

UNIVERSIDAD DE EL SALVADOR
FACULTAD MULTIDISCIPLINARIA DE OCCIDENTE
DEPARTAMENTO DE MATEMATICAS



ANALISIS DE YAHOO

CARRERA:

LICENCIATURA EN ESTADÍSTICA.

ASIGNATURA:

ANALISIS DE SISTEMAS

DOCENTE:

LICDA. Jaime Isaac Pena

PRESENTADO POR:

Marlene Esmeralda Pimentel PA20026

Jeimy Merary Romero RS19036

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Operaciones de Apple

```
!pip install yfinance
```

```
Requirement already satisfied: yfinance in c:\users\dell\appdata\local\programs\python\python312\lib\site-packages
Requirement already satisfied: pandas>=1.3.0 in c:\users\dell\appdata\local\programs\python\python312\lib\site-packages
Requirement already satisfied: numpy>=1.16.5 in c:\users\dell\appdata\local\programs\python\python312\lib\site-packages
Requirement already satisfied: requests>=2.31 in c:\users\dell\appdata\local\programs\python\python312\lib\site-packages
Requirement already satisfied: multitasking>=0.0.7 in c:\users\dell\appdata\local\programs\python\python312\lib\site-packages
Requirement already satisfied: lxml>=4.9.1 in c:\users\dell\appdata\local\programs\python\python312\lib\site-packages
Requirement already satisfied: platformdirs>=2.0.0 in c:\users\dell\appdata\local\programs\python\python312\lib\site-packages
Requirement already satisfied: pytz>=2022.5 in c:\users\dell\appdata\local\programs\python\python312\lib\site-packages
Requirement already satisfied: frozendict>=2.3.4 in c:\users\dell\appdata\local\programs\python\python312\lib\site-packages
Requirement already satisfied: peewee>=3.16.2 in c:\users\dell\appdata\local\programs\python\python312\lib\site-packages
Requirement already satisfied: beautifulsoup4>=4.11.1 in c:\users\dell\appdata\local\programs\python\python312\lib\site-packages
Requirement already satisfied: html5lib>=1.1 in c:\users\dell\appdata\local\programs\python\python312\lib\site-packages
Requirement already satisfied: soupsieve>1.2 in c:\users\dell\appdata\local\programs\python\python312\lib\site-packages
Requirement already satisfied: six>=1.9 in c:\users\dell\appdata\local\programs\python\python312\lib\site-packages
Requirement already satisfied: webencodings in c:\users\dell\appdata\local\programs\python\python312\lib\site-packages
Requirement already satisfied: python-dateutil>=2.8.2 in c:\users\dell\appdata\local\programs\python\python312\lib\site-packages
Requirement already satisfied: tzdata>=2022.7 in c:\users\dell\appdata\local\programs\python\python312\lib\site-packages
Requirement already satisfied: charset-normalizer<4,>=2 in c:\users\dell\appdata\local\programs\python\python312\lib\site-packages
Requirement already satisfied: idna<4,>=2.5 in c:\users\dell\appdata\local\programs\python\python312\lib\site-packages
Requirement already satisfied: urllib3<3,>=1.21.1 in c:\users\dell\appdata\local\programs\python\python312\lib\site-packages
Requirement already satisfied: certifi>=2017.4.17 in c:\users\dell\appdata\local\programs\python\python312\lib\site-packages
```

```
import yfinance as yf
import pandas as pd
```

se descarga la llama la base a usar

```
apple = yf.Ticker("AAPL")
```

```
apple_info=apple.info  
apple_info
```

```
{'address1': 'One Apple Park Way',  
  'city': 'Cupertino',  
  'state': 'CA',  
  'zip': '95014',  
  'country': 'United States',  
  'phone': '408 996 1010',  
  'website': 'https://www.apple.com',  
  'industry': 'Consumer Electronics',  
  'industryKey': 'consumer-electronics',  
  'industryDisp': 'Consumer Electronics',  
  'sector': 'Technology',  
  'sectorKey': 'technology',  
  'sectorDisp': 'Technology',  
  'longBusinessSummary': 'Apple Inc. designs, manufactures, and markets smartphones, personal computers,  
  'fullTimeEmployees': 150000,  
  'companyOfficers': [{'maxAge': 1,  
    'name': 'Mr. Timothy D. Cook',  
    'age': 62,  
    'title': 'CEO & Director',  
    'yearBorn': 1961,  
    'fiscalYear': 2023,  
    'totalPay': 16239562,  
    'exercisedValue': 0,  
    'unexercisedValue': 0},  
    {'maxAge': 1,  
      'name': 'Mr. Luca Maestri',  
      'age': 60,  
      'title': 'CFO & Senior VP',  
      'yearBorn': 1963,  
      'fiscalYear': 2023,  
      'totalPay': 4612242,  
      'exercisedValue': 0,
```

```
'unexercisedValue': 0},
{'maxAge': 1,
 'name': 'Mr. Jeffrey E. Williams',
 'age': 59,
 'title': 'Chief Operating Officer',
 'yearBorn': 1964,
 'fiscalYear': 2023,
 'totalPay': 4637585,
 'exercisedValue': 0,
 'unexercisedValue': 0},
{'maxAge': 1,
 'name': 'Ms. Katherine L. Adams',
 'age': 59,
 'title': 'Senior VP, General Counsel & Secretary',
 'yearBorn': 1964,
 'fiscalYear': 2023,
 'totalPay': 4618064,
 'exercisedValue': 0,
 'unexercisedValue': 0},
{'maxAge': 1,
 'name': "Ms. Deirdre O'Brien",
 'age': 56,
 'title': 'Senior Vice President of Retail',
 'yearBorn': 1967,
 'fiscalYear': 2023,
 'totalPay': 4613369,
 'exercisedValue': 0,
 'unexercisedValue': 0},
{'maxAge': 1,
 'name': 'Mr. Chris Kondo',
 'title': 'Senior Director of Corporate Accounting',
 'fiscalYear': 2023,
 'exercisedValue': 0,
 'unexercisedValue': 0},
{'maxAge': 1,
```

```
'name': 'Mr. James Wilson',
'title': 'Chief Technology Officer',
'fiscalYear': 2023,
'exercisedValue': 0,
'unexercisedValue': 0},
{'maxAge': 1,
 'name': 'Suhasini Chandramouli',
 'title': 'Director of Investor Relations',
 'fiscalYear': 2023,
 'exercisedValue': 0,
 'unexercisedValue': 0},
{'maxAge': 1,
 'name': 'Mr. Greg Joswiak',
 'title': 'Senior Vice President of Worldwide Marketing',
 'fiscalYear': 2023,
 'exercisedValue': 0,
 'unexercisedValue': 0},
{'maxAge': 1,
 'name': 'Mr. Adrian Perica',
 'age': 49,
 'title': 'Head of Corporate Development',
 'yearBorn': 1974,
 'fiscalYear': 2023,
 'exercisedValue': 0,
 'unexercisedValue': 0}],
'auditRisk': 6,
'boardRisk': 1,
'compensationRisk': 2,
'shareHolderRightsRisk': 1,
'overallRisk': 1,
'governanceEpochDate': 1714521600,
'compensationAsOfEpochDate': 1703980800,
'irWebsite': 'http://investor.apple.com/',
'maxAge': 86400,
'priceHint': 2,
```

```
'previousClose': 191.04,  
'open': 191.09,  
'dayLow': 190.9201,  
'dayHigh': 192.6499,  
'regularMarketPreviousClose': 191.04,  
'regularMarketOpen': 191.09,  
'regularMarketDayLow': 190.9201,  
'regularMarketDayHigh': 192.6499,  
'dividendRate': 1.0,  
'dividendYield': 0.0052,  
'exDividendDate': 1715299200,  
'payoutRatio': 0.14930001,  
'fiveYearAvgDividendYield': 0.73,  
'beta': 1.264,  
'trailingPE': 29.830746,  
'forwardPE': 26.571232,  
'volume': 19964230,  
'regularMarketVolume': 19964230,  
'averageVolume': 64492280,  
'averageVolume10days': 55539510,  
'averageDailyVolume10Day': 55539510,  
'bid': 191.91,  
'ask': 192.32,  
'bidSize': 100,  
'askSize': 100,  
'marketCap': 2945834024960,  
'fiftyTwoWeekLow': 164.08,  
'fiftyTwoWeekHigh': 199.62,  
'priceToSalesTrailing12Months': 7.7192254,  
'fiftyDayAverage': 174.5172,  
'twoHundredDayAverage': 180.7764,  
'trailingAnnualDividendRate': 0.96,  
'trailingAnnualDividendYield': 0.0050251256,  
'currency': 'USD',  
'enterpriseValue': 2966862954496,
```

```
'profitMargins': 0.26306,  
'floatShares': 15308474083,  
'sharesOutstanding': 15334099968,  
'sharesShort': 94308265,  
'sharesShortPriorMonth': 108782648,  
'sharesShortPreviousMonthDate': 1711584000,  
'dateShortInterest': 1714435200,  
'sharesPercentSharesOut': 0.0062,  
'heldPercentInsiders': 0.052199997,  
'heldPercentInstitutions': 0.57553,  
'shortRatio': 1.66,  
'shortPercentOffFloat': 0.0062,  
'impliedSharesOutstanding': 15467299840,  
'bookValue': 4.837,  
'priceToBook': 39.716766,  
'lastFiscalYearEnd': 1696032000,  
'nextFiscalYearEnd': 1727654400,  
'mostRecentQuarter': 1711756800,  
'earningsQuarterlyGrowth': -0.022,  
'netIncomeToCommon': 100389003264,  
'trailingEps': 6.44,  
'forwardEps': 7.23,  
'pegRatio': 2.76,  
'lastSplitFactor': '4:1',  
'lastSplitDate': 1598832000,  
'enterpriseToRevenue': 7.774,  
'enterpriseToEbitda': 22.887,  
'52WeekChange': 0.11354625,  
'SandP52WeekChange': 0.28043115,  
'lastDividendValue': 0.25,  
'lastDividendDate': 1715299200,  
'exchange': 'NMS',  
'quoteType': 'EQUITY',  
'symbol': 'AAPL',  
'underlyingSymbol': 'AAPL',
```



```
'shortName': 'Apple Inc.',
'longName': 'Apple Inc.',
'firstTradeDateEpochUtc': 345479400,
'timeZoneFullName': 'America/New_York',
'timeZoneShortName': 'EDT',
'uuid': '8b10e4ae-9eeb-3684-921a-9ab27e4d87aa',
'messageBoardId': 'finmb_24937',
'gmtOffSetMilliseconds': -14400000,
'currentPrice': 192.11,
'targetHighPrice': 250.0,
'targetLowPrice': 164.0,
'targetMeanPrice': 202.26,
'targetMedianPrice': 200.0,
'recommendationMean': 2.1,
'recommendationKey': 'buy',
'numberOfAnalystOpinions': 39,
'totalCash': 67150000128,
'totalCashPerShare': 4.379,
'ebitda': 129629003776,
'totalDebt': 104590000128,
'quickRatio': 0.875,
'currentRatio': 1.037,
'totalRevenue': 381623009280,
'debtToEquity': 140.968,
'revenuePerShare': 24.537,
'returnOnAssets': 0.22073999,
'returnOnEquity': 1.4725,
'freeCashflow': 84726874112,
'operatingCashflow': 110563000320,
'earningsGrowth': 0.007,
'revenueGrowth': -0.043,
'grossMargins': 0.45586,
'ebitdaMargins': 0.33968,
'operatingMargins': 0.30743,
'financialCurrency': 'USD',
```

```
'trailingPegRatio': 2.2654}
```

```
apple_info['country']
```

```
'United States'
```

```
historico_apple = apple.history(start='2010-01-01', end='2024-05-20')
print(historico_apple)
```

	Open	High	Low	Close \
Date				
2010-01-04 00:00:00-05:00	6.444464	6.476772	6.412760	6.461977
2010-01-05 00:00:00-05:00	6.479791	6.509684	6.439028	6.473148
2010-01-06 00:00:00-05:00	6.473149	6.498815	6.363542	6.370185
2010-01-07 00:00:00-05:00	6.393736	6.401285	6.312210	6.358407
2010-01-08 00:00:00-05:00	6.349953	6.401284	6.312512	6.400680
...
2024-05-13 00:00:00-04:00	185.440002	187.100006	184.619995	186.279999
2024-05-14 00:00:00-04:00	187.509995	188.300003	186.289993	187.429993
2024-05-15 00:00:00-04:00	187.910004	190.649994	187.369995	189.720001
2024-05-16 00:00:00-04:00	190.470001	191.100006	189.660004	189.839996
2024-05-17 00:00:00-04:00	189.509995	190.809998	189.179993	189.869995

	Volume	Dividends	Stock Splits
Date			
2010-01-04 00:00:00-05:00	493729600	0.0	0.0
2010-01-05 00:00:00-05:00	601904800	0.0	0.0
2010-01-06 00:00:00-05:00	552160000	0.0	0.0
2010-01-07 00:00:00-05:00	477131200	0.0	0.0
2010-01-08 00:00:00-05:00	447610800	0.0	0.0
...
2024-05-13 00:00:00-04:00	72044800	0.0	0.0
2024-05-14 00:00:00-04:00	52393600	0.0	0.0
2024-05-15 00:00:00-04:00	70400000	0.0	0.0
2024-05-16 00:00:00-04:00	52845200	0.0	0.0
2024-05-17 00:00:00-04:00	41282900	0.0	0.0

[3618 rows x 7 columns]

```
historico_apple.head()
```

	Open	High	Low	Close	Volume	Dividends	Stock Splits
Date							
2010-01-04 00:00:00-05:00	6.444464	6.476772	6.412760	6.461977	493729600	0.0	0.0
2010-01-05 00:00:00-05:00	6.479791	6.509684	6.439028	6.473148	601904800	0.0	0.0
2010-01-06 00:00:00-05:00	6.473149	6.498815	6.363542	6.370185	552160000	0.0	0.0
2010-01-07 00:00:00-05:00	6.393736	6.401285	6.312210	6.358407	477131200	0.0	0.0
2010-01-08 00:00:00-05:00	6.349953	6.401284	6.312512	6.400680	447610800	0.0	0.0

Si se quiere mostrar los diez primeros registros de los datos de una sola columna; por ejemplo la columna de precio de la acción al cierre de la jornada

```
print(historico_apple["Close"].head(10))
```

