In [15]:
```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
```

In [3]:
```
df = pd.read_csv(r"C:\Users\usr\Downloads\Bitcoin\bitcoin_price_Training - Training.csv"
```

In [4]:
```
df.head(5)
```

Out[4]:

	Date	Open	High	Low	Close	Volume	Market Cap
0	Jul 31, 2017	2763.24	2889.62	2720.61	2875.34	860,575,000	45,535,800,000
1	Jul 30, 2017	2724.39	2758.53	2644.85	2757.18	705,943,000	44,890,700,000
2	Jul 29, 2017	2807.02	2808.76	2692.80	2726.45	803,746,000	46,246,700,000
3	Jul 28, 2017	2679.73	2897.45	2679.73	2809.01	1,380,100,000	44,144,400,000
4	Jul 27, 2017	2538.71	2693.32	2529.34	2671.78	789,104,000	41,816,500,000

In [5]:
```
df.columns
```

Out[5]:
```
Index(['Date', 'Open', 'High', 'Low', 'Close', 'Volume', 'Market Cap'], dtype='object')
```

In [6]:
```
df.shape
```

Out[6]:
```
(1556, 7)
```

In [8]:
```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 1556 entries, 0 to 1555
Data columns (total 7 columns):
 #   Column      Non-Null Count  Dtype  
---  ------      --------------  -----  
 0   Date        1556 non-null   object 
 1   Open        1556 non-null   float64
 2   High        1556 non-null   float64
 3   Low         1556 non-null   float64
 4   Close       1556 non-null   float64
 5   Volume      1556 non-null   object 
 6   Market Cap  1556 non-null   object 
dtypes: float64(4), object(3)
memory usage: 85.2+ KB
```

In [11]:
```
df.describe().T
```

Out[11]:

	count	mean	std	min	25%	50%	75%	max
Open	1556.0	582.625328	523.137312	68.50	254.2875	438.600	662.4375	2953.22
High	1556.0	597.992847	542.992855	74.56	260.3275	447.560	674.5250	2999.91
Low	1556.0	567.851446	505.877401	65.53	248.8350	430.570	646.7350	2840.53
Close	1556.0	584.239396	525.904442	68.43	254.3200	438.855	663.4025	2958.11

In [ ]:
```
# Data preprocessing
```

In [18]:
```
df.dtypes
```

Out[18]:
```
Date           object
Open          float64
High          float64
Low           float64
Close         float64
Volume         object
Market Cap     object
dtype: object
```

In [22]:
```
df['Date'] = df['Date'].astype('datetime64[ns]')
```

In [21]:
```
df['Date'].min()
```

Out[21]:
```
Timestamp('2013-04-28 00:00:00')
```

In [23]:
```
df['Date'].max()
```

Out[23]:
```
Timestamp('2017-07-31 00:00:00')
```

In [24]:
```
df.isnull().sum()
```

Out[24]:
```
Date          0
Open          0
High          0
Low           0
Close         0
Volume        0
Market Cap    0
dtype: int64
```

In [26]:
```
df.duplicated().sum()
```

Out[26]:
```
0
```

In [27]:
```
df.head(5)
```

Out[27]:

	Date	Open	High	Low	Close	Volume	Market Cap
0	2017-07-31	2763.24	2889.62	2720.61	2875.34	860,575,000	45,535,800,000
1	2017-07-30	2724.39	2758.53	2644.85	2757.18	705,943,000	44,890,700,000
2	2017-07-29	2807.02	2808.76	2692.80	2726.45	803,746,000	46,246,700,000
3	2017-07-28	2679.73	2897.45	2679.73	2809.01	1,380,100,000	44,144,400,000
4	2017-07-27	2538.71	2693.32	2529.34	2671.78	789,104,000	41,816,500,000

In [28]:
```
df.tail(5)
```

Out[28]:

	Date	Open	High	Low	Close	Volume	Market Cap
1551	2013-05-02	116.38	125.60	92.28	105.21	-	1,292,190,000
1552	2013-05-01	139.00	139.89	107.72	116.99	-	1,542,820,000
1553	2013-04-30	144.00	146.93	134.05	139.00	-	1,597,780,000
1554	2013-04-29	134.44	147.49	134.00	144.54	-	1,491,160,000
1555	2013-04-28	135.30	135.98	132.10	134.21	-	1,500,520,000

