Practical Data Science: Analyzing Stock Market Data with R

Creating Great Charts With quantmod

I first discovered quantmod when I was looking for an easy and free way to download stock market data. So I was pleasantly surprised when I discovered its advanced charting capabilities.

In this lecture we'll look at:

- Creating charts with quantmod
- Time subset
- Controlling the chart's look with themes

Let's Download Some Stock Market Data

```
library(quantmod)
```

```
## Loading required package: xts
```

```
## Loading required package: zoo
```

```
##
## Attaching package: 'zoo'
```

```
## The following objects are masked from 'package:base':
##
##     as.Date, as.Date.numeric
```

```
## Loading required package: TTR
```

```
## Version 0.4-0 included new data defaults. See ?getSymbols.
```

```
getSymbols('SPY', src='google')
```

```
##     As of 0.4-0, 'getSymbols' uses env=parent.frame() and
##  auto.assign=TRUE by default.
##
##  This  behavior  will be  phased out in 0.5-0  when the call  will
##  default to use auto.assign=FALSE. getOption("getSymbols.env") and
##  getOptions("getSymbols.auto.assign") are now checked for alternate defaults
##
##  This message is shown once per session and may be disabled by setting
##  options("getSymbols.warning4.0"=FALSE). See ?getSymbols for more details.
```

```
## [1] "SPY"
```

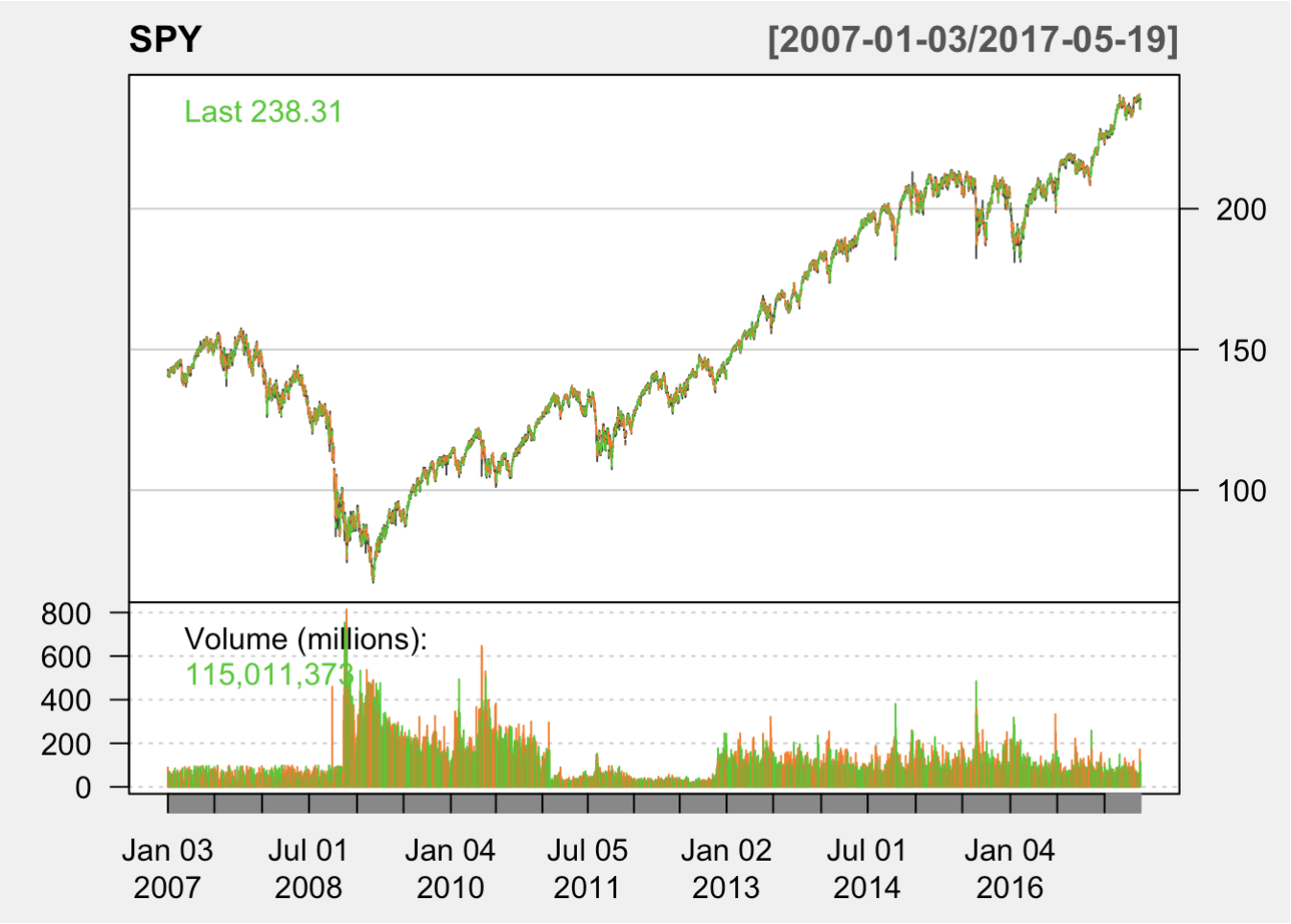
Technical Indicators

You can either start with a chart and add indicators to it or you can do it all on one line. First, one thing you may need to install is the `TTR` package as `quantmod` uses it for its technical indicators

