In [10]:

```
import pandas as pd
import numpy as np

df = pd.DataFrame({'X': [7, 2, 0, 3, 4, 2, 5, 0, 3, 4]})

izero = np.r_[-1, (df['X'] == 0).nonzero()[0]] # indices of zeros
idx = np.arange(len(df))
df['Y'] = idx - izero[np.searchsorted(izero - 1, idx) - 1]

print(df['Y'])
```

```
0    1
1    2
2    0
3    1
4    2
5    3
6    4
7    0
8    1
9    2
Name: Y, dtype: int64
```

In [5]:
```
import pandas as pd
dti = pd.date_range(start='2015-01-01', end='2015-12-31', freq='B')
print(dti)
print('\n\n')

#Index the series, s be the index
s = pd.Series(np.random.rand(len(dti)), index=dti)
```

```
DatetimeIndex(['2015-01-01', '2015-01-02', '2015-01-05', '2015-01-06',
               '2015-01-07', '2015-01-08', '2015-01-09', '2015-01-12',
               '2015-01-13', '2015-01-14',
               ...
               '2015-12-18', '2015-12-21', '2015-12-22', '2015-12-23',
               '2015-12-24', '2015-12-25', '2015-12-28', '2015-12-29',
               '2015-12-30', '2015-12-31'],
              dtype='datetime64[ns]', length=261, freq='B')



2015-01-01    0.280242
2015-01-02    0.552706
2015-01-05    0.852426
2015-01-06    0.562905
2015-01-07    0.585875
2015-01-08    0.484258
2015-01-09    0.902398
2015-01-12    0.343157
2015-01-13    0.776381
2015-01-14    0.900921
2015-01-15    0.629210
2015-01-16    0.586195
2015-01-19    0.578564
2015-01-20    0.782542
2015-01-21    0.784371
2015-01-22    0.392744
2015-01-23    0.433930
2015-01-26    0.490754
2015-01-27    0.836696
2015-01-28    0.486445
2015-01-29    0.405107
2015-01-30    0.322072
2015-02-02    0.290147
2015-02-03    0.358461
2015-02-04    0.168942
2015-02-05    0.585980
2015-02-06    0.327918
2015-02-09    0.827112
2015-02-10    0.277477
2015-02-11    0.819430
                ...
2015-11-20    0.725139
2015-11-23    0.310721
2015-11-24    0.867789
2015-11-25    0.015982
2015-11-26    0.643568
2015-11-27    0.906863
2015-11-30    0.536162
2015-12-01    0.949486
2015-12-02    0.245943
2015-12-03    0.020938
2015-12-04    0.176345
2015-12-07    0.799896
2015-12-08    0.819685
2015-12-09    0.951056
```

3) Find the sum of the values in s for every Wednesday

In [6]:

Out[6]:
```
26.814802987731042
```

4) Average For each calendar month

In [7]:

Out[7]:
```
2015-01-31    0.589541
2015-02-28    0.454435
2015-03-31    0.516619
2015-04-30    0.540800
2015-05-31    0.581563
2015-06-30    0.578953
2015-07-31    0.563426
2015-08-31    0.550628
2015-09-30    0.539029
2015-10-31    0.503502
2015-11-30    0.483782
2015-12-31    0.551215
Freq: M, dtype: float64
```

5) For each group of four consecutive calendar months in s, find the date on which the highest value occurred.

In [8]:

Out[8]:
```
2015-01-31   2015-01-09
2015-05-31   2015-04-16
2015-09-30   2015-08-24
2016-01-31   2015-10-23
dtype: datetime64[ns]
```