BNB
        id      binancecoin
        symbol      bnb
        name      BNB
        image      https://assets.coingecko.com/coins/images/825/large/bnb-
icon2_2x.png?1696501970
        current_price      302.54
        market_cap      46361104492
        market_cap_rank      4
        fully_diluted_valuation      46361104492
        total_volume      654341154
        high_24h      310.56
        low_24h      300.59
        price_change_24h      -7.634258629889928

```

```

price_change_percentage_24h      -2.46125
market_cap_change_24h      -1347776852.1702728
market_cap_change_percentage_24h      -2.825
circulating_supply      153856150.0
total_supply      153856150.0
max_supply      200000000.0
ath      686.31
ath_change_percentage      -55.58551
ath_date      2021-05-10T07:24:17.097Z
atl      0.0398177
atl_change_percentage      765437.95283
atl_date      2017-10-19T00:00:00.000Z
roi      None
last_updated      2024-01-31T20:19:35.030Z
5  Solana
    id      solana
    symbol      sol
    name      Solana
    image
https://assets.coingecko.com/coins/images/4128/large/solana.png?1696504756
    current_price      99.28
    market_cap      43266814955
    market_cap_rank      5
    fully_diluted_valuation      56436560955
    total_volume      3942804391
    high_24h      105.45
    low_24h      97.8
    price_change_24h      -5.885803979735016
    price_change_percentage_24h      -5.59694
    market_cap_change_24h      -2611757669.3631363
    market_cap_change_percentage_24h      -5.69276
    circulating_supply      435747756.743262
    total_supply      568382449.24628
    max_supply      None
    ath      259.96
    ath_change_percentage      -61.18572
    ath_date      2021-11-06T21:54:35.825Z
    atl      0.500801
    atl_change_percentage      20047.97524
    atl_date      2020-05-11T19:35:23.449Z
    roi      None
    last_updated      2024-01-31T20:19:37.882Z
6  XRP
    id      ripple
    symbol      xrp
    name      XRP
    image      https://assets.coingecko.com/coins/images/44/large/xrp-symbol-
white-128.png?1696501442

```

```

current_price    0.508138
market_cap       27536942536
market_cap_rank   6
fully_diluted_valuation  50637007829
total_volume     1661741316
high_24h         0.514684
low_24h          0.498261
price_change_24h -0.006545074086875325
price_change_percentage_24h -1.27167
market_cap_change_24h -427533255.660759
market_cap_change_percentage_24h -1.52884
circulating_supply  54374512255.0
total_supply      99987956150.0
max_supply        100000000000.0
ath              3.4
ath_change_percentage -84.96847
ath_date          2018-01-07T00:00:00.000Z
atl              0.00268621
atl_change_percentage 18917.121
atl_date          2014-05-22T00:00:00.000Z
roi              None
last_updated      2024-01-31T20:19:39.032Z

```

7 USDC

```

id      usd-coin
symbol   usdc
name    USDC
image

```

<https://assets.coingecko.com/coins/images/6319/large/usdc.png?1696506694>

```

current_price    0.999747
market_cap       26766583031
market_cap_rank   7
fully_diluted_valuation  25365322676
total_volume     7527094676
high_24h         1.004
low_24h          0.994008
price_change_24h -0.001270117122142311
price_change_percentage_24h -0.12688
market_cap_change_24h 262822552
market_cap_change_percentage_24h 0.99164
circulating_supply 26877872464.183
total_supply      25470785983.8999
max_supply        None
ath              1.17
ath_change_percentage -14.65554
ath_date          2019-05-08T00:40:28.300Z
atl              0.877647
atl_change_percentage 14.03675
atl_date          2023-03-11T08:02:13.981Z

```

```

    roi      None
    last_updated  2024-01-31T20:19:40.305Z
8  Lido Staked Ether
    id      staked-ether
    symbol      steth
    name      Lido Staked Ether
    image
https://assets.coingecko.com/coins/images/13442/large/steth_logo.png?1696513206
    current_price  2301.56
    market_cap      21615952642
    market_cap_rank      8
    fully_diluted_valuation      21615983099
    total_volume      15543586
    high_24h      2388.25
    low_24h      2282.2
    price_change_24h      -78.13973972609665
    price_change_percentage_24h      -3.28359
    market_cap_change_24h      -771314688.6999855
    market_cap_change_percentage_24h      -3.44533
    circulating_supply      9413448.85718321
    total_supply      9413462.12072922
    max_supply      9413448.85718321
    ath      4829.57
    ath_change_percentage      -52.00204
    ath_date      2021-11-10T14:40:47.256Z
    atl      482.9
    atl_change_percentage      380.04005
    atl_date      2020-12-22T04:08:21.854Z
    roi      None
    last_updated  2024-01-31T20:19:45.361Z
9  Cardano
    id      cardano
    symbol      ada
    name      Cardano
    image
https://assets.coingecko.com/coins/images/975/large/cardano.png?1696502090
    current_price  0.50775
    market_cap      17758193556
    market_cap_rank      9
    fully_diluted_valuation      22766708338
    total_volume      481526376
    high_24h      0.527035
    low_24h      0.497703
    price_change_24h      -0.01203695253956294
    price_change_percentage_24h      -2.31575
    market_cap_change_24h      -501923537.3990059
    market_cap_change_percentage_24h      -2.74874
    circulating_supply      35100318330.6778

```

```

total_supply      45000000000.0
max_supply        45000000000.0
ath               3.09
ath_change_percentage  -83.40436
ath_date          2021-09-02T06:00:10.474Z
atl              0.01925275
atl_change_percentage  2560.88116
atl_date          2020-03-13T02:22:55.044Z
roi               None
last_updated      2024-01-31T20:19:44.455Z
10  Avalanche
    id            avalanche-2
    symbol         avax
    name          Avalanche
    image          https://assets.coingecko.com/coins/images/12559/large/Avalanche
_Circle_RedWhite_Trans.png?1696512369
    current_price  34.85
    market_cap     12746055973
    market_cap_rank  10
    fully_diluted_valuation  15108313103
    total_volume   598769717
    high_24h       36.28
    low_24h        34.08
    price_change_24h  -1.402398844165539
    price_change_percentage_24h  -3.86895
    market_cap_change_24h  -549272885.7637234
    market_cap_change_percentage_24h  -4.13132
    circulating_supply  367084026.783708
    total_supply    435116909.331076
    max_supply      720000000.0
    ath             144.96
    ath_change_percentage  -75.75443
    ath_date        2021-11-21T14:18:56.538Z
    atl             2.8
    atl_change_percentage  1154.76122
    atl_date        2020-12-31T13:15:21.540Z
    roi             None
    last_updated    2024-01-31T20:19:42.191Z

```

```

[33]: from tqdm.notebook import tqdm
import time
for i in tqdm(range(10)):
    time.sleep(1)

```

```

0%|          | 0/10 [00:00<?, ?it/s]

```

1.4.1 while

```
[34]: count = 0
      while count < 8:
          print(crypto_data[count]['id'])
          count += 1
```

```
bitcoin
ethereum
tether
binancecoin
solana
ripple
usd-coin
staked-ether
```

```
[35]: x = 0
      while True:
          x += 1
```

```
-----
KeyboardInterrupt                                Traceback (most recent call last)
<ipython-input-35-196dc0a4cec4> in <cell line: 2>()
      1 x = 0
----> 2 while True:
      3     x += 1

KeyboardInterrupt:
```

```
[36]: count = 0
      while True:
          if (crypto_data[count]['market_cap_rank'] > 10):
              break
          else:
              print(crypto_data[count]['market_cap_rank'],
                    "\t",
                    crypto_data[count]['id'])
              count += 1
```

```
1      bitcoin
2      ethereum
3      tether
4      binancecoin
5      solana
6      ripple
7      usd-coin
8      staked-ether
```

```
9         cardano
10        avalanche-2
```

```
[37]: print("Top 10 Cryptocurrencies by Marketcap (excluding Stable Coins)")
count = 0
while True:
    if (crypto_data[count]['market_cap_rank'] > 10):
        break
    else:
        if abs(crypto_data[count]['current_price'] - 1) < 0.1 and \
            abs(crypto_data[count]['ath'] - crypto_data[count]['atl']) < 2:
            # stable coin
            count += 1
            continue
        else:
            print("rank ",
                  crypto_data[count]['market_cap_rank'], "\t",
                  crypto_data[count]['symbol'], "\t",
                  crypto_data[count]['current_price'])
            count += 1
```

Top 10 Cryptocurrencies by Marketcap (excluding Stable Coins)

rank	1	btc	42907
rank	2	eth	2303.04
rank	4	bnb	302.54
rank	5	sol	99.28
rank	6	xrp	0.508138
rank	8	steth	2301.56
rank	9	ada	0.50775
rank	10	avax	34.85

```
[38]: r = range(10)
list(r)
```

```
[38]: [0, 1, 2, 3, 4, 5, 6, 7, 8, 9]
```

```
[39]: x = enumerate(crypto_data)
```

```
[40]: next(x)
```

```
[40]: (0,
      {'id': 'bitcoin',
       'symbol': 'btc',
       'name': 'Bitcoin',
       'image':
       'https://assets.coingecko.com/coins/images/1/large/bitcoin.png?1696501400',
       'current_price': 42907,
```

```

'market_cap': 838368145426,
'market_cap_rank': 1,
'fully_diluted_valuation': 897595286525,
'total_volume': 21899910592,
'high_24h': 43717,
'low_24h': 42410,
'price_change_24h': -663.3445540015236,
'price_change_percentage_24h': -1.52247,
'market_cap_change_24h': -15717311355.644043,
'market_cap_change_percentage_24h': -1.84025,
'circulating_supply': 19614331.0,
'total_supply': 21000000.0,
'max_supply': 21000000.0,
'ath': 69045,
'ath_change_percentage': -37.24682,
'ath_date': '2021-11-10T14:24:11.849Z',
'atl': 67.81,
'atl_change_percentage': 63796.81043,
'atl_date': '2013-07-06T00:00:00.000Z',
'roi': None,
'last_updated': '2024-01-31T20:19:42.140Z'})

```

```
[41]: next(x)
```

```

[41]: (1,
      {'id': 'ethereum',
       'symbol': 'eth',
       'name': 'Ethereum',
       'image':
'https://assets.coingecko.com/coins/images/279/large/ethereum.png?1696501628',
       'current_price': 2303.04,
       'market_cap': 275903905958,
       'market_cap_rank': 2,
       'fully_diluted_valuation': 275903905958,
       'total_volume': 10690006168,
       'high_24h': 2385.34,
       'low_24h': 2282.14,
       'price_change_24h': -78.13349086839798,
       'price_change_percentage_24h': -3.28131,
       'market_cap_change_24h': -10154839948.63623,
       'market_cap_change_percentage_24h': -3.54991,
       'circulating_supply': 120182821.049024,
       'total_supply': 120182821.049024,
       'max_supply': None,
       'ath': 4878.26,
       'ath_change_percentage': -52.37031,
       'ath_date': '2021-11-10T14:24:19.604Z',

```



```
'atl': 0.432979,
'atl_change_percentage': 536531.3751,
'atl_date': '2015-10-20T00:00:00.000Z',
'roi': {'times': 70.75210959638481,
'currency': 'btc',
'percentage': 7075.210959638482},
'last_updated': '2024-01-31T20:19:44.156Z'})
```

```
[42]: from google.colab import drive
drive.mount('/content/drive')
```

Mounted at /content/drive

```
[43]: f = open('/content/drive/MyDrive/AIS_DG/gpl-3.0.txt')
lines = iter(f.readlines())
print(type(iter(lines)))
f.close()
```

<class 'list_iterator'>

```
[44]: next(lines)
```

```
[44]: '                GNU GENERAL PUBLIC LICENSE\n'
```

```
[45]: next(lines)
```

```
[45]: '                Version 3, 29 June 2007\n'
```

```
[46]: import pandas as pd
```

```
[47]: df = pd.read_excel('/content/drive/MyDrive/AIS_DG/Superstore.xlsx')
```

```
[48]: df.groupby('Customer ID').agg({'Sales': 'sum'})
```

```
[48]:
```

	Sales
Customer ID	
AA-10315	5563.560
AA-10375	1056.390
AA-10480	1790.512
AA-10645	5086.935
AB-10015	886.156
...	...
XP-21865	2374.658
YC-21895	5454.350
YS-21880	6720.444
ZC-21910	8025.707
ZD-21925	1493.944

[793 rows x 1 columns]

```
[49]: g = df.groupby('Customer ID')
```

```
[50]: type(g)
```

```
[50]: pandas.core.groupby.generic.DataFrameGroupBy
```

```
[51]: gt = iter(g)
```

```
[52]: next(gt)
```

```
[52]: ('AA-10315',
```

	Row ID	Order ID	Order Date	Ship Date	Ship Mode	\
1159	1160	CA-2014-147039	2015-06-30	2015-07-05	Standard Class	
1160	1161	CA-2014-147039	2015-06-30	2015-07-05	Standard Class	
1299	1300	CA-2012-121391	2013-10-04	2013-10-07	First Class	
2229	2230	CA-2011-128055	2012-03-31	2012-04-05	Standard Class	
2230	2231	CA-2011-128055	2012-03-31	2012-04-05	Standard Class	
5198	5199	CA-2013-103982	2014-03-04	2014-03-09	Standard Class	
5199	5200	CA-2013-103982	2014-03-04	2014-03-09	Standard Class	
5200	5201	CA-2013-103982	2014-03-04	2014-03-09	Standard Class	
5201	5202	CA-2013-103982	2014-03-04	2014-03-09	Standard Class	
7468	7469	CA-2011-138100	2012-09-15	2012-09-20	Standard Class	
7469	7470	CA-2011-138100	2012-09-15	2012-09-20	Standard Class	

	Customer ID	Customer Name	Segment	Country	City	...	\
1159	AA-10315	Alex Avila	Consumer	United States	Minneapolis	...	
1160	AA-10315	Alex Avila	Consumer	United States	Minneapolis	...	
1299	AA-10315	Alex Avila	Consumer	United States	San Francisco	...	
2229	AA-10315	Alex Avila	Consumer	United States	San Francisco	...	
2230	AA-10315	Alex Avila	Consumer	United States	San Francisco	...	
5198	AA-10315	Alex Avila	Consumer	United States	Round Rock	...	
5199	AA-10315	Alex Avila	Consumer	United States	Round Rock	...	
5200	AA-10315	Alex Avila	Consumer	United States	Round Rock	...	
5201	AA-10315	Alex Avila	Consumer	United States	Round Rock	...	
7468	AA-10315	Alex Avila	Consumer	United States	New York City	...	
7469	AA-10315	Alex Avila	Consumer	United States	New York City	...	

	Postal Code	Region	Product ID	Category	Sub-Category	\
1159	55407	Central	OFF-AP-10000576	Office Supplies	Appliances	
1160	55407	Central	OFF-BI-10004654	Office Supplies	Binders	
1299	94109	West	OFF-ST-10001590	Office Supplies	Storage	
2229	94122	West	OFF-BI-10004390	Office Supplies	Binders	
2230	94122	West	OFF-AP-10002765	Office Supplies	Appliances	
5198	78664	Central	OFF-SU-10000151	Office Supplies	Supplies	

5199	78664	Central	OFF-FA-10001332	Office Supplies	Fasteners
5200	78664	Central	TEC-PH-10000895	Technology	Phones
5201	78664	Central	TEC-AC-10002857	Technology	Accessories
7468	10011	East	OFF-PA-10000349	Office Supplies	Paper
7469	10011	East	FUR-FU-10002456	Furniture	Furnishings

		Product Name	Sales	Quantity \
1159		Belkin 325VA UPS Surge Protector, 6'	362.940	3
1160		Avery Binding System Hidden Tab Executive Styl...	11.540	2
1299		Tenex Personal Project File with Scoop Front D...	26.960	2
2229		GBC DocuBind 200 Manual Binding Machine	673.568	2
2230		Fellowes Advanced Computer Series Surge Protec...	52.980	2
5198		High Speed Automatic Electric Letter Opener	3930.072	3
5199		Acco Banker's Clasps, 5 3/4"-Long	2.304	1
5200		Polycom VVX 310 VoIP phone	431.976	3
5201		Verbatim 25 GB 6x Blu-ray Single Layer Record...	41.720	7
7468		Easy-staple paper	14.940	3
7469		Master Caster Door Stop, Large Neon Orange	14.560	2

	Discount	Profit
1159	0.0	90.7350
1160	0.0	5.7700
1299	0.0	7.0096
2229	0.2	252.5880
2230	0.0	14.8344
5198	0.2	-786.0144
5199	0.2	0.7776
5200	0.2	32.3982
5201	0.2	5.7365
7468	0.0	7.0218
7469	0.0	6.2608

[11 rows x 21 columns])

