final (1)

March 15, 2025

```python
[35]: import logging
      import time
      from selenium import webdriver
      from selenium.webdriver.firefox.service import Service
      from selenium.webdriver.common.by import By
      from selenium.webdriver.support.ui import WebDriverWait
      from selenium.webdriver.support import expected_conditions as EC
      from webdriver_manager.firefox import GeckoDriverManager
      import re
      import requests
      from bs4 import BeautifulSoup
      import pandas as pd
```

```python
[50]: logging.basicConfig(level=logging.CRITICAL)

      options = webdriver.FirefoxOptions()
      options.binary_location = "/share/fejermanlab/luqi/firefox/firefox"
      options.add_argument("--headless")

      service = Service(GeckoDriverManager(version="v0.34.0").install())

      driver = webdriver.Firefox(service=service, options=options)

      ordered_stock_names = []

      for page_index in range(0, 300, 100):  # 0-100, 100-200, 200-300
          url = f"https://finance.yahoo.com/markets/stocks/most-active/?
       ↪start={page_index}&count=100"
          driver.get(url)
          html = driver.execute_script('return document.body.innerHTML;')
          soup = BeautifulSoup(html, 'lxml')
          stock_names = [span.get_text() for span in soup.find_all('span',␣
       ↪attrs={"class": re.compile("symbol")})]
          stock_names = stock_names[:100]
          ordered_stock_names.extend(stock_names)
```

```python
url = "https://finance.yahoo.com/markets/stocks/most-active/?
  ↪start=300&count=100"
driver.get(url)

html = driver.execute_script('return document.body.innerHTML;')
soup = BeautifulSoup(html, 'lxml')

stock_names = [span.get_text() for span in soup.find_all('span', attrs={"class":
  ↪ re.compile("symbol")})]
stock_names = stock_names[:52]

ordered_stock_names.extend(stock_names)

driver.quit()

print(len(ordered_stock_names))
```

```
352
```

```python
[57]: ordered_stock_names = [stock.strip() for stock in ordered_stock_names]

print(ordered_stock_names)
```

```
['NVDA', 'F', 'TSLA', 'NIO', 'LCID', 'AAL', 'PLTR', 'SMCI', 'INTC', 'ALTM',
'HOOD', 'T', 'AAPL', 'BBD', 'LYG', 'VZ', 'SOFI', 'PSLV', 'NU', 'RGTI', 'WBD',
'BTG', 'BAC', 'GRAB', 'AMZN', 'VRN', 'RIG', 'CCL', 'MARA', 'LUV', 'VALE', 'PFE',
'AGNC', 'IQ', 'SNAP', 'CLF', 'AVGO', 'CMCSA', 'HBAN', 'ERIC', 'AMD', 'GOOGL',
'DAL', 'ITUB', 'HL', 'XPEV', 'WBA', 'AMCR', 'SOUN', 'BABA', 'STLA', 'NOK',
'HSAI', 'HPE', 'WMT', 'UMC', 'ORCL', 'UBER', 'HIMS', 'RIVN', 'ABEV', 'MRVL',
'ACHR', 'CORZ', 'ADT', 'PRMB', 'KGC', 'MU', 'C', 'CLSK', 'NGD', 'CX', 'MRK',
'GOOG', 'PINS', 'MSTR', 'KO', 'CSCO', 'XOM', 'WFC', 'TEVA', 'MSFT', 'RIOT',
'PCG', 'GOLD', 'ASAN', 'BCS', 'CNH', 'GM', 'FCX', 'RXRX', 'NCLH', 'AEG', 'ET',
'LYFT', 'IONQ', 'CPNG', 'PTEN', 'KVUE', 'AES', 'KDP', 'TME', 'INFY', 'AQN',
'VOD', 'IAG', 'CVE', 'UAL', 'JPM', 'KEY', 'CDE', 'CSX', 'RKLB', 'META', 'PBR',
'RBLX', 'NEE', 'DIS', 'DKNG', 'PTON', 'TTD', 'USB', 'RDDT', 'RKT', 'BB', 'PATH',
'UAA', 'U', 'OKLO', 'MS', 'LUMN', 'FHN', 'SBSW', 'GAP', 'NKE', 'TSM', 'YMM',
'BMY', 'LRCX', 'HLN', 'CRH', 'HAL', 'APP', 'NXE', 'NBIS', 'CMG', 'BEKE', 'TER',
'SHOP', 'SLB', 'VICI', 'VFC', 'KHC', 'PR', 'GILD', 'JD', 'VTRS', 'JOBY', 'COP',
'MRNA', 'HST', 'SIRI', 'MPW', 'S', 'ASTS', 'EQX', 'CCCS', 'KMI', 'COIN', 'NWL',
'VRT', 'RF', 'CFG', 'IVZ', 'NLY', 'QS', 'VNET', 'PARA', 'FLG', 'TFC', 'VST',
'MO', 'PYPL', 'ALIT', 'NEM', 'AVTR', 'BSX', 'ANET', 'PSNY', 'ABT', 'OXY',
'DASH', 'MCHP', 'SCHW', 'BP', 'IPG', 'BA', 'PG', 'COTY', 'KKR', 'AUR', 'DVN',
'QCOM', 'SAN', 'SBUX', 'CELH', 'HBM', 'TEM', 'HPQ', 'UEC', 'CVX', 'BK', 'OSCR',
'X', 'EQT', 'CIEN', 'OWL', 'VLY', 'ASX', 'CFLT', 'LI', 'ARCC', 'AFRM', 'FTI',
'M', 'MDLZ', 'TPR', 'WDC', 'V', 'OBDC', 'NFE', 'STM', 'TXN', 'DDOG', 'ARM',
'DNB', 'O', 'HMY', 'ACI', 'VIK', 'PPL', 'JNJ', 'VKTX', 'ON', 'EBAY', 'AS',
'NVO', 'HBI', 'CRWD', 'APA', 'AA', 'ABNB', 'TGT', 'COMP', 'TOST', 'DIDIY',
'MDT', 'DB', 'NWG', 'WMB', 'SNOW', 'ROIV', 'TSCO', 'GLW', 'NFLX', 'PHYS',
```

```
'CTRA', 'FE', 'SRE', 'JCI', 'MLCO', 'SYF', 'ALKT', 'TJX', 'CRM', 'BZ', 'UPS',
'APO', 'WU', 'AEO', 'KIM', 'IP', 'XP', 'BKR', 'SU', 'PK', 'ZETA', 'WIT', 'BILI',
'CRDO', 'GNW', 'PEP', 'DELL', 'ZIM', 'IOT', 'AIG', 'CARR', 'GGB', 'SE', 'BE',
'EXPE', 'CNC', 'UBS', 'NOV', 'MUFG', 'ONON', 'NET', 'ABBV', 'EQNR', 'NI', 'ZI',
'DOW', 'LU', 'BBWI', 'MGM', 'GSK', 'AMAT', 'ALK', 'GIS', 'AZN', 'CZR', 'CNP',
'CART', 'PDD', 'UPST', 'CNQ', 'BN', 'PLD', 'CVS', 'BTI', 'GEN', 'ING', 'ETR',
'OMC', 'ELAN', 'LITE', 'CPRT', 'BRK-B', 'CAG', 'IBN', 'EXC', 'APLE', 'NRG',
'MDB', 'ALAB', 'GE', 'EMR', 'CLVT', 'AR', 'DXCM', 'COF', 'SO']
```

[58]:
```
import yfinance as yf
data = yf.download(ordered_stock_names, start="2019-01-01", end="2025-03-10",⏎
 ↪group_by='tickers')
```

```
[*********************100%***********************]  352 of 352 completed
```

[59]:
```
data
```

[59]:
```
Ticker              AMZN                                                 PATH  \
Price               Open       High        Low       Close     Volume     Open
Date
2019-01-02     73.260002  77.667999  73.046501  76.956497  159662000      NaN
2019-01-03     76.000504  76.900002  74.855499  75.014000  139512000      NaN
2019-01-04     76.500000  79.699997  75.915497  78.769501  183652000      NaN
2019-01-07     80.115501  81.727997  79.459503  81.475502  159864000      NaN
2019-01-08     83.234497  83.830498  80.830498  82.829002  177628000      NaN
...                  ...        ...        ...        ...        ...      ...
2025-03-03    213.350006 214.009995 202.550003 205.020004   42948400   12.430
2025-03-04    200.110001 206.800003 197.429993 203.800003   60853100   11.610
2025-03-05    204.800003 209.979996 203.259995 208.360001   38610100   11.870
2025-03-06    204.399994 205.770004 198.300003 200.699997   49863800   11.780
2025-03-07    199.490005 202.270004 192.529999 199.250000   59802800   11.615

Ticker                                               ...      PARA            \
Price              High     Low  Close       Volume  ...      Open       High
Date                                                 ...
2019-01-02          NaN     NaN    NaN          NaN  ... 37.383789  39.209270
2019-01-03          NaN     NaN    NaN          NaN  ... 38.849324  40.014887
2019-01-04          NaN     NaN    NaN          NaN  ... 39.937761  40.580536
2019-01-07          NaN     NaN    NaN          NaN  ... 40.391987  41.377573
2019-01-08          NaN     NaN    NaN          NaN  ... 41.146176  41.711817
...                 ...     ...    ...          ...  ...       ...        ...
2025-03-03       12.605  11.720  11.76    8564200.0  ... 11.370000  11.460000
2025-03-04       12.060  11.380  11.79   13345100.0  ... 11.270000  11.570000
2025-03-05       12.185  11.790  12.07    7930600.0  ... 11.550000  11.600000
2025-03-06       12.140  11.635  11.75    8654500.0  ... 11.500000  11.800000
2025-03-07       12.370  11.580  12.31   16493200.0  ... 11.740000  12.540000

Ticker                                                 BCS                    \
```

```
Price              Low       Close    Volume       Open       High        Low
Date
2019-01-02   37.143820   39.132137   4704600   5.797587   5.969947   5.797587
2019-01-03   38.677917   39.534950   5106600   5.962112   5.993450   5.891600
2019-01-04   39.569236   40.426270   3917700   6.150141   6.197149   6.103134
2019-01-07   40.169156   40.854782   3413800   6.181479   6.259825   6.150141
2019-01-08   40.494832   41.454708   3219900   6.306834   6.322503   6.228488
...                 ...         ...       ...        ...        ...        ...
2025-03-03   11.280000   11.310000   7531500  16.000000  16.230000  15.680000
2025-03-04   11.250000   11.480000   9896800  15.390000  16.080000  14.980000
2025-03-05   11.420000   11.510000   7340600  15.850000  16.270000  15.750000
2025-03-06   11.390000   11.760000   9580300  16.200001  16.330000  15.900000
2025-03-07   11.670000   12.140000  23490100  15.870000  16.020000  15.590000

Ticker
Price           Close     Volume
Date
2019-01-02    5.954278    4504100
2019-01-03    5.930773    2911500
2019-01-04    6.173645    2985800
2019-01-07    6.236321    3045500
2019-01-08    6.275496    2109400
...                ...        ...
2025-03-03   15.830000   34899700
2025-03-04   15.710000   38367700
2025-03-05   16.240000   20728900
2025-03-06   16.020000   19088700
2025-03-07   15.940000   18084700

[1554 rows x 1763 columns]
```

