## **Visualizing Time Series Data**

Let's go through a few key points of creatng nice time visualizations!

```
In [1]:
```

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

# Optional for interactive
# %matplotlib notebook (watch video for full details)
```

#### In [2]:

```
mcdon = pd.read_csv('mcdonalds.csv',index_col='Date',parse_dates=True)
```

#### In [3]:

```
mcdon.head()
```

#### Out[3]:

#### Adj. Close Adj. Volume

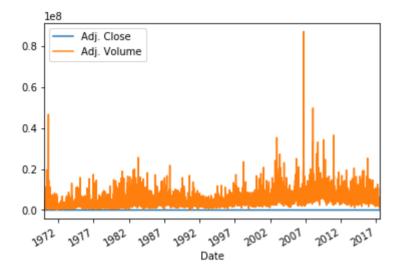
Date		
1970-01-02	0.209761	2825604.0
1970-01-05	0.213316	2210449.5
1970-01-06	0.214501	1951168.5
1970-01-07	0.213316	2728768.5
1970-01-08	0.213316	2242404.0

#### In [4]:

```
# Not Good!
mcdon.plot()
```

#### Out[4]:

<matplotlib.axes.\_subplots.AxesSubplot at 0x1955bcbea58>

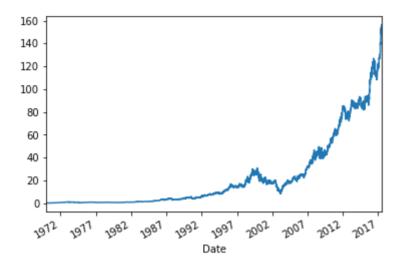


#### In [5]:

```
mcdon['Adj. Close'].plot()
```

#### Out[5]:

<matplotlib.axes.\_subplots.AxesSubplot at 0x1955be47e48>

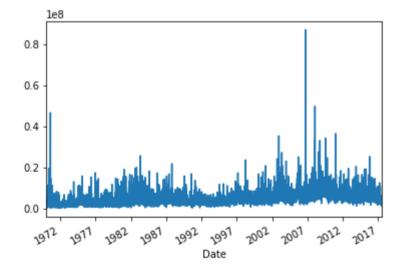


#### In [6]:

```
mcdon['Adj. Volume'].plot()
```

#### Out[6]:

<matplotlib.axes.\_subplots.AxesSubplot at 0x1955c3eb908>

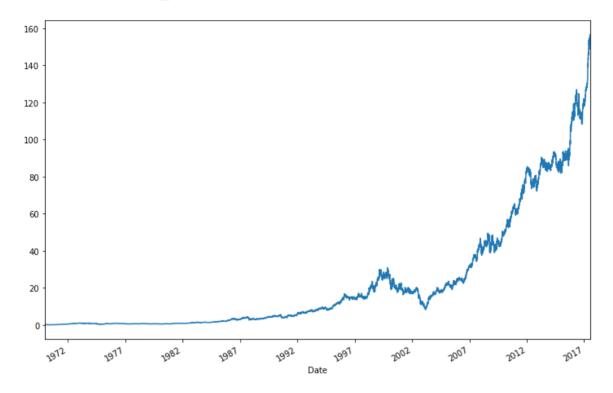


#### In [7]:

```
mcdon['Adj. Close'].plot(figsize=(12,8))
```

### Out[7]:

<matplotlib.axes.\_subplots.AxesSubplot at 0x1955c3eb860>

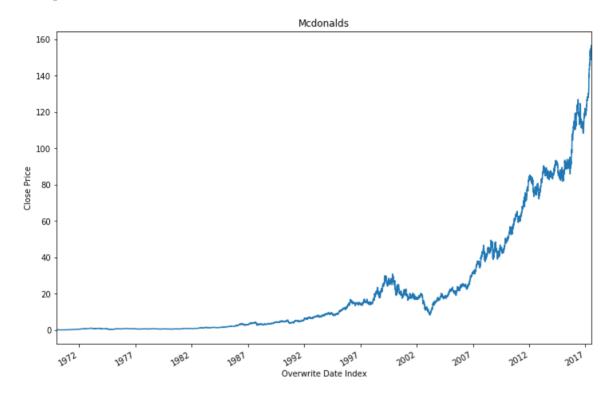


#### In [8]:

```
mcdon['Adj. Close'].plot(figsize=(12,8))
plt.ylabel('Close Price')
plt.xlabel('Overwrite Date Index')
plt.title('Mcdonalds')
```

#### Out[8]:

#### <matplotlib.text.Text at 0x1955c59b128>

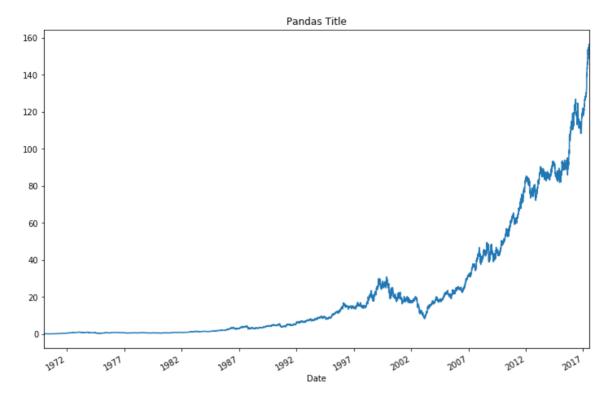


```
In [9]:
```

```
mcdon['Adj. Close'].plot(figsize=(12,8),title='Pandas Title')
```

#### Out[9]:

<matplotlib.axes.\_subplots.AxesSubplot at 0x1955c2eaef0>



# **Plot Formatting**

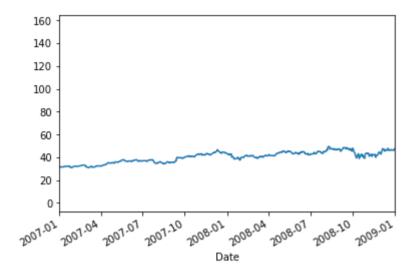
### **X Limits**

```
In [10]:
```

```
mcdon['Adj. Close'].plot(xlim=['2007-01-01','2009-01-01'])
```

#### Out[10]:

<matplotlib.axes.\_subplots.AxesSubplot at 0x1955d7bb3c8>

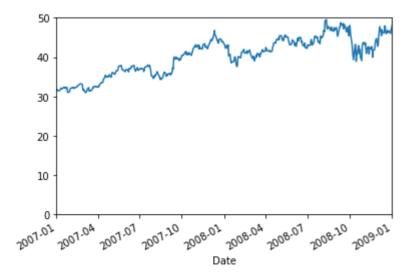


#### In [11]:

```
mcdon['Adj. Close'].plot(xlim=['2007-01-01','2009-01-01'],ylim=[0,50])
```

#### Out[11]:

<matplotlib.axes.\_subplots.AxesSubplot at 0x1955dbe0e80>



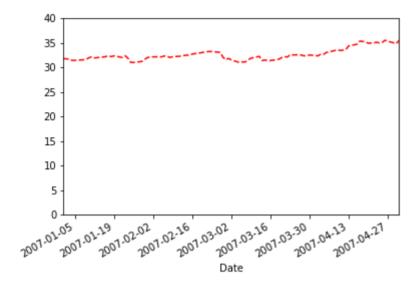
### **Color and Style**

#### In [12]:

```
mcdon['Adj. Close'].plot(xlim=['2007-01-01','2007-05-01'],ylim=[0,40],ls='--',c=
'r')
```

#### Out[12]:

<matplotlib.axes.\_subplots.AxesSubplot at 0x1955dbeb1d0>



### X Ticks

This is where you will need the power of matplotlib to do heavy lifting if you want some serious customization!

#### In [13]:

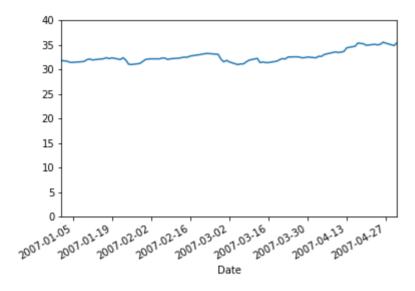
```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import matplotlib.dates as dates
```

#### In [14]:

```
mcdon['Adj. Close'].plot(xlim=['2007-01-01','2007-05-01'],ylim=[0,40])
```

#### Out[14]:

<matplotlib.axes.\_subplots.AxesSubplot at 0x1955df6f780>



#### In [15]:

```
idx = mcdon.loc['2007-01-01':'2007-05-01'].index
stock = mcdon.loc['2007-01-01':'2007-05-01']['Adj. Close']
```

idx

#### Out[16]:

```
DatetimeIndex(['2007-01-03', '2007-01-04', '2007-01-05', '2007-01-0
8',
               '2007-01-09', '2007-01-10', '2007-01-11', '2007-01-1
2',
               '2007-01-16', '2007-01-17', '2007-01-18', '2007-01-1
9',
               '2007-01-22', '2007-01-23', '2007-01-24', '2007-01-2
5',
               '2007-01-26', '2007-01-29', '2007-01-30', '2007-01-3
1',
               '2007-02-01', '2007-02-02', '2007-02-05', '2007-02-0
6',
               '2007-02-07', '2007-02-08', '2007-02-09', '2007-02-1
2',
               '2007-02-13', '2007-02-14', '2007-02-15', '2007-02-1
6',
               '2007-02-20', '2007-02-21', '2007-02-22', '2007-02-2
3',
               '2007-02-26', '2007-02-27', '2007-02-28', '2007-03-0
1',
               '2007-03-02', '2007-03-05', '2007-03-06', '2007-03-0
7',
               '2007-03-08', '2007-03-09', '2007-03-12', '2007-03-1
3',
               '2007-03-14', '2007-03-15', '2007-03-16', '2007-03-1
9',
               '2007-03-20', '2007-03-21', '2007-03-22', '2007-03-2
3',
               '2007-03-26', '2007-03-27', '2007-03-28', '2007-03-2
9',
               '2007-03-30', '2007-04-02', '2007-04-03', '2007-04-0
4',
               '2007-04-05', '2007-04-09', '2007-04-10', '2007-04-1
1',
               '2007-04-12', '2007-04-13', '2007-04-16', '2007-04-1
7',
               '2007-04-18', '2007-04-19', '2007-04-20', '2007-04-2
3',
               '2007-04-24', '2007-04-25', '2007-04-26', '2007-04-2
7',
               '2007-04-30', '2007-05-01'],
              dtype='datetime64[ns]', name='Date', freq=None)
```

### In [17]:

stock

### Out[17]:

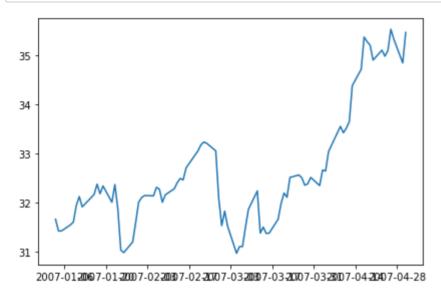
Date 2007-01-03		
2007-01-04       31.424580         2007-01-08       31.424580         2007-01-09       31.605015         2007-01-10       31.944233         2007-01-11       32.124668         2007-01-16       32.167973         2007-01-17       32.377277         2007-01-18       32.182407         2007-01-21       32.341190         2007-01-23       32.370060         2007-01-24       31.872059         2007-01-25       31.034840         2007-01-26       30.984318         2007-01-29       31.200840         2007-01-30       31.590580         2007-02-01       32.103016         2007-02-03       32.13231         2007-02-04       32.312321         2007-02-05       32.312321         2007-02-06       32.312321         2007-02-07       32.276234         2007-02-08       32.009190         2007-02-09       32.160755         2007-02-13       32.406147         2007-02-14       32.496147         2007-03-21       32.283451         2007-03-22       32.31408         2007-03-23       32.514408         2007-04-03       32.564930 <t< td=""><td></td><td></td></t<>		
2007-01-05       31.424580         2007-01-08       31.547276         2007-01-09       31.605015         2007-01-11       32.124668         2007-01-12       31.915364         2007-01-13       32.167973         2007-01-14       32.377277         2007-01-19       32.341190         2007-01-21       32.37060         2007-01-23       32.37060         2007-01-24       31.872059         2007-01-25       31.034840         2007-01-26       30.984318         2007-01-29       31.200840         2007-01-30       31.590580         2007-02-01       32.103016         2007-02-03       32.13231         2007-02-04       32.312321         2007-02-05       32.312321         2007-02-06       32.312321         2007-02-07       32.276234         2007-02-08       32.009190         2007-02-09       32.160755         2007-02-13       32.406147         2007-02-14       32.492756          2007-03-21         2007-03-21       32.3564930         2007-03-22       32.31408         2007-03-23       32.514408		
2007-01-08       31.547276         2007-01-09       31.605015         2007-01-10       31.944233         2007-01-11       32.124668         2007-01-16       32.167973         2007-01-17       32.377277         2007-01-18       32.341190         2007-01-22       32.009190         2007-01-23       32.370060         2007-01-24       31.872059         2007-01-25       31.034840         2007-01-26       30.984318         2007-01-29       31.200840         2007-01-30       31.590580         2007-02-01       32.103016         2007-02-03       32.139103         2007-02-05       32.139103         2007-02-06       32.312321         2007-02-07       32.276234         2007-02-08       32.009190         2007-02-09       32.160755         2007-02-13       32.406147         2007-02-14       32.492756          2007-03-21       32.34920         2007-03-21       32.396842         2007-03-22       32.110233         2007-03-23       32.514408         2007-03-24       32.507191         2007-03-27       32.507191 </td <td></td> <td></td>		
2007-01-09       31.605015         2007-01-10       31.944233         2007-01-11       32.124668         2007-01-16       32.167973         2007-01-17       32.377277         2007-01-18       32.341190         2007-01-22       32.009190         2007-01-23       32.370060         2007-01-24       31.872059         2007-01-25       31.034840         2007-01-26       30.984318         2007-01-29       31.590580         2007-01-30       31.590580         2007-02-01       32.103016         2007-02-03       32.139103         2007-02-04       32.312321         2007-02-05       32.139103         2007-02-06       32.312321         2007-02-07       32.276234         2007-02-08       32.009190         2007-02-09       32.160755         2007-02-13       32.406147         2007-02-14       32.492756          2007-03-21         2007-03-21       32.396842         2007-03-22       32.110233         2007-03-23       32.514408         2007-03-24       32.504919         2007-03-25       32.312321	2007-01-05	31.424580
2007-01-10       31.944233         2007-01-11       32.124668         2007-01-16       32.167973         2007-01-17       32.377277         2007-01-18       32.182407         2007-01-19       32.341190         2007-01-23       32.009190         2007-01-24       31.872059         2007-01-25       31.034840         2007-01-26       30.984318         2007-01-30       31.590580         2007-01-31       32.009190         2007-02-01       32.103016         2007-02-02       32.139103         2007-02-03       32.12321         2007-02-05       32.139103         2007-02-06       32.312321         2007-02-07       32.276234         2007-02-08       32.009190         2007-02-09       32.160755         2007-02-12       32.283451         2007-02-13       32.406147         2007-03-21       32.3996320         2007-03-21       32.999190         2007-03-21       32.283451         2007-03-21       32.366493         2007-03-22       32.196842         2007-03-23       32.514408         2007-04-03       32.564930	2007-01-08	31.547276
2007-01-10       31.944233         2007-01-11       32.124668         2007-01-16       32.167973         2007-01-17       32.377277         2007-01-18       32.182407         2007-01-19       32.341190         2007-01-23       32.009190         2007-01-24       31.872059         2007-01-25       31.034840         2007-01-26       30.984318         2007-01-30       31.590580         2007-01-31       32.009190         2007-02-01       32.103016         2007-02-02       32.139103         2007-02-03       32.12321         2007-02-05       32.139103         2007-02-06       32.312321         2007-02-07       32.276234         2007-02-08       32.009190         2007-02-09       32.160755         2007-02-12       32.283451         2007-02-13       32.406147         2007-03-21       32.3996320         2007-03-21       32.999190         2007-03-21       32.283451         2007-03-21       32.366493         2007-03-22       32.196842         2007-03-23       32.514408         2007-04-03       32.564930	2007-01-09	31.605015
2007-01-11       32.124668         2007-01-16       32.167973         2007-01-17       32.377277         2007-01-18       32.182407         2007-01-19       32.341190         2007-01-21       32.370060         2007-01-24       31.872059         2007-01-25       31.034840         2007-01-26       30.984318         2007-01-30       31.590580         2007-01-31       32.009190         2007-02-01       32.103016         2007-02-03       32.13231         2007-02-05       32.139103         2007-02-06       32.312321         2007-02-07       32.276234         2007-02-08       32.009190         2007-02-09       32.160755         2007-02-13       32.406147         2007-02-13       32.406147         2007-03-21       32.283451         2007-03-21       32.398495         2007-03-21       32.399990         2007-03-21       32.2664930         2007-03-21       32.3406147         2007-03-22       32.196842         2007-03-23       32.514408         2007-03-24       32.564930         2007-04-03       32.564930		
2007-01-12       31.915364         2007-01-16       32.167973         2007-01-17       32.377277         2007-01-19       32.341190         2007-01-23       32.370060         2007-01-24       31.872059         2007-01-25       31.034840         2007-01-26       30.984318         2007-01-29       31.200840         2007-01-30       31.590580         2007-02-01       32.103016         2007-02-01       32.103016         2007-02-03       32.13231         2007-02-05       32.312321         2007-02-07       32.276234         2007-02-08       32.009190         2007-02-09       32.160755         2007-02-13       32.406147         2007-02-14       32.492756          2007-03-21         2007-03-21       32.196842         2007-03-22       32.514408         2007-03-23       32.514408         2007-03-24       32.507191         2007-03-28       32.514408         2007-03-29       32.348495         2007-04-04       32.665974         2007-04-05       33.041279         2007-04-01       33.553714		
2007-01-16       32.167973         2007-01-17       32.377277         2007-01-18       32.182407         2007-01-19       32.341190         2007-01-22       32.009190         2007-01-24       31.872059         2007-01-25       31.034840         2007-01-26       30.984318         2007-01-29       31.200840         2007-01-30       31.590580         2007-02-01       32.103016         2007-02-02       32.146320         2007-02-05       32.312321         2007-02-06       32.312321         2007-02-07       32.276234         2007-02-08       32.009190         2007-02-09       32.160755         2007-02-13       32.406147         2007-02-13       32.496147         2007-03-21       32.283451         2007-03-21       32.196842         2007-03-21       32.196842         2007-03-23       32.514408         2007-03-24       32.507191         2007-03-27       32.507191         2007-03-28       32.514408         2007-03-29       32.348495         2007-04-04       32.665974         2007-04-05       33.041279		
2007-01-17       32.377277         2007-01-18       32.182407         2007-01-22       32.009190         2007-01-23       32.370060         2007-01-24       31.872059         2007-01-25       31.034840         2007-01-26       30.984318         2007-01-29       31.200840         2007-01-30       31.590580         2007-02-01       32.103016         2007-02-02       32.146320         2007-02-05       32.139103         2007-02-06       32.312321         2007-02-07       32.276234         2007-02-08       32.009190         2007-02-09       32.160755         2007-02-12       32.283451         2007-02-13       32.406147         2007-02-14       32.492756          2007-03-20         31.980320       32.514408         2007-03-21       32.504919         32.514408       32.564930         2007-03-21       32.514408         2007-03-22       32.514408         2007-03-23       32.514408         2007-03-29       32.384495         2007-04-03       32.564930         2007-04-03       32.665974		
2007-01-18       32.182407         2007-01-19       32.341190         2007-01-22       32.009190         2007-01-23       32.370060         2007-01-25       31.872059         2007-01-26       30.984318         2007-01-29       31.200840         2007-01-30       31.590580         2007-02-01       32.103016         2007-02-02       32.146320         2007-02-05       32.312321         2007-02-06       32.312321         2007-02-07       32.276234         2007-02-08       32.009190         2007-02-09       32.160755         2007-02-12       32.283451         2007-02-13       32.406147         2007-02-14       32.492756          2007-03-21         2007-03-23       32.514408         2007-03-24       32.507191         2007-03-25       32.348495         2007-03-27       32.348495         2007-03-28       32.355625         2007-03-29       32.348495         2007-04-03       32.514408         2007-04-03       32.54495         2007-04-09       33.553714         2007-04-01       33.423801		
2007-01-19       32.341190         2007-01-23       32.009190         2007-01-24       31.872059         2007-01-25       31.034840         2007-01-26       30.984318         2007-01-30       31.590580         2007-01-31       32.009190         2007-02-01       32.103016         2007-02-05       32.139103         2007-02-06       32.312321         2007-02-07       32.276234         2007-02-08       32.009190         2007-02-09       32.160755         2007-02-12       32.283451         2007-02-13       32.406147         2007-03-21       32.196842         2007-03-21       32.196842         2007-03-23       32.514408         2007-03-23       32.514408         2007-03-28       32.507191         2007-03-29       32.384495         2007-03-29       32.348408         2007-04-03       32.665974         2007-04-04       32.348408         2007-04-05       33.041279         2007-04-09       33.553714         2007-04-13       34.715717         2007-04-13       34.72500         2007-04-13       34.73570 <t< td=""><td></td><td></td></t<>		
2007-01-22       32.009190         2007-01-23       32.370060         2007-01-24       31.872059         2007-01-25       31.034840         2007-01-26       30.984318         2007-01-30       31.590580         2007-02-01       32.009190         2007-02-02       32.146320         2007-02-05       32.139103         2007-02-06       32.312321         2007-02-07       32.276234         2007-02-08       32.009190         2007-02-09       32.160755         2007-02-13       32.406147         2007-02-14       32.492756          2007-03-21         2007-03-23       32.110233         2007-03-24       32.564930         2007-03-25       32.355625         2007-03-27       32.507191         2007-03-28       32.507191         2007-03-29       32.384495         2007-03-29       32.384495         2007-03-29       32.384495         2007-03-29       32.384495         2007-04-03       32.514408         2007-04-03       32.59465974         2007-04-09       33.553714         2007-04-10       33.423801		
2007-01-23       32.370060         2007-01-24       31.872059         2007-01-25       31.034840         2007-01-29       31.200840         2007-01-30       31.590580         2007-02-01       32.009190         2007-02-02       32.146320         2007-02-05       32.139103         2007-02-06       32.312321         2007-02-07       32.276234         2007-02-08       32.009190         2007-02-09       32.160755         2007-02-12       32.283451         2007-02-13       32.406147         2007-03-21       32.492756          2007-03-21         2007-03-21       32.196842         2007-03-23       32.514408         2007-03-24       32.507191         2007-03-25       32.384495         2007-03-29       32.384495         2007-03-29       32.384495         2007-04-03       32.348408         2007-04-04       32.348408         2007-04-05       33.041279         2007-04-01       33.423801         2007-04-03       32.348408         2007-04-10       33.423801         2007-04-13       34.37571		
2007-01-24       31.872059         2007-01-25       31.034840         2007-01-26       30.984318         2007-01-30       31.590580         2007-02-01       32.009190         2007-02-02       32.146320         2007-02-05       32.139103         2007-02-06       32.312321         2007-02-07       32.276234         2007-02-08       32.009190         2007-02-09       32.160755         2007-02-12       32.406147         2007-02-13       32.492756          32.196842         2007-03-21       32.196842         2007-03-21       32.514408         2007-03-23       32.514408         2007-03-24       32.507191         2007-03-27       32.384495         2007-03-28       32.355625         2007-03-29       32.384495         2007-04-03       32.348408         2007-04-04       32.348408         2007-04-05       33.041279         2007-04-01       33.423801         2007-04-03       32.514408         2007-04-01       33.423801         2007-04-03       32.665974         2007-04-10       33.423801		
2007-01-25       31.034840         2007-01-26       30.984318         2007-01-30       31.200840         2007-01-31       32.009190         2007-02-01       32.103016         2007-02-05       32.139103         2007-02-06       32.312321         2007-02-07       32.276234         2007-02-08       32.009190         2007-02-12       32.283451         2007-02-13       32.406147         2007-02-14       32.492756          2007-03-21         2007-03-21       32.196842         2007-03-23       32.514408         2007-03-24       32.564930         2007-03-27       32.507191         2007-03-28       32.355625         2007-03-29       32.384495         2007-03-29       32.384495         2007-04-03       32.665974         2007-04-04       32.644321         2007-04-05       33.041279         2007-04-01       33.423801         2007-04-13       34.383716         2007-04-13       34.383716         2007-04-13       34.383716         2007-04-13       34.715717         2007-04-13       34.383716		32.370060
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2007-04-27 35.329196
2007-04-30 34.845630
2007-05-01 35.466327
Name: Adj. Close, Length: 82, dtype: float64
```

## **Basic matplotlib plot**

```
In [18]:
```

```
fig, ax = plt.subplots()
ax.plot_date(idx, stock,'-')
plt.tight_layout()
plt.show()
```

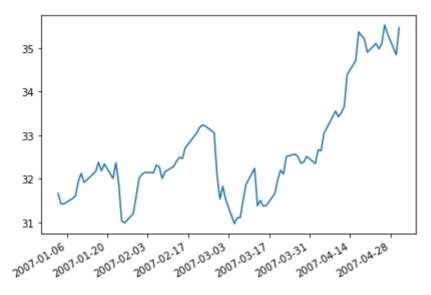


## Fix the overlap!

#### In [19]:

```
fig, ax = plt.subplots()
ax.plot_date(idx, stock,'-')

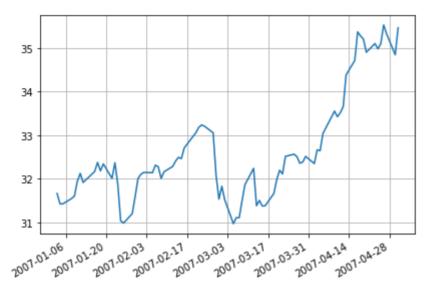
fig.autofmt_xdate() # Auto fixes the overlap!
plt.tight_layout()
plt.show()
```



## **Customize grid**

#### In [20]:

```
fig, ax = plt.subplots()
ax.plot_date(idx, stock,'-')
ax.yaxis.grid(True)
ax.xaxis.grid(True)
fig.autofmt_xdate() # Auto fixes the overlap!
plt.tight_layout()
plt.show()
```



