STAT361 Laboratory for Advanced R for Data Science

Lab 9

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Tests on Mars Project

Objective

- Complete main function mars()

```
mars <- function(formula,data,control=NULL...) {
  cc <- match.call() # save the call
  mf <- model.frame(formula,data)
  y <- model.response(mf)
  mt <- attr(mf, "terms")
  x <- model.matrix(mt, mf)
  fwd <- fwd_stepwise(y,x,control) # Note change from ear
  bwd <- bwd_stepwise(fwd,control)
  # Now prepare the output and return a "mars" object --
  # to be discussed in a future lecture
}
```

- Test,
  - Output of your backward stepwise function ‘bwd_stepwise()’
  - Output of your mars function
- Pull STAT360 repository for the following test data files
  - testmars.RData
  - Take a look at the sample test scripts

Complete mars()

- Fit the final model based on the basis function returned by backward stepwise function
  - Pass the function without the default intercept
  - Pass the data frame consists of response variable and basis functions returned from backward stepwise function

- Package your output as a list in the following order (to enable tests against test output – testmars.Rdata)
  - call: function call
  - formula: formula input by user
  - y: response variable
  - B: final set of basis functions for the input data, returned by bwd_stepwise()
  - Bfuncs: The Bfuncs returned by bwd_stepwise()
  - x_names: The colnames of the model matrix constructed from the input formula and data. These will be needed by our mars.summary() function to give names to the variables indicated in Bfuncs
  - The rest of the list output by lm from part (i). Finally, give your output list class mars that inherits from class lm

Testing your output

Create following R scripts in ‘mars/tests/testthat’ directory

- testbwd_stepwise.R (refer to test scripts provided along with the test data)
  - load testbwd_stepwise.Rdata
  - call your bwd_stepwise() function with inputs testfwd and testmc
  - use expect_equal() to compare the output to the output testbwd from testbwd_stepwise.Rdata

Testing your output

Create following R scripts in ‘mars/tests/testthat’ directory

- testmars.R (refer to test scripts provided along with the test data)
  - load testmars.Rdata
  - call your mars() function with the formula y ., data marstestdata, and control testmc
  - use expect_equal() to compare the output to testmars
  - Note: Add the argument ignore_attr=TRUE to your call to expect_equal(). The output of mars() includes formulas and other objects that store the environment in which they were created in their attributes. These environments will be different from one call of mars() to the next.