[60]:
```python
data.to_csv("stock_data.csv")
```

[66]:
```python
ticker = "AAPL"

ticker_object = yf.Ticker(ticker)

temp = pd.DataFrame.from_dict(ticker_object.info, orient="index")
temp.reset_index(inplace=True)
temp.columns = ["Attribute", "Recent"]

pd.set_option('display.max_rows', None)

print(temp)
```

```
                    Attribute  \
0                    address1
1                        city
```

```
2                             state
3                               zip
4                           country
5                             phone
6                           website
7                          industry
8                       industryKey
9                      industryDisp
10                           sector
11                        sectorKey
12                       sectorDisp
13              longBusinessSummary
14                 fullTimeEmployees
15                  companyOfficers
16                        auditRisk
17                        boardRisk
18                 compensationRisk
19             shareHolderRightsRisk
20                      overallRisk
21              governanceEpochDate
22          compensationAsOfEpochDate
23                        irWebsite
24                    executiveTeam
25                           maxAge
26                        priceHint
27                    previousClose
28                             open
29                           dayLow
30                          dayHigh
31        regularMarketPreviousClose
32                regularMarketOpen
33             regularMarketDayLow
34            regularMarketDayHigh
35                     dividendRate
36                    dividendYield
37                    exDividendDate
38                      payoutRatio
39          fiveYearAvgDividendYield
40                             beta
41                        trailingPE
42                         forwardPE
43                           volume
44              regularMarketVolume
45                    averageVolume
46               averageVolume10days
47            averageDailyVolume10Day
48                              bid
49                              ask
```

50	bidSize
51	askSize
52	marketCap
53	fiftyTwoWeekLow
54	fiftyTwoWeekHigh
55	priceToSalesTrailing12Months
56	fiftyDayAverage
57	twoHundredDayAverage
58	trailingAnnualDividendRate
59	trailingAnnualDividendYield
60	currency
61	tradeable
62	enterpriseValue
63	profitMargins
64	floatShares
65	sharesOutstanding
66	sharesShort
67	sharesShortPriorMonth
68	sharesShortPreviousMonthDate
69	dateShortInterest
70	sharesPercentSharesOut
71	heldPercentInsiders
72	heldPercentInstitutions
73	shortRatio
74	shortPercentOfFloat
75	impliedSharesOutstanding
76	bookValue
77	priceToBook
78	lastFiscalYearEnd
79	nextFiscalYearEnd
80	mostRecentQuarter
81	earningsQuarterlyGrowth
82	netIncomeToCommon
83	trailingEps
84	forwardEps
85	lastSplitFactor
86	lastSplitDate
87	enterpriseToRevenue
88	enterpriseToEbitda
89	52WeekChange
90	SandP52WeekChange
91	lastDividendValue
92	lastDividendDate
93	quoteType
94	currentPrice
95	targetHighPrice
96	targetLowPrice
97	targetMeanPrice

```
98                    targetMedianPrice
99                   recommendationMean
100                   recommendationKey
101              numberOfAnalystOpinions
102                            totalCash
103                    totalCashPerShare
104                               ebitda
105                            totalDebt
106                           quickRatio
107                         currentRatio
108                         totalRevenue
109                         debtToEquity
110                      revenuePerShare
111                        returnOnAssets
112                        returnOnEquity
113                          grossProfits
114                          freeCashflow
115                    operatingCashflow
116                       earningsGrowth
117                        revenueGrowth
118                         grossMargins
119                        ebitdaMargins
120                     operatingMargins
121                     financialCurrency
122                               symbol
123                             language
124                               region
125                             typeDisp
126                       quoteSourceName
127                          triggerable
128            customPriceAlertConfidence
129                            shortName
130                             longName
131                     corporateActions
132                        preMarketTime
133                     regularMarketTime
134                          marketState
135            regularMarketChangePercent
136                   regularMarketPrice
137                             exchange
138                       messageBoardId
139                exchangeTimezoneName
140            exchangeTimezoneShortName
141                gmtOffSetMilliseconds
142                               market
143                          esgPopulated
144                  hasPrePostMarketData
145            firstTradeDateMilliseconds
```

```
146                      preMarketChange
147               preMarketChangePercent
148                        preMarketPrice
149                  regularMarketChange
150               regularMarketDayRange
151                      fullExchangeName
152              averageDailyVolume3Month
153               fiftyTwoWeekLowChange
154        fiftyTwoWeekLowChangePercent
155                     fiftyTwoWeekRange
156              fiftyTwoWeekHighChange
157       fiftyTwoWeekHighChangePercent
158          fiftyTwoWeekChangePercent
159                  averageAnalystRating
160                        cryptoTradeable
161                          dividendDate
162                     earningsTimestamp
163                earningsTimestampStart
164                 earningsTimestampEnd
165          earningsCallTimestampStart
166            earningsCallTimestampEnd
167                 isEarningsDateEstimate
168             epsTrailingTwelveMonths
169                             epsForward
170                        epsCurrentYear
171                    priceEpsCurrentYear
172                fiftyDayAverageChange
173        fiftyDayAverageChangePercent
174          twoHundredDayAverageChange
175  twoHundredDayAverageChangePercent
176                          sourceInterval
177                  exchangeDataDelayedBy
178                           displayName
179                       trailingPegRatio
```

```
                                Recent
0                      One Apple Park Way
1                              Cupertino
2                                     CA
3                                  95014
4                          United States
5                         (408) 996-1010
6                  https://www.apple.com
7                    Consumer Electronics
8                    consumer-electronics
9                    Consumer Electronics
10                             Technology
11                             technology
```

12	Technology
13	Apple Inc. designs, manufactures, and markets …
14	150000
15	[{'maxAge': 1, 'name': 'Mr. Timothy D. Cook', …
16	7
17	1
18	3
19	1
20	1
21	1740787200
22	1703980800
23	http://investor.apple.com/
24	[]
25	86400
26	2
27	227.48
28	223.8
29	217.45
30	225.8399
31	227.48
32	223.8
33	217.45
34	225.8399
35	1.0
36	0.45
37	1739145600
38	0.1571
39	0.59
40	1.178
41	35.1097
42	26.575209
43	73947348
44	73947348
45	52766532
46	53023320
47	53023320
48	220.83
49	221.22
50	4
51	4
52	3317480554496
53	164.08
54	260.1
55	8.382556
56	237.463
57	227.41075
58	0.99
59	0.004352

60	USD
61	False
62	3360498647040
63	0.24295
64	14998187904
65	15022100480
66	134441154
67	124917523
68	1738281600
69	1740700800
70	0.009
71	0.0207
72	0.62792
73	2.71
74	0.009
75	15787400192
76	4.438
77	49.76115
78	1727481600
79	1759017600
80	1735344000
81	0.071
82	96150003712
83	6.29
84	8.31
85	4:1
86	1598832000
87	8.491
88	24.466
89	0.290481
90	0.078748
91	0.25
92	1739145600
93	EQUITY
94	220.84
95	325.0
96	197.0
97	252.79564
98	260.0
99	2.04444
100	buy
101	39
102	53774999552
103	3.58
104	137352003584
105	96798998528
106	0.783
107	0.923