## Format dates on Major Axis

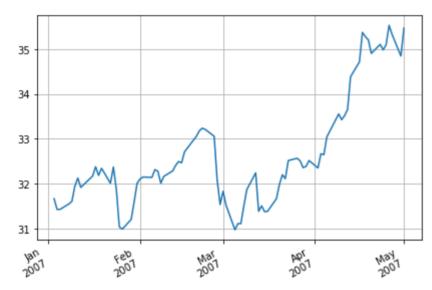
#### In [21]:

```
fig, ax = plt.subplots()
ax.plot_date(idx, stock,'-')

# Grids
ax.yaxis.grid(True)
ax.xaxis.grid(True)

# Major Axis
ax.xaxis.set_major_locator(dates.MonthLocator())
ax.xaxis.set_major_formatter(dates.DateFormatter('%b\n%Y'))

fig.autofmt_xdate() # Auto fixes the overlap!
plt.tight_layout()
plt.show()
```



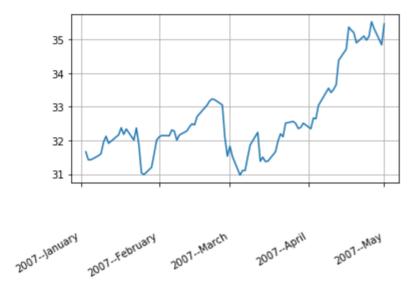
#### In [22]:

```
fig, ax = plt.subplots()
ax.plot_date(idx, stock,'-')

# Grids
ax.yaxis.grid(True)
ax.xaxis.grid(True)

# Major Axis
ax.xaxis.set_major_locator(dates.MonthLocator())
ax.xaxis.set_major_formatter(dates.DateFormatter('\n\n\n\n\sy--%B'))

fig.autofmt_xdate() # Auto fixes the overlap!
plt.tight_layout()
plt.show()
```

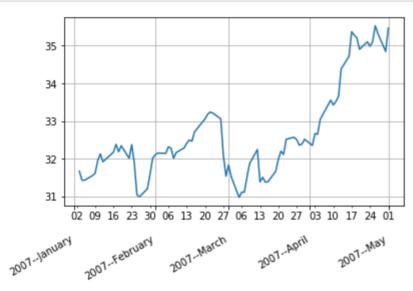


### **Minor Axis**

#### In [23]:

```
fig, ax = plt.subplots()
ax.plot_date(idx, stock,'-')

# Major Axis
ax.xaxis.set_major_locator(dates.MonthLocator())
ax.xaxis.set_major_formatter(dates.DateFormatter('\n\n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\frac{n\
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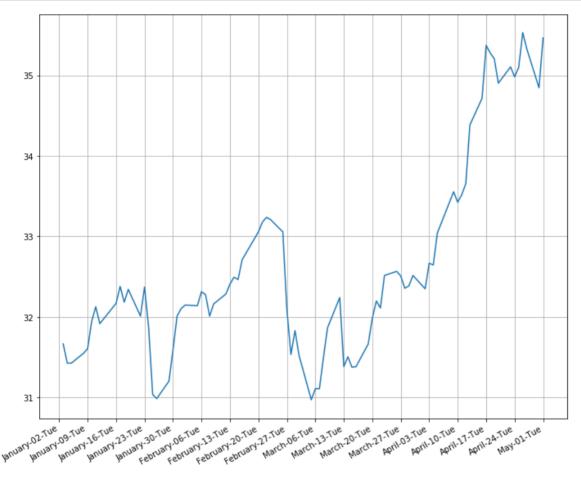


```
In [33]:
```

```
fig, ax = plt.subplots(figsize=(10,8))
ax.plot_date(idx, stock,'-')

# Major Axis
ax.xaxis.set_major_locator(dates.WeekdayLocator(byweekday=1))
ax.xaxis.set_major_formatter(dates.DateFormatter('%B-%d-%a'))
# Grids
ax.yaxis.grid(True)
ax.xaxis.grid(True)
fig.autofmt_xdate() # Auto fixes the overlap!

plt.tight_layout()
plt.show()
```



### **Great job!**