02-Time-Shifting

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1 Time Shifting

Sometimes you may need to shift all your data up or down along the time series index. In fact, a lot of pandas built-in methods do this under the hood. This isn't something we'll do often in the course, but it's definitely good to know about this anyways!

[1]:
```
import pandas as pd
```

[2]:
```
df = pd.read_csv('../Data/starbucks.csv',index_col='Date',parse_dates=True)
```

[3]:
```
df.head()
```

[3]:

Date	Close	Volume
2015-01-02	38.0061	6906098
2015-01-05	37.2781	11623796
2015-01-06	36.9748	7664340
2015-01-07	37.8848	9732554
2015-01-08	38.4961	13170548

[4]:
```
df.tail()
```

[4]:

Date	Close	Volume
2018-12-24	60.56	6323252
2018-12-26	63.08	16646238
2018-12-27	63.20	11308081
2018-12-28	63.39	7712127
2018-12-31	64.40	7690183

1.1 .shift() forward

This method shifts the entire date index a given number of rows, without regard for time periods (months & years).It returns a modified copy of the original DataFrame.

[5]:
```
df.shift(1).head()
```

[5]:
```
              Close      Volume
Date
2015-01-02      NaN         NaN
2015-01-05  38.0061   6906098.0
2015-01-06  37.2781  11623796.0
2015-01-07  36.9748   7664340.0
2015-01-08  37.8848   9732554.0
```

[6]:
```
# NOTE: You will lose that last piece of data that no longer has an index!
df.shift(1).tail()
```

[6]:
```
            Close      Volume
Date
2018-12-24  61.39  23524888.0
2018-12-26  60.56   6323252.0
2018-12-27  63.08  16646238.0
2018-12-28  63.20  11308081.0
2018-12-31  63.39   7712127.0
```

1.2 .shift() backwards

[7]:
```
df.shift(-1).head()
```

[7]:
```
              Close      Volume
Date
2015-01-02  37.2781  11623796.0
2015-01-05  36.9748   7664340.0
2015-01-06  37.8848   9732554.0
2015-01-07  38.4961  13170548.0
2015-01-08  37.2361  27556706.0
```

[8]:
```
df.shift(-1).tail()
```

[8]:
```
            Close      Volume
Date
2018-12-24  63.08  16646238.0
2018-12-26  63.20  11308081.0
2018-12-27  63.39   7712127.0
2018-12-28  64.40   7690183.0
```

```
2018-12-31     NaN          NaN
```

1.3 Shifting based on Time Series Frequency Code

We can choose to shift index values up or down without realigning the data by passing in a freq argument. This method shifts dates to the next period based on a frequency code. Common codes are 'M' for month-end and 'A' for year-end. Refer to the Time Series Offset Aliases table from the Time Resampling lecture for a full list of values, or click here.

[9]:
```
# Shift everything forward one month
df.shift(periods=1, freq='M').head()
```

[9]:
```
              Close    Volume
Date
2015-01-31  38.0061   6906098
2015-01-31  37.2781  11623796
2015-01-31  36.9748   7664340
2015-01-31  37.8848   9732554
2015-01-31  38.4961  13170548
```

For more info on time shifting visit http://pandas.pydata.org/pandas-docs/stable/generated/pandas.DataFrame.shift.html Up next we'll look at rolling and expanding!