In [32]:
```
data = df.sort_index(ascending=False).reset_index()
```

In [ ]:
```
#Change in price overtime
```

In [33]:
```
data
```

Out[33]:

	index	Date	Open	High	Low	Close	Volume	Market Cap
0	1555	2013-04-28	135.30	135.98	132.10	134.21	-	1,500,520,000
1	1554	2013-04-29	134.44	147.49	134.00	144.54	-	1,491,160,000
2	1553	2013-04-30	144.00	146.93	134.05	139.00	-	1,597,780,000
3	1552	2013-05-01	139.00	139.89	107.72	116.99	-	1,542,820,000
4	1551	2013-05-02	116.38	125.60	92.28	105.21	-	1,292,190,000
...	...	...	...	...	...	...	...	...
1551	4	2017-07-27	2538.71	2693.32	2529.34	2671.78	789,104,000	41,816,500,000
1552	3	2017-07-28	2679.73	2897.45	2679.73	2809.01	1,380,100,000	44,144,400,000
1553	2	2017-07-29	2807.02	2808.76	2692.80	2726.45	803,746,000	46,246,700,000
1554	1	2017-07-30	2724.39	2758.53	2644.85	2757.18	705,943,000	44,890,700,000
1555	0	2017-07-31	2763.24	2889.62	2720.61	2875.34	860,575,000	45,535,800,000

1556 rows × 8 columns

In [34]:
```
data.drop('index', axis = 1, inplace = True)
```

In [35]:
```
data
```

Out[35]:

	Date	Open	High	Low	Close	Volume	Market Cap
0	2013-04-28	135.30	135.98	132.10	134.21	-	1,500,520,000
1	2013-04-29	134.44	147.49	134.00	144.54	-	1,491,160,000
2	2013-04-30	144.00	146.93	134.05	139.00	-	1,597,780,000
3	2013-05-01	139.00	139.89	107.72	116.99	-	1,542,820,000
4	2013-05-02	116.38	125.60	92.28	105.21	-	1,292,190,000
...	...	...	...	...	...	...	...
1551	2017-07-27	2538.71	2693.32	2529.34	2671.78	789,104,000	41,816,500,000
1552	2017-07-28	2679.73	2897.45	2679.73	2809.01	1,380,100,000	44,144,400,000
1553	2017-07-29	2807.02	2808.76	2692.80	2726.45	803,746,000	46,246,700,000
1554	2017-07-30	2724.39	2758.53	2644.85	2757.18	705,943,000	44,890,700,000
1555	2017-07-31	2763.24	2889.62	2720.61	2875.34	860,575,000	45,535,800,000

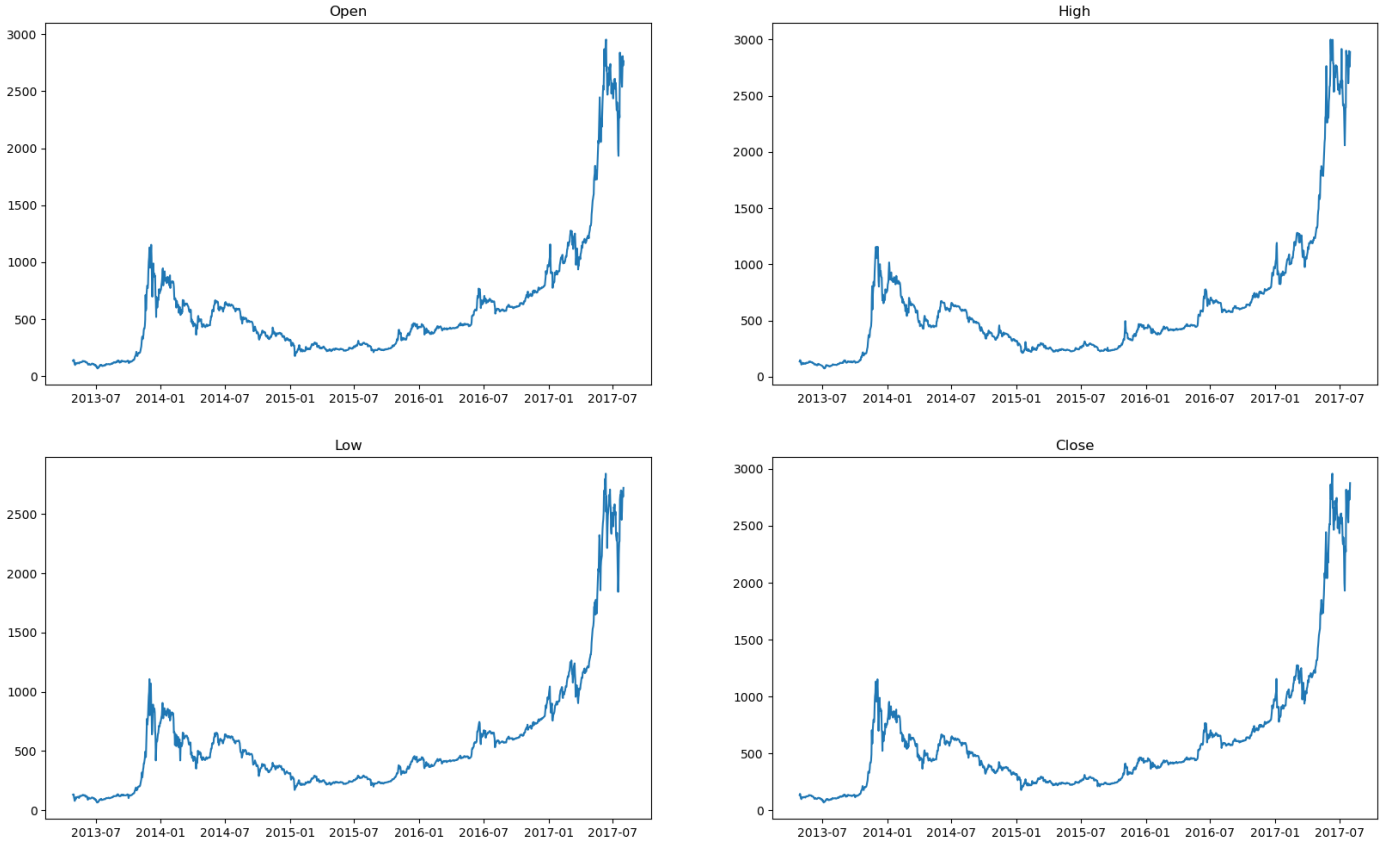
1556 rows × 7 columns

In [36]:
```
data.columns
```

Out[36]:
```
Index(['Date', 'Open', 'High', 'Low', 'Close', 'Volume', 'Market Cap'], dtype='object')
```

In [40]:
```
plt.figure(figsize=(20,12))
for index, col in enumerate(['Open', 'High', 'Low', 'Close'],1):
```

```
    plt.subplot(2,2,index)
    plt.plot(df['Date'], df[col])
    plt.title(col)
```