108	395760009216
109	145.0
110	25.974
111	0.22519
112	1.3652
113	184102993920
114	93833871360
115	108293996544
116	0.101
117	0.04
118	0.46519
119	0.34706
120	0.34459
121	USD
122	AAPL
123	en-US
124	US
125	Equity
126	Nasdaq Real Time Price
127	True
128	HIGH
129	Apple Inc.
130	Apple Inc.
131	[]
132	1741772920
133	1741723203
134	PRE
135	-2.918938
136	220.84
137	NMS
138	finmb_24937
139	America/New_York
140	EDT
141	-14400000
142	us_market
143	False
144	True
145	345479400000
146	-0.539993
147	-0.244518
148	220.3
149	-6.639999
150	217.45 - 225.8399
151	NasdaqGS
152	52766532
153	56.759995
154	0.345929
155	164.08 - 260.1

```
156                                     -39.26001
157                                      -0.150942
158                                      29.048098
159                                      2.0 - Buy
160                                          False
161                                     1739404800
162                                     1738272600
163                                     1746010740
164                                     1746446400
165                                     1738274400
166                                     1738274400
167                                           True
168                                           6.29
169                                           8.31
170                                        7.33302
171                                      30.115831
172                                     -16.623001
173                                      -0.070002
174                                      -6.570755
175                                      -0.028894
176                                             15
177                                              0
178                                          Apple
179                                         2.0454
```

[70]:

[73]:
```python
tickers_data = {}

for ticker in ordered_stock_names:
    ticker_object = yf.Ticker(ticker)
    industry = ticker_object.info.get("industry", "N/A")
    tickers_data[ticker] = industry
    time.sleep(1)

print(tickers_data)
```

{'NVDA': 'Semiconductors', 'F': 'Auto Manufacturers', 'TSLA': 'Auto
Manufacturers', 'NIO': 'Auto Manufacturers', 'LCID': 'Auto Manufacturers',
'AAL': 'Airlines', 'PLTR': 'Software - Infrastructure', 'SMCI': 'Computer
Hardware', 'INTC': 'Semiconductors', 'ALTM': 'Specialty Chemicals', 'HOOD':
'Capital Markets', 'T': 'Telecom Services', 'AAPL': 'Consumer Electronics',
'BBD': 'Banks - Regional', 'LYG': 'Banks - Regional', 'VZ': 'Telecom Services',
'SOFI': 'Credit Services', 'PSLV': 'N/A', 'NU': 'Banks - Regional', 'RGTI':
'Computer Hardware', 'WBD': 'Entertainment', 'BTG': 'Gold', 'BAC': 'Banks -
Diversified', 'GRAB': 'Software - Application', 'AMZN': 'Internet Retail',
'VRN': 'Oil & Gas E&P', 'RIG': 'Oil & Gas Drilling', 'CCL': 'Travel Services',
'MARA': 'Capital Markets', 'LUV': 'Airlines', 'VALE': 'Other Industrial Metals &

Mining', 'PFE': 'Drug Manufacturers - General', 'AGNC': 'REIT - Mortgage', 'IQ': 'Entertainment', 'SNAP': 'Internet Content & Information', 'CLF': 'Steel', 'AVGO': 'Semiconductors', 'CMCSA': 'Telecom Services', 'HBAN': 'Banks - Regional', 'ERIC': 'Communication Equipment', 'AMD': 'Semiconductors', 'GOOGL': 'Internet Content & Information', 'DAL': 'Airlines', 'ITUB': 'Banks - Regional', 'HL': 'Other Precious Metals & Mining', 'XPEV': 'Auto Manufacturers', 'WBA': 'Pharmaceutical Retailers', 'AMCR': 'Packaging & Containers', 'SOUN': 'Software - Application', 'BABA': 'Internet Retail', 'STLA': 'Auto Manufacturers', 'NOK': 'Communication Equipment', 'HSAI': 'Auto Parts', 'HPE': 'Communication Equipment', 'WMT': 'Discount Stores', 'UMC': 'Semiconductors', 'ORCL': 'Software - Infrastructure', 'UBER': 'Software - Application', 'HIMS': 'Household & Personal Products', 'RIVN': 'Auto Manufacturers', 'ABEV': 'Beverages - Brewers', 'MRVL': 'Semiconductors', 'ACHR': 'Aerospace & Defense', 'CORZ': 'Software - Infrastructure', 'ADT': 'Security & Protection Services', 'PRMB': 'Beverages - Non-Alcoholic', 'KGC': 'Gold', 'MU': 'Semiconductors', 'C': 'Banks - Diversified', 'CLSK': 'Capital Markets', 'NGD': 'Gold', 'CX': 'Building Materials', 'MRK': 'Drug Manufacturers - General', 'GOOG': 'Internet Content & Information', 'PINS': 'Internet Content & Information', 'MSTR': 'Software - Application', 'KO': 'Beverages - Non-Alcoholic', 'CSCO': 'Communication Equipment', 'XOM': 'Oil & Gas Integrated', 'WFC': 'Banks - Diversified', 'TEVA': 'Drug Manufacturers - Specialty & Generic', 'MSFT': 'Software - Infrastructure', 'RIOT': 'Capital Markets', 'PCG': 'Utilities - Regulated Electric', 'GOLD': 'Gold', 'ASAN': 'Software - Application', 'BCS': 'Banks - Diversified', 'CNH': 'Farm & Heavy Construction Machinery', 'GM': 'Auto Manufacturers', 'FCX': 'Copper', 'RXRX': 'Biotechnology', 'NCLH': 'Travel Services', 'AEG': 'Insurance - Diversified', 'ET': 'Oil & Gas Midstream', 'LYFT': 'Software - Application', 'IONQ': 'Computer Hardware', 'CPNG': 'Internet Retail', 'PTEN': 'Oil & Gas Drilling', 'KVUE': 'Household & Personal Products', 'AES': 'Utilities - Diversified', 'KDP': 'Beverages - Non-Alcoholic', 'TME': 'Internet Content & Information', 'INFY': 'Information Technology Services', 'AQN': 'Utilities - Diversified', 'VOD': 'Telecom Services', 'IAG': 'Gold', 'CVE': 'Oil & Gas Integrated', 'UAL': 'Airlines', 'JPM': 'Banks - Diversified', 'KEY': 'Banks - Regional', 'CDE': 'Gold', 'CSX': 'Railroads', 'RKLB': 'Aerospace & Defense', 'META': 'Internet Content & Information', 'PBR': 'Oil & Gas Integrated', 'RBLX': 'Electronic Gaming & Multimedia', 'NEE': 'Utilities - Regulated Electric', 'DIS': 'Entertainment', 'DKNG': 'Gambling', 'PTON': 'Leisure', 'TTD': 'Software - Application', 'USB': 'Banks - Regional', 'RDDT': 'Internet Content & Information', 'RKT': 'Mortgage Finance', 'BB': 'Software - Infrastructure', 'PATH': 'Software - Infrastructure', 'UAA': 'Apparel Manufacturing', 'U': 'Software - Application', 'OKLO': 'Utilities - Regulated Electric', 'MS': 'Capital Markets', 'LUMN': 'Telecom Services', 'FHN': 'Banks - Regional', 'SBSW': 'Other Precious Metals & Mining', 'GAP': 'Apparel Retail', 'NKE': 'Footwear & Accessories', 'TSM': 'Semiconductors', 'YMM': 'Software - Application', 'BMY': 'Drug Manufacturers - General', 'LRCX': 'Semiconductor Equipment & Materials', 'HLN': 'Drug Manufacturers - Specialty & Generic', 'CRH': 'Building Materials', 'HAL': 'Oil & Gas Equipment & Services', 'APP': 'Software - Application', 'NXE': 'Uranium', 'NBIS': 'Internet Content & Information', 'CMG': 'Restaurants', 'BEKE': 'Real Estate Services', 'TER':

'Semiconductor Equipment & Materials', 'SHOP': 'Software - Application', 'SLB': 'Oil & Gas Equipment & Services', 'VICI': 'REIT - Diversified', 'VFC': 'Apparel Manufacturing', 'KHC': 'Packaged Foods', 'PR': 'Oil & Gas E&P', 'GILD': 'Drug Manufacturers - General', 'JD': 'Internet Retail', 'VTRS': 'Drug Manufacturers - Specialty & Generic', 'JOBY': 'Airports & Air Services', 'COP': 'Oil & Gas E&P', 'MRNA': 'Biotechnology', 'HST': 'REIT - Hotel & Motel', 'SIRI': 'Entertainment', 'MPW': 'REIT - Healthcare Facilities', 'S': 'Software - Infrastructure', 'ASTS': 'Communication Equipment', 'EQX': 'Gold', 'CCCS': 'Software - Application', 'KMI': 'Oil & Gas Midstream', 'COIN': 'Financial Data & Stock Exchanges', 'NWL': 'Household & Personal Products', 'VRT': 'Electrical Equipment & Parts', 'RF': 'Banks - Regional', 'CFG': 'Banks - Regional', 'IVZ': 'Asset Management', 'NLY': 'REIT - Mortgage', 'QS': 'Auto Parts', 'VNET': 'Information Technology Services', 'PARA': 'Entertainment', 'FLG': 'Banks - Regional', 'TFC': 'Banks - Regional', 'VST': 'Utilities - Independent Power Producers', 'MO': 'Tobacco', 'PYPL': 'Credit Services', 'ALIT': 'Software - Application', 'NEM': 'Gold', 'AVTR': 'Medical Instruments & Supplies', 'BSX': 'Medical Devices', 'ANET': 'Computer Hardware', 'PSNY': 'Auto Manufacturers', 'ABT': 'Medical Devices', 'OXY': 'Oil & Gas E&P', 'DASH': 'Internet Content & Information', 'MCHP': 'Semiconductors', 'SCHW': 'Capital Markets', 'BP': 'Oil & Gas Integrated', 'IPG': 'Advertising Agencies', 'BA': 'Aerospace & Defense', 'PG': 'Household & Personal Products', 'COTY': 'Household & Personal Products', 'KKR': 'Asset Management', 'AUR': 'Information Technology Services', 'DVN': 'Oil & Gas E&P', 'QCOM': 'Semiconductors', 'SAN': 'Banks - Diversified', 'SBUX': 'Restaurants', 'CELH': 'Beverages - Non-Alcoholic', 'HBM': 'Copper', 'TEM': 'Health Information Services', 'HPQ': 'Computer Hardware', 'UEC': 'Uranium', 'CVX': 'Oil & Gas Integrated', 'BK': 'Banks - Diversified', 'OSCR': 'Healthcare Plans', 'X': 'Steel', 'EQT': 'Oil & Gas E&P', 'CIEN': 'Communication Equipment', 'OWL': 'Asset Management', 'VLY': 'Banks - Regional', 'ASX': 'Semiconductors', 'CFLT': 'Software - Infrastructure', 'LI': 'Auto Manufacturers', 'ARCC': 'Asset Management', 'AFRM': 'Software - Infrastructure', 'FTI': 'Oil & Gas Equipment & Services', 'M': 'Department Stores', 'MDLZ': 'Confectioners', 'TPR': 'Luxury Goods', 'WDC': 'Computer Hardware', 'V': 'Credit Services', 'OBDC': 'Asset Management', 'NFE': 'Utilities - Regulated Gas', 'STM': 'Semiconductors', 'TXN': 'Semiconductors', 'DDOG': 'Software - Application', 'ARM': 'Semiconductors', 'DNB': 'Financial Data & Stock Exchanges', 'O': 'REIT - Retail', 'HMY': 'Gold', 'ACI': 'Grocery Stores', 'VIK': 'Travel Services', 'PPL': 'Utilities - Regulated Electric', 'JNJ': 'Drug Manufacturers - General', 'VKTX': 'Biotechnology', 'ON': 'Semiconductors', 'EBAY': 'Internet Retail', 'AS': 'Leisure', 'NVO': 'Drug Manufacturers - General', 'HBI': 'Apparel Manufacturing', 'CRWD': 'Software - Infrastructure', 'APA': 'Oil & Gas E&P', 'AA': 'Aluminum', 'ABNB': 'Travel Services', 'TGT': 'Discount Stores', 'COMP': 'Real Estate Services', 'TOST': 'Software - Infrastructure', 'DIDIY': 'Software - Application', 'MDT': 'Medical Devices', 'DB': 'Banks - Regional', 'NWG': 'Banks - Regional', 'WMB': 'Oil & Gas Midstream', 'SNOW': 'Software - Application', 'ROIV': 'Biotechnology', 'TSCO': 'Specialty Retail', 'GLW': 'Electronic Components', 'NFLX': 'Entertainment', 'PHYS': 'N/A', 'CTRA': 'Oil & Gas E&P', 'FE': 'Utilities - Regulated Electric', 'SRE': 'Utilities - Diversified', 'JCI': 'Building Products & Equipment', 'MLCO': 'Resorts & Casinos', 'SYF': 'Credit Services', 'ALKT': 'Software -

Application', 'TJX': 'Apparel Retail', 'CRM': 'Software - Application', 'BZ':
'Internet Content & Information', 'UPS': 'Integrated Freight & Logistics',
'APO': 'Asset Management', 'WU': 'Credit Services', 'AEO': 'Apparel Retail',
'KIM': 'REIT - Retail', 'IP': 'Packaging & Containers', 'XP': 'Capital Markets',
'BKR': 'Oil & Gas Equipment & Services', 'SU': 'Oil & Gas Integrated', 'PK':
'REIT - Hotel & Motel', 'ZETA': 'Software - Infrastructure', 'WIT': 'Information
Technology Services', 'BILI': 'Electronic Gaming & Multimedia', 'CRDO':
'Semiconductors', 'GNW': 'Insurance - Life', 'PEP': 'Beverages - Non-Alcoholic',
'DELL': 'Computer Hardware', 'ZIM': 'Marine Shipping', 'IOT': 'Software -
Infrastructure', 'AIG': 'Insurance - Diversified', 'CARR': 'Building Products &
Equipment', 'GGB': 'Steel', 'SE': 'Internet Retail', 'BE': 'Electrical Equipment
& Parts', 'EXPE': 'Travel Services', 'CNC': 'Healthcare Plans', 'UBS': 'Banks -
Diversified', 'NOV': 'Oil & Gas Equipment & Services', 'MUFG': 'Banks -
Diversified', 'ONON': 'Footwear & Accessories', 'NET': 'Software -
Infrastructure', 'ABBV': 'Drug Manufacturers - General', 'EQNR': 'Oil & Gas
Integrated', 'NI': 'Utilities - Regulated Gas', 'ZI': 'Software - Application',
'DOW': 'Chemicals', 'LU': 'Credit Services', 'BBWI': 'Specialty Retail', 'MGM':
'Resorts & Casinos', 'GSK': 'Drug Manufacturers - General', 'AMAT':
'Semiconductor Equipment & Materials', 'ALK': 'Airlines', 'GIS': 'Packaged
Foods', 'AZN': 'Drug Manufacturers - General', 'CZR': 'Resorts & Casinos',
'CNP': 'Utilities - Regulated Electric', 'CART': 'Internet Retail', 'PDD':
'Internet Retail', 'UPST': 'Credit Services', 'CNQ': 'Oil & Gas E&P', 'BN':
'Asset Management', 'PLD': 'REIT - Industrial', 'CVS': 'Healthcare Plans',
'BTI': 'Tobacco', 'GEN': 'Software - Infrastructure', 'ING': 'Banks -
Diversified', 'ETR': 'Utilities - Regulated Electric', 'OMC': 'Advertising
Agencies', 'ELAN': 'Drug Manufacturers - Specialty & Generic', 'LITE':
'Communication Equipment', 'CPRT': 'Specialty Business Services', 'BRK-B':
'Insurance - Diversified', 'CAG': 'Packaged Foods', 'IBN': 'Banks - Regional',
'EXC': 'Utilities - Regulated Electric', 'APLE': 'REIT - Hotel & Motel', 'NRG':
'Utilities - Independent Power Producers', 'MDB': 'Software - Infrastructure',
'ALAB': 'Semiconductors', 'GE': 'Aerospace & Defense', 'EMR': 'Specialty
Industrial Machinery', 'CLVT': 'Information Technology Services', 'AR': 'Oil &
Gas E&P', 'DXCM': 'Medical Devices', 'COF': 'Credit Services', 'SO': 'Utilities
- Regulated Electric'}

[76]:
```python
df = pd.DataFrame(list(tickers_data.items()), columns=['Ticker', 'Industry'])

print(df)
```

```
    Ticker                    Industry
0     NVDA              Semiconductors
1        F          Auto Manufacturers
2     TSLA          Auto Manufacturers
3      NIO          Auto Manufacturers
4     LCID          Auto Manufacturers
5      AAL                    Airlines
6     PLTR     Software - Infrastructure
7     SMCI           Computer Hardware
```

8	INTC	Semiconductors
9	ALTM	Specialty Chemicals
10	HOOD	Capital Markets
11	T	Telecom Services
12	AAPL	Consumer Electronics
13	BBD	Banks - Regional
14	LYG	Banks - Regional
15	VZ	Telecom Services
16	SOFI	Credit Services
17	PSLV	N/A
18	NU	Banks - Regional
19	RGTI	Computer Hardware
20	WBD	Entertainment
21	BTG	Gold
22	BAC	Banks - Diversified
23	GRAB	Software - Application
24	AMZN	Internet Retail
25	VRN	Oil & Gas E&P
26	RIG	Oil & Gas Drilling
27	CCL	Travel Services
28	MARA	Capital Markets
29	LUV	Airlines
30	VALE	Other Industrial Metals & Mining
31	PFE	Drug Manufacturers - General
32	AGNC	REIT - Mortgage
33	IQ	Entertainment
34	SNAP	Internet Content & Information
35	CLF	Steel
36	AVGO	Semiconductors
37	CMCSA	Telecom Services
38	HBAN	Banks - Regional
39	ERIC	Communication Equipment
40	AMD	Semiconductors
41	GOOGL	Internet Content & Information
42	DAL	Airlines
43	ITUB	Banks - Regional
44	HL	Other Precious Metals & Mining
45	XPEV	Auto Manufacturers
46	WBA	Pharmaceutical Retailers
47	AMCR	Packaging & Containers
48	SOUN	Software - Application
49	BABA	Internet Retail
50	STLA	Auto Manufacturers
51	NOK	Communication Equipment
52	HSAI	Auto Parts
53	HPE	Communication Equipment
54	WMT	Discount Stores
55	UMC	Semiconductors

56	ORCL	Software - Infrastructure
57	UBER	Software - Application
58	HIMS	Household & Personal Products
59	RIVN	Auto Manufacturers
60	ABEV	Beverages - Brewers
61	MRVL	Semiconductors
62	ACHR	Aerospace & Defense
63	CORZ	Software - Infrastructure
64	ADT	Security & Protection Services
65	PRMB	Beverages - Non-Alcoholic
66	KGC	Gold
67	MU	Semiconductors
68	C	Banks - Diversified
69	CLSK	Capital Markets
70	NGD	Gold
71	CX	Building Materials
72	MRK	Drug Manufacturers - General
73	GOOG	Internet Content & Information
74	PINS	Internet Content & Information
75	MSTR	Software - Application
76	KO	Beverages - Non-Alcoholic
77	CSCO	Communication Equipment
78	XOM	Oil & Gas Integrated
79	WFC	Banks - Diversified
80	TEVA	Drug Manufacturers - Specialty & Generic
81	MSFT	Software - Infrastructure
82	RIOT	Capital Markets
83	PCG	Utilities - Regulated Electric
84	GOLD	Gold
85	ASAN	Software - Application
86	BCS	Banks - Diversified
87	CNH	Farm & Heavy Construction Machinery
88	GM	Auto Manufacturers
89	FCX	Copper
90	RXRX	Biotechnology
91	NCLH	Travel Services
92	AEG	Insurance - Diversified
93	ET	Oil & Gas Midstream
94	LYFT	Software - Application
95	IONQ	Computer Hardware
96	CPNG	Internet Retail
97	PTEN	Oil & Gas Drilling
98	KVUE	Household & Personal Products
99	AES	Utilities - Diversified
100	KDP	Beverages - Non-Alcoholic
101	TME	Internet Content & Information
102	INFY	Information Technology Services
103	AQN	Utilities - Diversified

104	VOD	Telecom Services
105	IAG	Gold
106	CVE	Oil & Gas Integrated
107	UAL	Airlines
108	JPM	Banks - Diversified
109	KEY	Banks - Regional
110	CDE	Gold
111	CSX	Railroads
112	RKLB	Aerospace & Defense
113	META	Internet Content & Information
114	PBR	Oil & Gas Integrated
115	RBLX	Electronic Gaming & Multimedia
116	NEE	Utilities - Regulated Electric
117	DIS	Entertainment
118	DKNG	Gambling
119	PTON	Leisure
120	TTD	Software - Application
121	USB	Banks - Regional
122	RDDT	Internet Content & Information
123	RKT	Mortgage Finance
124	BB	Software - Infrastructure
125	PATH	Software - Infrastructure
126	UAA	Apparel Manufacturing
127	U	Software - Application
128	OKLO	Utilities - Regulated Electric
129	MS	Capital Markets
130	LUMN	Telecom Services
131	FHN	Banks - Regional
132	SBSW	Other Precious Metals & Mining
133	GAP	Apparel Retail
134	NKE	Footwear & Accessories
135	TSM	Semiconductors
136	YMM	Software - Application
137	BMY	Drug Manufacturers - General
138	LRCX	Semiconductor Equipment & Materials
139	HLN	Drug Manufacturers - Specialty & Generic
140	CRH	Building Materials
141	HAL	Oil & Gas Equipment & Services
142	APP	Software - Application
143	NXE	Uranium
144	NBIS	Internet Content & Information
145	CMG	Restaurants
146	BEKE	Real Estate Services
147	TER	Semiconductor Equipment & Materials
148	SHOP	Software - Application
149	SLB	Oil & Gas Equipment & Services
150	VICI	REIT - Diversified
151	VFC	Apparel Manufacturing

152	KHC	Packaged Foods
153	PR	Oil & Gas E&P
154	GILD	Drug Manufacturers - General
155	JD	Internet Retail
156	VTRS	Drug Manufacturers - Specialty & Generic
157	JOBY	Airports & Air Services
158	COP	Oil & Gas E&P
159	MRNA	Biotechnology
160	HST	REIT - Hotel & Motel
161	SIRI	Entertainment
162	MPW	REIT - Healthcare Facilities
163	S	Software - Infrastructure
164	ASTS	Communication Equipment
165	EQX	Gold
166	CCCS	Software - Application
167	KMI	Oil & Gas Midstream
168	COIN	Financial Data & Stock Exchanges
169	NWL	Household & Personal Products
170	VRT	Electrical Equipment & Parts
171	RF	Banks - Regional
172	CFG	Banks - Regional
173	IVZ	Asset Management
174	NLY	REIT - Mortgage
175	QS	Auto Parts
176	VNET	Information Technology Services
177	PARA	Entertainment
178	FLG	Banks - Regional
179	TFC	Banks - Regional
180	VST	Utilities - Independent Power Producers
181	MO	Tobacco
182	PYPL	Credit Services
183	ALIT	Software - Application
184	NEM	Gold
185	AVTR	Medical Instruments & Supplies
186	BSX	Medical Devices
187	ANET	Computer Hardware
188	PSNY	Auto Manufacturers
189	ABT	Medical Devices
190	OXY	Oil & Gas E&P
191	DASH	Internet Content & Information
192	MCHP	Semiconductors
193	SCHW	Capital Markets
194	BP	Oil & Gas Integrated
195	IPG	Advertising Agencies
196	BA	Aerospace & Defense
197	PG	Household & Personal Products
198	COTY	Household & Personal Products
199	KKR	Asset Management

200	AUR	Information Technology Services
201	DVN	Oil & Gas E&P
202	QCOM	Semiconductors
203	SAN	Banks - Diversified
204	SBUX	Restaurants
205	CELH	Beverages - Non-Alcoholic
206	HBM	Copper
207	TEM	Health Information Services
208	HPQ	Computer Hardware
209	UEC	Uranium
210	CVX	Oil & Gas Integrated
211	BK	Banks - Diversified
212	OSCR	Healthcare Plans
213	X	Steel
214	EQT	Oil & Gas E&P
215	CIEN	Communication Equipment
216	OWL	Asset Management
217	VLY	Banks - Regional
218	ASX	Semiconductors
219	CFLT	Software - Infrastructure
220	LI	Auto Manufacturers
221	ARCC	Asset Management
222	AFRM	Software - Infrastructure
223	FTI	Oil & Gas Equipment & Services
224	M	Department Stores
225	MDLZ	Confectioners
226	TPR	Luxury Goods
227	WDC	Computer Hardware
228	V	Credit Services
229	OBDC	Asset Management
230	NFE	Utilities - Regulated Gas
231	STM	Semiconductors
232	TXN	Semiconductors
233	DDOG	Software - Application
234	ARM	Semiconductors
235	DNB	Financial Data & Stock Exchanges
236	O	REIT - Retail
237	HMY	Gold
238	ACI	Grocery Stores
239	VIK	Travel Services
240	PPL	Utilities - Regulated Electric
241	JNJ	Drug Manufacturers - General
242	VKTX	Biotechnology
243	ON	Semiconductors
244	EBAY	Internet Retail
245	AS	Leisure
246	NVO	Drug Manufacturers - General
247	HBI	Apparel Manufacturing

248	CRWD	Software - Infrastructure
249	APA	Oil & Gas E&P
250	AA	Aluminum
251	ABNB	Travel Services
252	TGT	Discount Stores
253	COMP	Real Estate Services
254	TOST	Software - Infrastructure
255	DIDIY	Software - Application
256	MDT	Medical Devices
257	DB	Banks - Regional
258	NWG	Banks - Regional
259	WMB	Oil & Gas Midstream
260	SNOW	Software - Application
261	ROIV	Biotechnology
262	TSCO	Specialty Retail
263	GLW	Electronic Components
264	NFLX	Entertainment
265	PHYS	N/A
266	CTRA	Oil & Gas E&P
267	FE	Utilities - Regulated Electric
268	SRE	Utilities - Diversified
269	JCI	Building Products & Equipment
270	MLCO	Resorts & Casinos
271	SYF	Credit Services
272	ALKT	Software - Application
273	TJX	Apparel Retail
274	CRM	Software - Application
275	BZ	Internet Content & Information
276	UPS	Integrated Freight & Logistics
277	APO	Asset Management
278	WU	Credit Services
279	AEO	Apparel Retail
280	KIM	REIT - Retail
281	IP	Packaging & Containers
282	XP	Capital Markets
283	BKR	Oil & Gas Equipment & Services
284	SU	Oil & Gas Integrated
285	PK	REIT - Hotel & Motel
286	ZETA	Software - Infrastructure
287	WIT	Information Technology Services
288	BILI	Electronic Gaming & Multimedia
289	CRDO	Semiconductors
290	GNW	Insurance - Life
291	PEP	Beverages - Non-Alcoholic
292	DELL	Computer Hardware
293	ZIM	Marine Shipping
294	IOT	Software - Infrastructure
295	AIG	Insurance - Diversified

296	CARR	Building Products & Equipment
297	GGB	Steel
298	SE	Internet Retail
299	BE	Electrical Equipment & Parts
300	EXPE	Travel Services
301	CNC	Healthcare Plans
302	UBS	Banks - Diversified
303	NOV	Oil & Gas Equipment & Services
304	MUFG	Banks - Diversified
305	ONON	Footwear & Accessories
306	NET	Software - Infrastructure
307	ABBV	Drug Manufacturers - General
308	EQNR	Oil & Gas Integrated
309	NI	Utilities - Regulated Gas
310	ZI	Software - Application
311	DOW	Chemicals
312	LU	Credit Services
313	BBWI	Specialty Retail
314	MGM	Resorts & Casinos
315	GSK	Drug Manufacturers - General
316	AMAT	Semiconductor Equipment & Materials
317	ALK	Airlines
318	GIS	Packaged Foods
319	AZN	Drug Manufacturers - General
320	CZR	Resorts & Casinos
321	CNP	Utilities - Regulated Electric
322	CART	Internet Retail
323	PDD	Internet Retail
324	UPST	Credit Services
325	CNQ	Oil & Gas E&P
326	BN	Asset Management
327	PLD	REIT - Industrial
328	CVS	Healthcare Plans
329	BTI	Tobacco
330	GEN	Software - Infrastructure
331	ING	Banks - Diversified
332	ETR	Utilities - Regulated Electric
333	OMC	Advertising Agencies
334	ELAN	Drug Manufacturers - Specialty & Generic
335	LITE	Communication Equipment
336	CPRT	Specialty Business Services
337	BRK-B	Insurance - Diversified
338	CAG	Packaged Foods
339	IBN	Banks - Regional
340	EXC	Utilities - Regulated Electric
341	APLE	REIT - Hotel & Motel
342	NRG	Utilities - Independent Power Producers
343	MDB	Software - Infrastructure

```
344    ALAB                      Semiconductors
345      GE                  Aerospace & Defense
346     EMR          Specialty Industrial Machinery
347    CLVT        Information Technology Services
348      AR                        Oil & Gas E&P
349    DXCM                      Medical Devices
350     COF                      Credit Services
351      SO          Utilities - Regulated Electric
```

[77]: `df.to_csv('tickers_industry_data.csv', index=False)`