R Time series - having trouble making bollinger lines - need simple example please

asked 4 years ago

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Learning R language - I know how to do a moving average but I need to do more - but I am not a statistician - unfortunately all the docs seem to be written for statisticians.

I do this in excel a lot, it's really handy for analysis of operational activities.

Here are the fields on each row to make bollinger bands:

Value could be # of calls, complaint ratio, anything

TimeStamp | Value | Moving Average | Moving STDEVP | Lower Control | Upper Control

Briefly, the moving avg and the stdevP point to the prior 8 or so values in the series. Lower control at a given point in time is = moving average - 2*moving stdevP and upper control = moving average + 2*moving stdevP

This can easily be done in excel for a single file, but if I can find a way to make R work R will be better for my needs. Hopefully faster and more reliable when automated, too.

links or tips would be appreciated.

r statistics time-series

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edited Mar 31 '11 at 17:23

Joris Meys
46.5k ● 14 ● 111 ● 168

asked Sep 8 '10 at 23:45

freewary
104 ● 1 ● 9

This could be done easily for sure. Please provide a sample datafile to see the struscute of your data, and I could help you with the source code. Retagging your question to R should get faster answeres also. – daroczig Jan 8 '11 at 14:01

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2 Answers

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You could use the function `rollapply()` from the `zoo` package, providing you work with a zoo series :

```
TimeSeries <- cumsum(rnorm(1000))
ZooSeries <- as.zoo(TimeSeries)

BollLines <- rollapply(ZooSeries,9,function(x){
    M <- mean(x)
    SD <- sd(x)
    c(M,M+SD*2,M-SD*2)
})
```

Now you have to remember that `rollapply` uses a centered frame, meaning that it takes the values to the left and the right of the current day. This is also more convenient and more true to the definition of the Bollinger Band than your suggestion of taking x prior values.

If you don't want to convert to zoo, you can use the vectors as well and write your own function. I added an S3 based plotting function that allows you to easily plot the calculations as well. With these functions, you could do something like :

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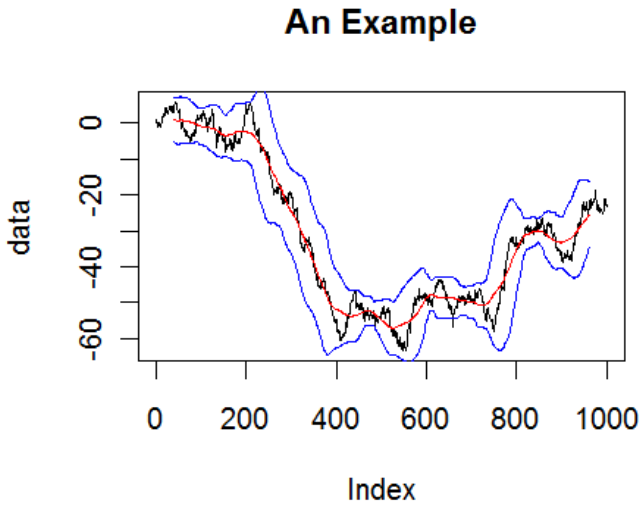
```
TimeSeries <- cumsum(rnorm(1000))
X <- BollingerBands(TimeSeries,80)
plot(X,TimeSeries,type="l",main="An Example")
```

to get :



The function codes :

```
BollingerBands <- function(x,width){
  Start <- width +1
  Stop <- length(x)
  Trail <- rep(NA,ceiling(width/2))
  Tail <- rep(NA,floor(width/2))

  Lines <- sapply(Start:Stop,function(i){
    M <- mean(x[(i-width):i])
    SD <- sd(x[(i-width):i])
    c(M,M+2*SD,M-2*SD)
  })


  Lines <- apply(Lines,1,function(i)c(Trail,i,Tail))
  Out <- data.frame(Lines)
  names(Out) <- c("Mean","Upper","Lower")

  class(Out) <- c("BollingerBands",class(Out))

  Out
}

plot.BollingerBands <- function(x,data,lcol=c("red","blue","blue"),...){
    plot(data,...)

    for(i in 1:3){
      lines(x[,i],col=lcol[i])
    }
}
```

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edited Mar 30 '11 at 14:47

answered Mar 30 '11 at 14:29

Joris Meys
46.5k • 14 • 111 • 168

Joris that is a fantastic answer to my question! I am still making very slow progress toward learning R. I know enough now that I can read and understand your code. I will use your example. thanks. – freeway Apr 1 '11 at 4:58

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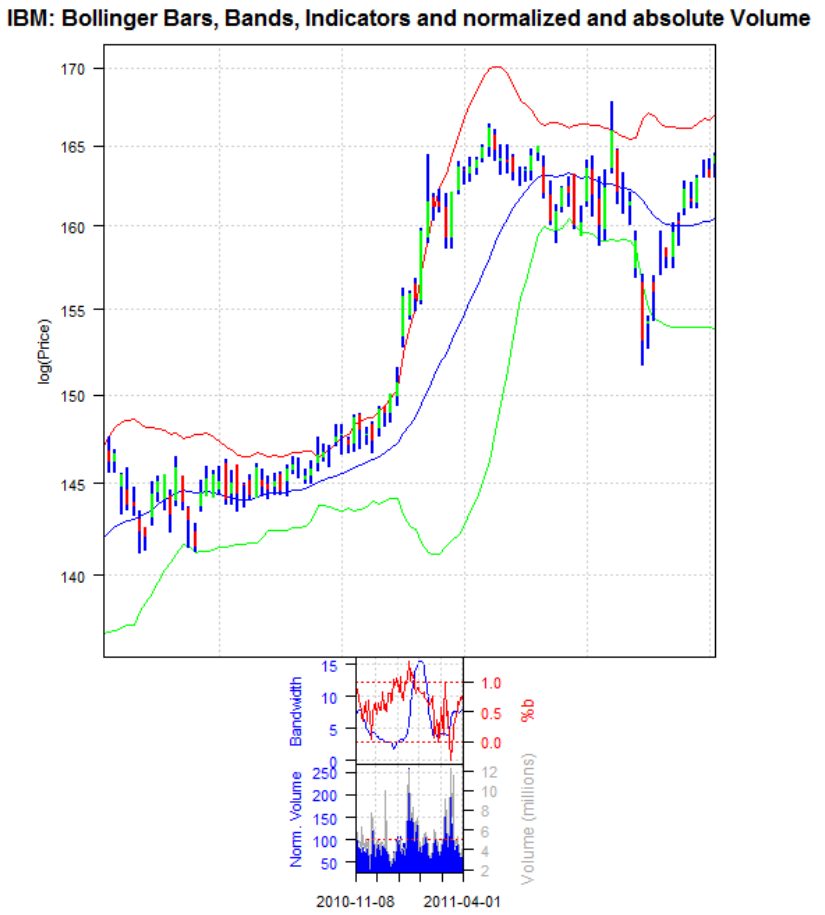
1

There is an illustration in the R Graph Gallery (65) giving code both for calculating the bands and for plotting share prices.

The 2005 code still seems to work six years later and will give IBM's current share price and going back several months



The most obvious bug is the width of the bandwidth and volume lower charts which have been narrowed; there may be another over the number of days covered.

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answered Apr 3 '11 at 23:51

Henry

3,513 ● 1 ● 7 ● 22

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