In [41]:
```
data.shape
```

Out[41]:
```
(1556, 7)
```

In [51]:
```
bitcoin_sample = data [0:50]
```

In [70]:
```
data
```

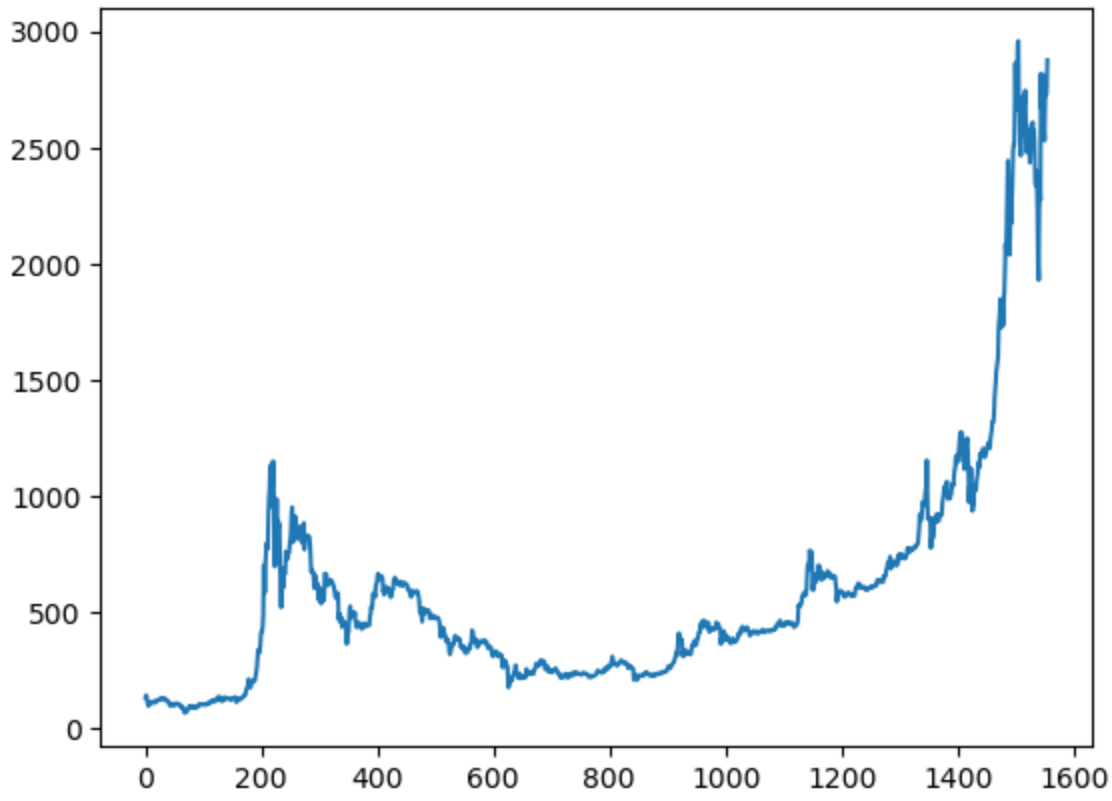
Out[70]:

Date	Open	High	Low	Close	Volume	Market Cap
2013-04-28	135.30	135.98	132.10	134.21	-	1,500,520,000
2013-04-29	134.44	147.49	134.00	144.54	-	1,491,160,000
2013-04-30	144.00	146.93	134.05	139.00	-	1,597,780,000
2013-05-01	139.00	139.89	107.72	116.99	-	1,542,820,000
2013-05-02	116.38	125.60	92.28	105.21	-	1,292,190,000
...	...	...	...	...	...	...
2017-07-27	2538.71	2693.32	2529.34	2671.78	789,104,000	41,816,500,000
2017-07-28	2679.73	2897.45	2679.73	2809.01	1,380,100,000	44,144,400,000
2017-07-29	2807.02	2808.76	2692.80	2726.45	803,746,000	46,246,700,000
2017-07-30	2724.39	2758.53	2644.85	2757.18	705,943,000	44,890,700,000
2017-07-31	2763.24	2889.62	2720.61	2875.34	860,575,000	45,535,800,000

1556 rows × 6 columns

In [60]:
```
data['Close'].plot()
```

Out[60]:
```
<Axes: >
```



In [79]:
```
data.set_index("Date", inplace = True)
```

```
---------------------------------------------------------------------------
KeyError                                  Traceback (most recent call last)
Cell In[79], line 1
----> 1 data.set_index("Date", inplace = True)

File C:\ProgramData\anaconda3\lib\site-packages\pandas\util\_decorators.py:331, in deprecate_nonkeyword_arguments.<locals>.decorate.<locals>.wrapper(*args, **kwargs)
    325 if len(args) > num_allow_args:
    326     warnings.warn(
    327         msg.format(arguments=_format_argument_list(allow_args)),
    328         FutureWarning,
    329         stacklevel=find_stack_level(),
    330     )
--> 331 return func(*args, **kwargs)

File C:\ProgramData\anaconda3\lib\site-packages\pandas\core\frame.py:6012, in DataFrame.set_index(self, keys, drop, append, inplace, verify_integrity)
   6009                 missing.append(col)
   6011 if missing:
-> 6012     raise KeyError(f"None of {missing} are in the columns")
   6014 if inplace:
   6015     frame = self

KeyError: "None of ['Date'] are in the columns"
```

In [80]:
```
data.head()
```

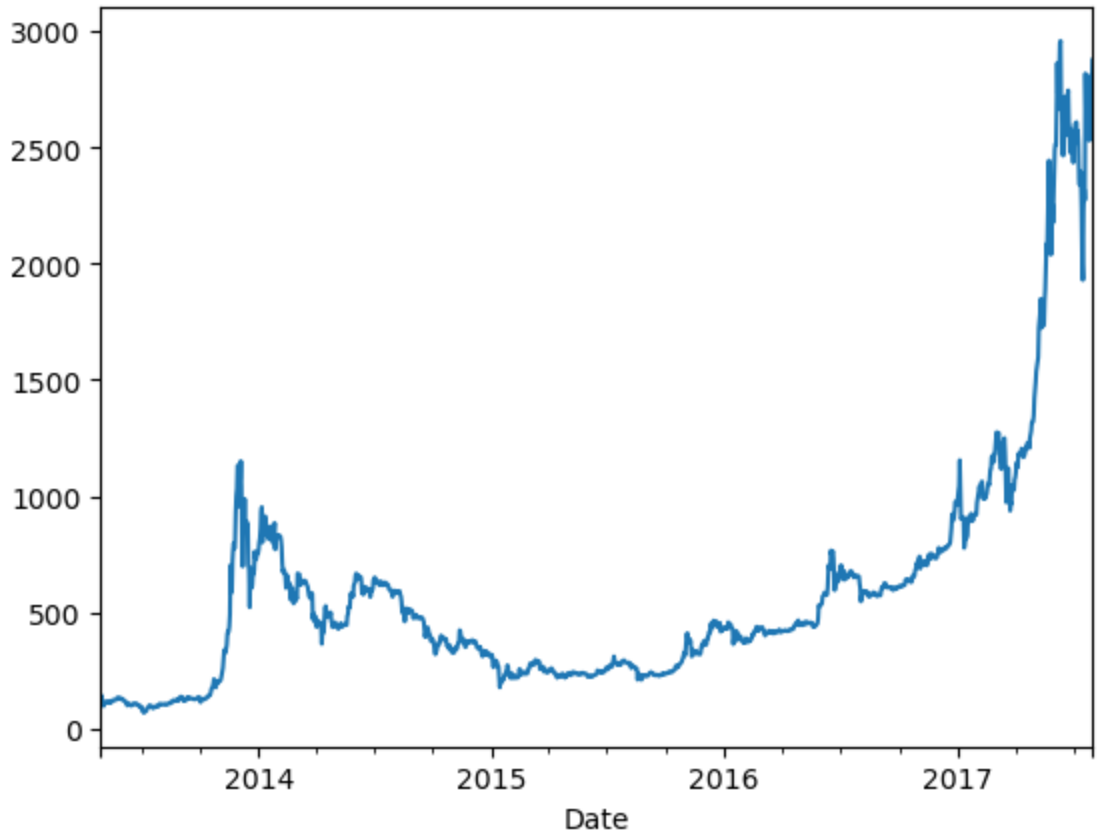
Out[80]:

Date	Open	High	Low	Close	Volume	Market Cap
2013-04-28	135.30	135.98	132.10	134.21	-	1,500,520,000

2013-04-29	134.44	147.49	134.00	144.54	-	1,491,160,000
2013-04-30	144.00	146.93	134.05	139.00	-	1,597,780,000
2013-05-01	139.00	139.89	107.72	116.99	-	1,542,820,000
2013-05-02	116.38	125.60	92.28	105.21	-	1,292,190,000

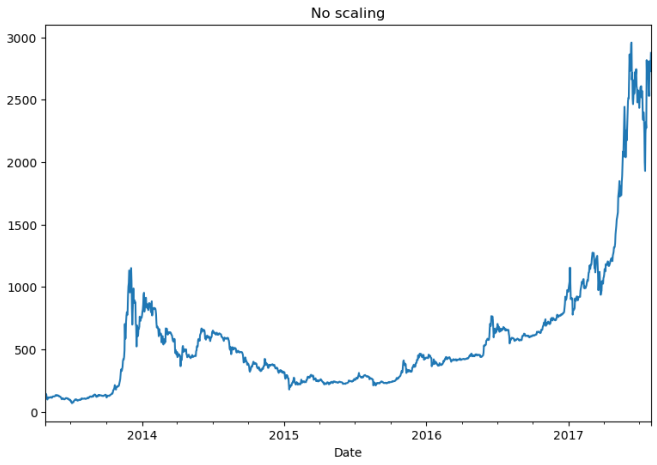
In [81]:
```
data['Close'].plot()
```

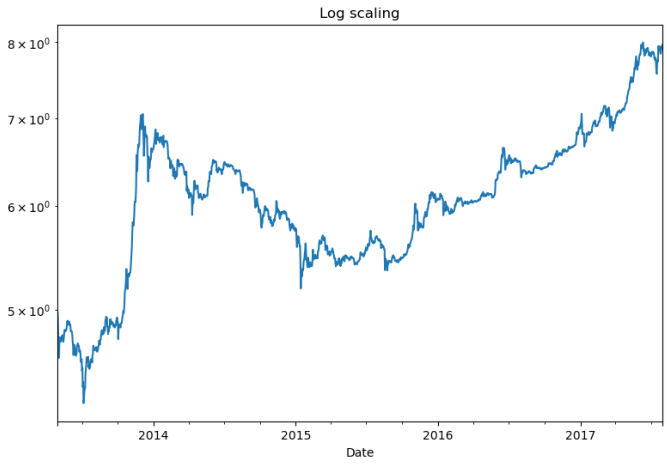
Out[81]:
```
<Axes: xlabel='Date'>
```



In [84]:
```
plt.figure(figsize = (20,6))
plt.subplot(1,2,1)
data['Close'].plot()
plt.title('No scaling')

plt. subplot(1,2,2)
np.log1p(data['Close']).plot()
plt.title('Log scaling')
plt.yscale('log')
```





In [85]:
```
data.head(3)
```

Out[85]:

Date	Open	High	Low	Close	Volume	Market Cap
2013-04-28	135.30	135.98	132.10	134.21	-	1,500,520,000
2013-04-29	134.44	147.49	134.00	144.54	-	1,491,160,000
2013-04-30	144.00	146.93	134.05	139.00	-	1,597,780,000

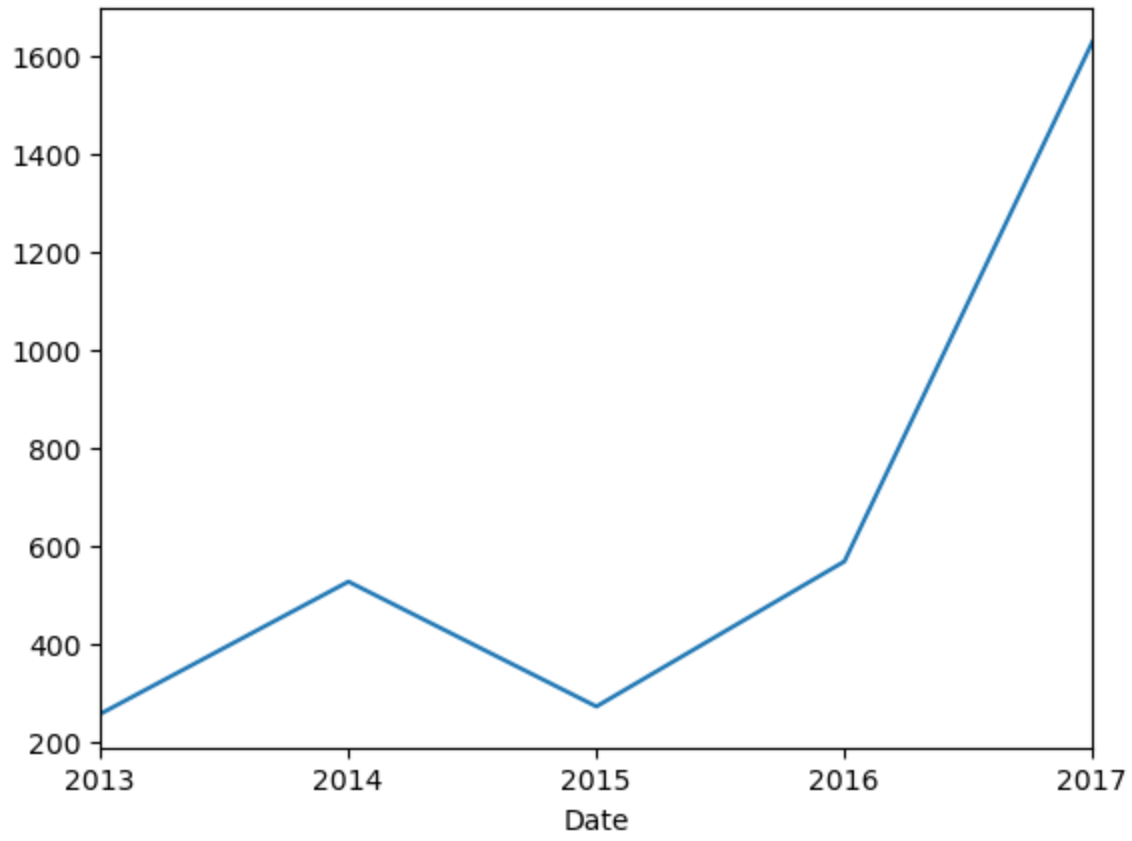
In [ ]:
```
# Perform Analysis on closing Price on Yearly , Quarterly & monthly basis !
```

In [86]:
```
data['Close'].resample('Y').mean()
```

Out[86]:
```
Date
2013-12-31     257.474476
2014-12-31     527.236658
2015-12-31     272.453260
2016-12-31     568.492131
2017-12-31    1628.622123
Freq: A-DEC, Name: Close, dtype: float64
```

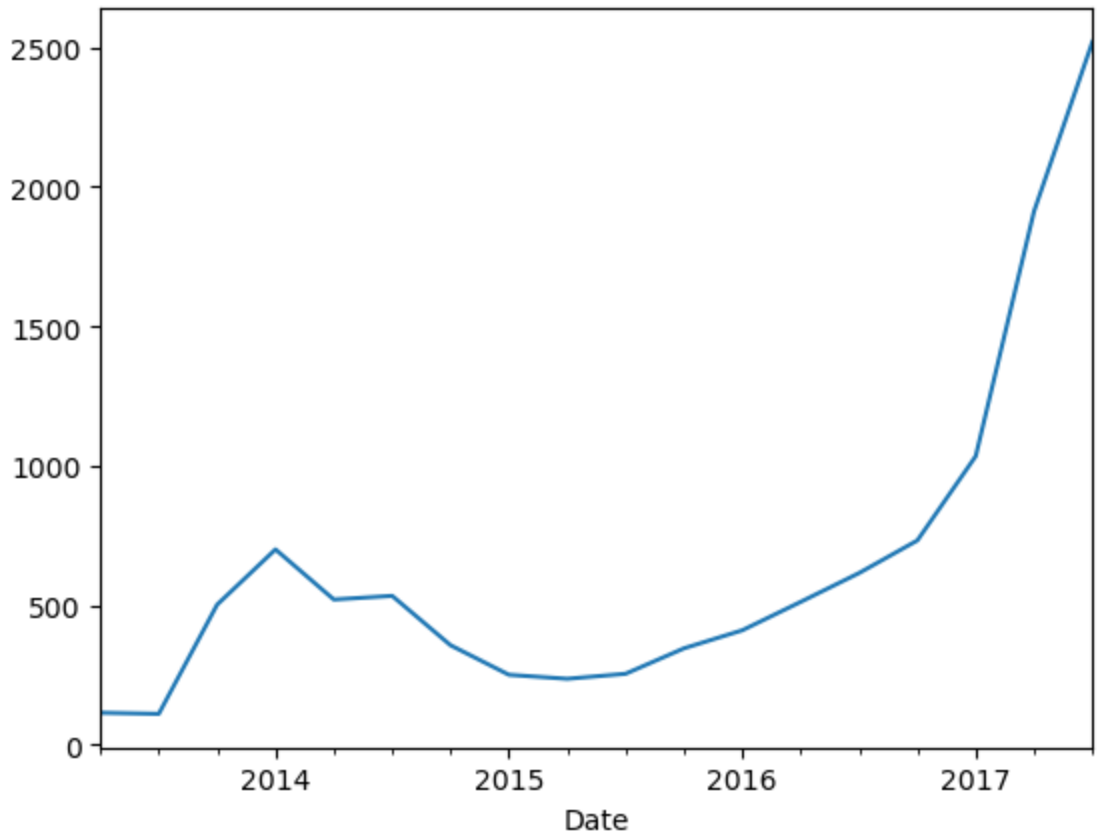
In [87]:
```
data['Close'].resample('Y').mean().plot()
```