```
[53]: next(gt)
```

```
[53]: ('AA-10375',
```

	Row ID	Order ID	Order Date	Ship Date	Ship Mode \
535	536	CA-2013-126613	2014-07-11	2014-07-17	Standard Class
807	808	CA-2012-140921	2013-02-03	2013-02-05	First Class
808	809	CA-2012-140921	2013-02-03	2013-02-05	First Class
1172	1173	CA-2011-158064	2012-04-21	2012-04-25	Standard Class
1978	1979	CA-2012-109939	2013-05-08	2013-05-12	Standard Class
2263	2264	CA-2013-131065	2014-11-15	2014-11-17	Second Class
2264	2265	CA-2013-131065	2014-11-15	2014-11-17	Second Class
2265	2266	CA-2013-131065	2014-11-15	2014-11-17	Second Class
3007	3008	CA-2011-130729	2012-10-24	2012-10-29	Standard Class

6465	6466	CA-2012-114503	2013-11-13	2013-11-17	Standard Class
6747	6748	CA-2014-100230	2015-12-12	2015-12-16	Standard Class
6748	6749	CA-2014-100230	2015-12-12	2015-12-16	Standard Class
6749	6750	CA-2014-100230	2015-12-12	2015-12-16	Standard Class
9538	9539	US-2014-169488	2015-09-08	2015-09-10	First Class
9539	9540	US-2014-169488	2015-09-08	2015-09-10	First Class

	Customer ID	Customer Name	Segment	Country	City \
535	AA-10375	Allen Arnold	Consumer	United States	Mesa
807	AA-10375	Allen Arnold	Consumer	United States	Omaha
808	AA-10375	Allen Arnold	Consumer	United States	Omaha
1172	AA-10375	Allen Arnold	Consumer	United States	Los Angeles
1978	AA-10375	Allen Arnold	Consumer	United States	Salem
2263	AA-10375	Allen Arnold	Consumer	United States	Atlanta
2264	AA-10375	Allen Arnold	Consumer	United States	Atlanta
2265	AA-10375	Allen Arnold	Consumer	United States	Atlanta
3007	AA-10375	Allen Arnold	Consumer	United States	Rancho Cucamonga
6465	AA-10375	Allen Arnold	Consumer	United States	Lebanon
6747	AA-10375	Allen Arnold	Consumer	United States	New York City
6748	AA-10375	Allen Arnold	Consumer	United States	New York City
6749	AA-10375	Allen Arnold	Consumer	United States	New York City
9538	AA-10375	Allen Arnold	Consumer	United States	Providence
9539	AA-10375	Allen Arnold	Consumer	United States	Providence

	...	Postal Code	Region	Product ID	Category	Sub-Category
535	...	85204	West	OFF-ST-10001325	Office Supplies	Storage
807	...	68104	Central	FUR-FU-10003347	Furniture	Furnishings
808	...	68104	Central	TEC-AC-10004901	Technology	Accessories
1172	...	90008	West	OFF-BI-10002976	Office Supplies	Binders
1978	...	97301	West	OFF-AR-10000127	Office Supplies	Art
2263	...	30318	South	TEC-AC-10004145	Technology	Accessories
2264	...	30318	South	OFF-PA-10002479	Office Supplies	Paper
2265	...	30318	South	OFF-BI-10004970	Office Supplies	Binders
3007	...	91730	West	OFF-BI-10002706	Office Supplies	Binders
6465	...	37087	South	OFF-ST-10003572	Office Supplies	Storage
6747	...	10035	East	OFF-BI-10002498	Office Supplies	Binders
6748	...	10035	East	OFF-PA-10002245	Office Supplies	Paper
6749	...	10035	East	TEC-PH-10004522	Technology	Phones
9538	...	2908	East	OFF-PA-10002659	Office Supplies	Paper
9539	...	2908	East	OFF-PA-10000157	Office Supplies	Paper

	Product Name	Sales	Quantity \
535	Sterilite Officeware Hinged File Box	16.768	2
807	Coloredge Poster Frame	28.400	2
808	Kensington SlimBlade Notebook Wireless Mouse w...	149.970	3
1172	ACCOHIDE Binder by Acco	16.520	5

1978		Newell 321	5.248	2
2263		Logitech diNovo Edge Keyboard	499.980	2
2264	Xerox 4200 Series MultiUse Premium Copy Paper ...		5.280	1
2265		ACCOHIDE 3-Ring Binder, Blue, 1"	8.260	2
3007	Avery Premier Heavy-Duty Binder with Round Loc...		34.272	3
6465		Portfile Personal File Boxes	84.960	6
6747		Clear Mylar Reinforcing Strips	14.952	1
6748		Xerox 1895	17.940	3
6749	Dexim XPower Skin Super-Thin Power Case for iP...		116.980	2
9538	Avoid Verbal Orders Carbonless Minifold Book		16.900	5
9539		Xerox 191	39.960	2

	Discount	Profit
535	0.2	1.4672
807	0.0	11.0760
808	0.0	50.9898
1172	0.2	5.5755
1978	0.2	0.5904
2263	0.0	114.9954
2264	0.0	2.3760
2265	0.0	3.8822
3007	0.2	11.1384
6465	0.2	6.3720
6747	0.2	5.0463
6748	0.0	8.0730
6749	0.0	29.2450
9538	0.0	7.7740
9539	0.0	18.7812

[15 rows x 21 columns])

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YS-21880 (12, 21)
ZC-21910 (31, 21)
ZD-21925 (9, 21)
```

```
[56]: import h5py
```

```
[57]: coin_list = [coin['id'] for coin in crypto_data]
      coin_list
```

```
[57]: ['bitcoin',
      'ethereum',
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      'ripple',
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      'cardano',
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      'chainlink',
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```

'axie-infinity',
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'frax-ether',
'gala',
'klay-token']

```

```

[58]: f = open('/content/drive/MyDrive/AIS_DG/gpl-3.0.txt')
      data = f.readlines()
      f.close()

```

```

[59]: data_txt = " ".join(data)

```

```

[60]: word_vector = data_txt.split(" ")
      len(word_vector)

```

```

[60]: 6509

```

```

[61]: [t for t in word_vector if t != '']

```

```

[61]: ['GNU',
      'GENERAL',
      'PUBLIC',
      'LICENSE\n',
      'Version',

```


'3',
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'work',
'under',
'this',
'License,',
'and',
'how',
'to',
'view',
'a',
'copy',
'of',
'this',
'License.',
'If\n',

'the',
'interface',
'presents',
'a',
'list',
'of',
'user',
'commands',
'or',
'options,',
'such',
'as',
'a\n',
'menu,',
'a',
'prominent',
'item',
'in',
'the',
'list',
'meets',
'this',
'criterion.\n',
'\n',
'1.',
'Source',
'Code.\n',
'\n',
'The',
'"source',
'code"',
'for',
'a',
'work',
'means',
'the',
'preferred',
'form',
'of',
'the',
'work\n',
'for',
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'modifications',
'to',
'it.',
'"Object',

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'a',
'work.\n',
'\n',
'A',
'"Standard',
'Interface"',
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'interface',
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'a',
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'or,',
'in',
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'case',
'of\n',
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'that\n',
'is',
'widely',
'used',
'among',
'developers',
'working',

```

'in',
'that',
'language.\n',
'\n',
'The',
'"System',
'Libraries"',
'of',
...]

```

```

[62]: top_10_coins_list = [coin['id'] for coin in crypto_data if
    ↪ coin['market_cap_rank'] <= 10]
top_10_coins_list

```

```

[62]: ['bitcoin',
'ethereum',
'tether',
'binancecoin',
'solana',
'ripple',
'usd-coin',
'staked-ether',
'cardano',
'avalanche-2']

```

```

[63]: non_stable_coins = [coin['symbol']
    ↪ if abs(coin['current_price']-1) > 0.1
    ↪ else "stable-coin: "+coin['symbol']
    ↪ for coin in crypto_data]
non_stable_coins[:10]

```

```

[63]: ['btc',
'eth',
'stable-coin: usdt',
'bnb',
'sol',
'xrp',
'stable-coin: usdc',
'steth',
'ada',
'avax']

```

```

[64]: import numpy as np

x = np.random.uniform(size = 100000000)

```

```

[65]: x_list = list(x)

```

```
[66]: from tqdm.notebook import tqdm
count = 0
for v in tqdm(x_list):
    if v < 0.5:
        count += 1
```

```
0%|          | 0/100000000 [00:00<?, ?it/s]
```

```
[67]: %%time
y = [v for v in x_list if v < 0.5]
len(y)
```

```
CPU times: user 8.03 s, sys: 338 ms, total: 8.37 s
Wall time: 8.47 s
```

```
[67]: 50002487
```

```
[68]: x.shape
```

```
[68]: (100000000,)
```

```
[69]: %%time
import pandas as pd
x_s = pd.Series(x)
(x_s < 0.5).sum()
```

```
CPU times: user 1.89 s, sys: 49 ms, total: 1.94 s
Wall time: 1.8 s
```

```
[69]: 50002487
```

1.5 Activity

Write an API crawler to build a DataFrame that contains

1. timestamp
2. coin symbol
3. coin current price

Use `time.sleep(5)` to make Python thread sleep for 5 seconds before repeating the process for 10 times

1. API crawler to list of JSON
2. Use list comprehension to extract data

```
[70]: # work here
import time
from tqdm.notebook import tqdm
```

```
import requests

data = list()

for i in tqdm(range(5)):
    resp = requests.get('https://api.coingecko.com/api/v3/coins/markets/?
↳vs_currency=usd')
    crypto_data = resp.json()
    print(resp.status_code)
    data.append(crypto_data)
    time.sleep(5)
```

```
0%|          | 0/5 [00:00<?, ?it/s]
```

```
200
200
200
200
200
```

```
[71]: len(data)
```

```
[71]: 5
```

```
[72]: coin_ts = [coin['last_updated'] for d in data for coin in d]
```

```
[73]: coin_symbol = [coin['symbol'] for d in data for coin in d]
```

```
[74]: coin_price = [coin['current_price'] for d in data for coin in d]
```

```
[75]: import pandas as pd
df = pd.DataFrame({'Time':coin_ts, 'Symbol':coin_symbol, 'Price':coin_price})
df.head(10)
```

```
[75]:
```

	Time	Symbol	Price
0	2024-01-31T20:19:42.140Z	btc	42907.000000
1	2024-01-31T20:19:44.156Z	eth	2303.040000
2	2024-01-31T20:15:17.050Z	usdt	0.998104
3	2024-01-31T20:19:35.030Z	bnb	302.540000
4	2024-01-31T20:19:37.882Z	sol	99.280000
5	2024-01-31T20:19:39.032Z	xrp	0.508138
6	2024-01-31T20:19:40.305Z	usdc	0.999747
7	2024-01-31T20:19:45.361Z	steth	2301.560000
8	2024-01-31T20:19:44.455Z	ada	0.507750
9	2024-01-31T20:19:42.191Z	avax	34.850000

```
[75]:
```