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> rm(list = ls())
> # name: jblubau1_hw07_script.r
> # path: ~/Projects/learning/Statistics/STAT_604/Homework
> # created by: Joseph Blubaugh
> # created on: 24 Sept 2016
> # purpose: Homework 07
> # last ran:
> Sys.time()
[1] "2016-09-24 14:41:01 CDT"
>
> # Clean the workspace
> ls(); rm(list = ls())
character(0)
>
> # 1) Read in file
> dta <- read.csv("/home/jeston/Projects/learning/Statistics/STAT_604/Data/cisco.csv")
>
> # 2) Define PDF device
> pdf(file = "/home/jeston/Projects/learning/Statistics/STAT_604/Homework/jblubau1_hw07_graph.pdf",
+   width = 11, height = 8.5, onefile = TRUE)
>
> # 3)
> ## a) assign alpha value
> N <- 30; alpha <- 2 / (1 + N)
>
> ## b) create empty vector of 0s
> results <- rep(0, nrow(dta))
>
> ## c) put the 30 day avg of the first 30 days into the 30th position on results
> results[30] <- mean(dta$Adj.Close[1:30])
>
> ## d) use a loop to fill in the moving average formula
> for (i in 31:6655) {
+   results[i] <- (dta$Adj.Close[i] * alpha) + (results[i-1] * (1 - alpha))
+ }
>
> ## e) graph the last 260 days
> plot(x = 1:260, y = results[6396:6655], type = "l", col = "purple", ylim = c(0, 35),
+   xlab = "Days", ylab = "Adjusted Closing Price", main = "30 Day EMA and Daily Stock Prices")
>
> ## f) add formula for EMA
> text(x = 0, y = 2, adj = 0,
+   labels = bquote(paste("EMA")[i] == (paste("P")[i] %*% alpha) +
+     (paste("EMA")[i-1] %*% (1 - alpha)) ~ ~ paste("where") ~ ~
+     alpha == frac(2, 1+. (N))))
>
> ## g) add actual values
> lines(x = 1:260, y = dta$Adj.Close[6396:6655], col = "green2")

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>
> # 4) Turn code into function
> plt.fun <- function(x, n = 30, limit = 35) {
+   N <- n; alpha <- 2 / (1 + n)
+   results <- rep(0, length(x))
+   results[n] <- mean(dta$Adj.Close[1:n])
+   for (i in (n+1):length(x)) {
+     results[i] <- (dta$Adj.Close[i] * alpha) + (results[i-1] * (1 - alpha))
+   }
+   plot(x = 1:260, y = results[(length(results)-259):length(results)],
+        type = "l",
+        col = "purple",
+        ylim = c(0, limit),
+        xlab = "Days",
+        ylab = "Adjusted Closing Price",
+        main = paste(N, "Day EMA and Daily Stock Prices"))
+
+   text(x = 0, y = 2, adj = 0,
+        labels = bquote(paste("EMA")[i] == (paste("P")[i] %*% alpha) +
+                          (paste("EMA")[i-1] %*% (1 - alpha)) ~ ~ paste("where") ~ ~
+                          alpha == frac(2, 1+. (N))))
+   lines(x = 1:260, y = dta$Adj.Close[(length(x)-259):length(x)], col = "green2")
+ }
>
> # 5) Fix Margins
> par(mfrow = c(1, 2),
+     oma = c(.5, .5, 1.5, .5),
+     mar = c(4, 4, 2, 0))
>
> # 6) Call Plots
> plt.fun(x = dta$Adj.Close)
> plt.fun(x = dta$Adj.Close, n = 100)
>
> # 7) Write system time
> mtext(text = Sys.time(), side = 1, adj = 0, outer = TRUE)
>
> dev.off()
RStudioGD

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