Out[87]:
```
<Axes: xlabel='Date'>
```



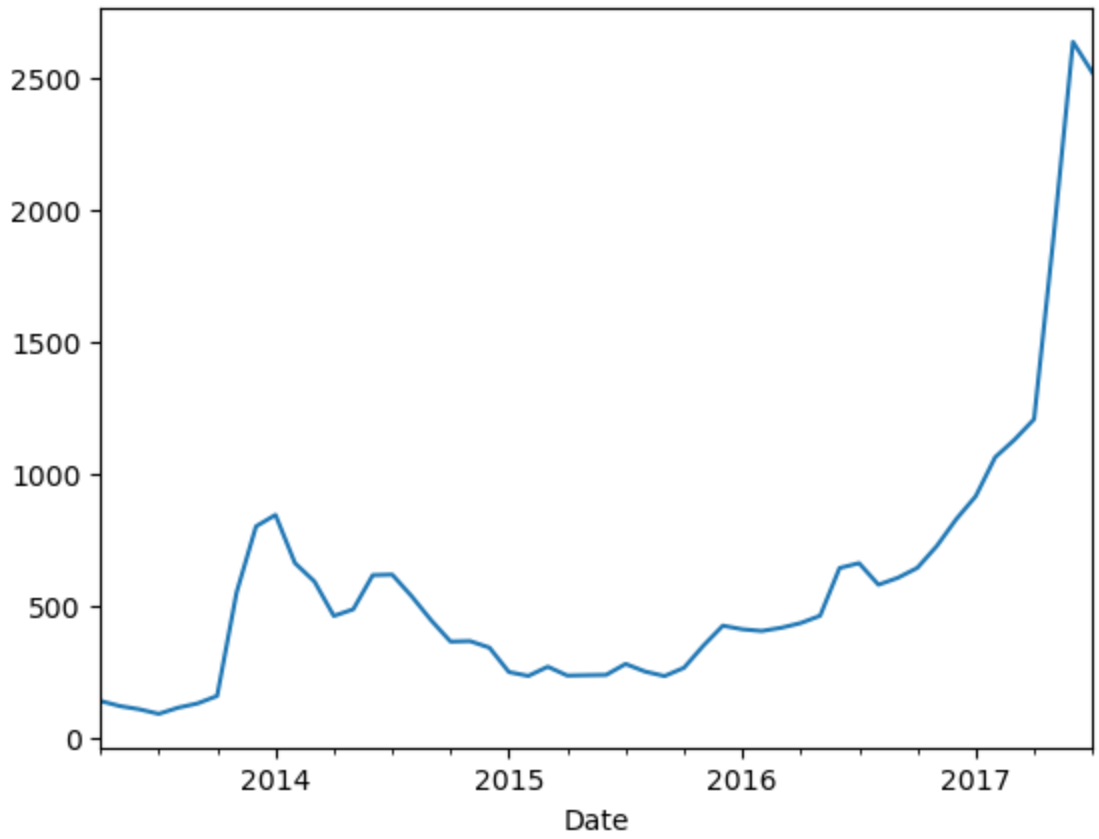
In [88]:
```
data['Close'].resample('Q').mean().plot()
```

Out[88]:
```
<Axes: xlabel='Date'>
```



In [89]:
```
data['Close'].resample('M').mean().plot()
```

Out[89]:
```
<Axes: xlabel='Date'>
```



In [ ]: