

Rle Tips and Tricks

Patrick Aboyoun

August 17, 2011

```
> rollmeanRle <- function(x, k) {
+   n <- length(x)
+   cumsum(c(Rle(sum(window(x, 1, k))), window(x,
+     k + 1, n) - window(x, 1, n - k)))/k
+ }

> rollvarRle <- function(x, k) {
+   n <- length(x)
+   means <- rollmeanRle(x, k)
+   nextMean <- window(means, 2, n - k + 1)
+   cumsum(c(Rle(sum((window(x, 1, k) - means[1])^2)),
+     k * diff(means)^2 - (window(x, 1, n -
+     k) - nextMean)^2 + (window(x, k +
+     1, n) - nextMean)^2))/(k - 1)
+ }

> rollcovRle <- function(x, y, k) {
+   n <- length(x)
+   meanX <- rollmeanRle(x, k)
+   meanY <- rollmeanRle(y, k)
+   nextMeanX <- window(meanX, 2, n - k + 1)
+   nextMeanY <- window(meanY, 2, n - k + 1)
+   cumsum(c(Rle(sum((window(x, 1, k) - meanX[1]) *
+     (window(y, 1, k) - meanY[1]))), k * diff(meanX) *
+     diff(meanY) - (window(x, 1, n - k) - nextMeanX) *
+     (window(y, 1, n - k) - nextMeanY) + (window(x,
+     k + 1, n) - nextMeanX) * (window(y, k +
+     1, n) - nextMeanY)))/(k - 1)
+ }

> rollsdRle <- function(x, k) {
+   sqrt(rollvarRle(x, k))
+ }

> rollcorRle <- function(x, y, k) {
+   rollcovRle(x, y, k)/(rollsdRle(x, k) * rollsdRle(y,
+     k))
+ }
```