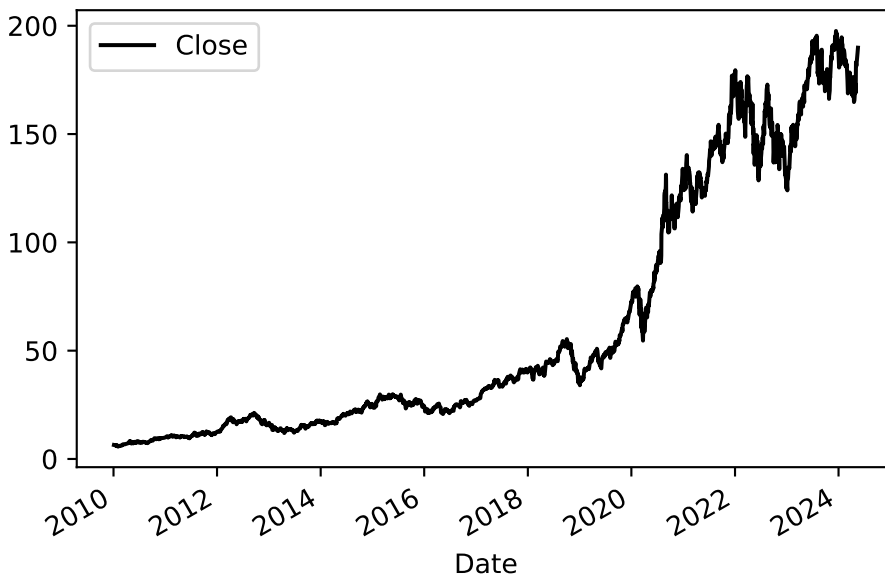
```
Date
2010-01-04 00:00:00-05:00    6.461977
2010-01-05 00:00:00-05:00    6.473148
2010-01-06 00:00:00-05:00    6.370185
2010-01-07 00:00:00-05:00    6.358407
2010-01-08 00:00:00-05:00    6.400680
2010-01-11 00:00:00-05:00    6.344217
2010-01-12 00:00:00-05:00    6.272052
2010-01-13 00:00:00-05:00    6.360522
2010-01-14 00:00:00-05:00    6.323684
2010-01-15 00:00:00-05:00    6.218004
```

Name: Close, dtype: float64

```
historico_apple.reset_index(inplace=True)
```

Se grafica el precio al cierre por fecha.

```
historico_apple.plot(x="Date", y="Close", color="black")
```



Al observar el grafico se puede decir que muestra la evolución del precio de cierre de las acciones de Apple a lo largo del tiempo donde se observa que el precio ha tendido a aumentar desde el año 2020 en adelante.

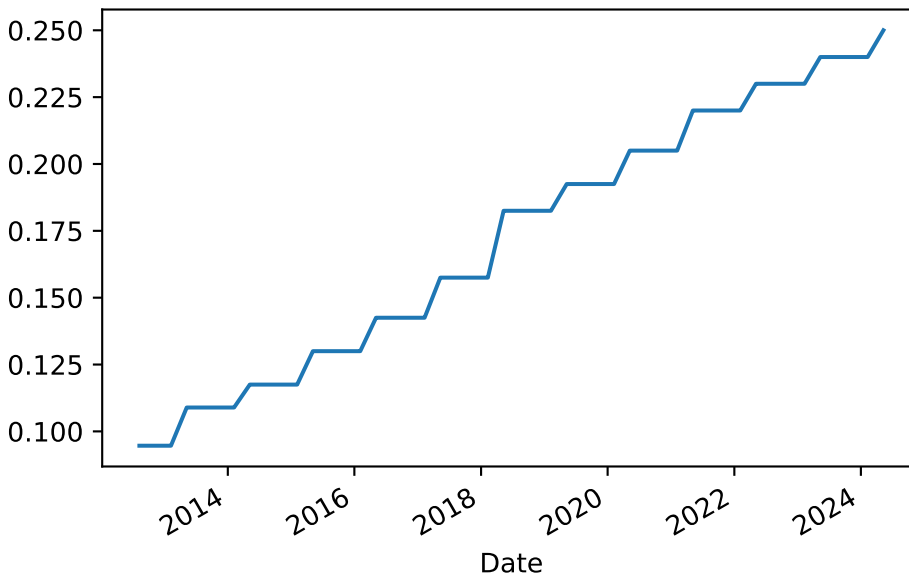
```
apple.dividends
```

Date	
2012-08-09 00:00:00-04:00	0.094643
2012-11-07 00:00:00-05:00	0.094643
2013-02-07 00:00:00-05:00	0.094643
2013-05-09 00:00:00-04:00	0.108929
2013-08-08 00:00:00-04:00	0.108929
2013-11-06 00:00:00-05:00	0.108929
2014-02-06 00:00:00-05:00	0.108929
2014-05-08 00:00:00-04:00	0.117500
2014-08-07 00:00:00-04:00	0.117500
2014-11-06 00:00:00-05:00	0.117500
2015-02-05 00:00:00-05:00	0.117500
2015-05-07 00:00:00-04:00	0.130000
2015-08-06 00:00:00-04:00	0.130000