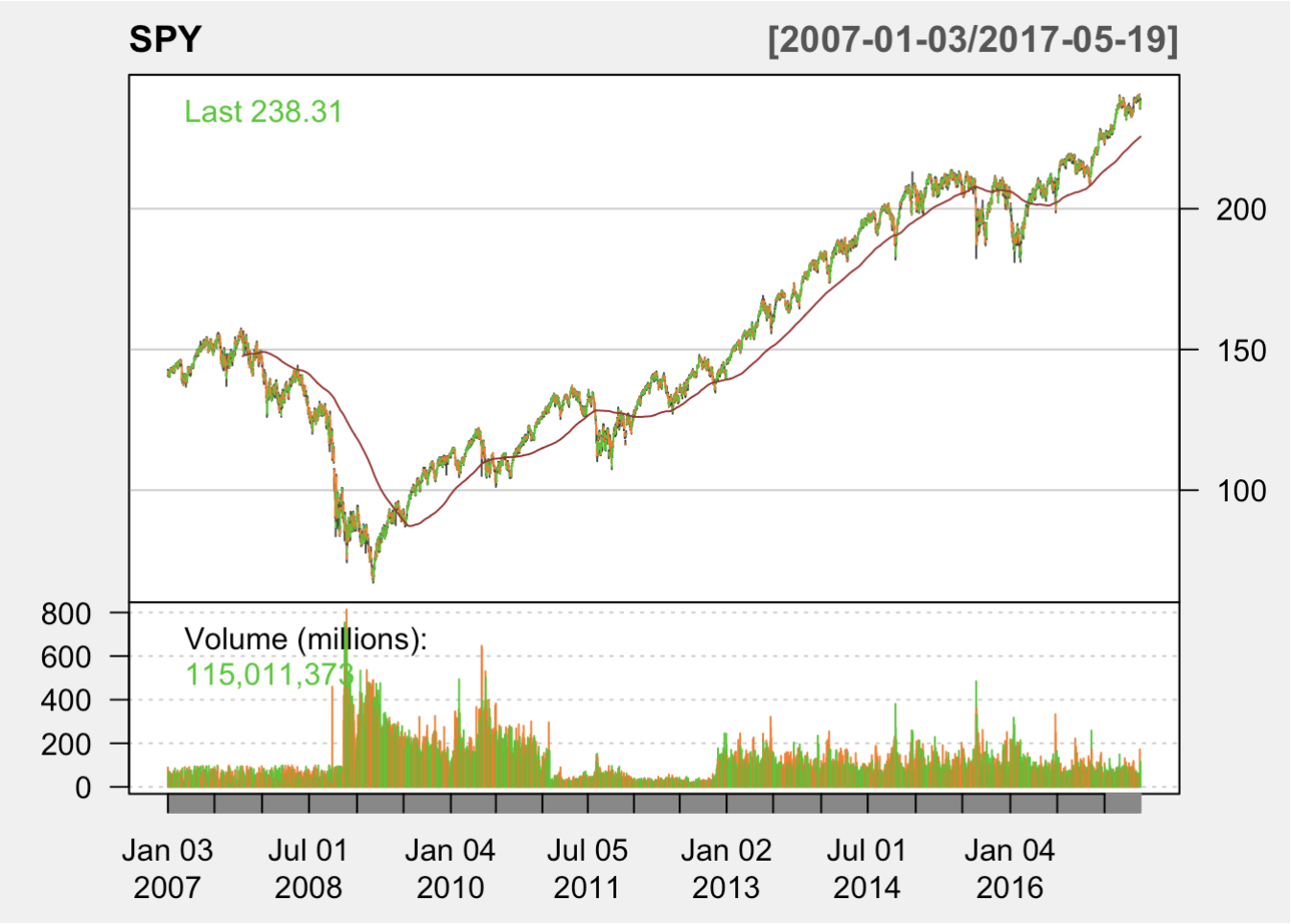
```
# install.packages('TTR')
```

Let's add a 200-period simple moving average (SMA) and a 10-period rate of change (ROC) (https://en.wikipedia.org/wiki/Momentum_(technical_analysis)). The SMA will be overlaid directly on the chart as it shares the same scale while the ROC will live in a new pane underneath the main chart.

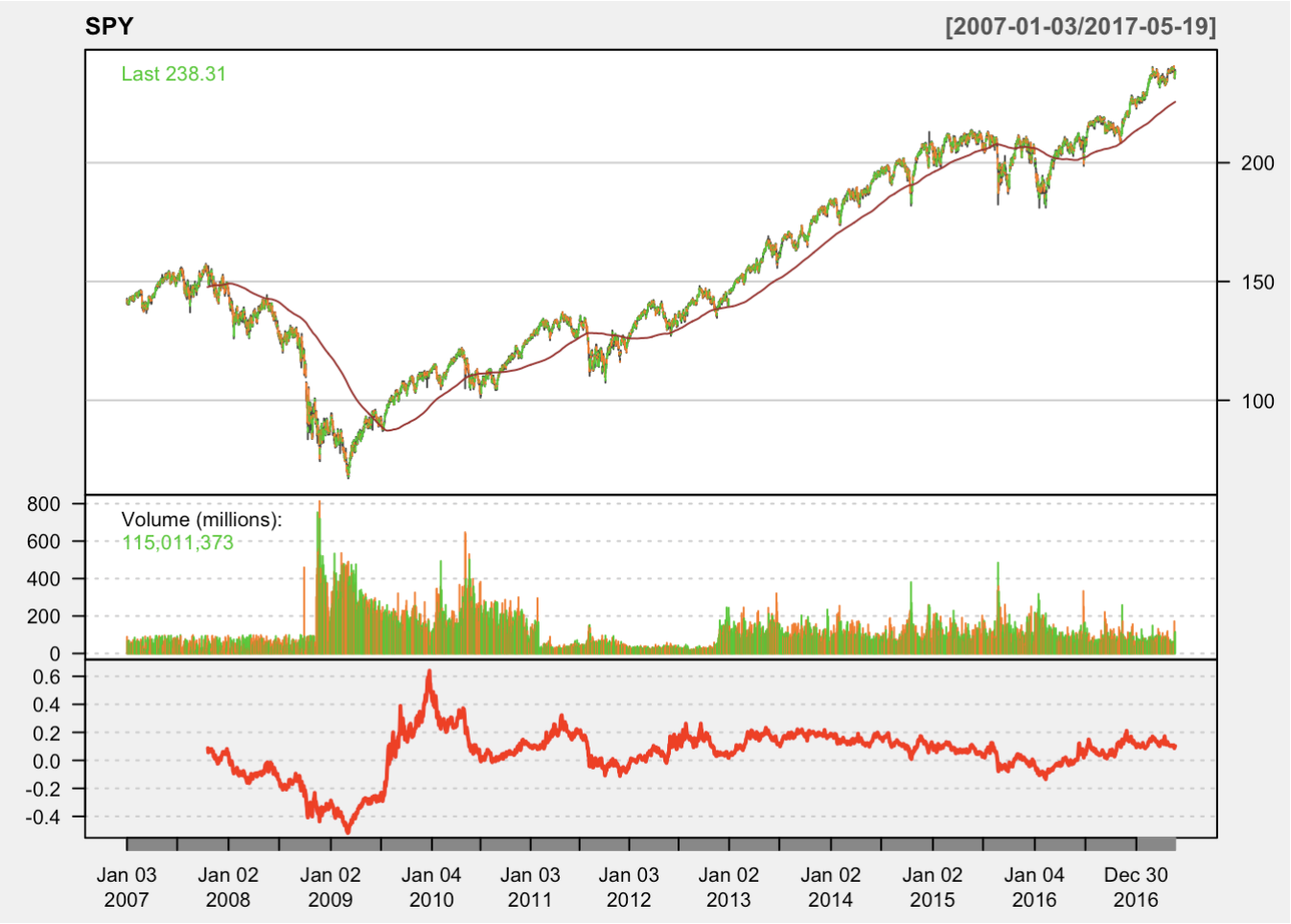
```
chartSeries(SPY, theme='white')
```


SPY
[2007-01-03/2017-05-19]
Last 238.31
200
150
100
800
600
400
200
0
Volume (millions):
115,011,373
Jan 03
2007
Jul 01
2008
Jan 04
2010
Jul 05
2011
Jan 02
2013
Jul 01
2014
Jan 04
2016

```
addSMA(n=200)
```

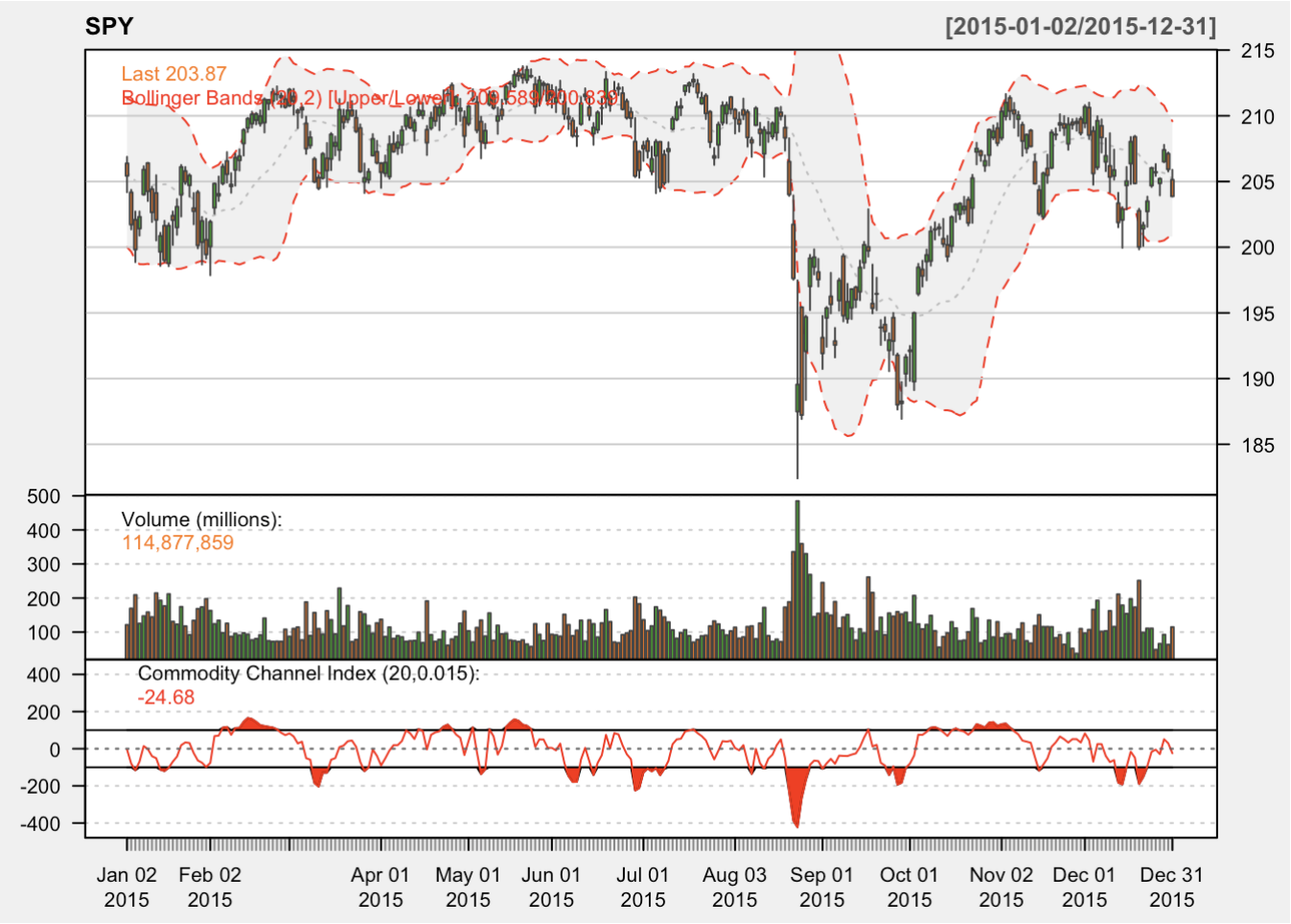

SPY
[2007-01-03/2017-05-19]
Last 238.31
200
150
100
800
600
400
200
0
Volume (millions):
115,011,373
Jan 03
2007
Jul 01
2008
Jan 04
2010
Jul 05
2011
Jan 02
2013
Jul 01
2014
Jan 04
2016

```
addROC(n=200)
```



Here is an in-line example with Bollinger Bands (https://en.wikipedia.org/wiki/Bollinger_Bands) and Commodity Channel Index (CCI) (https://en.wikipedia.org/wiki/Commodity_channel_index) for the past year:

```
chartSeries(SPY, theme="white",
TA="addVo();addBBands();addCCI()", subset='2015')
```



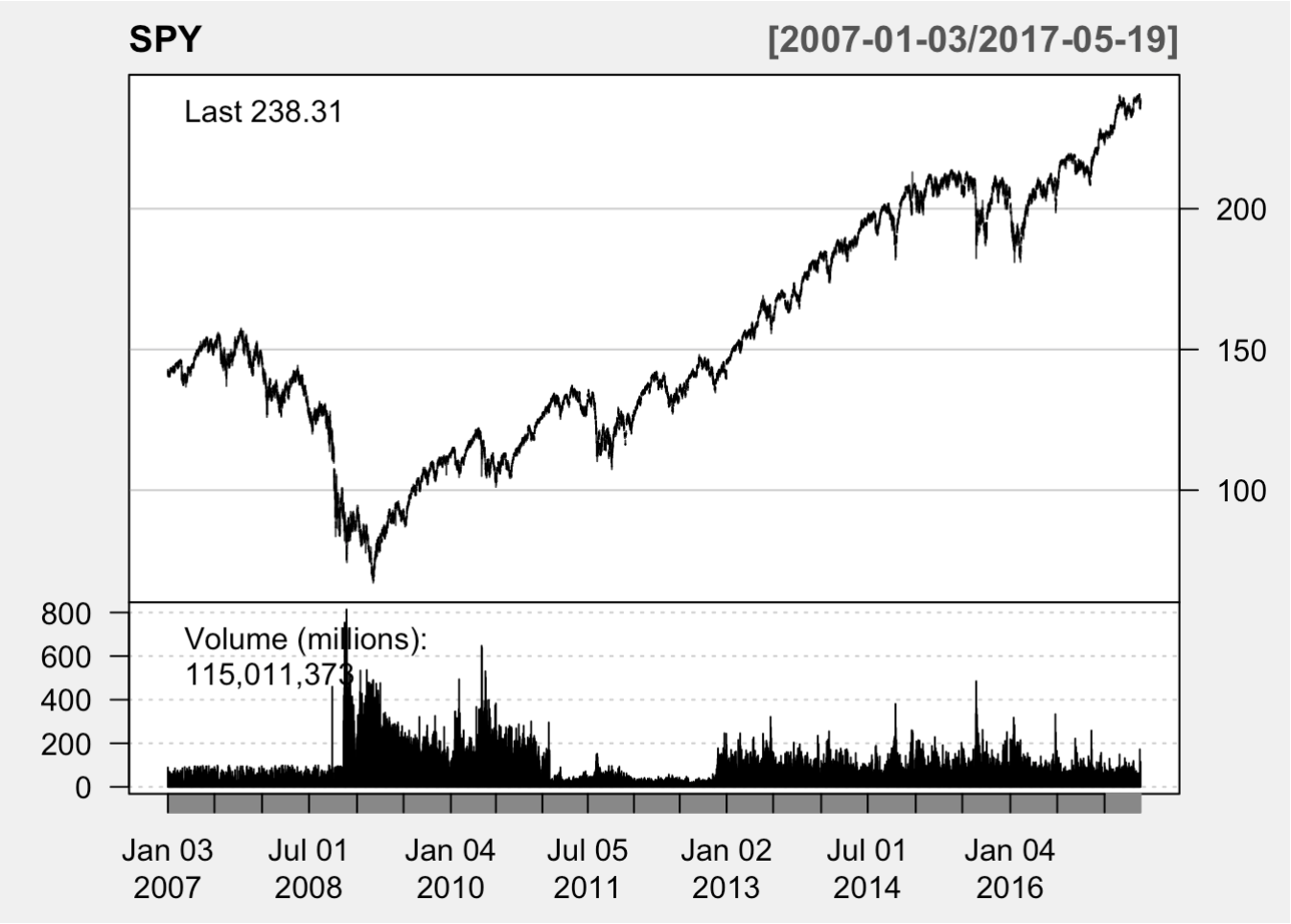
If you're interested in seeing all the support indicators in quantmod or to learn additional abilities, check out the quantmod Charting page (http://www.quantmod.com/examples/charting/) of the quantmod site.

Custom Technical Indicators

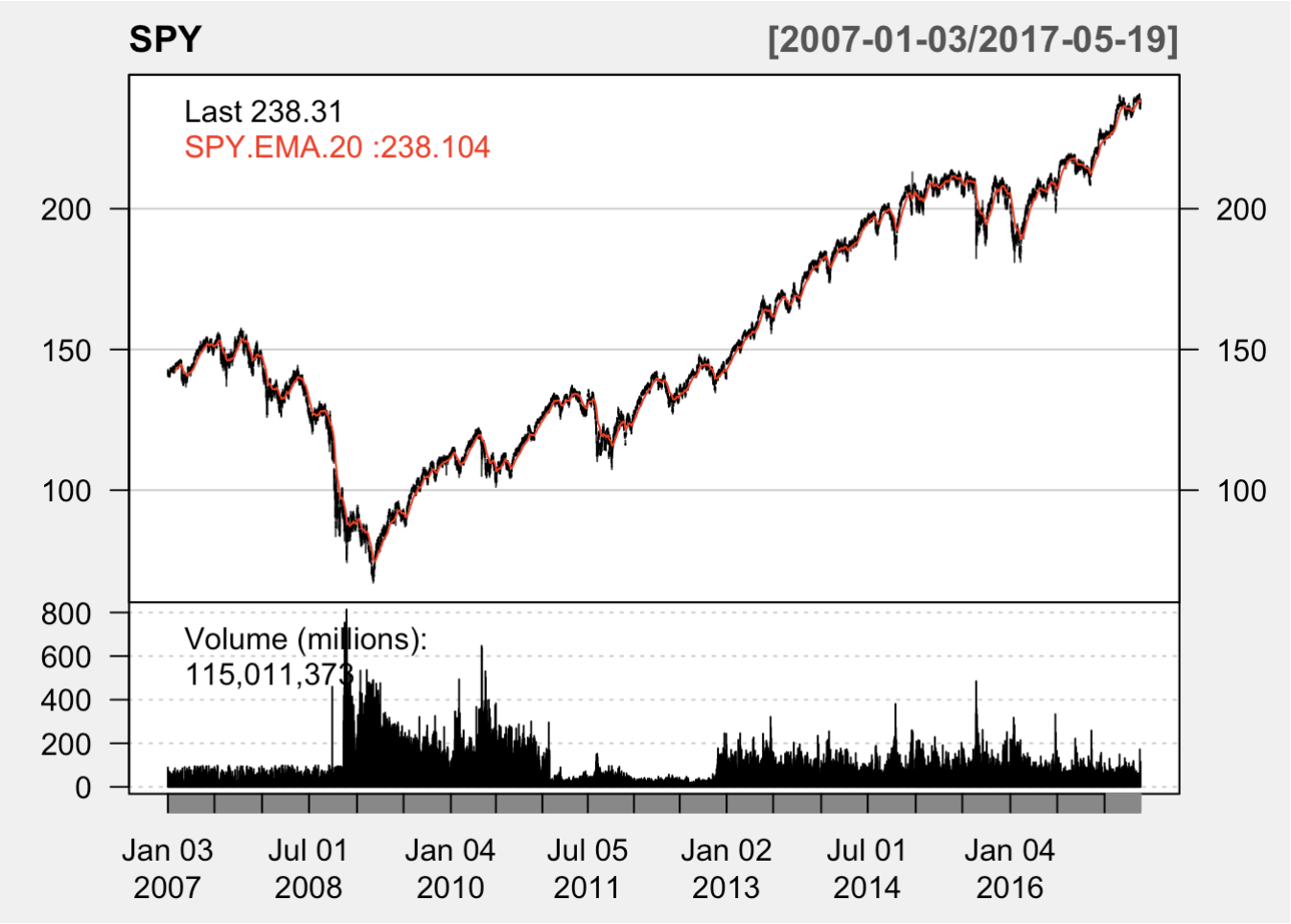
This is an area will explore more in a later lecture, but here is a taste on how to create your own indicator.

The indicator I'll build now will be the difference between two moving averages. We'll first create a chart, then a vector for each moving average that we'll overlay atop the main chart, and finally the difference between both moving averages in its own pane:

```
chartSeries(SPY, theme=chartTheme('white'), up.col="black",
dn.col="black")
```




```
SPY.EMA.20<- EMA(SPY$SPY.Close, n=20)
SPY.EMA.100<- EMA(SPY$SPY.Close, n=100)
addTA(SPY.EMA.20, on=1, col = "red")
```


SPY
[2007-01-03/2017-05-19]
Last 238.31
SPY.EMA.20 :238.104
200
150
100
800
600
400
200
0
Volume (millions):
115,011,373
Jan 03
2007
Jul 01
2008
Jan 04
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