



# University of St.Gallen

## Forests

**University of St. Gallen**

School of Management, Economics, Law,  
Social Sciences, International Affairs  
and Computer Science

### **Assignment 3**

Data Analytics I: Predictive Econometrics  
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submitted by

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## Requirements

To solve the following tasks, the required libraries and the data sets are loaded first.

```
library(grf)
library(DiagrammeR)
library(glmnet)

browser_2006 <- read.csv(file = "/Users/jonashusmann/Desktop/GHA_3/browser_2006.csv")
browser_new <- read.csv(file = "/Users/jonashusmann/Desktop/GHA_3/browser_new.csv")
```

## Exercise 1

The average online spending is \$1959.921

```
mean(browser_2006$spend)
```

```
## [1] 1959.921
```

## Exercise 2

The household with id = 1297 (first row of the 2006 sample) spends most of the time on *weather.com*

```
row_id_1297 <- browser_2006[browser_2006$id==1297,3:ncol(browser_2006)]
which.max(row_id_1297)
```

```
## weather.com
##           52
```

## Exercise 3

To find the best two linear predictors, lasso was used. First, a 5-fold cross validation was performed to determine the optimal lambda parameter. Then, the largest coefficients of the lasso model in terms of their absolute value were determined, since they have the greatest influence on the prediction. The best two linear predictors are therefore the two websites *staples.com* and *officedepot.com*.

```
lasso.cv <- cv.glmnet(x = as.matrix(browser_2006[!names(browser_2006) %in%
                                                    c("id", "spend")]],
                      y = browser_2006$spend,
                      type.measure = "mse",
                      family = "gaussian",
                      nfolds = 5,
```

```

      alpha = 1)

coef.lasso.cv <- coef(lasso.cv, s = "lambda.min")
(best.lin.pred <- data.frame(name = coef.lasso.cv@Dimnames[[1]][coef.lasso.cv@i + 1],
      coefficient = coef.lasso.cv@x) %>%
  .[order(abs(.$coefficient), decreasing = T),] %>%
  .[1:2,])

```

```

##           name coefficient
## 6 staples.com    2520.562
## 1 (Intercept)   1795.746

```