##

## ── Running yfR for 1 stocks | 2019-01-01 --> 2024-03-20 (1905 days) ──

##

## ℹ Downloading data for benchmark ticker ^GSPC

## ℹ (1/1) Fetching data for ^BVSP

## ✔ - found cache file (2019-01-02 --> 2024-03-19)

## ✔ - got 1295 valid rows (2019-01-02 --> 2024-03-19)

## ✔ - got 96% of valid prices -- Looking good!

## ℹ Binding price data

##

## ── Diagnostics ───────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────

## ✔ Returned dataframe with 1295 rows -- Mas bah tche, que coisa linda!

## ℹ Using 1.9 MB at C:\Users\James\AppData\Local\Temp\RtmpopNQRl/yf\_cache for 14 cache files

## ℹ Out of 1 requested tickers, you got 1 (100%)

## [1] "2019-01-02" "2024-03-19"

##

## ── Running yfR for 1 stocks | 2019-01-01 --> 2024-03-20 (1905 days) ──

##

## ℹ Downloading data for benchmark ticker ^GSPC

## ℹ (1/1) Fetching data for ^FTAS

## ✔ - found cache file (2019-01-02 --> 2024-03-19)

## ✔ - got 1317 valid rows (2019-01-02 --> 2024-03-19)

## ✔ - got 98% of valid prices -- Looking good!

## ℹ Binding price data

##

## ── Diagnostics ───────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────

## ✔ Returned dataframe with 1317 rows -- Time for some tea?

## ℹ Using 1.9 MB at C:\Users\James\AppData\Local\Temp\RtmpopNQRl/yf\_cache for 14 cache files

## ℹ Out of 1 requested tickers, you got 1 (100%)

## [1] "2019-01-02" "2024-03-19"

## [1] "2019-01-02" "2024-03-19"

## # A tibble: 6 × 8  
## date open close high low price logvolume return  
## <date> <dbl> <dbl> <dbl> <dbl> <dbl> <dbl> <dbl>  
## 1 2019-01-02 3675. 3681. 3689. 3610. 3681. 18.3 NA   
## 2 2019-01-03 3681. 3658. 3689. 3656. 3658. 18.4 -0.00648  
## 3 2019-01-04 3658. 3734. 3739. 3658. 3734. 18.4 0.0208   
## 4 2019-01-07 3734. 3729. 3753. 3713. 3729. 18.5 -0.00129  
## 5 2019-01-08 3729. 3759. 3779. 3726. 3759. 18.5 0.00809  
## 6 2019-01-09 3759. 3787. 3802. 3759. 3787. 18.7 0.00759

## [1] "2019-01-02" "2024-03-19"

##

## ── Running yfR for 1 stocks | 2019-01-01 --> 2024-03-20 (1905 days) ──

##

## ℹ Downloading data for benchmark ticker ^GSPC

## ℹ (1/1) Fetching data for CL=F

## ✔ - found cache file (2019-01-02 --> 2024-03-19)

## ✔ - got 1313 valid rows (2019-01-02 --> 2024-03-19)

## ✔ - got 100% of valid prices -- Good stuff!

## ℹ Binding price data

##

## ── Diagnostics ───────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────

## ✔ Returned dataframe with 1313 rows -- Good stuff!

## ℹ Using 1.9 MB at C:\Users\James\AppData\Local\Temp\RtmpopNQRl/yf\_cache for 14 cache files

## ℹ Out of 1 requested tickers, you got 1 (100%)

##

## ── Running yfR for 1 stocks | 2019-01-01 --> 2024-03-20 (1905 days) ──

##

## ℹ Downloading data for benchmark ticker ^GSPC

## ℹ (1/1) Fetching data for GBPUSD=X

## ✔ - found cache file (2019-01-01 --> 2024-03-20)

## ✔ - got 1361 valid rows (2019-01-01 --> 2024-03-20)

## ✔ - got 89% of valid prices -- Got it!

## ℹ Binding price data

##

## ── Diagnostics ───────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────

## ✔ Returned dataframe with 1361 rows -- Looking good!

## ℹ Using 1.9 MB at C:\Users\James\AppData\Local\Temp\RtmpopNQRl/yf\_cache for 14 cache files

## ℹ Out of 1 requested tickers, you got 1 (100%)

##

## ── Running yfR for 1 stocks | 2019-01-01 --> 2024-03-20 (1905 days) ──

##

## ℹ Downloading data for benchmark ticker ^GSPC

## ℹ (1/1) Fetching data for GBPEUR=X

## ✔ - found cache file (2019-01-01 --> 2024-03-20)

## ✔ - got 1362 valid rows (2019-01-01 --> 2024-03-20)

## ✔ - got 89% of valid prices -- Well done !

## ℹ Binding price data

##

## ── Diagnostics ───────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────

## ✔ Returned dataframe with 1362 rows -- Parabens , tudo certo!

## ℹ Using 1.9 MB at C:\Users\James\AppData\Local\Temp\RtmpopNQRl/yf\_cache for 14 cache files

## ℹ Out of 1 requested tickers, you got 1 (100%)

##

## ── Running yfR for 1 stocks | 2019-01-01 --> 2024-03-20 (1905 days) ──

##

## ℹ Downloading data for benchmark ticker ^GSPC

## ℹ (1/1) Fetching data for BRLUSD=X

## ✔ - found cache file (2019-01-01 --> 2024-03-20)

## ✔ - got 1361 valid rows (2019-01-01 --> 2024-03-20)

## ✔ - got 89% of valid prices -- All OK!

## ℹ Binding price data

##

## ── Diagnostics ───────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────

## ✔ Returned dataframe with 1361 rows -- Good stuff!

## ℹ Using 1.9 MB at C:\Users\James\AppData\Local\Temp\RtmpopNQRl/yf\_cache for 14 cache files

## ℹ Out of 1 requested tickers, you got 1 (100%)

##

## ── Running yfR for 1 stocks | 2019-01-01 --> 2024-03-20 (1905 days) ──

##

## ℹ Downloading data for benchmark ticker ^GSPC

## ℹ (1/1) Fetching data for BRLEUR=X

## ✔ - found cache file (2019-01-01 --> 2024-03-20)

## ✔ - got 1362 valid rows (2019-01-01 --> 2024-03-20)

## ✔ - got 89% of valid prices -- Nice!

## ℹ Binding price data

##

## ── Diagnostics ───────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────

## ✔ Returned dataframe with 1362 rows -- Got it!

## ℹ Using 1.9 MB at C:\Users\James\AppData\Local\Temp\RtmpopNQRl/yf\_cache for 14 cache files

## ℹ Out of 1 requested tickers, you got 1 (100%)

## Rows: 1728 Columns: 6  
## ── Column specification ──────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────  
## Delimiter: ","  
## chr (2): Date, Change %  
## dbl (4): Price, Open, High, Low  
##   
## ℹ Use `spec()` to retrieve the full column specification for this data.  
## ℹ Specify the column types or set `show\_col\_types = FALSE` to quiet this message.  
## Rows: 1324 Columns: 6  
## ── Column specification ──────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────  
## Delimiter: ","  
## chr (2): Date, Change %  
## dbl (2): Price, Low  
## num (2): Open, High  
##   
## ℹ Use `spec()` to retrieve the full column specification for this data.  
## ℹ Specify the column types or set `show\_col\_types = FALSE` to quiet this message.  
##   
##   
## ── Running yfR for 1 stocks | 2019-01-01 --> 2024-03-20 (1905 days) ──  
##   
##   
##   
## ℹ Downloading data for benchmark ticker ^GSPC  
##   
## ℹ (1/1) Fetching data for ZC=F  
##   
## ✔ - found cache file (2019-01-02 --> 2024-03-19)  
##   
## ✔ - got 1312 valid rows (2019-01-02 --> 2024-03-19)  
##   
## ✔ - got 100% of valid prices -- Well done !  
##   
## ℹ Binding price data  
##   
##   
##   
## ── Diagnostics ───────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────  
##   
## ✔ Returned dataframe with 1312 rows -- Well done !  
##   
## ℹ Using 1.9 MB at C:\Users\James\AppData\Local\Temp\RtmpopNQRl/yf\_cache for 14 cache files  
##   
## ℹ Out of 1 requested tickers, you got 1 (100%)  
##   
##   
##   
## ── Running yfR for 1 stocks | 2019-01-01 --> 2024-03-20 (1905 days) ──  
##   
##   
##   
## ℹ Downloading data for benchmark ticker ^GSPC  
##   
## ℹ (1/1) Fetching data for SB=F  
##   
## ✔ - found cache file (2019-01-02 --> 2024-03-19)  
##   
## ✔ - got 1313 valid rows (2019-01-02 --> 2024-03-19)  
##   
## ✔ - got 100% of valid prices -- Nice!  
##   
## ℹ Binding price data  
##   
##   
##   
## ── Diagnostics ───────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────  
##   
## ✔ Returned dataframe with 1313 rows -- You got it !  
##   
## ℹ Using 1.9 MB at C:\Users\James\AppData\Local\Temp\RtmpopNQRl/yf\_cache for 14 cache files  
##   
## ℹ Out of 1 requested tickers, you got 1 (100%)  
##   
##   
##   
## ── Running yfR for 1 stocks | 2019-01-01 --> 2024-03-20 (1905 days) ──  
##   
##   
##   
## ℹ Downloading data for benchmark ticker ^GSPC  
##   
## ℹ (1/1) Fetching data for GC=F  
##   
## ✔ - found cache file (2019-01-02 --> 2024-03-19)  
##   
## ✔ - got 1313 valid rows (2019-01-02 --> 2024-03-19)  
##   
## ✔ - got 100% of valid prices -- You got it !  
##   
## ℹ Binding price data  
##   
##   
##   
## ── Diagnostics ───────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────  
##   
## ✔ Returned dataframe with 1313 rows -- Got it!  
##   
## ℹ Using 1.9 MB at C:\Users\James\AppData\Local\Temp\RtmpopNQRl/yf\_cache for 14 cache files  
##   
## ℹ Out of 1 requested tickers, you got 1 (100%)  
##   
##   
##   
## ── Running yfR for 1 stocks | 2019-01-01 --> 2024-03-20 (1905 days) ──  
##   
##   
##   
## ℹ Downloading data for benchmark ticker ^GSPC  
##   
## ℹ (1/1) Fetching data for EWZ  
##   
## ✔ - found cache file (2019-01-02 --> 2024-03-19)  
##   
## ✔ - got 1312 valid rows (2019-01-02 --> 2024-03-19)  
##   
## ✔ - got 100% of valid prices -- Nice!  
##   
## ℹ Binding price data  
##   
##   
##   
## ── Diagnostics ───────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────  
##   
## ✔ Returned dataframe with 1312 rows -- Youre doing good!  
##   
## ℹ Using 1.9 MB at C:\Users\James\AppData\Local\Temp\RtmpopNQRl/yf\_cache for 14 cache files  
##   
## ℹ Out of 1 requested tickers, you got 1 (100%)  
##   
##   
##   
## ── Running yfR for 1 stocks | 2019-01-01 --> 2024-03-20 (1905 days) ──  
##   
##   
##   
## ℹ Downloading data for benchmark ticker ^GSPC  
##   
## ℹ (1/1) Fetching data for ^STOXX  
##   
## ✔ - found cache file (2019-01-03 --> 2024-03-19)  
##   
## ✔ - got 1315 valid rows (2019-01-03 --> 2024-03-19)  
##   
## ✔ - got 98% of valid prices -- All OK!  
##   
## ℹ Binding price data  
##   
##   
##   
## ── Diagnostics ───────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────  
##   
## ✔ Returned dataframe with 1315 rows -- Got it!  
##   
## ℹ Using 1.9 MB at C:\Users\James\AppData\Local\Temp\RtmpopNQRl/yf\_cache for 14 cache files  
##   
## ℹ Out of 1 requested tickers, you got 1 (100%)  
##   
## Rows: 6856 Columns: 8  
## ── Column specification ──────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────  
## Delimiter: ","  
## chr (3): Date, DateasText, date  
## dbl (5): eu\_price, nz\_price, kor\_price, uk\_price, t  
##   
## ℹ Use `spec()` to retrieve the full column specification for this data.  
## ℹ Specify the column types or set `show\_col\_types = FALSE` to quiet this message.  
##   
##   
## ── Running yfR for 1 stocks | 2019-01-01 --> 2024-03-20 (1905 days) ──  
##   
##   
##   
## ℹ Downloading data for benchmark ticker ^GSPC  
##   
## ℹ (1/1) Fetching data for NG=F  
##   
## ✔ - found cache file (2019-01-02 --> 2024-03-19)  
##   
## ✔ - got 1313 valid rows (2019-01-02 --> 2024-03-19)  
##   
## ✔ - got 100% of valid prices -- Good job !  
##   
## ℹ Binding price data  
##   
##   
##   
## ── Diagnostics ───────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────  
##   
## ✔ Returned dataframe with 1313 rows -- Got it!  
##   
## ℹ Using 1.9 MB at C:\Users\James\AppData\Local\Temp\RtmpopNQRl/yf\_cache for 14 cache files  
##   
## ℹ Out of 1 requested tickers, you got 1 (100%)  
##   
## Rows: 1900 Columns: 3  
## ── Column specification ──────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────  
## Delimiter: ","  
## chr (1): date  
## dbl (2): brazil\_temp, uk\_temp  
##   
## ℹ Use `spec()` to retrieve the full column specification for this data.  
## ℹ Specify the column types or set `show\_col\_types = FALSE` to quiet this message.  
## Rows: 1900 Columns: 3  
## ── Column specification ──────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────────  
## Delimiter: ","  
## chr (1): date  
## dbl (2): brazil\_temp, uk\_temp  
##   
## ℹ Use `spec()` to retrieve the full column specification for this data.  
## ℹ Specify the column types or set `show\_col\_types = FALSE` to quiet this message.

## Rows: 2,379  
## Columns: 112  
## $ date <date> 2019-01-02, 2019-01-03, 2019-01-04, 2019-01-…  
## $ open <dbl> 3675.06, 3681.37, 3657.52, 3733.55, 3728.73, …  
## $ close <dbl> 3681.37, 3657.52, 3733.55, 3728.73, 3758.89, …  
## $ high <dbl> 3688.57, 3689.13, 3739.32, 3753.23, 3779.39, …  
## $ low <dbl> 3609.69, 3656.10, 3657.52, 3712.58, 3726.45, …  
## $ price <dbl> 3681.37, 3657.52, 3733.55, 3728.73, 3758.89, …  
## $ logvolume <dbl> 18.34389, 18.43566, 18.41227, 18.51120, 18.54…  
## $ return <dbl> NA, -6.478593e-03, 2.078732e-02, -1.291015e-0…  
## $ direction <fct> NA, DOWN, UP, DOWN, UP, UP, UP, DOWN, DOWN, U…  
## $ direction.1 <fct> DOWN, UP, DOWN, UP, UP, UP, DOWN, DOWN, UP, D…  
## $ intraday <dbl> 1.715522e-03, -6.499670e-03, 2.057421e-02, -1…  
## $ dirintra <fct> SMALL\_UP, SMALL\_DOWN, LARGE\_UP, SMALL\_DOWN, L…  
## $ direction.2 <fct> SMALL\_DOWN, LARGE\_UP, SMALL\_DOWN, LARGE\_UP, L…  
## $ DVI2 <dbl[,3]> <matrix[26 x 3]>  
## $ DVI7 <dbl[,3]> <matrix[26 x 3]>  
## $ DVI14 <dbl[,3]> <matrix[26 x 3]>  
## $ DVI21 <dbl[,3]> <matrix[26 x 3]>  
## $ UltOsc <dbl> NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, N…  
## $ TRIX2 <dbl[,2]> <matrix[26 x 2]>  
## $ TRIX5 <dbl[,2]> <matrix[26 x 2]>  
## $ TRIX10 <dbl[,2]> <matrix[26 x 2]>  
## $ runSum <dbl> NA, NA, NA, NA, NA, NA, NA, NA, NA, 37495…  
## $ runMin <dbl> NA, NA, NA, NA, NA, NA, NA, NA, NA, 3657.…  
## $ runMax <dbl> NA, NA, NA, NA, NA, NA, NA, NA, NA, 3804.…  
## $ runMedian <dbl> NA, NA, NA, NA, NA, NA, NA, NA, NA, 3761.455,…  
## $ runVar <dbl> NA, NA, NA, NA, NA, NA, NA, NA, NA, 2430.…  
## $ runSD <dbl> NA, NA, NA, NA, NA, NA, NA, NA, NA, 49.29…  
## $ runMAD <dbl> NA, NA, NA, NA, NA, NA, NA, NA, NA, 44.94…  
## $ wilderSum <dbl> NA, NA, NA, NA, NA, NA, NA, NA, NA, 34123.85,…  
## $ BBands2 <dbl[,4]> <matrix[26 x 4]>  
## $ BBands5 <dbl[,4]> <matrix[26 x 4]>  
## $ BBands10 <dbl[,4]> <matrix[26 x 4]>  
## $ aroon2 <dbl[,3]> <matrix[26 x 3]>  
## $ aroon5 <dbl[,3]> <matrix[26 x 3]>  
## $ aroon10 <dbl[,3]> <matrix[26 x 3]>  
## $ WilliamsAD <dbl> NA, -31.60986, 44.42017, 19.92017, 52.36011, …  
## $ tdi10 <dbl[,2]> <matrix[26 x 2]>  
## $ tdi20 <dbl[,2]> <matrix[26 x 2]>  
## $ tdi30 <dbl[,2]> <matrix[26 x 2]>  
## $ ChaikinAD <dbl> 14.995135, -1.855456, 13.959283, 10.156805, 1…  
## $ kst <dbl[,2]> <matrix[26 x 2]>  
## $ cmo <dbl> NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, N…  
## $ cmf <dbl> NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, N…  
## $ donchianchannel20 <dbl[,3]> <matrix[26 x 3]>  
## $ donchianchannel10 <dbl[,3]> <matrix[26 x 3]>  
## $ EHcorrel <dbl> NA, NA, NA, NA, NA, NA, NA, NA, NA, 0.7818181…  
## $ tr <dbl[,3]> <matrix[26 x 3]>  
## $ dx <dbl[,4]> <matrix[26 x 4]>  
## $ rsi3 <dbl> NA, NA, NA, 47.36912, 57.73733, 56.85313, 49.…  
## $ rsi5 <dbl> NA, NA, NA, NA, NA, 54.36486, 51.39830, 45.05…  
## $ rsi10 <dbl> NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, 4…  
## $ rsi14 <dbl> NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, N…  
## $ cci3 <dbl> NA, NA, 100.00000, 80.12391, 100.00000, 1…  
## $ cci5 <dbl> NA, NA, NA, NA, 101.663851, 109.716506, 9…  
## $ clv <dbl> 0.81744575, -0.91402173, 0.85892381, -0.2…  
## $ GMMA <dbl[,12]> <matrix[26 x 12]>  
## $ sar <dbl[,1]> <matrix[26 x 1]>  
## $ snr <dbl> NA, NA, NA, NA, NA, 2.10997264, 3.0259056…  
## $ macd <dbl[,2]> <matrix[26 x 2]>  
## $ vhf <dbl> NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, N…  
## $ zigzag <dbl> 3649.130, 3651.462, 3653.794, 3656.127, 3…  
## $ pbands <dbl[,3]> <matrix[26 x 3]>  
## $ lag <dbl> NA, 3681.37, 3657.52, 3733.55, 3728.73, 3…  
## $ chvol <dbl> NA, NA, NA, NA, NA, NA, NA, NA, NA, -0.31…  
## $ sma2 <dbl> NA, 3669.445, 3695.535, 3731.140, 3743.810, 3…  
## $ disparityfive <dbl> NA, -3.249824e-05, 1.028674e-04, -6.45924…  
## $ OBV <dbl> 18.343890408, -0.091766629, 18.320504856, -0.…  
## $ MFI <dbl> NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, N…  
## $ sma5 <dbl> NA, NA, NA, NA, 3712.012, 3733.224, 3762.…  
## $ sma10 <dbl> NA, NA, NA, NA, NA, NA, NA, NA, NA, 3749.…  
## $ sma20 <dbl> NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, N…  
## $ volsma2 <dbl> NA, 18.38977, 18.42396, 18.46174, 18.5281…  
## $ volsma5 <dbl> NA, NA, NA, NA, 18.44963, 18.51142, 18.51…  
## $ volsma10 <dbl> NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, N…  
## $ ema2 <dbl> NA, 3669.445, 3712.182, 3723.214, 3746.998, 3…  
## $ ema7 <dbl> NA, NA, NA, NA, NA, NA, 3735.984, 3751.271, 3…  
## $ ema14 <dbl> NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, N…  
## $ ema21 <dbl> NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, N…  
## $ EMV <dbl[,2]> <matrix[26 x 2]>  
## $ WPR <dbl> NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, N…  
## $ keltnerChannels <dbl[,3]> <matrix[26 x 3]>  
## $ runPercentRank <dbl> NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, N…  
## $ stoch\_k <dbl> NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, …  
## $ stoch\_d <dbl> NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, N…  
## $ volatility <dbl> NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, N…  
## $ ROC <dbl> NA, -6.499670e-03, 2.057421e-02, -1.29184…  
## $ M2 <dbl> NA, NA, 52.179932, 71.209961, 25.339844, 58.6…  
## $ M7 <dbl> NA, NA, NA, NA, NA, NA, NA, 115.7597656, 106.…  
## $ M14 <dbl> NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, N…  
## $ M21 <dbl> NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, N…  
## $ brookman <dbl> 1.934898e-03, -7.319768e-03, 2.362181e-02, -1…  
## $ corn\_price <dbl> 375.75, 379.75, 383.00, 382.25, 380.00, 382.0…  
## $ sugar\_price <dbl> 11.93, 11.69, 11.93, 12.65, 12.76, 12.87, 12.…  
## $ gold\_price <dbl> 1281.0, 1291.8, 1282.7, 1286.8, 1283.2, 1289.…  
## $ UK.EPU <dbl> 261.75, 260.50, 202.67, 222.88, 353.46, 184.2…  
## $ World.EPU <dbl> 263.3797, 263.3797, 263.3797, 263.3797, 263.3…  
## $ Geopolitcial.uncertainty <dbl> 87.42410, 87.42410, 87.42410, 87.42410, 87.42…  
## $ oil\_price <dbl> 46.54, 47.09, 47.96, 48.52, 49.78, 52.36, 52.…  
## $ GBPUSD <dbl> 1.275429, 1.252191, 1.262881, 1.273496, 1.278…  
## $ GBPEUR <dbl> 1.11264, 1.10570, 1.10851, 1.11593, 1.11362, …  
## $ BRLUSD <dbl> 0.2577386, 0.2641101, 0.2663045, 0.2731345, 0…  
## $ BRLEUR <dbl> 0.22300, 0.23292, 0.23360, 0.23610, 0.23300, …  
## $ uk\_bond <dbl> 0.747, 0.722, 0.766, 0.813, 0.773, 0.762, 0.7…  
## $ brazil\_bond <dbl> 6.480, 6.525, 6.550, 6.615, 6.600, 6.585, 6.6…  
## $ brazil\_neighbour <dbl> 40.64, 40.90, 41.82, 41.40, 41.90, 42.96, 42.…  
## $ uk\_neighbour <dbl> NA, 333.92, 343.38, 342.88, 345.85, 347.7…  
## $ eu\_carbon\_price <dbl> 25.02, 23.04, 23.49, 22.07, 22.65, 21.86, 21.…  
## $ nz\_carbon\_price <dbl> NA, 14.90948, 14.90948, 14.87981, 14.8501…  
## $ kor\_carbon\_price <dbl> 19.52208, 19.52208, 19.52208, 19.52208, 19.52…  
## $ `NGAS price` <dbl> 2.958, 2.945, 3.044, 2.944, 2.967, 2.984, 2.9…  
## $ brazil\_temp <dbl> 83, 87, 88, 87, 88, 86, 85, 85, 85, 86, 85, 8…  
## $ uk\_temp <dbl> 41, 40, 37, 47, 44, 40, 39, 43, 44, 42, 44, 3…

## Rows: 2,300  
## Columns: 112  
## $ date <date> 2019-01-02, 2019-01-03, 2019-01-04, 2019-01-…  
## $ open <dbl> 87887, 91011, 91577, 91845, 91699, 92033, 935…  
## $ close <dbl> 91012, 91564, 91841, 91699, 92032, 93613, 938…  
## $ high <dbl> 91479, 91596, 92701, 92552, 92231, 93626, 939…  
## $ low <dbl> 87536, 89922, 90824, 91288, 91064, 92028, 930…  
## $ price <dbl> 91012, 91564, 91841, 91699, 92032, 93613, 938…  
## $ logvolume <dbl> 15.54102, 15.61824, 15.48738, 15.33393, 15.31…  
## $ return <dbl> NA, 0.0060651343, 0.0030252064, -0.0015461504…  
## $ direction <fct> NA, UP, UP, DOWN, UP, UP, UP, DOWN, UP, DOWN,…  
## $ direction.1 <fct> UP, UP, DOWN, UP, UP, UP, DOWN, UP, DOWN, UP,…  
## $ intraday <dbl> 0.0349394675, 0.0060578030, 0.0028786726, -0.…  
## $ dirintra <fct> LARGE\_UP, SMALL\_UP, SMALL\_UP, SMALL\_DOWN, SMA…  
## $ direction.2 <fct> SMALL\_UP, SMALL\_UP, SMALL\_DOWN, SMALL\_UP, LAR…  
## $ DVI2 <dbl[,3]> <matrix[26 x 3]>  
## $ DVI7 <dbl[,3]> <matrix[26 x 3]>  
## $ DVI14 <dbl[,3]> <matrix[26 x 3]>  
## $ DVI21 <dbl[,3]> <matrix[26 x 3]>  
## $ UltOsc <dbl> NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, N…  
## $ TRIX2 <dbl[,2]> <matrix[26 x 2]>  
## $ TRIX5 <dbl[,2]> <matrix[26 x 2]>  
## $ TRIX10 <dbl[,2]> <matrix[26 x 2]>  
## $ runSum <dbl> NA, NA, NA, NA, NA, NA, NA, NA, NA, 92775…  
## $ runMin <dbl> NA, NA, NA, NA, NA, NA, NA, NA, NA, 91012…  
## $ runMax <dbl> NA, NA, NA, NA, NA, NA, NA, NA, NA, 94474…  
## $ runMedian <dbl> NA, NA, NA, NA, NA, NA, NA, NA, NA, 92822.5, …  
## $ runVar <dbl> NA, NA, NA, NA, NA, NA, NA, NA, NA, 15810…  
## $ runSD <dbl> NA, NA, NA, NA, NA, NA, NA, NA, NA, 1257.…  
## $ runMAD <dbl> NA, NA, NA, NA, NA, NA, NA, NA, NA, 1561.…  
## $ wilderSum <dbl> NA, NA, NA, NA, NA, NA, NA, NA, NA, 844385.1,…  
## $ BBands2 <dbl[,4]> <matrix[26 x 4]>  
## $ BBands5 <dbl[,4]> <matrix[26 x 4]>  
## $ BBands10 <dbl[,4]> <matrix[26 x 4]>  
## $ aroon2 <dbl[,3]> <matrix[26 x 3]>  
## $ aroon5 <dbl[,3]> <matrix[26 x 3]>  
## $ aroon10 <dbl[,3]> <matrix[26 x 3]>  
## $ WilliamsAD <dbl> NA, 1642, 2659, 1806, 2774, 4359, 5115, 4812,…  
## $ tdi10 <dbl[,2]> <matrix[26 x 2]>  
## $ tdi20 <dbl[,2]> <matrix[26 x 2]>  
## $ tdi30 <dbl[,2]> <matrix[26 x 2]>  
## $ ChaikinAD <dbl> 11.85974, 26.88087, 28.17629, 22.81427, 32.90…  
## $ kst <dbl[,2]> <matrix[26 x 2]>  
## $ cmo <dbl> NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, N…  
## $ cmf <dbl> NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, N…  
## $ donchianchannel20 <dbl[,3]> <matrix[26 x 3]>  
## $ donchianchannel10 <dbl[,3]> <matrix[26 x 3]>  
## $ EHcorrel <dbl> NA, NA, NA, NA, NA, NA, NA, NA, NA, 0.9636364…  
## $ tr <dbl[,3]> <matrix[26 x 3]>  
## $ dx <dbl[,4]> <matrix[26 x 4]>  
## $ rsi3 <dbl> NA, NA, NA, 0.00000, 17.63911, 50.96443, 30.4…  
## $ rsi5 <dbl> NA, NA, NA, NA, NA, 33.75378, 25.26892, 23.38…  
## $ rsi10 <dbl> NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, 3…  
## $ rsi14 <dbl> NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, N…  
## $ cci3 <dbl> NA, NA, 90.81487, 55.47353, -65.19481, 10…  
## $ cci5 <dbl> NA, NA, NA, NA, 52.5421043, 166.6666667, …  
## $ clv <dbl> 0.763124524, 0.961768220, 0.083644113, -0…  
## $ GMMA <dbl[,12]> <matrix[26 x 12]>  
## $ sar <dbl[,1]> <matrix[26 x 1]>  
## $ snr <dbl> NA, NA, NA, NA, NA, 1.71569921, 1.6011998…  
## $ macd <dbl[,2]> <matrix[26 x 2]>  
## $ vhf <dbl> NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, N…  
## $ zigzag <dbl> 89507.50, 89726.13, 89944.76, 90163.39, 9…  
## $ pbands <dbl[,3]> <matrix[26 x 3]>  
## $ lag <dbl> NA, 91012, 91564, 91841, 91699, 92032, 93…  
## $ chvol <dbl> NA, NA, NA, NA, NA, NA, NA, NA, NA, -0.37…  
## $ sma2 <dbl> NA, 91288.0, 91702.5, 91770.0, 91865.5, 92822…  
## $ disparityfive <dbl> NA, 3.023398e-05, 1.510319e-05, -7.736733…  
## $ OBV <dbl> 15.54102, 31.15927, 46.64664, 31.31272, 46.63…  
## $ MFI <dbl> NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, N…  
## $ sma5 <dbl> NA, NA, NA, NA, 91629.6, 92149.8, 92598.2…  
## $ sma10 <dbl> NA, NA, NA, NA, NA, NA, NA, NA, NA, 92775…  
## $ sma20 <dbl> NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, N…  
## $ volsma2 <dbl> NA, 15.57963, 15.55281, 15.41065, 15.3263…  
## $ volsma5 <dbl> NA, NA, NA, NA, 15.45988, 15.43712, 15.39…  
## $ volsma10 <dbl> NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, N…  
## $ ema2 <dbl> NA, 91288.00, 91656.67, 91684.89, 91916.30, 9…  
## $ ema7 <dbl> NA, NA, NA, NA, NA, NA, 92223.86, 92582.39, 9…  
## $ ema14 <dbl> NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, N…  
## $ ema21 <dbl> NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, N…  
## $ EMV <dbl[,2]> <matrix[26 x 2]>  
## $ WPR <dbl> NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, N…  
## $ keltnerChannels <dbl[,3]> <matrix[26 x 3]>  
## $ runPercentRank <dbl> NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, N…  
## $ stoch\_k <tibble[,1]> <tbl\_df[26 x 1]>  
## $ stoch\_d <tibble[,1]> <tbl\_df[26 x 1]>  
## $ volatility <dbl> NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, …  
## $ ROC <dbl> NA, 0.0060468154, 0.0030206397, -0.001547…  
## $ M2 <dbl> NA, NA, 829, 135, 191, 1914, 1774, 45, 668, 3…  
## $ M7 <dbl> NA, NA, NA, NA, NA, NA, NA, 2646, 2910, 2…  
## $ M14 <dbl> NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, N…  
## $ M21 <dbl> NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, NA, N…  
## $ brookman <dbl> 0.82538249, 0.14468809, 0.06838604, -0.03…  
## $ corn\_price <dbl> 375.75, 379.75, 383.00, 382.25, 380.00, 382.0…  
## $ sugar\_price <dbl> 11.93, 11.69, 11.93, 12.65, 12.76, 12.87, 12.…  
## $ gold\_price <dbl> 1281.0, 1291.8, 1282.7, 1286.8, 1283.2, 1289.…  
## $ UK.EPU <dbl> 261.75, 260.50, 202.67, 222.88, 353.46, 184.2…  
## $ World.EPU <dbl> 263.3797, 263.3797, 263.3797, 263.3797, 263.3…  
## $ Geopolitcial.uncertainty <dbl> 87.42410, 87.42410, 87.42410, 87.42410, 87.42…  
## $ oil\_price <dbl> 46.54, 47.09, 47.96, 48.52, 49.78, 52.36, 52.…  
## $ GBPUSD <dbl> 1.275429, 1.252191, 1.262881, 1.273496, 1.278…  
## $ GBPEUR <dbl> 1.11264, 1.10570, 1.10851, 1.11593, 1.11362, …  
## $ BRLUSD <dbl> 0.2577386, 0.2641101, 0.2663045, 0.2731345, 0…  
## $ BRLEUR <dbl> 0.22300, 0.23292, 0.23360, 0.23610, 0.23300, …  
## $ uk\_bond <dbl> 0.747, 0.722, 0.766, 0.813, 0.773, 0.762, 0.7…  
## $ brazil\_bond <dbl> 6.480, 6.525, 6.550, 6.615, 6.600, 6.585, 6.6…  
## $ brazil\_neighbour <dbl> 40.64, 40.90, 41.82, 41.40, 41.90, 42.96, 42.…  
## $ uk\_neighbour <dbl> NA, 333.92, 343.38, 342.88, 345.85, 347.70, 3…  
## $ eu\_carbon\_price <dbl> 25.02, 23.04, 23.49, 22.07, 22.65, 21.86, 21.…  
## $ nz\_carbon\_price <dbl> NA, 14.90948, 14.90948, 14.87981, 14.8501…  
## $ kor\_carbon\_price <dbl> 19.52208, 19.52208, 19.52208, 19.52208, 19.52…  
## $ `NGAS price` <dbl> 2.958, 2.945, 3.044, 2.944, 2.967, 2.984,…  
## $ brazil\_temp <dbl> 83, 87, 88, 87, 88, 86, 85, 85, 85, 86, 85, 8…  
## $ uk\_temp <dbl> 41, 40, 37, 47, 44, 40, 39, 43, 44, 42…

## Loading required package: foreach

##   
## Attaching package: 'foreach'

## The following objects are masked from 'package:purrr':  
##   
## accumulate, when

## Loading required package: iterators

## Loading required package: parallel

## Brazil TTR 1 step fixed window

## [1] 240 87

## Warning in nominalTrainWorkflow(x = x, y = y, wts = weights, info = trainInfo,  
## : There were missing values in resampled performance measures.

## glmnet   
##   
## 240 samples  
## 86 predictor  
## 4 classes: 'LARGE\_DOWN', 'LARGE\_UP', 'SMALL\_DOWN', 'SMALL\_UP'   
##   
## No pre-processing  
## Resampling: Rolling Forecasting Origin Resampling (1 held-out with a fixed window)   
## Summary of sample sizes: 146, 146, 146, 146, 146, 146, ...   
## Resampling results across tuning parameters:  
##   
## alpha lambda Accuracy Kappa  
## 0.1000000 4.062241e-05 0.2234043 0   
## 0.1000000 1.130343e-04 0.2127660 0   
## 0.1000000 3.145245e-04 0.2234043 0   
## 0.1000000 8.751832e-04 0.2340426 0   
## 0.1000000 2.435249e-03 0.2340426 0   
## 0.1000000 6.776226e-03 0.2340426 0   
## 0.1000000 1.885525e-02 0.2553191 0   
## 0.1000000 5.246586e-02 0.3085106 0   
## 0.2285714 4.062241e-05 0.2234043 0   
## 0.2285714 1.130343e-04 0.2234043 0   
## 0.2285714 3.145245e-04 0.2234043 0   
## 0.2285714 8.751832e-04 0.2446809 0   
## 0.2285714 2.435249e-03 0.2340426 0   
## 0.2285714 6.776226e-03 0.2234043 0   
## 0.2285714 1.885525e-02 0.2659574 0   
## 0.2285714 5.246586e-02 0.2978723 0   
## 0.3571429 4.062241e-05 0.2234043 0   
## 0.3571429 1.130343e-04 0.2234043 0   
## 0.3571429 3.145245e-04 0.2340426 0   
## 0.3571429 8.751832e-04 0.2553191 0   
## 0.3571429 2.435249e-03 0.2127660 0   
## 0.3571429 6.776226e-03 0.2340426 0   
## 0.3571429 1.885525e-02 0.3085106 0   
## 0.3571429 5.246586e-02 0.2765957 0   
## 0.4857143 4.062241e-05 0.2234043 0   
## 0.4857143 1.130343e-04 0.2127660 0   
## 0.4857143 3.145245e-04 0.2234043 0   
## 0.4857143 8.751832e-04 0.2553191 0   
## 0.4857143 2.435249e-03 0.2340426 0   
## 0.4857143 6.776226e-03 0.2446809 0   
## 0.4857143 1.885525e-02 0.3191489 0   
## 0.4857143 5.246586e-02 0.3297872 0   
## 0.6142857 4.062241e-05 0.2127660 0   
## 0.6142857 1.130343e-04 0.2127660 0   
## 0.6142857 3.145245e-04 0.2340426 0   
## 0.6142857 8.751832e-04 0.2446809 0   
## 0.6142857 2.435249e-03 0.2446809 0   
## 0.6142857 6.776226e-03 0.2446809 0   
## 0.6142857 1.885525e-02 0.3191489 0   
## 0.6142857 5.246586e-02 0.3617021 0   
## 0.7428571 4.062241e-05 0.2340426 0   
## 0.7428571 1.130343e-04 0.2234043 0   
## 0.7428571 3.145245e-04 0.2234043 0   
## 0.7428571 8.751832e-04 0.2446809 0   
## 0.7428571 2.435249e-03 0.2446809 0   
## 0.7428571 6.776226e-03 0.2659574 0   
## 0.7428571 1.885525e-02 0.3191489 0   
## 0.7428571 5.246586e-02 0.3191489 0   
## 0.8714286 4.062241e-05 0.2340426 0   
## 0.8714286 1.130343e-04 0.2340426 0   
## 0.8714286 3.145245e-04 0.2340426 0   
## 0.8714286 8.751832e-04 0.2446809 0   
## 0.8714286 2.435249e-03 0.2446809 0   
## 0.8714286 6.776226e-03 0.2659574 0   
## 0.8714286 1.885525e-02 0.3297872 0   
## 0.8714286 5.246586e-02 0.3085106 0   
## 1.0000000 4.062241e-05 0.2446809 0   
## 1.0000000 1.130343e-04 0.2553191 0   
## 1.0000000 3.145245e-04 0.2553191 0   
## 1.0000000 8.751832e-04 0.2446809 0   
## 1.0000000 2.435249e-03 0.2659574 0   
## 1.0000000 6.776226e-03 0.2765957 0   
## 1.0000000 1.885525e-02 0.3191489 0   
## 1.0000000 5.246586e-02 0.3191489 0   
##   
## Kappa was used to select the optimal model using the largest value.  
## The final values used for the model were alpha = 0.1 and lambda = 0.05246586.

## Warning in nominalTrainWorkflow(x = x, y = y, wts = weights, info = trainInfo,  
## : There were missing values in resampled performance measures.

## Bagged CART   
##   
## 240 samples  
## 86 predictor  
## 4 classes: 'LARGE\_DOWN', 'LARGE\_UP', 'SMALL\_DOWN', 'SMALL\_UP'   
##   
## No pre-processing  
## Resampling: Rolling Forecasting Origin Resampling (1 held-out with a fixed window)   
## Summary of sample sizes: 146, 146, 146, 146, 146, 146, ...   
## Resampling results:  
##   
## Accuracy Kappa  
## 0.2978723 0

## Warning in nominalTrainWorkflow(x = x, y = y, wts = weights, info = trainInfo,  
## : There were missing values in resampled performance measures.

## Support Vector Machines with Linear Kernel   
##   
## 240 samples  
## 86 predictor  
## 4 classes: 'LARGE\_DOWN', 'LARGE\_UP', 'SMALL\_DOWN', 'SMALL\_UP'   
##   
## No pre-processing  
## Resampling: Rolling Forecasting Origin Resampling (1 held-out with a fixed window)   
## Summary of sample sizes: 146, 146, 146, 146, 146, 146, ...   
## Resampling results:  
##   
## Accuracy Kappa  
## 0.2978723 0   
##   
## Tuning parameter 'C' was held constant at a value of 1

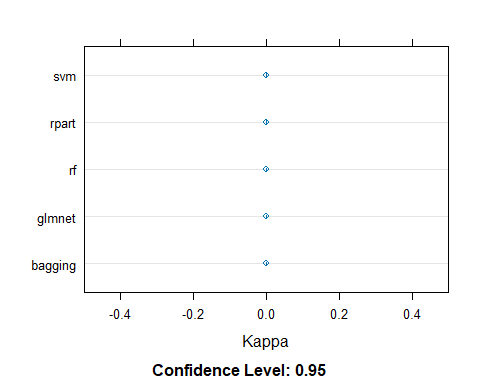
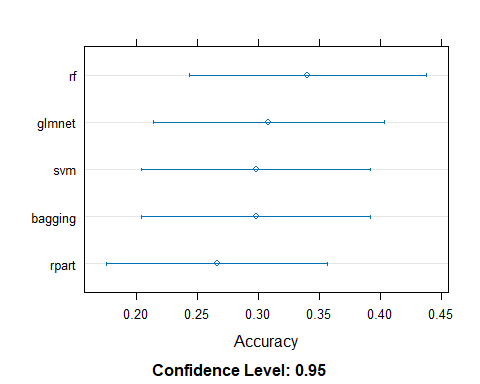
## Warning in nominalTrainWorkflow(x = x, y = y, wts = weights, info = trainInfo,  
## : There were missing values in resampled performance measures.

## CART   
##   
## 240 samples  
## 86 predictor  
## 4 classes: 'LARGE\_DOWN', 'LARGE\_UP', 'SMALL\_DOWN', 'SMALL\_UP'   
##   
## No pre-processing  
## Resampling: Rolling Forecasting Origin Resampling (1 held-out with a fixed window)   
## Summary of sample sizes: 146, 146, 146, 146, 146, 146, ...   
## Resampling results across tuning parameters:  
##   
## cp Accuracy Kappa  
## 0.00000000 0.3085106 0   
## 0.00591716 0.3085106 0   
## 0.01775148 0.2978723 0   
## 0.01972387 0.2978723 0   
## 0.02071006 0.2978723 0   
## 0.03550296 0.2765957 0   
## 0.03846154 0.2553191 0   
## 0.10059172 0.2659574 0   
##   
## Kappa was used to select the optimal model using the largest value.  
## The final value used for the model was cp = 0.1005917.

## Warning in nominalTrainWorkflow(x = x, y = y, wts = weights, info = trainInfo,  
## : There were missing values in resampled performance measures.

## Random Forest   
##   
## 240 samples  
## 86 predictor  
## 4 classes: 'LARGE\_DOWN', 'LARGE\_UP', 'SMALL\_DOWN', 'SMALL\_UP'   
##   
## No pre-processing  
## Resampling: Rolling Forecasting Origin Resampling (1 held-out with a fixed window)   
## Summary of sample sizes: 146, 146, 146, 146, 146, 146, ...   
## Resampling results across tuning parameters:  
##   
## mtry Accuracy Kappa  
## 2 0.3404255 0   
## 22 0.3085106 0   
## 42 0.2978723 0   
## 62 0.2978723 0   
## 82 0.3085106 0   
## 102 0.2659574 0   
## 122 0.3191489 0   
## 143 0.3085106 0   
##   
## Kappa was used to select the optimal model using the largest value.  
## The final value used for the model was mtry = 2.

##   
## Call:  
## summary.resamples(object = resamps)  
##   
## Models: glmnet, rpart, rf, bagging, svm   
## Number of resamples: 94   
##   
## Accuracy   
## Min. 1st Qu. Median Mean 3rd Qu. Max. NA's  
## glmnet 0 0 0 0.3085106 1 1 0  
## rpart 0 0 0 0.2659574 1 1 0  
## rf 0 0 0 0.3404255 1 1 0  
## bagging 0 0 0 0.2978723 1 1 0  
## svm 0 0 0 0.2978723 1 1 0  
##   
## Kappa   
## Min. 1st Qu. Median Mean 3rd Qu. Max. NA's  
## glmnet 0 0 0 0 0 0 29  
## rpart 0 0 0 0 0 0 25  
## rf 0 0 0 0 0 0 32  
## bagging 0 0 0 0 0 0 28  
## svm 0 0 0 0 0 0 28



## Warning in nominalTrainWorkflow(x = x, y = y, wts = weights, info = trainInfo,  
## : There were missing values in resampled performance measures.

## Warning: from glmnet C++ code (error code -99); Convergence for 99th lambda  
## value not reached after maxit=100000 iterations; solutions for larger lambdas  
## returned

## glmnet   
##   
## 240 samples  
## 86 predictor  
## 4 classes: 'LARGE\_DOWN', 'LARGE\_UP', 'SMALL\_DOWN', 'SMALL\_UP'   
##   
## No pre-processing  
## Resampling: Rolling Forecasting Origin Resampling (1 held-out with a fixed window)   
## Summary of sample sizes: 146, 146, 146, 146, 146, 146, ...   
## Resampling results across tuning parameters:  
##   
## alpha lambda Accuracy Kappa  
## 0.1000000 4.062241e-05 0.2234043 0   
## 0.1000000 1.130343e-04 0.2127660 0   
## 0.1000000 3.145245e-04 0.2234043 0   
## 0.1000000 8.751832e-04 0.2340426 0   
## 0.1000000 2.435249e-03 0.2340426 0   
## 0.1000000 6.776226e-03 0.2340426 0   
## 0.1000000 1.885525e-02 0.2553191 0   
## 0.1000000 5.246586e-02 0.3085106 0   
## 0.2285714 4.062241e-05 0.2234043 0   
## 0.2285714 1.130343e-04 0.2234043 0   
## 0.2285714 3.145245e-04 0.2234043 0   
## 0.2285714 8.751832e-04 0.2446809 0   
## 0.2285714 2.435249e-03 0.2340426 0   
## 0.2285714 6.776226e-03 0.2234043 0   
## 0.2285714 1.885525e-02 0.2659574 0   
## 0.2285714 5.246586e-02 0.2978723 0   
## 0.3571429 4.062241e-05 0.2234043 0   
## 0.3571429 1.130343e-04 0.2234043 0   
## 0.3571429 3.145245e-04 0.2340426 0   
## 0.3571429 8.751832e-04 0.2553191 0   
## 0.3571429 2.435249e-03 0.2127660 0   
## 0.3571429 6.776226e-03 0.2340426 0   
## 0.3571429 1.885525e-02 0.3085106 0   
## 0.3571429 5.246586e-02 0.2765957 0   
## 0.4857143 4.062241e-05 0.2234043 0   
## 0.4857143 1.130343e-04 0.2127660 0   
## 0.4857143 3.145245e-04 0.2234043 0   
## 0.4857143 8.751832e-04 0.2553191 0   
## 0.4857143 2.435249e-03 0.2340426 0   
## 0.4857143 6.776226e-03 0.2446809 0   
## 0.4857143 1.885525e-02 0.3191489 0   
## 0.4857143 5.246586e-02 0.3297872 0   
## 0.6142857 4.062241e-05 0.2127660 0   
## 0.6142857 1.130343e-04 0.2127660 0   
## 0.6142857 3.145245e-04 0.2340426 0   
## 0.6142857 8.751832e-04 0.2446809 0   
## 0.6142857 2.435249e-03 0.2446809 0   
## 0.6142857 6.776226e-03 0.2446809 0   
## 0.6142857 1.885525e-02 0.3191489 0   
## 0.6142857 5.246586e-02 0.3617021 0   
## 0.7428571 4.062241e-05 0.2340426 0   
## 0.7428571 1.130343e-04 0.2234043 0   
## 0.7428571 3.145245e-04 0.2234043 0   
## 0.7428571 8.751832e-04 0.2446809 0   
## 0.7428571 2.435249e-03 0.2446809 0   
## 0.7428571 6.776226e-03 0.2659574 0   
## 0.7428571 1.885525e-02 0.3191489 0   
## 0.7428571 5.246586e-02 0.3191489 0   
## 0.8714286 4.062241e-05 0.2340426 0   
## 0.8714286 1.130343e-04 0.2340426 0   
## 0.8714286 3.145245e-04 0.2340426 0   
## 0.8714286 8.751832e-04 0.2446809 0   
## 0.8714286 2.435249e-03 0.2446809 0   
## 0.8714286 6.776226e-03 0.2659574 0   
## 0.8714286 1.885525e-02 0.3297872 0   
## 0.8714286 5.246586e-02 0.3085106 0   
## 1.0000000 4.062241e-05 0.2446809 0   
## 1.0000000 1.130343e-04 0.2553191 0   
## 1.0000000 3.145245e-04 0.2553191 0   
## 1.0000000 8.751832e-04 0.2446809 0   
## 1.0000000 2.435249e-03 0.2659574 0   
## 1.0000000 6.776226e-03 0.2765957 0   
## 1.0000000 1.885525e-02 0.3191489 0   
## 1.0000000 5.246586e-02 0.3191489 0   
##   
## Accuracy was used to select the optimal model using the largest value.  
## The final values used for the model were alpha = 0.6142857 and lambda  
## = 0.05246586.

## Warning in nominalTrainWorkflow(x = x, y = y, wts = weights, info = trainInfo,  
## : There were missing values in resampled performance measures.

## Bagged CART   
##   
## 240 samples  
## 86 predictor  
## 4 classes: 'LARGE\_DOWN', 'LARGE\_UP', 'SMALL\_DOWN', 'SMALL\_UP'   
##   
## No pre-processing  
## Resampling: Rolling Forecasting Origin Resampling (1 held-out with a fixed window)   
## Summary of sample sizes: 146, 146, 146, 146, 146, 146, ...   
## Resampling results:  
##   
## Accuracy Kappa  
## 0.2978723 0

## Warning in nominalTrainWorkflow(x = x, y = y, wts = weights, info = trainInfo,  
## : There were missing values in resampled performance measures.

## Support Vector Machines with Linear Kernel   
##   
## 240 samples  
## 86 predictor  
## 4 classes: 'LARGE\_DOWN', 'LARGE\_UP', 'SMALL\_DOWN', 'SMALL\_UP'   
##   
## No pre-processing  
## Resampling: Rolling Forecasting Origin Resampling (1 held-out with a fixed window)   
## Summary of sample sizes: 146, 146, 146, 146, 146, 146, ...   
## Resampling results:  
##   
## Accuracy Kappa  
## 0.2978723 0   
##   
## Tuning parameter 'C' was held constant at a value of 1

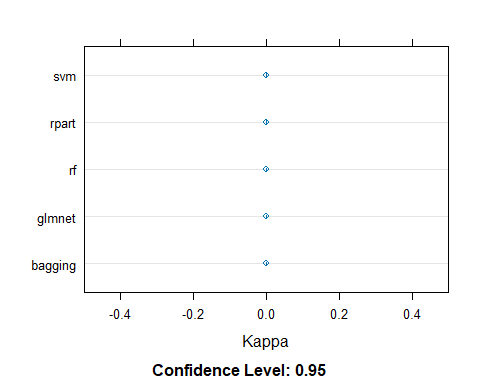
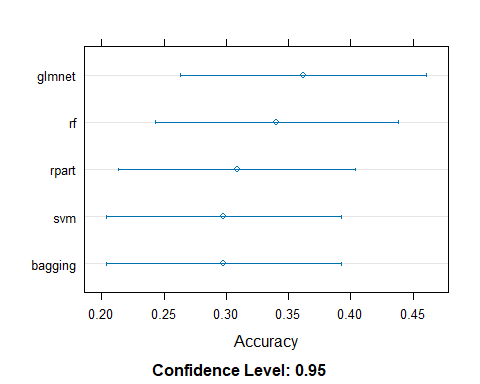
## Warning in nominalTrainWorkflow(x = x, y = y, wts = weights, info = trainInfo,  
## : There were missing values in resampled performance measures.

## CART   
##   
## 240 samples  
## 86 predictor  
## 4 classes: 'LARGE\_DOWN', 'LARGE\_UP', 'SMALL\_DOWN', 'SMALL\_UP'   
##   
## No pre-processing  
## Resampling: Rolling Forecasting Origin Resampling (1 held-out with a fixed window)   
## Summary of sample sizes: 146, 146, 146, 146, 146, 146, ...   
## Resampling results across tuning parameters:  
##   
## cp Accuracy Kappa  
## 0.00000000 0.3085106 0   
## 0.00591716 0.3085106 0   
## 0.01775148 0.2978723 0   
## 0.01972387 0.2978723 0   
## 0.02071006 0.2978723 0   
## 0.03550296 0.2765957 0   
## 0.03846154 0.2553191 0   
## 0.10059172 0.2659574 0   
##   
## Accuracy was used to select the optimal model using the largest value.  
## The final value used for the model was cp = 0.00591716.

## Warning in nominalTrainWorkflow(x = x, y = y, wts = weights, info = trainInfo,  
## : There were missing values in resampled performance measures.

## Random Forest   
##   
## 240 samples  
## 86 predictor  
## 4 classes: 'LARGE\_DOWN', 'LARGE\_UP', 'SMALL\_DOWN', 'SMALL\_UP'   
##   
## No pre-processing  
## Resampling: Rolling Forecasting Origin Resampling (1 held-out with a fixed window)   
## Summary of sample sizes: 146, 146, 146, 146, 146, 146, ...   
## Resampling results across tuning parameters:  
##   
## mtry Accuracy Kappa  
## 2 0.3404255 0   
## 22 0.3085106 0   
## 42 0.2978723 0   
## 62 0.2978723 0   
## 82 0.3085106 0   
## 102 0.2659574 0   
## 122 0.3191489 0   
## 143 0.3085106 0   
##   
## Accuracy was used to select the optimal model using the largest value.  
## The final value used for the model was mtry = 2.

##   
## Call:  
## summary.resamples(object = resamps)  
##   
## Models: glmnet, rpart, rf, bagging, svm   
## Number of resamples: 94   
##   
## Accuracy   
## Min. 1st Qu. Median Mean 3rd Qu. Max. NA's  
## glmnet 0 0 0 0.3617021 1 1 0  
## rpart 0 0 0 0.3085106 1 1 0  
## rf 0 0 0 0.3404255 1 1 0  
## bagging 0 0 0 0.2978723 1 1 0  
## svm 0 0 0 0.2978723 1 1 0  
##   
## Kappa   
## Min. 1st Qu. Median Mean 3rd Qu. Max. NA's  
## glmnet 0 0 0 0 0 0 34  
## rpart 0 0 0 0 0 0 29  
## rf 0 0 0 0 0 0 32  
## bagging 0 0 0 0 0 0 28  
## svm 0 0 0 0 0 0 28

 ## Brazil TTR fixed five step

## Warning: from glmnet C++ code (error code -81); Convergence for 81th lambda  
## value not reached after maxit=100000 iterations; solutions for larger lambdas  
## returned

## glmnet   
##   
## 240 samples  
## 86 predictor  
## 4 classes: 'LARGE\_DOWN', 'LARGE\_UP', 'SMALL\_DOWN', 'SMALL\_UP'   
##   
## No pre-processing  
## Resampling: Rolling Forecasting Origin Resampling (5 held-out with a fixed window)   
## Summary of sample sizes: 146, 146, 146, 146, 146, 146, ...   
## Resampling results across tuning parameters:  
##   
## alpha lambda Accuracy Kappa   
## 0.1000000 4.062241e-05 0.2044444 0.0300818617  
## 0.1000000 1.130343e-04 0.2022222 0.0264878071  
## 0.1000000 3.145245e-04 0.2133333 0.0328119933  
## 0.1000000 8.751832e-04 0.2266667 0.0400804929  
## 0.1000000 2.435249e-03 0.2266667 0.0319201812  
## 0.1000000 6.776226e-03 0.2266667 0.0257791763  
## 0.1000000 1.885525e-02 0.2400000 0.0311423716  
## 0.1000000 5.246586e-02 0.2644444 0.0396483376  
## 0.2285714 4.062241e-05 0.1911111 0.0191717361  
## 0.2285714 1.130343e-04 0.2000000 0.0233805018  
## 0.2285714 3.145245e-04 0.2177778 0.0410223317  
## 0.2285714 8.751832e-04 0.2266667 0.0381882412  
## 0.2285714 2.435249e-03 0.2288889 0.0321130796  
## 0.2285714 6.776226e-03 0.2222222 0.0143894028  
## 0.2285714 1.885525e-02 0.2488889 0.0331765537  
## 0.2285714 5.246586e-02 0.2822222 0.0459636724  
## 0.3571429 4.062241e-05 0.1955556 0.0249972548  
## 0.3571429 1.130343e-04 0.1977778 0.0222637052  
## 0.3571429 3.145245e-04 0.2177778 0.0431657901  
## 0.3571429 8.751832e-04 0.2266667 0.0365006350  
## 0.3571429 2.435249e-03 0.2333333 0.0396969102  
## 0.3571429 6.776226e-03 0.2244444 0.0184245507  
## 0.3571429 1.885525e-02 0.2622222 0.0421682499  
## 0.3571429 5.246586e-02 0.2822222 0.0324981537  
## 0.4857143 4.062241e-05 0.1977778 0.0261567817  
## 0.4857143 1.130343e-04 0.1977778 0.0257642123  
## 0.4857143 3.145245e-04 0.2155556 0.0405359468  
## 0.4857143 8.751832e-04 0.2333333 0.0475812399  
## 0.4857143 2.435249e-03 0.2311111 0.0328286261  
## 0.4857143 6.776226e-03 0.2333333 0.0227555538  
## 0.4857143 1.885525e-02 0.2755556 0.0525042282  
## 0.4857143 5.246586e-02 0.2955556 0.0387671767  
## 0.6142857 4.062241e-05 0.2022222 0.0359288524  
## 0.6142857 1.130343e-04 0.2044444 0.0339172936  
## 0.6142857 3.145245e-04 0.2177778 0.0417115739  
## 0.6142857 8.751832e-04 0.2288889 0.0411179725  
## 0.6142857 2.435249e-03 0.2355556 0.0428446356  
## 0.6142857 6.776226e-03 0.2488889 0.0427741453  
## 0.6142857 1.885525e-02 0.2733333 0.0453051285  
## 0.6142857 5.246586e-02 0.3000000 0.0305513008  
## 0.7428571 4.062241e-05 0.2066667 0.0386167590  
## 0.7428571 1.130343e-04 0.2066667 0.0374214770  
## 0.7428571 3.145245e-04 0.2088889 0.0323539770  
## 0.7428571 8.751832e-04 0.2288889 0.0440867872  
## 0.7428571 2.435249e-03 0.2422222 0.0479721057  
## 0.7428571 6.776226e-03 0.2555556 0.0464957681  
## 0.7428571 1.885525e-02 0.2844444 0.0537717994  
## 0.7428571 5.246586e-02 0.2888889 -0.0008783945  
## 0.8714286 4.062241e-05 0.2133333 0.0420797381  
## 0.8714286 1.130343e-04 0.2088889 0.0368238832  
## 0.8714286 3.145245e-04 0.2111111 0.0347412570  
## 0.8714286 8.751832e-04 0.2244444 0.0369018325  
## 0.8714286 2.435249e-03 0.2488889 0.0531341239  
## 0.8714286 6.776226e-03 0.2533333 0.0455883208  
## 0.8714286 1.885525e-02 0.2933333 0.0639545305  
## 0.8714286 5.246586e-02 0.2844444 -0.0108625400  
## 1.0000000 4.062241e-05 0.2200000 0.0356166775  
## 1.0000000 1.130343e-04 0.2244444 0.0419650803  
## 1.0000000 3.145245e-04 0.2266667 0.0444491600  
## 1.0000000 8.751832e-04 0.2333333 0.0511493388  
## 1.0000000 2.435249e-03 0.2533333 0.0555195766  
## 1.0000000 6.776226e-03 0.2488889 0.0353473323  
## 1.0000000 1.885525e-02 0.2933333 0.0626961156  
## 1.0000000 5.246586e-02 0.2933333 -0.0006688755  
##   
## Kappa was used to select the optimal model using the largest value.  
## The final values used for the model were alpha = 0.8714286 and lambda  
## = 0.01885525.

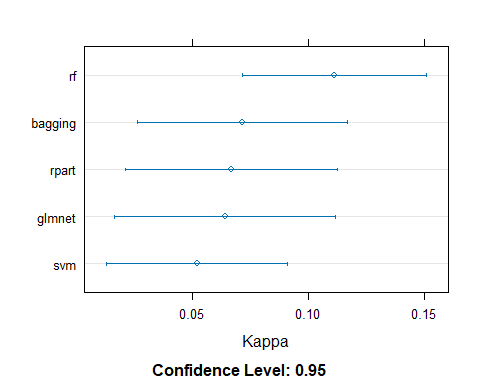
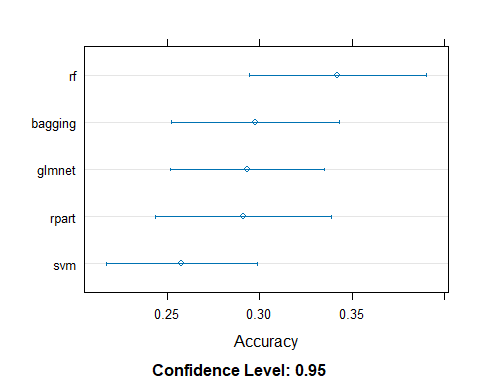
## Bagged CART   
##   
## 240 samples  
## 86 predictor  
## 4 classes: 'LARGE\_DOWN', 'LARGE\_UP', 'SMALL\_DOWN', 'SMALL\_UP'   
##   
## No pre-processing  
## Resampling: Rolling Forecasting Origin Resampling (5 held-out with a fixed window)   
## Summary of sample sizes: 146, 146, 146, 146, 146, 146, ...   
## Resampling results:  
##   
## Accuracy Kappa   
## 0.2977778 0.07143221

## Support Vector Machines with Linear Kernel   
##   
## 240 samples  
## 86 predictor  
## 4 classes: 'LARGE\_DOWN', 'LARGE\_UP', 'SMALL\_DOWN', 'SMALL\_UP'   
##   
## No pre-processing  
## Resampling: Rolling Forecasting Origin Resampling (5 held-out with a fixed window)   
## Summary of sample sizes: 146, 146, 146, 146, 146, 146, ...   
## Resampling results:  
##   
## Accuracy Kappa   
## 0.2577778 0.05183341  
##   
## Tuning parameter 'C' was held constant at a value of 1

## CART   
##   
## 240 samples  
## 86 predictor  
## 4 classes: 'LARGE\_DOWN', 'LARGE\_UP', 'SMALL\_DOWN', 'SMALL\_UP'   
##   
## No pre-processing  
## Resampling: Rolling Forecasting Origin Resampling (5 held-out with a fixed window)   
## Summary of sample sizes: 146, 146, 146, 146, 146, 146, ...   
## Resampling results across tuning parameters:  
##   
## cp Accuracy Kappa   
## 0.00000000 0.2800000 0.04454110  
## 0.00591716 0.2800000 0.04454110  
## 0.01775148 0.2800000 0.04525286  
## 0.01972387 0.2800000 0.04525286  
## 0.02071006 0.2911111 0.06661359  
## 0.03550296 0.2600000 0.05014717  
## 0.03846154 0.2333333 0.04652399  
## 0.10059172 0.2577778 0.01391326  
##   
## Kappa was used to select the optimal model using the largest value.  
## The final value used for the model was cp = 0.02071006.

## Random Forest   
##   
## 240 samples  
## 86 predictor  
## 4 classes: 'LARGE\_DOWN', 'LARGE\_UP', 'SMALL\_DOWN', 'SMALL\_UP'   
##   
## No pre-processing  
## Resampling: Rolling Forecasting Origin Resampling (5 held-out with a fixed window)   
## Summary of sample sizes: 146, 146, 146, 146, 146, 146, ...   
## Resampling results across tuning parameters:  
##   
## mtry Accuracy Kappa   
## 2 0.3400000 0.08299142  
## 22 0.3222222 0.08231809  
## 42 0.3422222 0.11122422  
## 62 0.3266667 0.08797730  
## 82 0.3088889 0.06887099  
## 102 0.3377778 0.10658831  
## 122 0.3200000 0.08161663  
## 143 0.3177778 0.08063095  
##   
## Kappa was used to select the optimal model using the largest value.  
## The final value used for the model was mtry = 42.

##   
## Call:  
## summary.resamples(object = resamps)  
##   
## Models: glmnet, rpart, rf, bagging, svm   
## Number of resamples: 90   
##   
## Accuracy   
## Min. 1st Qu. Median Mean 3rd Qu. Max. NA's  
## glmnet 0 0.2 0.2 0.2933333 0.40 1.0 0  
## rpart 0 0.2 0.2 0.2911111 0.40 0.8 0  
## rf 0 0.2 0.4 0.3422222 0.55 0.8 0  
## bagging 0 0.2 0.2 0.2977778 0.40 0.8 0  
## svm 0 0.2 0.2 0.2577778 0.40 0.8 0  
##   
## Kappa   
## Min. 1st Qu. Median Mean 3rd Qu. Max. NA's  
## glmnet -0.5625000 0.00000000 0.04761905 0.06395453 0.1666667 1.0000000 0  
## rpart -0.4705882 -0.05263158 0.00000000 0.06661359 0.1576087 0.7222222 0  
## rf -0.2500000 0.00000000 0.05505952 0.11122422 0.2105263 0.7058824 0  
## bagging -0.5625000 -0.04989035 0.04761905 0.07143221 0.2105263 0.6875000 0  
## svm -0.4285714 -0.06672932 0.00000000 0.05183341 0.1666667 0.5454545 0



## Warning: from glmnet C++ code (error code -99); Convergence for 99th lambda  
## value not reached after maxit=100000 iterations; solutions for larger lambdas  
## returned

## glmnet   
##   
## 240 samples  
## 86 predictor  
## 4 classes: 'LARGE\_DOWN', 'LARGE\_UP', 'SMALL\_DOWN', 'SMALL\_UP'   
##   
## No pre-processing  
## Resampling: Rolling Forecasting Origin Resampling (5 held-out with a fixed window)   
## Summary of sample sizes: 146, 146, 146, 146, 146, 146, ...   
## Resampling results across tuning parameters:  
##   
## alpha lambda Accuracy Kappa   
## 0.1000000 4.062241e-05 0.2044444 0.0300818617  
## 0.1000000 1.130343e-04 0.2022222 0.0264878071  
## 0.1000000 3.145245e-04 0.2133333 0.0328119933  
## 0.1000000 8.751832e-04 0.2266667 0.0400804929  
## 0.1000000 2.435249e-03 0.2266667 0.0319201812  
## 0.1000000 6.776226e-03 0.2266667 0.0257791763  
## 0.1000000 1.885525e-02 0.2400000 0.0311423716  
## 0.1000000 5.246586e-02 0.2644444 0.0396483376  
## 0.2285714 4.062241e-05 0.1911111 0.0191717361  
## 0.2285714 1.130343e-04 0.2000000 0.0233805018  
## 0.2285714 3.145245e-04 0.2177778 0.0410223317  
## 0.2285714 8.751832e-04 0.2266667 0.0381882412  
## 0.2285714 2.435249e-03 0.2288889 0.0321130796  
## 0.2285714 6.776226e-03 0.2222222 0.0143894028  
## 0.2285714 1.885525e-02 0.2488889 0.0331765537  
## 0.2285714 5.246586e-02 0.2822222 0.0459636724  
## 0.3571429 4.062241e-05 0.1955556 0.0249972548  
## 0.3571429 1.130343e-04 0.1977778 0.0222637052  
## 0.3571429 3.145245e-04 0.2177778 0.0431657901  
## 0.3571429 8.751832e-04 0.2266667 0.0365006350  
## 0.3571429 2.435249e-03 0.2333333 0.0396969102  
## 0.3571429 6.776226e-03 0.2244444 0.0184245507  
## 0.3571429 1.885525e-02 0.2622222 0.0421682499  
## 0.3571429 5.246586e-02 0.2822222 0.0324981537  
## 0.4857143 4.062241e-05 0.1977778 0.0261567817  
## 0.4857143 1.130343e-04 0.1977778 0.0257642123  
## 0.4857143 3.145245e-04 0.2155556 0.0405359468  
## 0.4857143 8.751832e-04 0.2333333 0.0475812399  
## 0.4857143 2.435249e-03 0.2311111 0.0328286261  
## 0.4857143 6.776226e-03 0.2333333 0.0227555538  
## 0.4857143 1.885525e-02 0.2755556 0.0525042282  
## 0.4857143 5.246586e-02 0.2955556 0.0387671767  
## 0.6142857 4.062241e-05 0.2022222 0.0359288524  
## 0.6142857 1.130343e-04 0.2044444 0.0339172936  
## 0.6142857 3.145245e-04 0.2177778 0.0417115739  
## 0.6142857 8.751832e-04 0.2288889 0.0411179725  
## 0.6142857 2.435249e-03 0.2355556 0.0428446356  
## 0.6142857 6.776226e-03 0.2488889 0.0427741453  
## 0.6142857 1.885525e-02 0.2733333 0.0453051285  
## 0.6142857 5.246586e-02 0.3000000 0.0305513008  
## 0.7428571 4.062241e-05 0.2066667 0.0386167590  
## 0.7428571 1.130343e-04 0.2066667 0.0374214770  
## 0.7428571 3.145245e-04 0.2088889 0.0323539770  
## 0.7428571 8.751832e-04 0.2288889 0.0440867872  
## 0.7428571 2.435249e-03 0.2422222 0.0479721057  
## 0.7428571 6.776226e-03 0.2555556 0.0464957681  
## 0.7428571 1.885525e-02 0.2844444 0.0537717994  
## 0.7428571 5.246586e-02 0.2888889 -0.0008783945  
## 0.8714286 4.062241e-05 0.2133333 0.0420797381  
## 0.8714286 1.130343e-04 0.2088889 0.0368238832  
## 0.8714286 3.145245e-04 0.2111111 0.0347412570  
## 0.8714286 8.751832e-04 0.2244444 0.0369018325  
## 0.8714286 2.435249e-03 0.2488889 0.0531341239  
## 0.8714286 6.776226e-03 0.2533333 0.0455883208  
## 0.8714286 1.885525e-02 0.2933333 0.0639545305  
## 0.8714286 5.246586e-02 0.2844444 -0.0108625400  
## 1.0000000 4.062241e-05 0.2200000 0.0356166775  
## 1.0000000 1.130343e-04 0.2244444 0.0419650803  
## 1.0000000 3.145245e-04 0.2266667 0.0444491600  
## 1.0000000 8.751832e-04 0.2333333 0.0511493388  
## 1.0000000 2.435249e-03 0.2533333 0.0555195766  
## 1.0000000 6.776226e-03 0.2488889 0.0353473323  
## 1.0000000 1.885525e-02 0.2933333 0.0626961156  
## 1.0000000 5.246586e-02 0.2933333 -0.0006688755  
##   
## Accuracy was used to select the optimal model using the largest value.  
## The final values used for the model were alpha = 0.6142857 and lambda  
## = 0.05246586.

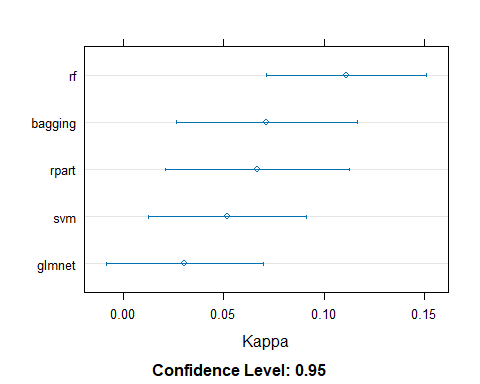
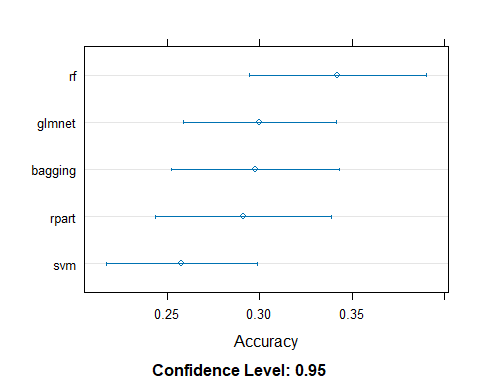
## Bagged CART   
##   
## 240 samples  
## 86 predictor  
## 4 classes: 'LARGE\_DOWN', 'LARGE\_UP', 'SMALL\_DOWN', 'SMALL\_UP'   
##   
## No pre-processing  
## Resampling: Rolling Forecasting Origin Resampling (5 held-out with a fixed window)   
## Summary of sample sizes: 146, 146, 146, 146, 146, 146, ...   
## Resampling results:  
##   
## Accuracy Kappa   
## 0.2977778 0.07143221

## Support Vector Machines with Linear Kernel   
##   
## 240 samples  
## 86 predictor  
## 4 classes: 'LARGE\_DOWN', 'LARGE\_UP', 'SMALL\_DOWN', 'SMALL\_UP'   
##   
## No pre-processing  
## Resampling: Rolling Forecasting Origin Resampling (5 held-out with a fixed window)   
## Summary of sample sizes: 146, 146, 146, 146, 146, 146, ...   
## Resampling results:  
##   
## Accuracy Kappa   
## 0.2577778 0.05183341  
##   
## Tuning parameter 'C' was held constant at a value of 1

## CART   
##   
## 240 samples  
## 86 predictor  
## 4 classes: 'LARGE\_DOWN', 'LARGE\_UP', 'SMALL\_DOWN', 'SMALL\_UP'   
##   
## No pre-processing  
## Resampling: Rolling Forecasting Origin Resampling (5 held-out with a fixed window)   
## Summary of sample sizes: 146, 146, 146, 146, 146, 146, ...   
## Resampling results across tuning parameters:  
##   
## cp Accuracy Kappa   
## 0.00000000 0.2800000 0.04454110  
## 0.00591716 0.2800000 0.04454110  
## 0.01775148 0.2800000 0.04525286  
## 0.01972387 0.2800000 0.04525286  
## 0.02071006 0.2911111 0.06661359  
## 0.03550296 0.2600000 0.05014717  
## 0.03846154 0.2333333 0.04652399  
## 0.10059172 0.2577778 0.01391326  
##   
## Accuracy was used to select the optimal model using the largest value.  
## The final value used for the model was cp = 0.02071006.

## Random Forest   
##   
## 240 samples  
## 86 predictor  
## 4 classes: 'LARGE\_DOWN', 'LARGE\_UP', 'SMALL\_DOWN', 'SMALL\_UP'   
##   
## No pre-processing  
## Resampling: Rolling Forecasting Origin Resampling (5 held-out with a fixed window)   
## Summary of sample sizes: 146, 146, 146, 146, 146, 146, ...   
## Resampling results across tuning parameters:  
##   
## mtry Accuracy Kappa   
## 2 0.3400000 0.08299142  
## 22 0.3222222 0.08231809  
## 42 0.3422222 0.11122422  
## 62 0.3266667 0.08797730  
## 82 0.3088889 0.06887099  
## 102 0.3377778 0.10658831  
## 122 0.3200000 0.08161663  
## 143 0.3177778 0.08063095  
##   
## Accuracy was used to select the optimal model using the largest value.  
## The final value used for the model was mtry = 42.

##   
## Call:  
## summary.resamples(object = resamps)  
##   
## Models: glmnet, rpart, rf, bagging, svm   
## Number of resamples: 90   
##   
## Accuracy   
## Min. 1st Qu. Median Mean 3rd Qu. Max. NA's  
## glmnet 0 0.2 0.2 0.3000000 0.40 0.8 0  
## rpart 0 0.2 0.2 0.2911111 0.40 0.8 0  
## rf 0 0.2 0.4 0.3422222 0.55 0.8 0  
## bagging 0 0.2 0.2 0.2977778 0.40 0.8 0  
## svm 0 0.2 0.2 0.2577778 0.40 0.8 0  
##   
## Kappa   
## Min. 1st Qu. Median Mean 3rd Qu. Max. NA's  
## glmnet -0.5625000 0.00000000 0.00000000 0.03055130 0.0625000 0.7058824 0  
## rpart -0.4705882 -0.05263158 0.00000000 0.06661359 0.1576087 0.7222222 0  
## rf -0.2500000 0.00000000 0.05505952 0.11122422 0.2105263 0.7058824 0  
## bagging -0.5625000 -0.04989035 0.04761905 0.07143221 0.2105263 0.6875000 0  
## svm -0.4285714 -0.06672932 0.00000000 0.05183341 0.1666667 0.5454545 0

 # Brazil TTR non-fixed window 1 step

## Warning in nominalTrainWorkflow(x = x, y = y, wts = weights, info = trainInfo,  
## : There were missing values in resampled performance measures.

## glmnet   
##   
## 240 samples  
## 86 predictor  
## 4 classes: 'LARGE\_DOWN', 'LARGE\_UP', 'SMALL\_DOWN', 'SMALL\_UP'   
##   
## No pre-processing  
## Resampling: Rolling Forecasting Origin Resampling (1 held-out with no fixed window)   
## Summary of sample sizes: 146, 147, 148, 149, 150, 151, ...   
## Resampling results across tuning parameters:  
##   
## alpha lambda Accuracy Kappa  
## 0.1000000 4.062241e-05 0.2659574 0   
## 0.1000000 1.130343e-04 0.2765957 0   
## 0.1000000 3.145245e-04 0.2553191 0   
## 0.1000000 8.751832e-04 0.2659574 0   
## 0.1000000 2.435249e-03 0.2446809 0   
## 0.1000000 6.776226e-03 0.2659574 0   
## 0.1000000 1.885525e-02 0.2978723 0   
## 0.1000000 5.246586e-02 0.3085106 0   
## 0.2285714 4.062241e-05 0.2659574 0   
## 0.2285714 1.130343e-04 0.2553191 0   
## 0.2285714 3.145245e-04 0.2446809 0   
## 0.2285714 8.751832e-04 0.2553191 0   
## 0.2285714 2.435249e-03 0.2446809 0   
## 0.2285714 6.776226e-03 0.2553191 0   
## 0.2285714 1.885525e-02 0.2978723 0   
## 0.2285714 5.246586e-02 0.3297872 0   
## 0.3571429 4.062241e-05 0.2553191 0   
## 0.3571429 1.130343e-04 0.2553191 0   
## 0.3571429 3.145245e-04 0.2659574 0   
## 0.3571429 8.751832e-04 0.2446809 0   
## 0.3571429 2.435249e-03 0.2446809 0   
## 0.3571429 6.776226e-03 0.2659574 0   
## 0.3571429 1.885525e-02 0.2872340 0   
## 0.3571429 5.246586e-02 0.3191489 0   
## 0.4857143 4.062241e-05 0.2659574 0   
## 0.4857143 1.130343e-04 0.2659574 0   
## 0.4857143 3.145245e-04 0.2659574 0   
## 0.4857143 8.751832e-04 0.2340426 0   
## 0.4857143 2.435249e-03 0.2234043 0   
## 0.4857143 6.776226e-03 0.2765957 0   
## 0.4857143 1.885525e-02 0.3191489 0   
## 0.4857143 5.246586e-02 0.3510638 0   
## 0.6142857 4.062241e-05 0.2765957 0   
## 0.6142857 1.130343e-04 0.2659574 0   
## 0.6142857 3.145245e-04 0.2659574 0   
## 0.6142857 8.751832e-04 0.2234043 0   
## 0.6142857 2.435249e-03 0.2340426 0   
## 0.6142857 6.776226e-03 0.2765957 0   
## 0.6142857 1.885525e-02 0.3510638 0   
## 0.6142857 5.246586e-02 0.2978723 0   
## 0.7428571 4.062241e-05 0.2765957 0   
## 0.7428571 1.130343e-04 0.2659574 0   
## 0.7428571 3.145245e-04 0.2553191 0   
## 0.7428571 8.751832e-04 0.2234043 0   
## 0.7428571 2.435249e-03 0.2234043 0   
## 0.7428571 6.776226e-03 0.2765957 0   
## 0.7428571 1.885525e-02 0.3404255 0   
## 0.7428571 5.246586e-02 0.3297872 0   
## 0.8714286 4.062241e-05 0.2553191 0   
## 0.8714286 1.130343e-04 0.2553191 0   
## 0.8714286 3.145245e-04 0.2659574 0   
## 0.8714286 8.751832e-04 0.2340426 0   
## 0.8714286 2.435249e-03 0.2234043 0   
## 0.8714286 6.776226e-03 0.2872340 0   
## 0.8714286 1.885525e-02 0.3404255 0   
## 0.8714286 5.246586e-02 0.3404255 0   
## 1.0000000 4.062241e-05 0.2446809 0   
## 1.0000000 1.130343e-04 0.2446809 0   
## 1.0000000 3.145245e-04 0.2234043 0   
## 1.0000000 8.751832e-04 0.2340426 0   
## 1.0000000 2.435249e-03 0.2340426 0   
## 1.0000000 6.776226e-03 0.2659574 0   
## 1.0000000 1.885525e-02 0.3404255 0   
## 1.0000000 5.246586e-02 0.3085106 0   
##   
## Kappa was used to select the optimal model using the largest value.  
## The final values used for the model were alpha = 0.1 and lambda = 0.05246586.

## Warning in nominalTrainWorkflow(x = x, y = y, wts = weights, info = trainInfo,  
## : There were missing values in resampled performance measures.

## Bagged CART   
##   
## 240 samples  
## 86 predictor  
## 4 classes: 'LARGE\_DOWN', 'LARGE\_UP', 'SMALL\_DOWN', 'SMALL\_UP'   
##   
## No pre-processing  
## Resampling: Rolling Forecasting Origin Resampling (1 held-out with no fixed window)   
## Summary of sample sizes: 146, 147, 148, 149, 150, 151, ...   
## Resampling results:  
##   
## Accuracy Kappa  
## 0.3085106 0

## Warning in nominalTrainWorkflow(x = x, y = y, wts = weights, info = trainInfo,  
## : There were missing values in resampled performance measures.

## Support Vector Machines with Linear Kernel   
##   
## 240 samples  
## 86 predictor  
## 4 classes: 'LARGE\_DOWN', 'LARGE\_UP', 'SMALL\_DOWN', 'SMALL\_UP'   
##   
## No pre-processing  
## Resampling: Rolling Forecasting Origin Resampling (1 held-out with no fixed window)   
## Summary of sample sizes: 146, 147, 148, 149, 150, 151, ...   
## Resampling results:  
##   
## Accuracy Kappa  
## 0.2553191 0   
##   
## Tuning parameter 'C' was held constant at a value of 1

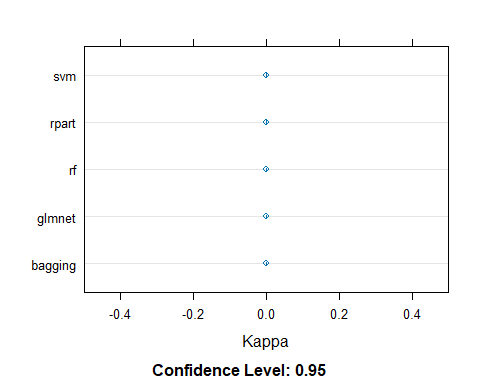
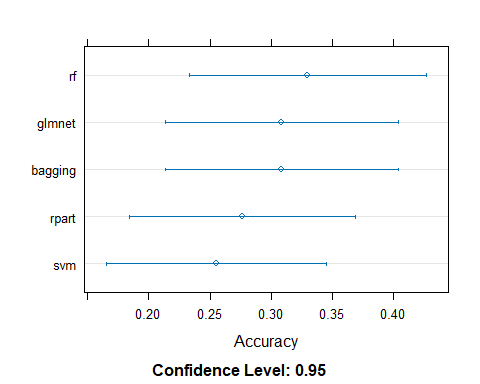
## Warning in nominalTrainWorkflow(x = x, y = y, wts = weights, info = trainInfo,  
## : There were missing values in resampled performance measures.

## CART   
##   
## 240 samples  
## 86 predictor  
## 4 classes: 'LARGE\_DOWN', 'LARGE\_UP', 'SMALL\_DOWN', 'SMALL\_UP'   
##   
## No pre-processing  
## Resampling: Rolling Forecasting Origin Resampling (1 held-out with no fixed window)   
## Summary of sample sizes: 146, 147, 148, 149, 150, 151, ...   
## Resampling results across tuning parameters:  
##   
## cp Accuracy Kappa  
## 0.00000000 0.2659574 0   
## 0.00591716 0.2659574 0   
## 0.01775148 0.2340426 0   
## 0.01972387 0.2446809 0   
## 0.02071006 0.2340426 0   
## 0.03550296 0.2340426 0   
## 0.03846154 0.2340426 0   
## 0.10059172 0.2765957 0   
##   
## Kappa was used to select the optimal model using the largest value.  
## The final value used for the model was cp = 0.1005917.

## Warning in nominalTrainWorkflow(x = x, y = y, wts = weights, info = trainInfo,  
## : There were missing values in resampled performance measures.

## Random Forest   
##   
## 240 samples  
## 86 predictor  
## 4 classes: 'LARGE\_DOWN', 'LARGE\_UP', 'SMALL\_DOWN', 'SMALL\_UP'   
##   
## No pre-processing  
## Resampling: Rolling Forecasting Origin Resampling (1 held-out with no fixed window)   
## Summary of sample sizes: 146, 147, 148, 149, 150, 151, ...   
## Resampling results across tuning parameters:  
##   
## mtry Accuracy Kappa  
## 2 0.3297872 0   
## 22 0.3085106 0   
## 42 0.3617021 0   
## 62 0.2765957 0   
## 82 0.3404255 0   
## 102 0.3404255 0   
## 122 0.3297872 0   
## 143 0.3191489 0   
##   
## Kappa was used to select the optimal model using the largest value.  
## The final value used for the model was mtry = 2.

##   
## Call:  
## summary.resamples(object = resamps)  
##   
## Models: glmnet, rpart, rf, bagging, svm   
## Number of resamples: 94   
##   
## Accuracy   
## Min. 1st Qu. Median Mean 3rd Qu. Max. NA's  
## glmnet 0 0 0 0.3085106 1.00 1 0  
## rpart 0 0 0 0.2765957 1.00 1 0  
## rf 0 0 0 0.3297872 1.00 1 0  
## bagging 0 0 0 0.3085106 1.00 1 0  
## svm 0 0 0 0.2553191 0.75 1 0  
##   
## Kappa   
## Min. 1st Qu. Median Mean 3rd Qu. Max. NA's  
## glmnet 0 0 0 0 0 0 29  
## rpart 0 0 0 0 0 0 26  
## rf 0 0 0 0 0 0 31  
## bagging 0 0 0 0 0 0 29  
## svm 0 0 0 0 0 0 24



## Warning in nominalTrainWorkflow(x = x, y = y, wts = weights, info = trainInfo,  
## : There were missing values in resampled performance measures.

## glmnet   
##   
## 240 samples  
## 86 predictor  
## 4 classes: 'LARGE\_DOWN', 'LARGE\_UP', 'SMALL\_DOWN', 'SMALL\_UP'   
##   
## No pre-processing  
## Resampling: Rolling Forecasting Origin Resampling (1 held-out with no fixed window)   
## Summary of sample sizes: 146, 147, 148, 149, 150, 151, ...   
## Resampling results across tuning parameters:  
##   
## alpha lambda Accuracy Kappa  
## 0.1000000 4.062241e-05 0.2659574 0   
## 0.1000000 1.130343e-04 0.2765957 0   
## 0.1000000 3.145245e-04 0.2553191 0   
## 0.1000000 8.751832e-04 0.2659574 0   
## 0.1000000 2.435249e-03 0.2446809 0   
## 0.1000000 6.776226e-03 0.2659574 0   
## 0.1000000 1.885525e-02 0.2978723 0   
## 0.1000000 5.246586e-02 0.3085106 0   
## 0.2285714 4.062241e-05 0.2659574 0   
## 0.2285714 1.130343e-04 0.2553191 0   
## 0.2285714 3.145245e-04 0.2446809 0   
## 0.2285714 8.751832e-04 0.2553191 0   
## 0.2285714 2.435249e-03 0.2446809 0   
## 0.2285714 6.776226e-03 0.2553191 0   
## 0.2285714 1.885525e-02 0.2978723 0   
## 0.2285714 5.246586e-02 0.3297872 0   
## 0.3571429 4.062241e-05 0.2553191 0   
## 0.3571429 1.130343e-04 0.2553191 0   
## 0.3571429 3.145245e-04 0.2659574 0   
## 0.3571429 8.751832e-04 0.2446809 0   
## 0.3571429 2.435249e-03 0.2446809 0   
## 0.3571429 6.776226e-03 0.2659574 0   
## 0.3571429 1.885525e-02 0.2872340 0   
## 0.3571429 5.246586e-02 0.3191489 0   
## 0.4857143 4.062241e-05 0.2659574 0   
## 0.4857143 1.130343e-04 0.2659574 0   
## 0.4857143 3.145245e-04 0.2659574 0   
## 0.4857143 8.751832e-04 0.2340426 0   
## 0.4857143 2.435249e-03 0.2234043 0   
## 0.4857143 6.776226e-03 0.2765957 0   
## 0.4857143 1.885525e-02 0.3191489 0   
## 0.4857143 5.246586e-02 0.3510638 0   
## 0.6142857 4.062241e-05 0.2765957 0   
## 0.6142857 1.130343e-04 0.2659574 0   
## 0.6142857 3.145245e-04 0.2659574 0   
## 0.6142857 8.751832e-04 0.2234043 0   
## 0.6142857 2.435249e-03 0.2340426 0   
## 0.6142857 6.776226e-03 0.2765957 0   
## 0.6142857 1.885525e-02 0.3510638 0   
## 0.6142857 5.246586e-02 0.2978723 0   
## 0.7428571 4.062241e-05 0.2765957 0   
## 0.7428571 1.130343e-04 0.2659574 0   
## 0.7428571 3.145245e-04 0.2553191 0   
## 0.7428571 8.751832e-04 0.2234043 0   
## 0.7428571 2.435249e-03 0.2234043 0   
## 0.7428571 6.776226e-03 0.2765957 0   
## 0.7428571 1.885525e-02 0.3404255 0   
## 0.7428571 5.246586e-02 0.3297872 0   
## 0.8714286 4.062241e-05 0.2553191 0   
## 0.8714286 1.130343e-04 0.2553191 0   
## 0.8714286 3.145245e-04 0.2659574 0   
## 0.8714286 8.751832e-04 0.2340426 0   
## 0.8714286 2.435249e-03 0.2234043 0   
## 0.8714286 6.776226e-03 0.2872340 0   
## 0.8714286 1.885525e-02 0.3404255 0   
## 0.8714286 5.246586e-02 0.3404255 0   
## 1.0000000 4.062241e-05 0.2446809 0   
## 1.0000000 1.130343e-04 0.2446809 0   
## 1.0000000 3.145245e-04 0.2234043 0   
## 1.0000000 8.751832e-04 0.2340426 0   
## 1.0000000 2.435249e-03 0.2340426 0   
## 1.0000000 6.776226e-03 0.2659574 0   
## 1.0000000 1.885525e-02 0.3404255 0   
## 1.0000000 5.246586e-02 0.3085106 0   
##   
## Accuracy was used to select the optimal model using the largest value.  
## The final values used for the model were alpha = 0.4857143 and lambda  
## = 0.05246586.

## Warning in nominalTrainWorkflow(x = x, y = y, wts = weights, info = trainInfo,  
## : There were missing values in resampled performance measures.

## Bagged CART   
##   
## 240 samples  
## 86 predictor  
## 4 classes: 'LARGE\_DOWN', 'LARGE\_UP', 'SMALL\_DOWN', 'SMALL\_UP'   
##   
## No pre-processing  
## Resampling: Rolling Forecasting Origin Resampling (1 held-out with no fixed window)   
## Summary of sample sizes: 146, 147, 148, 149, 150, 151, ...   
## Resampling results:  
##   
## Accuracy Kappa  
## 0.3085106 0

## Warning in nominalTrainWorkflow(x = x, y = y, wts = weights, info = trainInfo,  
## : There were missing values in resampled performance measures.

## Support Vector Machines with Linear Kernel   
##   
## 240 samples  
## 86 predictor  
## 4 classes: 'LARGE\_DOWN', 'LARGE\_UP', 'SMALL\_DOWN', 'SMALL\_UP'   
##   
## No pre-processing  
## Resampling: Rolling Forecasting Origin Resampling (1 held-out with no fixed window)   
## Summary of sample sizes: 146, 147, 148, 149, 150, 151, ...   
## Resampling results:  
##   
## Accuracy Kappa  
## 0.2553191 0   
##   
## Tuning parameter 'C' was held constant at a value of 1

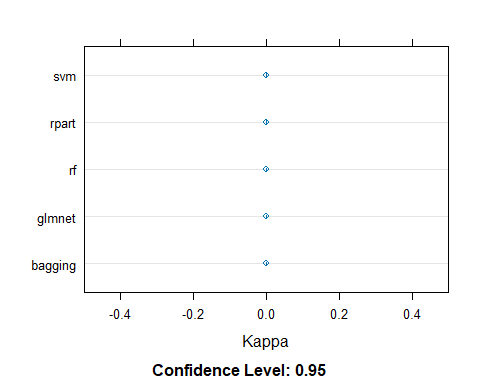
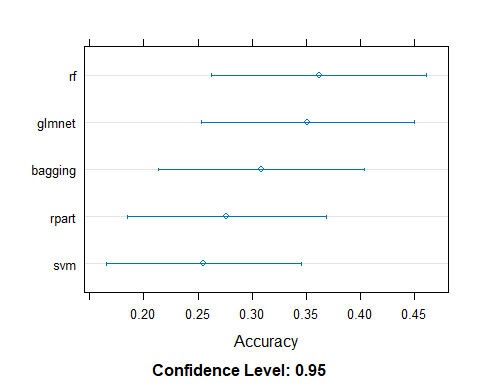
## Warning in nominalTrainWorkflow(x = x, y = y, wts = weights, info = trainInfo,  
## : There were missing values in resampled performance measures.

## CART   
##   
## 240 samples  
## 86 predictor  
## 4 classes: 'LARGE\_DOWN', 'LARGE\_UP', 'SMALL\_DOWN', 'SMALL\_UP'   
##   
## No pre-processing  
## Resampling: Rolling Forecasting Origin Resampling (1 held-out with no fixed window)   
## Summary of sample sizes: 146, 147, 148, 149, 150, 151, ...   
## Resampling results across tuning parameters:  
##   
## cp Accuracy Kappa  
## 0.00000000 0.2659574 0   
## 0.00591716 0.2659574 0   
## 0.01775148 0.2340426 0   
## 0.01972387 0.2446809 0   
## 0.02071006 0.2340426 0   
## 0.03550296 0.2340426 0   
## 0.03846154 0.2340426 0   
## 0.10059172 0.2765957 0   
##   
## Accuracy was used to select the optimal model using the largest value.  
## The final value used for the model was cp = 0.1005917.

## Warning in nominalTrainWorkflow(x = x, y = y, wts = weights, info = trainInfo,  
## : There were missing values in resampled performance measures.

## Random Forest   
##   
## 240 samples  
## 86 predictor  
## 4 classes: 'LARGE\_DOWN', 'LARGE\_UP', 'SMALL\_DOWN', 'SMALL\_UP'   
##   
## No pre-processing  
## Resampling: Rolling Forecasting Origin Resampling (1 held-out with no fixed window)   
## Summary of sample sizes: 146, 147, 148, 149, 150, 151, ...   
## Resampling results across tuning parameters:  
##   
## mtry Accuracy Kappa  
## 2 0.3297872 0   
## 22 0.3085106 0   
## 42 0.3617021 0   
## 62 0.2765957 0   
## 82 0.3404255 0   
## 102 0.3404255 0   
## 122 0.3297872 0   
## 143 0.3191489 0   
##   
## Accuracy was used to select the optimal model using the largest value.  
## The final value used for the model was mtry = 42.

##   
## Call:  
## summary.resamples(object = resamps)  
##   
## Models: glmnet, rpart, rf, bagging, svm   
## Number of resamples: 94   
##   
## Accuracy   
## Min. 1st Qu. Median Mean 3rd Qu. Max. NA's  
## glmnet 0 0 0 0.3510638 1.00 1 0  
## rpart 0 0 0 0.2765957 1.00 1 0  
## rf 0 0 0 0.3617021 1.00 1 0  
## bagging 0 0 0 0.3085106 1.00 1 0  
## svm 0 0 0 0.2553191 0.75 1 0  
##   
## Kappa   
## Min. 1st Qu. Median Mean 3rd Qu. Max. NA's  
## glmnet 0 0 0 0 0 0 33  
## rpart 0 0 0 0 0 0 26  
## rf 0 0 0 0 0 0 34  
## bagging 0 0 0 0 0 0 29  
## svm 0 0 0 0 0 0 24

 ## Brazil TTR non-fixed window 5 step

## glmnet   
##   
## 240 samples  
## 86 predictor  
## 4 classes: 'LARGE\_DOWN', 'LARGE\_UP', 'SMALL\_DOWN', 'SMALL\_UP'   
##   
## No pre-processing  
## Resampling: Rolling Forecasting Origin Resampling (5 held-out with no fixed window)   
## Summary of sample sizes: 146, 147, 148, 149, 150, 151, ...   
## Resampling results across tuning parameters:  
##   
## alpha lambda Accuracy Kappa   
## 0.1000000 4.062241e-05 0.2800000 0.073604611  
## 0.1000000 1.130343e-04 0.2711111 0.071810824  
## 0.1000000 3.145245e-04 0.2644444 0.055560148  
## 0.1000000 8.751832e-04 0.2511111 0.048949156  
## 0.1000000 2.435249e-03 0.2333333 0.022296416  
## 0.1000000 6.776226e-03 0.2222222 -0.002334431  
## 0.1000000 1.885525e-02 0.2422222 0.013448445  
## 0.1000000 5.246586e-02 0.2600000 0.029483034  
## 0.2285714 4.062241e-05 0.2777778 0.064379995  
## 0.2285714 1.130343e-04 0.2644444 0.058721745  
## 0.2285714 3.145245e-04 0.2577778 0.047688129  
## 0.2285714 8.751832e-04 0.2466667 0.041132212  
## 0.2285714 2.435249e-03 0.2288889 0.015894685  
## 0.2285714 6.776226e-03 0.2244444 -0.003153136  
## 0.2285714 1.885525e-02 0.2377778 0.012877280  
## 0.2285714 5.246586e-02 0.2911111 0.049027786  
## 0.3571429 4.062241e-05 0.2733333 0.060205784  
## 0.3571429 1.130343e-04 0.2733333 0.065453443  
## 0.3571429 3.145245e-04 0.2666667 0.057959072  
## 0.3571429 8.751832e-04 0.2444444 0.035224835  
## 0.3571429 2.435249e-03 0.2355556 0.022521783  
## 0.3571429 6.776226e-03 0.2333333 0.008089916  
## 0.3571429 1.885525e-02 0.2400000 0.010761159  
## 0.3571429 5.246586e-02 0.2955556 0.042197369  
## 0.4857143 4.062241e-05 0.2755556 0.062366104  
## 0.4857143 1.130343e-04 0.2755556 0.066586363  
## 0.4857143 3.145245e-04 0.2688889 0.061819623  
## 0.4857143 8.751832e-04 0.2444444 0.035318913  
## 0.4857143 2.435249e-03 0.2288889 0.013311212  
## 0.4857143 6.776226e-03 0.2311111 0.010566293  
## 0.4857143 1.885525e-02 0.2666667 0.032120675  
## 0.4857143 5.246586e-02 0.3111111 0.065469037  
## 0.6142857 4.062241e-05 0.2755556 0.062931124  
## 0.6142857 1.130343e-04 0.2755556 0.068175178  
## 0.6142857 3.145245e-04 0.2622222 0.056291593  
## 0.6142857 8.751832e-04 0.2444444 0.037543754  
## 0.6142857 2.435249e-03 0.2355556 0.022999960  
## 0.6142857 6.776226e-03 0.2422222 0.026289752  
## 0.6142857 1.885525e-02 0.2911111 0.058983517  
## 0.6142857 5.246586e-02 0.2688889 -0.001407189  
## 0.7428571 4.062241e-05 0.2777778 0.065019678  
## 0.7428571 1.130343e-04 0.2755556 0.068175178  
## 0.7428571 3.145245e-04 0.2600000 0.048805130  
## 0.7428571 8.751832e-04 0.2511111 0.043592335  
## 0.7428571 2.435249e-03 0.2266667 0.019093378  
## 0.7428571 6.776226e-03 0.2422222 0.022126071  
## 0.7428571 1.885525e-02 0.2911111 0.060512049  
## 0.7428571 5.246586e-02 0.2866667 0.015421150  
## 0.8714286 4.062241e-05 0.2733333 0.054075230  
## 0.8714286 1.130343e-04 0.2711111 0.055049878  
## 0.8714286 3.145245e-04 0.2600000 0.047122154  
## 0.8714286 8.751832e-04 0.2600000 0.053471957  
## 0.8714286 2.435249e-03 0.2333333 0.033245258  
## 0.8714286 6.776226e-03 0.2444444 0.033012983  
## 0.8714286 1.885525e-02 0.2955556 0.060073526  
## 0.8714286 5.246586e-02 0.2955556 0.027398001  
## 1.0000000 4.062241e-05 0.2533333 0.034212402  
## 1.0000000 1.130343e-04 0.2511111 0.035398162  
## 1.0000000 3.145245e-04 0.2466667 0.035468395  
## 1.0000000 8.751832e-04 0.2533333 0.044503689  
## 1.0000000 2.435249e-03 0.2355556 0.036971055  
## 1.0000000 6.776226e-03 0.2311111 0.021268710  
## 1.0000000 1.885525e-02 0.3111111 0.071859154  
## 1.0000000 5.246586e-02 0.2822222 0.002823411  
##   
## Kappa was used to select the optimal model using the largest value.  
## The final values used for the model were alpha = 0.1 and lambda = 4.062241e-05.

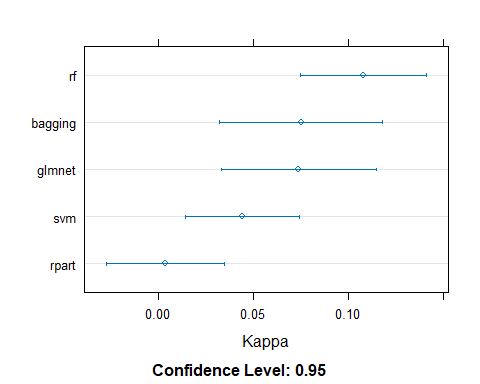
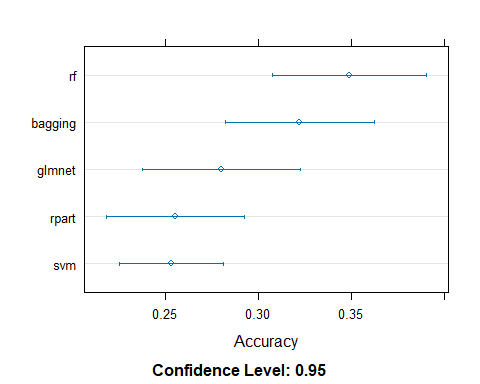
## Bagged CART   
##   
## 240 samples  
## 86 predictor  
## 4 classes: 'LARGE\_DOWN', 'LARGE\_UP', 'SMALL\_DOWN', 'SMALL\_UP'   
##   
## No pre-processing  
## Resampling: Rolling Forecasting Origin Resampling (5 held-out with no fixed window)   
## Summary of sample sizes: 146, 147, 148, 149, 150, 151, ...   
## Resampling results:  
##   
## Accuracy Kappa   
## 0.3222222 0.07503163

## Support Vector Machines with Linear Kernel   
##   
## 240 samples  
## 86 predictor  
## 4 classes: 'LARGE\_DOWN', 'LARGE\_UP', 'SMALL\_DOWN', 'SMALL\_UP'   
##   
## No pre-processing  
## Resampling: Rolling Forecasting Origin Resampling (5 held-out with no fixed window)   
## Summary of sample sizes: 146, 147, 148, 149, 150, 151, ...   
## Resampling results:  
##   
## Accuracy Kappa   
## 0.2533333 0.04404173  
##   
## Tuning parameter 'C' was held constant at a value of 1

## CART   
##   
## 240 samples  
## 86 predictor  
## 4 classes: 'LARGE\_DOWN', 'LARGE\_UP', 'SMALL\_DOWN', 'SMALL\_UP'   
##   
## No pre-processing  
## Resampling: Rolling Forecasting Origin Resampling (5 held-out with no fixed window)   
## Summary of sample sizes: 146, 147, 148, 149, 150, 151, ...   
## Resampling results across tuning parameters:  
##   
## cp Accuracy Kappa   
## 0.00000000 0.2555556 0.003559432  
## 0.00591716 0.2555556 0.003559432  
## 0.01775148 0.2377778 -0.020550957  
## 0.01972387 0.2355556 -0.025944474  
## 0.02071006 0.2266667 -0.021366790  
## 0.03550296 0.2200000 -0.020583622  
## 0.03846154 0.2133333 -0.021655553  
## 0.10059172 0.2711111 -0.009116809  
##   
## Kappa was used to select the optimal model using the largest value.  
## The final value used for the model was cp = 0.00591716.

## Random Forest   
##   
## 240 samples  
## 86 predictor  
## 4 classes: 'LARGE\_DOWN', 'LARGE\_UP', 'SMALL\_DOWN', 'SMALL\_UP'   
##   
## No pre-processing  
## Resampling: Rolling Forecasting Origin Resampling (5 held-out with no fixed window)   
## Summary of sample sizes: 146, 147, 148, 149, 150, 151, ...   
## Resampling results across tuning parameters:  
##   
## mtry Accuracy Kappa   
## 2 0.3222222 0.05989287  
## 22 0.3488889 0.10777584  
## 42 0.3111111 0.06615936  
## 62 0.3355556 0.09943290  
## 82 0.3288889 0.09391872  
## 102 0.3266667 0.08746267  
## 122 0.3288889 0.07961560  
## 143 0.3244444 0.08971698  
##   
## Kappa was used to select the optimal model using the largest value.  
## The final value used for the model was mtry = 22.

##   
## Call:  
## summary.resamples(object = resamps)  
##   
## Models: glmnet, rpart, rf, bagging, svm   
## Number of resamples: 90   
##   
## Accuracy   
## Min. 1st Qu. Median Mean 3rd Qu. Max. NA's  
## glmnet 0 0.2 0.2 0.2800000 0.4 0.8 0  
## rpart 0 0.2 0.2 0.2555556 0.4 0.8 0  
## rf 0 0.2 0.4 0.3488889 0.4 0.8 0  
## bagging 0 0.2 0.4 0.3222222 0.4 0.8 0  
## svm 0 0.2 0.2 0.2533333 0.4 0.4 0  
##   
## Kappa   
## Min. 1st Qu. Median Mean 3rd Qu. Max. NA's  
## glmnet -0.3333333 -0.04166667 0.04761905 0.073604611 0.21052632 0.7368421 0  
## rpart -0.4285714 -0.08695652 0.00000000 0.003559432 0.09090909 0.4444444 0  
## rf -0.3157895 0.00000000 0.07670455 0.107775837 0.19956140 0.5454545 0  
## bagging -0.3888889 -0.04989035 0.04761905 0.075031633 0.21052632 0.7222222 0  
## svm -0.3157895 -0.03947368 0.04761905 0.044041728 0.16666667 0.2500000 0



## glmnet   
##   
## 240 samples  
## 86 predictor  
## 4 classes: 'LARGE\_DOWN', 'LARGE\_UP', 'SMALL\_DOWN', 'SMALL\_UP'   
##   
## No pre-processing  
## Resampling: Rolling Forecasting Origin Resampling (5 held-out with no fixed window)   
## Summary of sample sizes: 146, 147, 148, 149, 150, 151, ...   
## Resampling results across tuning parameters:  
##   
## alpha lambda Accuracy Kappa   
## 0.1000000 4.062241e-05 0.2800000 0.073604611  
## 0.1000000 1.130343e-04 0.2711111 0.071810824  
## 0.1000000 3.145245e-04 0.2644444 0.055560148  
## 0.1000000 8.751832e-04 0.2511111 0.048949156  
## 0.1000000 2.435249e-03 0.2333333 0.022296416  
## 0.1000000 6.776226e-03 0.2222222 -0.002334431  
## 0.1000000 1.885525e-02 0.2422222 0.013448445  
## 0.1000000 5.246586e-02 0.2600000 0.029483034  
## 0.2285714 4.062241e-05 0.2777778 0.064379995  
## 0.2285714 1.130343e-04 0.2644444 0.058721745  
## 0.2285714 3.145245e-04 0.2577778 0.047688129  
## 0.2285714 8.751832e-04 0.2466667 0.041132212  
## 0.2285714 2.435249e-03 0.2288889 0.015894685  
## 0.2285714 6.776226e-03 0.2244444 -0.003153136  
## 0.2285714 1.885525e-02 0.2377778 0.012877280  
## 0.2285714 5.246586e-02 0.2911111 0.049027786  
## 0.3571429 4.062241e-05 0.2733333 0.060205784  
## 0.3571429 1.130343e-04 0.2733333 0.065453443  
## 0.3571429 3.145245e-04 0.2666667 0.057959072  
## 0.3571429 8.751832e-04 0.2444444 0.035224835  
## 0.3571429 2.435249e-03 0.2355556 0.022521783  
## 0.3571429 6.776226e-03 0.2333333 0.008089916  
## 0.3571429 1.885525e-02 0.2400000 0.010761159  
## 0.3571429 5.246586e-02 0.2955556 0.042197369  
## 0.4857143 4.062241e-05 0.2755556 0.062366104  
## 0.4857143 1.130343e-04 0.2755556 0.066586363  
## 0.4857143 3.145245e-04 0.2688889 0.061819623  
## 0.4857143 8.751832e-04 0.2444444 0.035318913  
## 0.4857143 2.435249e-03 0.2288889 0.013311212  
## 0.4857143 6.776226e-03 0.2311111 0.010566293  
## 0.4857143 1.885525e-02 0.2666667 0.032120675  
## 0.4857143 5.246586e-02 0.3111111 0.065469037  
## 0.6142857 4.062241e-05 0.2755556 0.062931124  
## 0.6142857 1.130343e-04 0.2755556 0.068175178  
## 0.6142857 3.145245e-04 0.2622222 0.056291593  
## 0.6142857 8.751832e-04 0.2444444 0.037543754  
## 0.6142857 2.435249e-03 0.2355556 0.022999960  
## 0.6142857 6.776226e-03 0.2422222 0.026289752  
## 0.6142857 1.885525e-02 0.2911111 0.058983517  
## 0.6142857 5.246586e-02 0.2688889 -0.001407189  
## 0.7428571 4.062241e-05 0.2777778 0.065019678  
## 0.7428571 1.130343e-04 0.2755556 0.068175178  
## 0.7428571 3.145245e-04 0.2600000 0.048805130  
## 0.7428571 8.751832e-04 0.2511111 0.043592335  
## 0.7428571 2.435249e-03 0.2266667 0.019093378  
## 0.7428571 6.776226e-03 0.2422222 0.022126071  
## 0.7428571 1.885525e-02 0.2911111 0.060512049  
## 0.7428571 5.246586e-02 0.2866667 0.015421150  
## 0.8714286 4.062241e-05 0.2733333 0.054075230  
## 0.8714286 1.130343e-04 0.2711111 0.055049878  
## 0.8714286 3.145245e-04 0.2600000 0.047122154  
## 0.8714286 8.751832e-04 0.2600000 0.053471957  
## 0.8714286 2.435249e-03 0.2333333 0.033245258  
## 0.8714286 6.776226e-03 0.2444444 0.033012983  
## 0.8714286 1.885525e-02 0.2955556 0.060073526  
## 0.8714286 5.246586e-02 0.2955556 0.027398001  
## 1.0000000 4.062241e-05 0.2533333 0.034212402  
## 1.0000000 1.130343e-04 0.2511111 0.035398162  
## 1.0000000 3.145245e-04 0.2466667 0.035468395  
## 1.0000000 8.751832e-04 0.2533333 0.044503689  
## 1.0000000 2.435249e-03 0.2355556 0.036971055  
## 1.0000000 6.776226e-03 0.2311111 0.021268710  
## 1.0000000 1.885525e-02 0.3111111 0.071859154  
## 1.0000000 5.246586e-02 0.2822222 0.002823411  
##   
## Accuracy was used to select the optimal model using the largest value.  
## The final values used for the model were alpha = 0.4857143 and lambda  
## = 0.05246586.

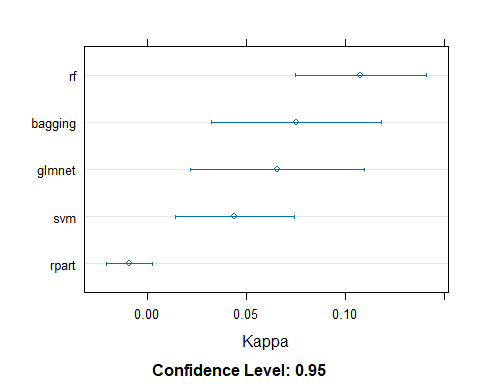
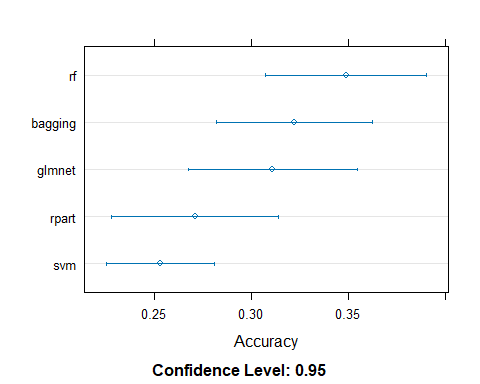
## Bagged CART   
##   
## 240 samples  
## 86 predictor  
## 4 classes: 'LARGE\_DOWN', 'LARGE\_UP', 'SMALL\_DOWN', 'SMALL\_UP'   
##   
## No pre-processing  
## Resampling: Rolling Forecasting Origin Resampling (5 held-out with no fixed window)   
## Summary of sample sizes: 146, 147, 148, 149, 150, 151, ...   
## Resampling results:  
##   
## Accuracy Kappa   
## 0.3222222 0.07503163

## Support Vector Machines with Linear Kernel   
##   
## 240 samples  
## 86 predictor  
## 4 classes: 'LARGE\_DOWN', 'LARGE\_UP', 'SMALL\_DOWN', 'SMALL\_UP'   
##   
## No pre-processing  
## Resampling: Rolling Forecasting Origin Resampling (5 held-out with no fixed window)   
## Summary of sample sizes: 146, 147, 148, 149, 150, 151, ...   
## Resampling results:  
##   
## Accuracy Kappa   
## 0.2533333 0.04404173  
##   
## Tuning parameter 'C' was held constant at a value of 1

## CART   
##   
## 240 samples  
## 86 predictor  
## 4 classes: 'LARGE\_DOWN', 'LARGE\_UP', 'SMALL\_DOWN', 'SMALL\_UP'   
##   
## No pre-processing  
## Resampling: Rolling Forecasting Origin Resampling (5 held-out with no fixed window)   
## Summary of sample sizes: 146, 147, 148, 149, 150, 151, ...   
## Resampling results across tuning parameters:  
##   
## cp Accuracy Kappa   
## 0.00000000 0.2555556 0.003559432  
## 0.00591716 0.2555556 0.003559432  
## 0.01775148 0.2377778 -0.020550957  
## 0.01972387 0.2355556 -0.025944474  
## 0.02071006 0.2266667 -0.021366790  
## 0.03550296 0.2200000 -0.020583622  
## 0.03846154 0.2133333 -0.021655553  
## 0.10059172 0.2711111 -0.009116809  
##   
## Accuracy was used to select the optimal model using the largest value.  
## The final value used for the model was cp = 0.1005917.

## Random Forest   
##   
## 240 samples  
## 86 predictor  
## 4 classes: 'LARGE\_DOWN', 'LARGE\_UP', 'SMALL\_DOWN', 'SMALL\_UP'   
##   
## No pre-processing  
## Resampling: Rolling Forecasting Origin Resampling (5 held-out with no fixed window)   
## Summary of sample sizes: 146, 147, 148, 149, 150, 151, ...   
## Resampling results across tuning parameters:  
##   
## mtry Accuracy Kappa   
## 2 0.3222222 0.05989287  
## 22 0.3488889 0.10777584  
## 42 0.3111111 0.06615936  
## 62 0.3355556 0.09943290  
## 82 0.3288889 0.09391872  
## 102 0.3266667 0.08746267  
## 122 0.3288889 0.07961560  
## 143 0.3244444 0.08971698  
##   
## Accuracy was used to select the optimal model using the largest value.  
## The final value used for the model was mtry = 22.

##   
## Call:  
## summary.resamples(object = resamps)  
##   
## Models: glmnet, rpart, rf, bagging, svm   
## Number of resamples: 90   
##   
## Accuracy   
## Min. 1st Qu. Median Mean 3rd Qu. Max. NA's  
## glmnet 0 0.2 0.2 0.3111111 0.4 0.8 0  
## rpart 0 0.2 0.2 0.2711111 0.4 0.8 0  
## rf 0 0.2 0.4 0.3488889 0.4 0.8 0  
## bagging 0 0.2 0.4 0.3222222 0.4 0.8 0  
## svm 0 0.2 0.2 0.2533333 0.4 0.4 0  
##   
## Kappa   
## Min. 1st Qu. Median Mean 3rd Qu. Max.  
## glmnet -0.5625000 -2.602085e-17 0.00000000 0.065469037 0.1304348 0.7222222  
## rpart -0.3333333 0.000000e+00 0.00000000 -0.009116809 0.0000000 0.1666667  
## rf -0.3157895 0.000000e+00 0.07670455 0.107775837 0.1995614 0.5454545  
## bagging -0.3888889 -4.989035e-02 0.04761905 0.075031633 0.2105263 0.7222222  
## svm -0.3157895 -3.947368e-02 0.04761905 0.044041728 0.1666667 0.2500000  
## NA's  
## glmnet 0  
## rpart 0  
## rf 0  
## bagging 0  
## svm 0



# brazil external nf

## [1] 74 106

## Warning in nominalTrainWorkflow(x = x, y = y, wts = weights, info = trainInfo,  
## : There were missing values in resampled performance measures.

## glmnet   
##   
## 74 samples  
## 105 predictors  
## 4 classes: 'LARGE\_DOWN', 'LARGE\_UP', 'SMALL\_DOWN', 'SMALL\_UP'   
##   
## No pre-processing  
## Resampling: Rolling Forecasting Origin Resampling (1 held-out with a fixed window)   
## Summary of sample sizes: 56, 56, 56, 56, 56, 56, ...   
## Resampling results across tuning parameters:  
##   
## alpha lambda Accuracy Kappa  
## 0.1000000 0.005228773 0.11111111 0   
## 0.1000000 0.008722119 0.11111111 0   
## 0.1000000 0.014549371 0.11111111 0   
## 0.1000000 0.024269814 0.11111111 0   
## 0.1000000 0.040484490 0.22222222 0   
## 0.1000000 0.067532200 0.22222222 0   
## 0.1000000 0.112650499 0.22222222 0   
## 0.1000000 0.187912358 0.22222222 0   
## 0.2285714 0.005228773 0.11111111 0   
## 0.2285714 0.008722119 0.11111111 0   
## 0.2285714 0.014549371 0.11111111 0   
## 0.2285714 0.024269814 0.16666667 0   
## 0.2285714 0.040484490 0.16666667 0   
## 0.2285714 0.067532200 0.22222222 0   
## 0.2285714 0.112650499 0.22222222 0   
## 0.2285714 0.187912358 0.22222222 0   
## 0.3571429 0.005228773 0.05555556 0   
## 0.3571429 0.008722119 0.05555556 0   
## 0.3571429 0.014549371 0.11111111 0   
## 0.3571429 0.024269814 0.16666667 0   
## 0.3571429 0.040484490 0.16666667 0   
## 0.3571429 0.067532200 0.11111111 0   
## 0.3571429 0.112650499 0.22222222 0   
## 0.3571429 0.187912358 0.16666667 0   
## 0.4857143 0.005228773 0.05555556 0   
## 0.4857143 0.008722119 0.11111111 0   
## 0.4857143 0.014549371 0.11111111 0   
## 0.4857143 0.024269814 0.05555556 0   
## 0.4857143 0.040484490 0.05555556 0   
## 0.4857143 0.067532200 0.16666667 0   
## 0.4857143 0.112650499 0.16666667 0   
## 0.4857143 0.187912358 0.22222222 0   
## 0.6142857 0.005228773 0.11111111 0   
## 0.6142857 0.008722119 0.11111111 0   
## 0.6142857 0.014549371 0.11111111 0   
## 0.6142857 0.024269814 0.05555556 0   
## 0.6142857 0.040484490 0.05555556 0   
## 0.6142857 0.067532200 0.16666667 0   
## 0.6142857 0.112650499 0.11111111 0   
## 0.6142857 0.187912358 0.22222222 0   
## 0.7428571 0.005228773 0.11111111 0   
## 0.7428571 0.008722119 0.11111111 0   
## 0.7428571 0.014549371 0.05555556 0   
## 0.7428571 0.024269814 0.05555556 0   
## 0.7428571 0.040484490 0.05555556 0   
## 0.7428571 0.067532200 0.16666667 0   
## 0.7428571 0.112650499 0.16666667 0   
## 0.7428571 0.187912358 0.22222222 0   
## 0.8714286 0.005228773 0.11111111 0   
## 0.8714286 0.008722119 0.11111111 0   
## 0.8714286 0.014549371 0.05555556 0   
## 0.8714286 0.024269814 0.05555556 0   
## 0.8714286 0.040484490 0.11111111 0   
## 0.8714286 0.067532200 0.16666667 0   
## 0.8714286 0.112650499 0.16666667 0   
## 0.8714286 0.187912358 0.16666667 0   
## 1.0000000 0.005228773 0.11111111 0   
## 1.0000000 0.008722119 0.11111111 0   
## 1.0000000 0.014549371 0.11111111 0   
## 1.0000000 0.024269814 0.05555556 0   
## 1.0000000 0.040484490 0.11111111 0   
## 1.0000000 0.067532200 0.16666667 0   
## 1.0000000 0.112650499 0.22222222 0   
## 1.0000000 0.187912358 0.16666667 0   
##   
## Kappa was used to select the optimal model using the largest value.  
## The final values used for the model were alpha = 0.1 and lambda = 0.1879124.

## Warning in nominalTrainWorkflow(x = x, y = y, wts = weights, info = trainInfo,  
## : There were missing values in resampled performance measures.

## Bagged CART   
##   
## 74 samples  
## 105 predictors  
## 4 classes: 'LARGE\_DOWN', 'LARGE\_UP', 'SMALL\_DOWN', 'SMALL\_UP'   
##   
## No pre-processing  
## Resampling: Rolling Forecasting Origin Resampling (1 held-out with a fixed window)   
## Summary of sample sizes: 56, 56, 56, 56, 56, 56, ...   
## Resampling results:  
##   
## Accuracy Kappa  
## 0.2777778 0

## Support Vector Machines with Linear Kernel   
##   
## 74 samples  
## 105 predictors  
## 4 classes: 'LARGE\_DOWN', 'LARGE\_UP', 'SMALL\_DOWN', 'SMALL\_UP'   
##   
## No pre-processing  
## Resampling: Rolling Forecasting Origin Resampling (1 held-out with a fixed window)   
## Summary of sample sizes: 56, 56, 56, 56, 56, 56, ...   
## Resampling results:  
##   
## Accuracy Kappa  
## 0 0   
##   
## Tuning parameter 'C' was held constant at a value of 1

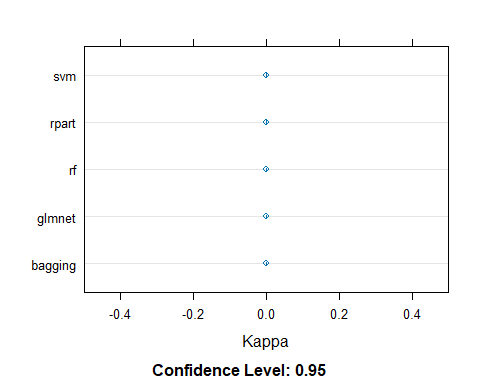
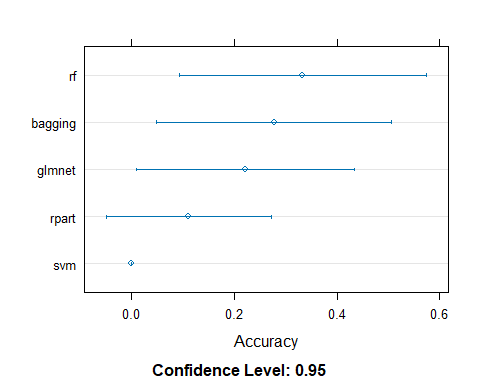
## Warning in nominalTrainWorkflow(x = x, y = y, wts = weights, info = trainInfo,  
## : There were missing values in resampled performance measures.

## CART   
##   
## 74 samples  
## 105 predictors  
## 4 classes: 'LARGE\_DOWN', 'LARGE\_UP', 'SMALL\_DOWN', 'SMALL\_UP'   
##   
## No pre-processing  
## Resampling: Rolling Forecasting Origin Resampling (1 held-out with a fixed window)   
## Summary of sample sizes: 56, 56, 56, 56, 56, 56, ...   
## Resampling results across tuning parameters:  
##   
## cp Accuracy Kappa  
## 0.00000000 0.2777778 0   
## 0.03571429 0.2777778 0   
## 0.07142857 0.2777778 0   
## 0.10714286 0.2222222 0   
## 0.14285714 0.2222222 0   
## 0.17857143 0.1666667 0   
## 0.21428571 0.1666667 0   
## 0.25000000 0.1111111 0   
##   
## Kappa was used to select the optimal model using the largest value.  
## The final value used for the model was cp = 0.25.

## Warning in nominalTrainWorkflow(x = x, y = y, wts = weights, info = trainInfo,  
## : There were missing values in resampled performance measures.

## Random Forest   
##   
## 74 samples  
## 105 predictors  
## 4 classes: 'LARGE\_DOWN', 'LARGE\_UP', 'SMALL\_DOWN', 'SMALL\_UP'   
##   
## No pre-processing  
## Resampling: Rolling Forecasting Origin Resampling (1 held-out with a fixed window)   
## Summary of sample sizes: 56, 56, 56, 56, 56, 56, ...   
## Resampling results across tuning parameters:  
##   
## mtry Accuracy Kappa  
## 2 0.3333333 0   
## 24 0.4444444 0   
## 47 0.4444444 0   
## 70 0.4444444 0   
## 93 0.4444444 0   
## 116 0.3888889 0   
## 139 0.3888889 0   
## 162 0.3333333 0   
##   
## Kappa was used to select the optimal model using the largest value.  
## The final value used for the model was mtry = 2.

##   
## Call:  
## summary.resamples(object = resamps)  
##   
## Models: glmnet, rpart, rf, bagging, svm   
## Number of resamples: 18   
##   
## Accuracy   
## Min. 1st Qu. Median Mean 3rd Qu. Max. NA's  
## glmnet 0 0 0 0.2222222 0.00 1 0  
## rpart 0 0 0 0.1111111 0.00 1 0  
## rf 0 0 0 0.3333333 1.00 1 0  
## bagging 0 0 0 0.2777778 0.75 1 0  
## svm 0 0 0 0.0000000 0.00 0 0  
##   
## Kappa   
## Min. 1st Qu. Median Mean 3rd Qu. Max. NA's  
## glmnet 0 0 0 0 0 0 4  
## rpart 0 0 0 0 0 0 2  
## rf 0 0 0 0 0 0 6  
## bagging 0 0 0 0 0 0 5  
## svm 0 0 0 0 0 0 0



## Warning in nominalTrainWorkflow(x = x, y = y, wts = weights, info = trainInfo,  
## : There were missing values in resampled performance measures.

## glmnet   
##   
## 74 samples  
## 105 predictors  
## 4 classes: 'LARGE\_DOWN', 'LARGE\_UP', 'SMALL\_DOWN', 'SMALL\_UP'   
##   
## No pre-processing  
## Resampling: Rolling Forecasting Origin Resampling (1 held-out with a fixed window)   
## Summary of sample sizes: 56, 56, 56, 56, 56, 56, ...   
## Resampling results across tuning parameters:  
##   
## alpha lambda Accuracy Kappa  
## 0.1000000 0.005228773 0.11111111 0   
## 0.1000000 0.008722119 0.11111111 0   
## 0.1000000 0.014549371 0.11111111 0   
## 0.1000000 0.024269814 0.11111111 0   
## 0.1000000 0.040484490 0.22222222 0   
## 0.1000000 0.067532200 0.22222222 0   
## 0.1000000 0.112650499 0.22222222 0   
## 0.1000000 0.187912358 0.22222222 0   
## 0.2285714 0.005228773 0.11111111 0   
## 0.2285714 0.008722119 0.11111111 0   
## 0.2285714 0.014549371 0.11111111 0   
## 0.2285714 0.024269814 0.16666667 0   
## 0.2285714 0.040484490 0.16666667 0   
## 0.2285714 0.067532200 0.22222222 0   
## 0.2285714 0.112650499 0.22222222 0   
## 0.2285714 0.187912358 0.22222222 0   
## 0.3571429 0.005228773 0.05555556 0   
## 0.3571429 0.008722119 0.05555556 0   
## 0.3571429 0.014549371 0.11111111 0   
## 0.3571429 0.024269814 0.16666667 0   
## 0.3571429 0.040484490 0.16666667 0   
## 0.3571429 0.067532200 0.11111111 0   
## 0.3571429 0.112650499 0.22222222 0   
## 0.3571429 0.187912358 0.16666667 0   
## 0.4857143 0.005228773 0.05555556 0   
## 0.4857143 0.008722119 0.11111111 0   
## 0.4857143 0.014549371 0.11111111 0   
## 0.4857143 0.024269814 0.05555556 0   
## 0.4857143 0.040484490 0.05555556 0   
## 0.4857143 0.067532200 0.16666667 0   
## 0.4857143 0.112650499 0.16666667 0   
## 0.4857143 0.187912358 0.22222222 0   
## 0.6142857 0.005228773 0.11111111 0   
## 0.6142857 0.008722119 0.11111111 0   
## 0.6142857 0.014549371 0.11111111 0   
## 0.6142857 0.024269814 0.05555556 0   
## 0.6142857 0.040484490 0.05555556 0   
## 0.6142857 0.067532200 0.16666667 0   
## 0.6142857 0.112650499 0.11111111 0   
## 0.6142857 0.187912358 0.22222222 0   
## 0.7428571 0.005228773 0.11111111 0   
## 0.7428571 0.008722119 0.11111111 0   
## 0.7428571 0.014549371 0.05555556 0   
## 0.7428571 0.024269814 0.05555556 0   
## 0.7428571 0.040484490 0.05555556 0   
## 0.7428571 0.067532200 0.16666667 0   
## 0.7428571 0.112650499 0.16666667 0   
## 0.7428571 0.187912358 0.22222222 0   
## 0.8714286 0.005228773 0.11111111 0   
## 0.8714286 0.008722119 0.11111111 0   
## 0.8714286 0.014549371 0.05555556 0   
## 0.8714286 0.024269814 0.05555556 0   
## 0.8714286 0.040484490 0.11111111 0   
## 0.8714286 0.067532200 0.16666667 0   
## 0.8714286 0.112650499 0.16666667 0   
## 0.8714286 0.187912358 0.16666667 0   
## 1.0000000 0.005228773 0.11111111 0   
## 1.0000000 0.008722119 0.11111111 0   
## 1.0000000 0.014549371 0.11111111 0   
## 1.0000000 0.024269814 0.05555556 0   
## 1.0000000 0.040484490 0.11111111 0   
## 1.0000000 0.067532200 0.16666667 0   
## 1.0000000 0.112650499 0.22222222 0   
## 1.0000000 0.187912358 0.16666667 0   
##   
## Accuracy was used to select the optimal model using the largest value.  
## The final values used for the model were alpha = 0.1 and lambda = 0.1879124.

## Warning in nominalTrainWorkflow(x = x, y = y, wts = weights, info = trainInfo,  
## : There were missing values in resampled performance measures.

## Bagged CART   
##   
## 74 samples  
## 105 predictors  
## 4 classes: 'LARGE\_DOWN', 'LARGE\_UP', 'SMALL\_DOWN', 'SMALL\_UP'   
##   
## No pre-processing  
## Resampling: Rolling Forecasting Origin Resampling (1 held-out with a fixed window)   
## Summary of sample sizes: 56, 56, 56, 56, 56, 56, ...   
## Resampling results:  
##   
## Accuracy Kappa  
## 0.2777778 0

## Support Vector Machines with Linear Kernel   
##   
## 74 samples  
## 105 predictors  
## 4 classes: 'LARGE\_DOWN', 'LARGE\_UP', 'SMALL\_DOWN', 'SMALL\_UP'   
##   
## No pre-processing  
## Resampling: Rolling Forecasting Origin Resampling (1 held-out with a fixed window)   
## Summary of sample sizes: 56, 56, 56, 56, 56, 56, ...   
## Resampling results:  
##   
## Accuracy Kappa  
## 0 0   
##   
## Tuning parameter 'C' was held constant at a value of 1

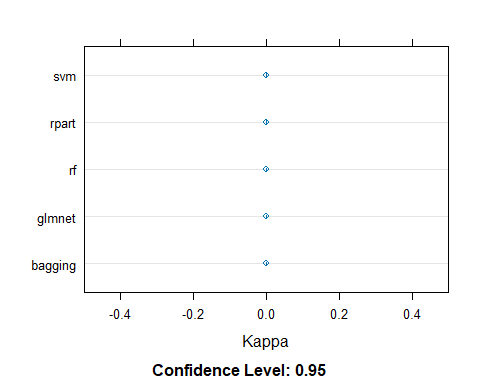
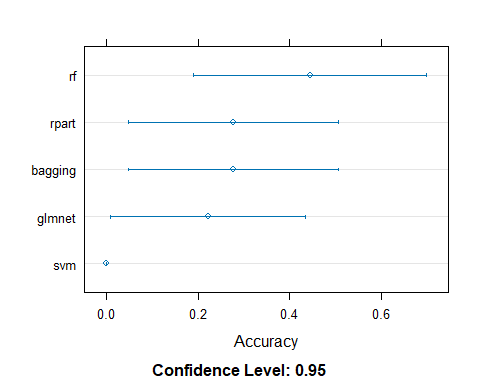
## Warning in nominalTrainWorkflow(x = x, y = y, wts = weights, info = trainInfo,  
## : There were missing values in resampled performance measures.

## CART   
##   
## 74 samples  
## 105 predictors  
## 4 classes: 'LARGE\_DOWN', 'LARGE\_UP', 'SMALL\_DOWN', 'SMALL\_UP'   
##   
## No pre-processing  
## Resampling: Rolling Forecasting Origin Resampling (1 held-out with a fixed window)   
## Summary of sample sizes: 56, 56, 56, 56, 56, 56, ...   
## Resampling results across tuning parameters:  
##   
## cp Accuracy Kappa  
## 0.00000000 0.2777778 0   
## 0.03571429 0.2777778 0   
## 0.07142857 0.2777778 0   
## 0.10714286 0.2222222 0   
## 0.14285714 0.2222222 0   
## 0.17857143 0.1666667 0   
## 0.21428571 0.1666667 0   
## 0.25000000 0.1111111 0   
##   
## Accuracy was used to select the optimal model using the largest value.  
## The final value used for the model was cp = 0.07142857.

## Warning in nominalTrainWorkflow(x = x, y = y, wts = weights, info = trainInfo,  
## : There were missing values in resampled performance measures.

## Random Forest   
##   
## 74 samples  
## 105 predictors  
## 4 classes: 'LARGE\_DOWN', 'LARGE\_UP', 'SMALL\_DOWN', 'SMALL\_UP'   
##   
## No pre-processing  
## Resampling: Rolling Forecasting Origin Resampling (1 held-out with a fixed window)   
## Summary of sample sizes: 56, 56, 56, 56, 56, 56, ...   
## Resampling results across tuning parameters:  
##   
## mtry Accuracy Kappa  
## 2 0.3333333 0   
## 24 0.4444444 0   
## 47 0.4444444 0   
## 70 0.4444444 0   
## 93 0.4444444 0   
## 116 0.3888889 0   
## 139 0.3888889 0   
## 162 0.3333333 0   
##   
## Accuracy was used to select the optimal model using the largest value.  
## The final value used for the model was mtry = 24.

##   
## Call:  
## summary.resamples(object = resamps)  
##   
## Models: glmnet, rpart, rf, bagging, svm   
## Number of resamples: 18   
##   
## Accuracy   
## Min. 1st Qu. Median Mean 3rd Qu. Max. NA's  
## glmnet 0 0 0 0.2222222 0.00 1 0  
## rpart 0 0 0 0.2777778 0.75 1 0  
## rf 0 0 0 0.4444444 1.00 1 0  
## bagging 0 0 0 0.2777778 0.75 1 0  
## svm 0 0 0 0.0000000 0.00 0 0  
##   
## Kappa   
## Min. 1st Qu. Median Mean 3rd Qu. Max. NA's  
## glmnet 0 0 0 0 0 0 4  
## rpart 0 0 0 0 0 0 5  
## rf 0 0 0 0 0 0 8  
## bagging 0 0 0 0 0 0 5  
## svm 0 0 0 0 0 0 0

 # Brazil TTR nf external

## Warning in nominalTrainWorkflow(x = x, y = y, wts = weights, info = trainInfo,  
## : There were missing values in resampled performance measures.

## glmnet   
##   
## 74 samples  
## 105 predictors  
## 4 classes: 'LARGE\_DOWN', 'LARGE\_UP', 'SMALL\_DOWN', 'SMALL\_UP'   
##   
## No pre-processing  
## Resampling: Rolling Forecasting Origin Resampling (1 held-out with no fixed window)   
## Summary of sample sizes: 56, 57, 58, 59, 60, 61, ...   
## Resampling results across tuning parameters:  
##   
## alpha lambda Accuracy Kappa  
## 0.1000000 0.005228773 0.22222222 0   
## 0.1000000 0.008722119 0.22222222 0   
## 0.1000000 0.014549371 0.22222222 0   
## 0.1000000 0.024269814 0.16666667 0   
## 0.1000000 0.040484490 0.16666667 0   
## 0.1000000 0.067532200 0.22222222 0   
## 0.1000000 0.112650499 0.22222222 0   
## 0.1000000 0.187912358 0.22222222 0   
## 0.2285714 0.005228773 0.11111111 0   
## 0.2285714 0.008722119 0.11111111 0   
## 0.2285714 0.014549371 0.16666667 0   
## 0.2285714 0.024269814 0.11111111 0   
## 0.2285714 0.040484490 0.16666667 0   
## 0.2285714 0.067532200 0.22222222 0   
## 0.2285714 0.112650499 0.22222222 0   
## 0.2285714 0.187912358 0.22222222 0   
## 0.3571429 0.005228773 0.05555556 0   
## 0.3571429 0.008722119 0.05555556 0   
## 0.3571429 0.014549371 0.11111111 0   
## 0.3571429 0.024269814 0.05555556 0   
## 0.3571429 0.040484490 0.11111111 0   
## 0.3571429 0.067532200 0.16666667 0   
## 0.3571429 0.112650499 0.16666667 0   
## 0.3571429 0.187912358 0.16666667 0   
## 0.4857143 0.005228773 0.05555556 0   
## 0.4857143 0.008722119 0.05555556 0   
## 0.4857143 0.014549371 0.05555556 0   
## 0.4857143 0.024269814 0.05555556 0   
## 0.4857143 0.040484490 0.11111111 0   
## 0.4857143 0.067532200 0.16666667 0   
## 0.4857143 0.112650499 0.11111111 0   
## 0.4857143 0.187912358 0.16666667 0   
## 0.6142857 0.005228773 0.05555556 0   
## 0.6142857 0.008722119 0.05555556 0   
## 0.6142857 0.014549371 0.05555556 0   
## 0.6142857 0.024269814 0.05555556 0   
## 0.6142857 0.040484490 0.11111111 0   
## 0.6142857 0.067532200 0.16666667 0   
## 0.6142857 0.112650499 0.11111111 0   
## 0.6142857 0.187912358 0.22222222 0   
## 0.7428571 0.005228773 0.05555556 0   
## 0.7428571 0.008722119 0.11111111 0   
## 0.7428571 0.014549371 0.05555556 0   
## 0.7428571 0.024269814 0.05555556 0   
## 0.7428571 0.040484490 0.16666667 0   
## 0.7428571 0.067532200 0.11111111 0   
## 0.7428571 0.112650499 0.16666667 0   
## 0.7428571 0.187912358 0.27777778 0   
## 0.8714286 0.005228773 0.05555556 0   
## 0.8714286 0.008722119 0.05555556 0   
## 0.8714286 0.014549371 0.05555556 0   
## 0.8714286 0.024269814 0.05555556 0   
## 0.8714286 0.040484490 0.16666667 0   
## 0.8714286 0.067532200 0.11111111 0   
## 0.8714286 0.112650499 0.16666667 0   
## 0.8714286 0.187912358 0.16666667 0   
## 1.0000000 0.005228773 0.05555556 0   
## 1.0000000 0.008722119 0.05555556 0   
## 1.0000000 0.014549371 0.05555556 0   
## 1.0000000 0.024269814 0.11111111 0   
## 1.0000000 0.040484490 0.22222222 0   
## 1.0000000 0.067532200 0.11111111 0   
## 1.0000000 0.112650499 0.27777778 0   
## 1.0000000 0.187912358 0.11111111 0   
##   
## Kappa was used to select the optimal model using the largest value.  
## The final values used for the model were alpha = 0.1 and lambda = 0.1879124.

## Warning in nominalTrainWorkflow(x = x, y = y, wts = weights, info = trainInfo,  
## : There were missing values in resampled performance measures.

## Bagged CART   
##   
## 74 samples  
## 105 predictors  
## 4 classes: 'LARGE\_DOWN', 'LARGE\_UP', 'SMALL\_DOWN', 'SMALL\_UP'   
##   
## No pre-processing  
## Resampling: Rolling Forecasting Origin Resampling (1 held-out with no fixed window)   
## Summary of sample sizes: 56, 57, 58, 59, 60, 61, ...   
## Resampling results:  
##   
## Accuracy Kappa  
## 0.3888889 0

## Warning in nominalTrainWorkflow(x = x, y = y, wts = weights, info = trainInfo,  
## : There were missing values in resampled performance measures.

## Support Vector Machines with Linear Kernel   
##   
## 74 samples  
## 105 predictors  
## 4 classes: 'LARGE\_DOWN', 'LARGE\_UP', 'SMALL\_DOWN', 'SMALL\_UP'   
##   
## No pre-processing  
## Resampling: Rolling Forecasting Origin Resampling (1 held-out with no fixed window)   
## Summary of sample sizes: 56, 57, 58, 59, 60, 61, ...   
## Resampling results:  
##   
## Accuracy Kappa  
## 0.1666667 0   
##   
## Tuning parameter 'C' was held constant at a value of 1

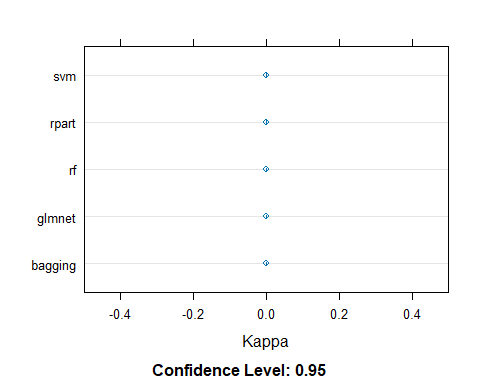
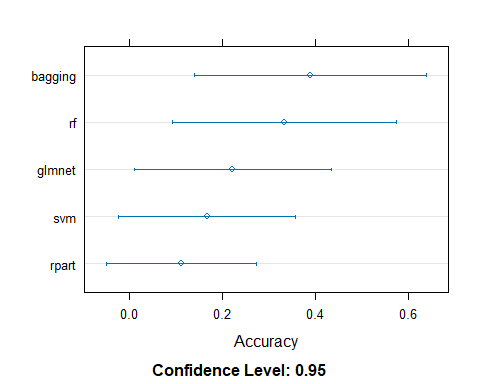
## Warning in nominalTrainWorkflow(x = x, y = y, wts = weights, info = trainInfo,  
## : There were missing values in resampled performance measures.

## CART   
##   
## 74 samples  
## 105 predictors  
## 4 classes: 'LARGE\_DOWN', 'LARGE\_UP', 'SMALL\_DOWN', 'SMALL\_UP'   
##   
## No pre-processing  
## Resampling: Rolling Forecasting Origin Resampling (1 held-out with no fixed window)   
## Summary of sample sizes: 56, 57, 58, 59, 60, 61, ...   
## Resampling results across tuning parameters:  
##   
## cp Accuracy Kappa  
## 0.00000000 0.3333333 0   
## 0.03571429 0.3333333 0   
## 0.07142857 0.2222222 0   
## 0.10714286 0.2222222 0   
## 0.14285714 0.2777778 0   
## 0.17857143 0.2777778 0   
## 0.21428571 0.2222222 0   
## 0.25000000 0.1111111 0   
##   
## Kappa was used to select the optimal model using the largest value.  
## The final value used for the model was cp = 0.25.

## Warning in nominalTrainWorkflow(x = x, y = y, wts = weights, info = trainInfo,  
## : There were missing values in resampled performance measures.

## Random Forest   
##   
## 74 samples  
## 105 predictors  
## 4 classes: 'LARGE\_DOWN', 'LARGE\_UP', 'SMALL\_DOWN', 'SMALL\_UP'   
##   
## No pre-processing  
## Resampling: Rolling Forecasting Origin Resampling (1 held-out with no fixed window)   
## Summary of sample sizes: 56, 57, 58, 59, 60, 61, ...   
## Resampling results across tuning parameters:  
##   
## mtry Accuracy Kappa  
## 2 0.3333333 0   
## 24 0.3888889 0   
## 47 0.3888889 0   
## 70 0.3888889 0   
## 93 0.3888889 0   
## 116 0.4444444 0   
## 139 0.3888889 0   
## 162 0.3888889 0   
##   
## Kappa was used to select the optimal model using the largest value.  
## The final value used for the model was mtry = 2.

##   
## Call:  
## summary.resamples(object = resamps)  
##   
## Models: glmnet, rpart, rf, bagging, svm   
## Number of resamples: 18   
##   
## Accuracy   
## Min. 1st Qu. Median Mean 3rd Qu. Max. NA's  
## glmnet 0 0 0 0.2222222 0 1 0  
## rpart 0 0 0 0.1111111 0 1 0  
## rf 0 0 0 0.3333333 1 1 0  
## bagging 0 0 0 0.3888889 1 1 0  
## svm 0 0 0 0.1666667 0 1 0  
##   
## Kappa   
## Min. 1st Qu. Median Mean 3rd Qu. Max. NA's  
## glmnet 0 0 0 0 0 0 4  
## rpart 0 0 0 0 0 0 2  
## rf 0 0 0 0 0 0 6  
## bagging 0 0 0 0 0 0 7  
## svm 0 0 0 0 0 0 3



## Warning in nominalTrainWorkflow(x = x, y = y, wts = weights, info = trainInfo,  
## : There were missing values in resampled performance measures.

## glmnet   
##   
## 74 samples  
## 105 predictors  
## 4 classes: 'LARGE\_DOWN', 'LARGE\_UP', 'SMALL\_DOWN', 'SMALL\_UP'   
##   
## No pre-processing  
## Resampling: Rolling Forecasting Origin Resampling (1 held-out with no fixed window)   
## Summary of sample sizes: 56, 57, 58, 59, 60, 61, ...   
## Resampling results across tuning parameters:  
##   
## alpha lambda Accuracy Kappa  
## 0.1000000 0.005228773 0.22222222 0   
## 0.1000000 0.008722119 0.22222222 0   
## 0.1000000 0.014549371 0.22222222 0   
## 0.1000000 0.024269814 0.16666667 0   
## 0.1000000 0.040484490 0.16666667 0   
## 0.1000000 0.067532200 0.22222222 0   
## 0.1000000 0.112650499 0.22222222 0   
## 0.1000000 0.187912358 0.22222222 0   
## 0.2285714 0.005228773 0.11111111 0   
## 0.2285714 0.008722119 0.11111111 0   
## 0.2285714 0.014549371 0.16666667 0   
## 0.2285714 0.024269814 0.11111111 0   
## 0.2285714 0.040484490 0.16666667 0   
## 0.2285714 0.067532200 0.22222222 0   
## 0.2285714 0.112650499 0.22222222 0   
## 0.2285714 0.187912358 0.22222222 0   
## 0.3571429 0.005228773 0.05555556 0   
## 0.3571429 0.008722119 0.05555556 0   
## 0.3571429 0.014549371 0.11111111 0   
## 0.3571429 0.024269814 0.05555556 0   
## 0.3571429 0.040484490 0.11111111 0   
## 0.3571429 0.067532200 0.16666667 0   
## 0.3571429 0.112650499 0.16666667 0   
## 0.3571429 0.187912358 0.16666667 0   
## 0.4857143 0.005228773 0.05555556 0   
## 0.4857143 0.008722119 0.05555556 0   
## 0.4857143 0.014549371 0.05555556 0   
## 0.4857143 0.024269814 0.05555556 0   
## 0.4857143 0.040484490 0.11111111 0   
## 0.4857143 0.067532200 0.16666667 0   
## 0.4857143 0.112650499 0.11111111 0   
## 0.4857143 0.187912358 0.16666667 0   
## 0.6142857 0.005228773 0.05555556 0   
## 0.6142857 0.008722119 0.05555556 0   
## 0.6142857 0.014549371 0.05555556 0   
## 0.6142857 0.024269814 0.05555556 0   
## 0.6142857 0.040484490 0.11111111 0   
## 0.6142857 0.067532200 0.16666667 0   
## 0.6142857 0.112650499 0.11111111 0   
## 0.6142857 0.187912358 0.22222222 0   
## 0.7428571 0.005228773 0.05555556 0   
## 0.7428571 0.008722119 0.11111111 0   
## 0.7428571 0.014549371 0.05555556 0   
## 0.7428571 0.024269814 0.05555556 0   
## 0.7428571 0.040484490 0.16666667 0   
## 0.7428571 0.067532200 0.11111111 0   
## 0.7428571 0.112650499 0.16666667 0   
## 0.7428571 0.187912358 0.27777778 0   
## 0.8714286 0.005228773 0.05555556 0   
## 0.8714286 0.008722119 0.05555556 0   
## 0.8714286 0.014549371 0.05555556 0   
## 0.8714286 0.024269814 0.05555556 0   
## 0.8714286 0.040484490 0.16666667 0   
## 0.8714286 0.067532200 0.11111111 0   
## 0.8714286 0.112650499 0.16666667 0   
## 0.8714286 0.187912358 0.16666667 0   
## 1.0000000 0.005228773 0.05555556 0   
## 1.0000000 0.008722119 0.05555556 0   
## 1.0000000 0.014549371 0.05555556 0   
## 1.0000000 0.024269814 0.11111111 0   
## 1.0000000 0.040484490 0.22222222 0   
## 1.0000000 0.067532200 0.11111111 0   
## 1.0000000 0.112650499 0.27777778 0   
## 1.0000000 0.187912358 0.11111111 0   
##   
## Accuracy was used to select the optimal model using the largest value.  
## The final values used for the model were alpha = 0.7428571 and lambda  
## = 0.1879124.

## Warning in nominalTrainWorkflow(x = x, y = y, wts = weights, info = trainInfo,  
## : There were missing values in resampled performance measures.

## Bagged CART   
##   
## 74 samples  
## 105 predictors  
## 4 classes: 'LARGE\_DOWN', 'LARGE\_UP', 'SMALL\_DOWN', 'SMALL\_UP'   
##   
## No pre-processing  
## Resampling: Rolling Forecasting Origin Resampling (1 held-out with no fixed window)   
## Summary of sample sizes: 56, 57, 58, 59, 60, 61, ...   
## Resampling results:  
##   
## Accuracy Kappa  
## 0.3888889 0

## Warning in nominalTrainWorkflow(x = x, y = y, wts = weights, info = trainInfo,  
## : There were missing values in resampled performance measures.

## Support Vector Machines with Linear Kernel   
##   
## 74 samples  
## 105 predictors  
## 4 classes: 'LARGE\_DOWN', 'LARGE\_UP', 'SMALL\_DOWN', 'SMALL\_UP'   
##   
## No pre-processing  
## Resampling: Rolling Forecasting Origin Resampling (1 held-out with no fixed window)   
## Summary of sample sizes: 56, 57, 58, 59, 60, 61, ...   
## Resampling results:  
##   
## Accuracy Kappa  
## 0.1666667 0   
##   
## Tuning parameter 'C' was held constant at a value of 1

## Warning in nominalTrainWorkflow(x = x, y = y, wts = weights, info = trainInfo,  
## : There were missing values in resampled performance measures.

## CART   
##   
## 74 samples  
## 105 predictors  
## 4 classes: 'LARGE\_DOWN', 'LARGE\_UP', 'SMALL\_DOWN', 'SMALL\_UP'   
##   
## No pre-processing  
## Resampling: Rolling Forecasting Origin Resampling (1 held-out with no fixed window)   
## Summary of sample sizes: 56, 57, 58, 59, 60, 61, ...   
## Resampling results across tuning parameters:  
##   
## cp Accuracy Kappa  
## 0.00000000 0.3333333 0   
## 0.03571429 0.3333333 0   
## 0.07142857 0.2222222 0   
## 0.10714286 0.2222222 0   
## 0.14285714 0.2777778 0   
## 0.17857143 0.2777778 0   
## 0.21428571 0.2222222 0   
## 0.25000000 0.1111111 0   
##   
## Accuracy was used to select the optimal model using the largest value.  
## The final value used for the model was cp = 0.03571429.

## Warning in nominalTrainWorkflow(x = x, y = y, wts = weights, info = trainInfo,  
## : There were missing values in resampled performance measures.

## Random Forest   
##   
## 74 samples  
## 105 predictors  
## 4 classes: 'LARGE\_DOWN', 'LARGE\_UP', 'SMALL\_DOWN', 'SMALL\_UP'   
##   
## No pre-processing  
## Resampling: Rolling Forecasting Origin Resampling (1 held-out with no fixed window)   
## Summary of sample sizes: 56, 57, 58, 59, 60, 61, ...   
## Resampling results across tuning parameters:  
##   
## mtry Accuracy Kappa  
## 2 0.3333333 0   
## 24 0.3888889 0   
## 47 0.3888889 0   
## 70 0.3888889 0   
## 93 0.3888889 0   
## 116 0.4444444 0   
## 139 0.3888889 0   
## 162 0.3888889 0   
##   
## Accuracy was used to select the optimal model using the largest value.  
## The final value used for the model was mtry = 116.

##   
## Call:  
## summary.resamples(object = resamps)  
##   
## Models: glmnet, rpart, rf, bagging, svm   
## Number of resamples: 18   
##   
## Accuracy   
## Min. 1st Qu. Median Mean 3rd Qu. Max. NA's  
## glmnet 0 0 0 0.2777778 0.75 1 0  
## rpart 0 0 0 0.3333333 1.00 1 0  
## rf 0 0 0 0.4444444 1.00 1 0  
## bagging 0 0 0 0.3888889 1.00 1 0  
## svm 0 0 0 0.1666667 0.00 1 0  
##   
## Kappa   
## Min. 1st Qu. Median Mean 3rd Qu. Max. NA's  
## glmnet 0 0 0 0 0 0 5  
## rpart 0 0 0 0 0 0 6  
## rf 0 0 0 0 0 0 8  
## bagging 0 0 0 0 0 0 7  
## svm 0 0 0 0 0 0 3