2015-11-05 00:00:00-05:00	0.130000
2016-02-04 00:00:00-05:00	0.130000
2016-05-05 00:00:00-04:00	0.142500
2016-08-04 00:00:00-04:00	0.142500
2016-11-03 00:00:00-04:00	0.142500
2017-02-09 00:00:00-05:00	0.142500
2017-05-11 00:00:00-04:00	0.157500
2017-08-10 00:00:00-04:00	0.157500
2017-11-10 00:00:00-05:00	0.157500
2018-02-09 00:00:00-05:00	0.157500
2018-05-11 00:00:00-04:00	0.182500
2018-08-10 00:00:00-04:00	0.182500
2018-11-08 00:00:00-05:00	0.182500
2019-02-08 00:00:00-05:00	0.182500
2019-05-10 00:00:00-04:00	0.192500
2019-08-09 00:00:00-04:00	0.192500
2019-11-07 00:00:00-05:00	0.192500
2020-02-07 00:00:00-05:00	0.192500
2020-05-08 00:00:00-04:00	0.205000
2020-08-07 00:00:00-04:00	0.205000
2020-11-06 00:00:00-05:00	0.205000
2021-02-05 00:00:00-05:00	0.205000
2021-05-07 00:00:00-04:00	0.220000
2021-08-06 00:00:00-04:00	0.220000
2021-11-05 00:00:00-04:00	0.220000
2022-02-04 00:00:00-05:00	0.220000
2022-05-06 00:00:00-04:00	0.230000
2022-08-05 00:00:00-04:00	0.230000
2022-11-04 00:00:00-04:00	0.230000
2023-02-10 00:00:00-05:00	0.230000
2023-05-12 00:00:00-04:00	0.240000
2023-08-11 00:00:00-04:00	0.240000
2023-11-10 00:00:00-05:00	0.240000
2024-02-09 00:00:00-05:00	0.240000
2024-05-10 00:00:00-04:00	0.250000

Name: Dividends, dtype: float64

```
apple.dividends.plot()
```



```
import matplotlib.pyplot as plt
import pandas as pd

# Calcular el promedio móvil
historico_apple['MA'] = historico_apple['Close'].rolling(window=30).mean()

# Graficar
plt.figure(figsize=(10, 6))
plt.plot(historico_apple['Date'], historico_apple['Close'], label='Precio de cierre')
plt.plot(historico_apple['Date'], historico_apple['MA'], label='Promedio móvil (30 días)')
plt.xlabel('Fecha')
plt.ylabel('Precio')
plt.title('Precio de cierre de las acciones de Apple con promedio móvil')
plt.legend()
plt.show()
```



El código calcula el promedio móvil de 30 días del precio de cierre de las acciones de Apple y luego lo grafica junto con el precio de cierre original en función de la fecha.

Se pueden observar cruces entre el precio de cierre y el promedio móvil donde no hay un cambio significativo.

Gráfico de barras de volumen de operaciones:

El volumen de operaciones es la cantidad de acciones que se negocian en un período de tiempo determinado. Un gráfico de barras que muestra el volumen de operaciones junto con el precio de cierre puede proporcionar información sobre el interés de los inversores en un determinado período.

```
historico_apple['Volume'].plot(kind='bar', figsize=(10, 6), color='black')
plt.xlabel('Fecha')
plt.ylabel('Volumen de operaciones')
plt.title('Volumen de operaciones de las acciones de Apple')
plt.show()
```

