In [ ]:
```
import pandas as pd
import numpy as np
import yfinance as yf
import matplotlib.pyplot as plt
import warnings
from shutil import which
from matplotlib.pyplot import ylabel

%matplotlib inline
%config InlineBackend.figure_format = 'retina'

# todos los imports superiores son necesarios para graficar

# ahora descargamos la informacion, en este caso de microsoft

df = yf.download(
    'MSFT' ,
    start = '1988-01-01' ,
    end = '2020-12-31' ,
    progress = False
)
df = df.loc[:,['Adj Close']]
df.rename(columns={'Adj Close' : 'adj_close'} , inplace = True)
df
```

Out[ ]:

Date	adj_close
1988-01-04	0.240652
1988-01-05	0.244949
1988-01-06	0.251395
1988-01-07	0.259990
1988-01-08	0.240652
...	...
2020-12-23	214.842209
2020-12-24	216.523865
2020-12-28	218.672089
2020-12-29	217.884750
2020-12-30	215.483780

8316 rows × 1 columns

In [ ]:
```
# calcular los rendimientos simples y logaritmicos

df['rendimiento_simple'] = df.adj_close.pct_change()
df ['rendimiento_log'] = np.log(df.adj_close/df.adj_close.shift(1))
df
```

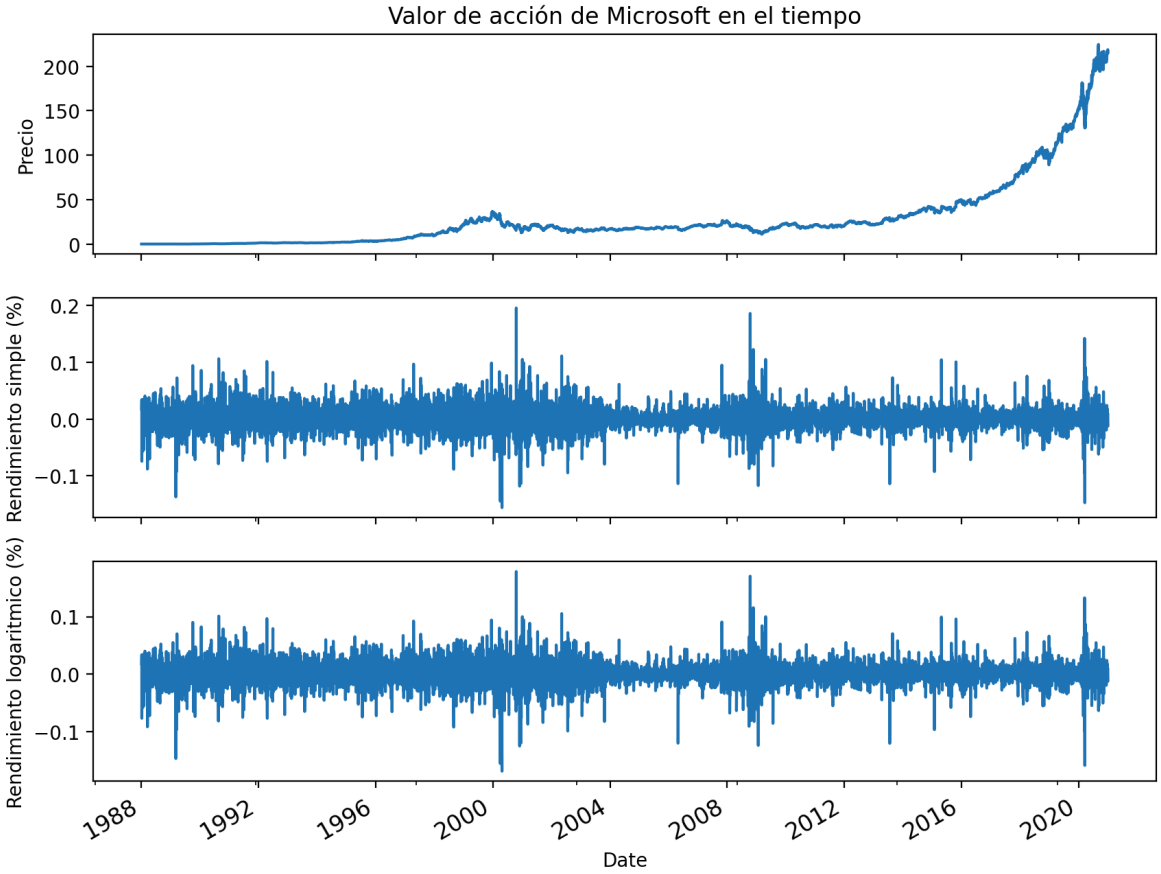
Out[ ]:

Date	adj_close	rendimiento_simple	rendimiento_log
1988-01-04	0.240652	NaN	NaN
1988-01-05	0.244949	0.017856	0.017699
1988-01-06	0.251395	0.026316	0.025976
1988-01-07	0.259990	0.034188	0.033617
1988-01-08	0.240652	-0.074380	-0.077291
...	...	...	...
2020-12-23	214.842209	-0.013039	-0.013125
2020-12-24	216.523865	0.007827	0.007797
2020-12-28	218.672089	0.009921	0.009873
2020-12-29	217.884750	-0.003601	-0.003607
2020-12-30	215.483780	-0.011019	-0.011081

8316 rows × 3 columns

In [ ]:

```
# Graficamos

fig,ax = plt.subplots(3,1, sharex = True, figsize = (10,8)) # hemos creado un 'p

# agregar los precios a la gráfica

df.adj_close.plot(ax = ax[0]) # añadiendo el valor adj_close al eje 0X
ax[0].set(
    title = 'Valor de acción de Microsoft en el tiempo' ,
    ylabel = 'Precio'
)

# agregar los rendimientos simples

df.rendimiento_simple.plot(ax=ax[1])
ax[1].set(
    ylabel = 'Rendimiento simple (%)'

)

# agregar los rendimientos logaritmicos

df.rendimiento_log.plot(ax=ax[2])
ax[2].set(
    ylabel = 'Rendimiento logaritmico (%)'
)

ax[2].tick_params(
    axis = 'x' ,
    which = 'major' ,
    labelsize = 12
)
```


Valor de acción de Microsoft en el tiempo
Precio
200
150
100
50
0
Rendimiento simple (%)
0.2
0.1
0.0
−0.1
Rendimiento logaritmico (%)
0.1
0.0
−0.1
1988
1992
1996
2000
2004
2008
2012
2016
2020
Date

In [ ]: