Exploratory Data Analysis - Temperature Data Viewer

Open the menu item Cell and click Run All to see a summary of the data feed passed into this notebook from the URL.

In [11]:
```
%%javascript
function getQueryStringValue (key)
{
    return unescape(window.location.search.replace(new RegExp("^(?:.*[&\\?]" + escape(key).replace(/[\.\+\*]/g, "\\$&") + "(?:\\=([^&]*))?)?.*$", "i"), "$1"));
}
IPython.notebook.kernel.execute("DATA='".concat(getQueryStringValue("DATA")).concat("'"));
```

Load libraries for charting

In [12]:
```
%run DataViewerHelper.py
```

Get chart data and review head to see features (and those we have enhanced)

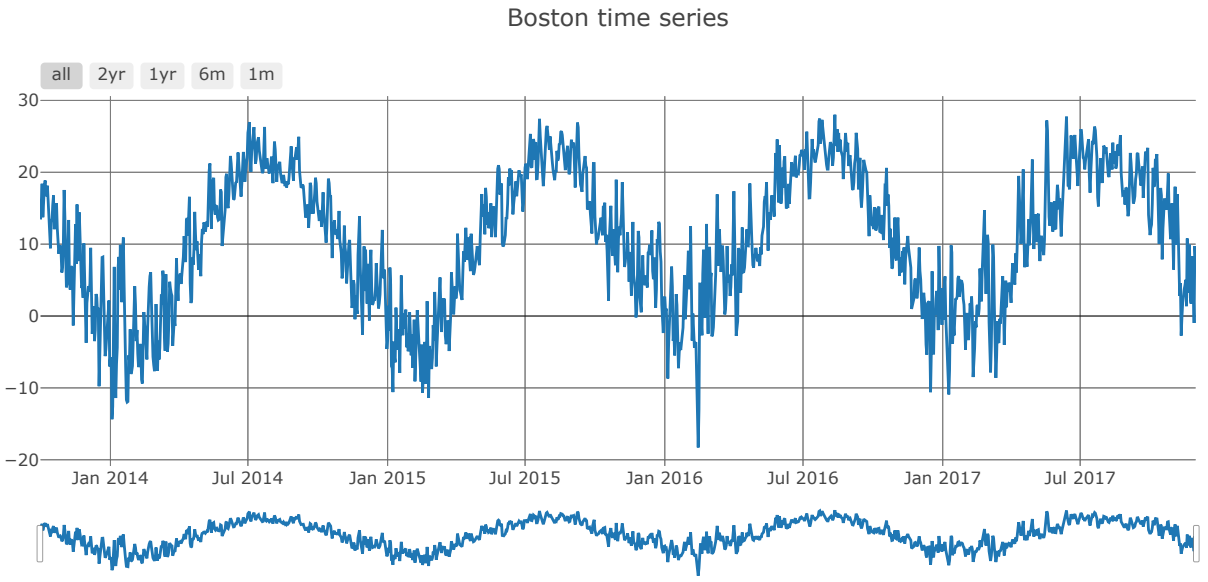
In [13]:
```
df = get_data(DATA)
df.head(10)
```

Out[13]:

datetime	temperature	temperature_lag1	temperature_lag2	temperature_lag7	temperature_lag30	temperature_lag90	temperature_lag365	temperature_mavg7	temperature_mavg30	temperature_mavg60	tempe
2013-10-01	13.435553	12.082927	13.775979	11.581382	22.374375	24.321125	14.204333	13.418761	17.882211	19.420925	
2013-10-02	17.426121	13.435553	12.082927	12.606729	23.005167	24.445833	15.863090	14.107246	17.696243	19.352180	
2013-10-03	18.405358	17.426121	13.435553	14.247764	21.077704	27.494375	15.870833	14.701187	17.607165	19.306616	
2013-10-04	13.742917	18.405358	17.426121	14.693125	20.946385	28.105375	16.893750	14.565443	17.367049	19.190891	
2013-10-05	17.659250	13.742917	18.405358	13.089250	18.253493	27.980833	16.367292	15.218301	17.347241	19.175545	
2013-10-06	17.948667	17.659250	13.742917	13.775979	19.216074	26.404583	17.998958	15.814399	17.304994	19.190334	
2013-10-07	18.860583	17.948667	17.659250	12.082927	18.642200	25.204167	18.042917	16.782635	17.312273	19.185328	
2013-10-08	16.668610	18.860583	17.948667	13.435553	19.479515	20.030417	10.657917	17.244501	17.218577	19.084884	
2013-10-09	17.186250	16.668610	18.860583	17.426121	13.941667	22.366250	9.864375	17.210233	17.326729	18.984527	
2013-10-10	18.134583	17.186250	16.668610	18.405358	17.676625	24.219167	11.317917	17.171551	17.341995	18.889336	

Lets now plot the time series

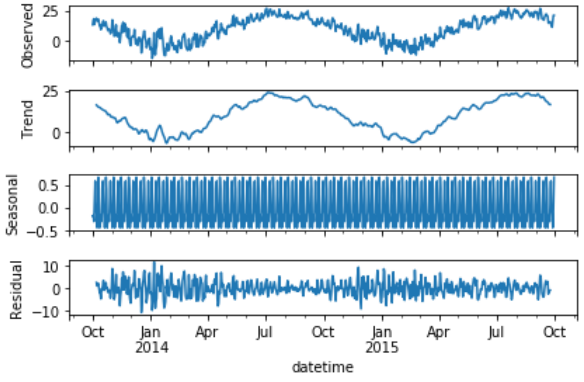
In [14]:
```
fig = chart(f'{DATA} time series', df)
iplot(fig)
```



Export to plot.ly »

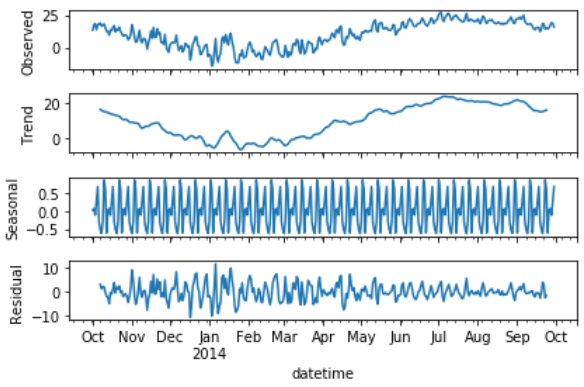
Lets review multiple years and examine the observed, trends, seasonality and residuals using decomposition with additive differencing.

In [15]:
```
dsd = seasonal_decompose(df[:730]['temperature'], model='additive',freq=12)
dsd.plot()
plt.show()
```



Lets zoom in an review a single calendar year

In [17]:
```
dsd = seasonal_decompose(df[:365]['temperature'], model='additive',freq=12)
dsd.plot()
plt.show()
```



We can see each temperature time series has a well structured oscillating trend pattern coinciding with the seasonal patterns.

In [ ]: