第 七 次 作 业

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1. CODE

```r
library(MASS)
library(leaps)
library(grpreg)
classify <- function(lst){
    correct = 0
    add = 0
    less = 0
    error = 0
    xz <- matrix(rownames(data.frame(lst)))
    if('V1'%in%xz & 'V2'%in%xz & 'V3'%in%xz )
    {
        if(length(xz) == 4)
            correct = correct + 1
        else
            add = add + 1
    }
    else if('V4'%in%xz | 'V5'%in%xz | 'V6'%in%xz |'V7'%in%xz | 'V8'%in%xz | 'V9'%in%xz |'V10'%in%xz)
        error = error + 1
    else
        less = less + 1
    return(cbind(correct, add, less, error))
}

generate_data<-function(n,p)
{
    beta <- as.matrix(runif(4, min = 1, max = 2))
    mean <- rep(0, p)
    sigma <- diag(p)
```

```r
29        X <- MASS::mvrnorm(n, mean, sigma)
30        eps <- rnorm(n)
31        y <- cbind(matrix(1, nrow = n, ncol = 1), X)[,1:4] %*%
32        beta + as.matrix(eps)
33        return(list(y,X,beta,eps))
34  }
35
36  get_result<-function(n, p)
37  {
38        Lasso <- t(rep(0, 4))
39        Scad  <- t(rep(0, 4))
40        for (i in 1:500)
41        {
42            Lasso <- Lasso + simulate(n,p)[[1]]
43            Scad <- Scad + simulate(n,p)[[2]]
44        }
45        Lasso <- Lasso / 500
46        Scad <- Scad / 500
47        return(rbind(Lasso, Scad))
48  }
49
50  simulate<-function(n,p)
51  {
52        data <- generate_data(n,p)
53        y <- data[[1]]
54        X <- data[[2]]
55        fit1 <- grpreg(X = X, y = y, penalty = "grLasso")
56        lasso <- select(fit1, "BIC")$beta
57        lasso <- which(lasso != 0)
58        fit2 <- grpreg(X = X, y = y, penalty = "grSCAD")
59        scad <- select(fit2, "BIC")$beta
60        scad <- which(scad!=0)
61        return(list(classify(lasso), classify(scad)))
62  }
63  get_result(200, 10)
```

2. RESULT

输出结果如下:

	correct	add	less	error
[1,]	0.020	0.980	0	0
[2,]	0.494	0.506	0	0

输出结果如下: