VISUALIZING TIME SERIES DATA IN R

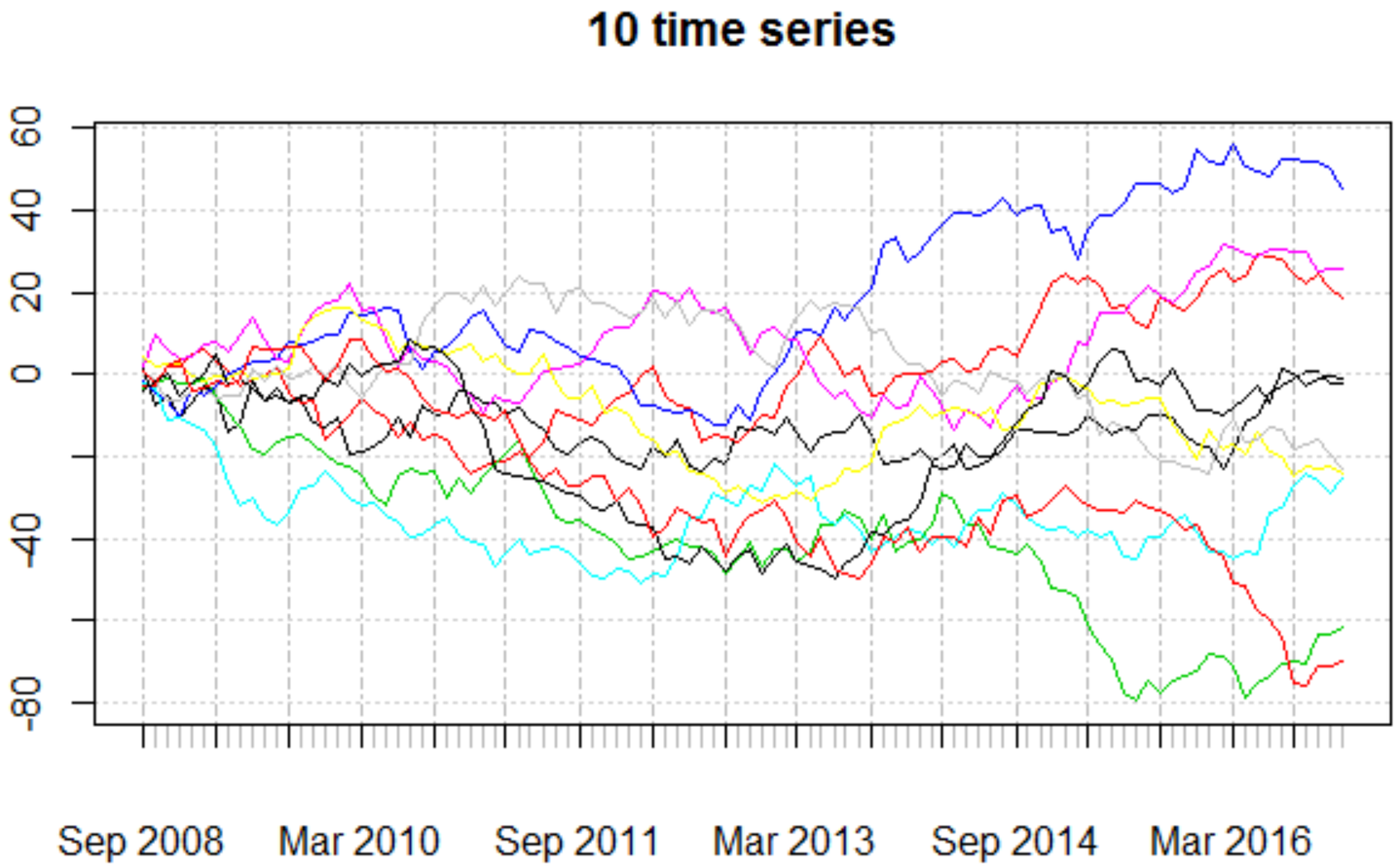
Dealing with higher dimensions

Arnaud Amsellem
The R Trader

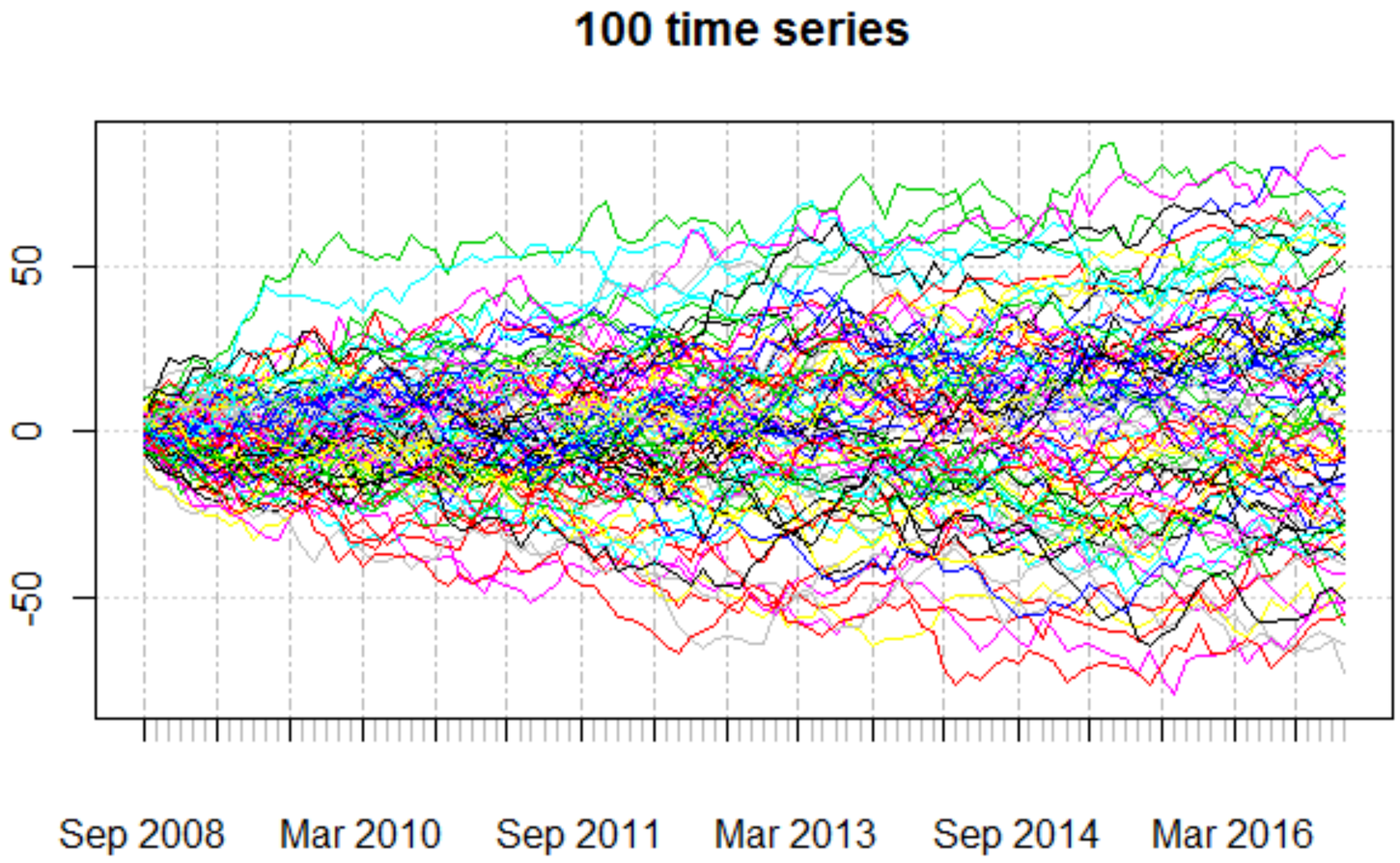
Multiple time series

- Identify how they interact
- Eg.: **single** stock price reaction to interest rates change
- Eg.: stock price reaction of **several** stocks to interest rates change
- Identify **patterns**

10 time series



100 time series



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Let’s practice!

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Multivariate time series

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Stocks

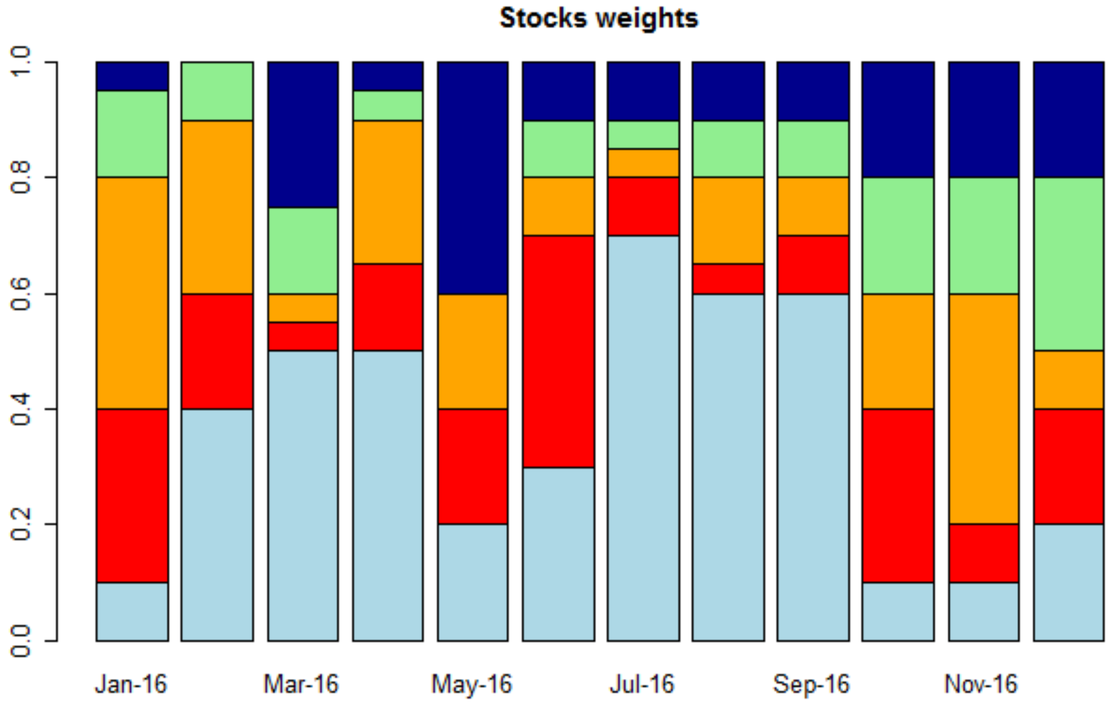
```
> head(my_stocks)

    Stock A   Stock B   Stock C   Stock D   Stock E
1   -0.0320   -0.0092   -0.0286   -0.0314   -0.0209
2   -0.0358   -0.0148    0.0001   -0.0162    0.0016
3    0.0092    0.0126    0.0139   -0.0016   -0.0127
4    0.0149    0.0290    0.0377    0.0246    0.0332
5   -0.0226   -0.0084    0.0011   -0.0016   -0.0102
6   -0.0079   -0.0126   -0.0249   -0.0059   -0.0187

> head(stock_weights)
       Stock A Stock B Stock C Stock D Stock E
Jan-16     0.1    0.30    0.40    0.15    0.05
Feb-16     0.4    0.20    0.30    0.10    0.00
Mar-16     0.5    0.05    0.05    0.15    0.25
Apr-16     0.5    0.15    0.25    0.05    0.05
May-16     0.2    0.20    0.20    0.00    0.40
Jun-16     0.3    0.40    0.10    0.10    0.10
```

Stacked chart

```
> # stacked chart of the weights of 5 stocks in a portfolio
> barplot(stock_weights,
          col = c("lightblue", "red", "orange", "lightgreen", "darkblue"),
          main = "Stocks weights")
```



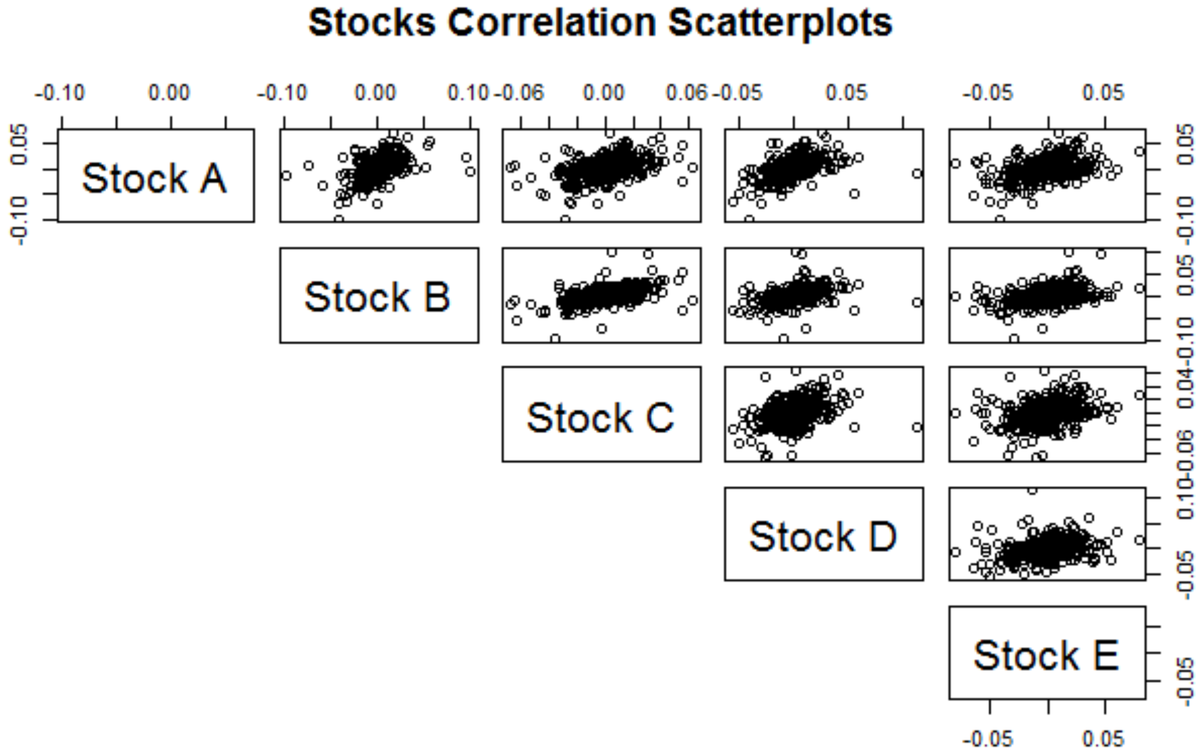
Correlation matrix with numbers

```
> round(cor(my_stocks), digit = 4)

          Stock A  Stock B   Stock C   Stock D   Stock E
Stock A   1.0000   0.4841    0.4292    0.5085    0.4029
Stock B   0.4841   1.0000    0.5133    0.3955    0.4329
Stock C   0.4292   0.5133    1.0000    0.3628    0.3414
Stock D   0.5085   0.3955    0.3628    1.0000    0.2939
Stock E   0.4029   0.4329    0.3414    0.2939    1.0000
```

Correlation matrix with scatterplots

```
> pairs(my_stocks,
        lower.panel = NULL,
         main = "Stocks Correlation Scatterplots")
```



corrplot()

```
> corrplot(my_stocks,
           method = "number",
           type = "upper")
```

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Higher dimension time series

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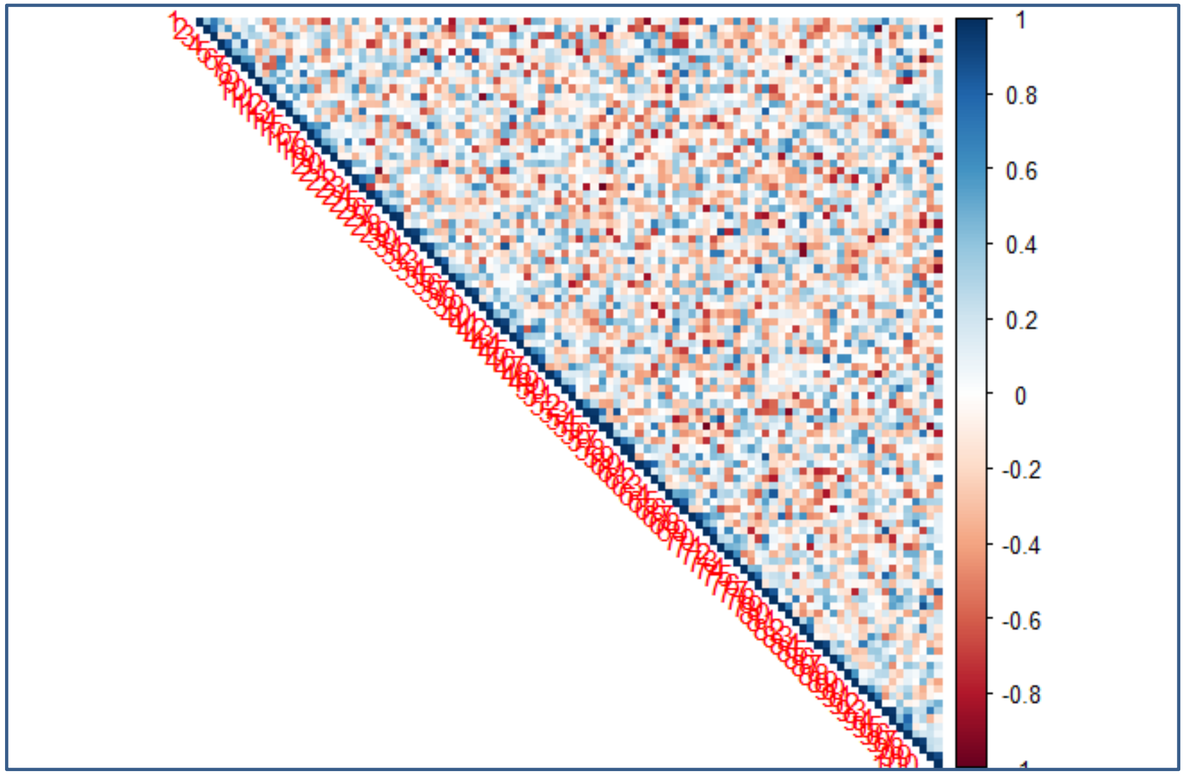
100 x 100 correlation matrix

```
> cor_mat
```

100x100 Correlation Matrix

Correlation matrix as heatmap

```
> corrplot(cor_mat, method = "color", type = "upper")
```



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