Week 4

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目录

回归

```r
SurgicalData <- read.table('SurgicalData.txt', col.names = c('V1','V2','V3','V4','V5','V6','V7','V8',
fit1 <- lm(V10 ~ V1 + V2 + V3 + V4 + V5, data = SurgicalData)
fit1
```

```
##
## Call:
## lm(formula = V10 ~ V1 + V2 + V3 + V4 + V5, data = SurgicalData)
##
## Coefficients:
## (Intercept)           V1           V2           V3           V4
##    4.047377     0.090811     0.012969     0.016130     0.011042
##          V5
##   -0.004579
```

```r
fit2 <- lm(V10 ~ V1 + V2 + V3, data = SurgicalData)
fit2
```

```
##
## Call:
## lm(formula = V10 ~ V1 + V2 + V3, data = SurgicalData)
##
## Coefficients:
## (Intercept)           V1           V2           V3
##     3.76618      0.09546      0.01334      0.01645
```

最优子集选择

```
bodyfat <- read.table('female-bodyfat.txt', col.names = c('V1','V2','V3','V4'))
fit1 <- lm(V10 ~ V1 + V2 + V3 + V4 + V5, data = SurgicalData)
fit1
```

```
## 
## Call:
## lm(formula = V10 ~ V1 + V2 + V3 + V4 + V5, data = SurgicalData)
## 
## Coefficients:
## (Intercept)            V1            V2            V3            V4
##    4.047377      0.090811      0.012969      0.016130      0.011042
##          V5
##   -0.004579
```

```
library(leaps)
all.bodyfat <- regsubsets(x = as.matrix(bodyfat[,1:3]),
                          y = bodyfat[,4],
                          method = "exhaustive")
plot(all.bodyfat)
```
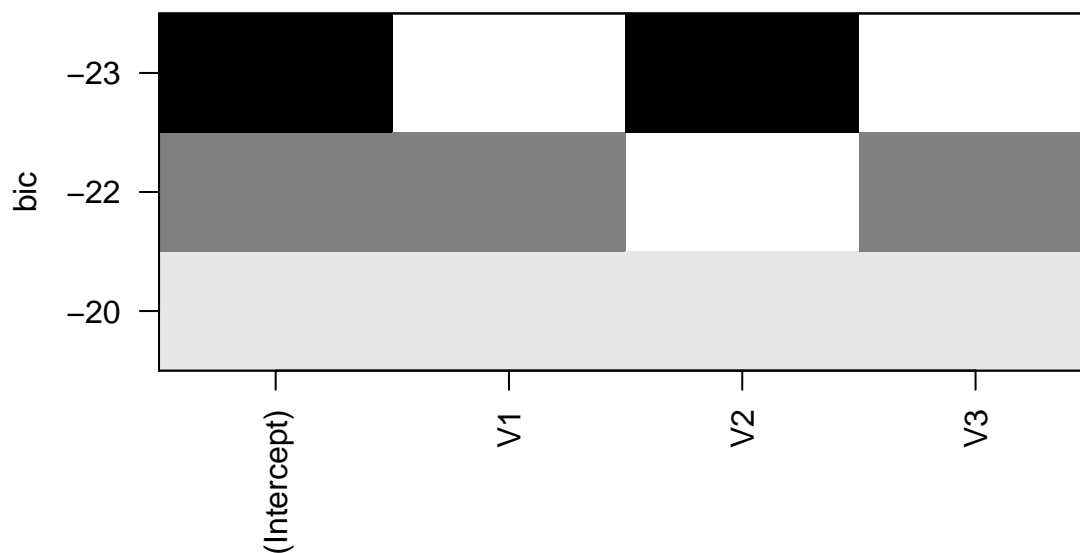


```
bodyfat.null <- lm(V4 ~ 1, data = bodyfat)
bodyfat.full <- lm(V4 ~ ., data = bodyfat)

step(object = bodyfat.null,
     direction = "forward",
     scope = list(lower = bodyfat.null, upper = bodyfat.full))
```

```
## Start:  AIC=66.19
## V4 ~ 1
##
##        Df Sum of Sq    RSS    AIC
## + V2    1    381.97 113.42 38.708
## + V1    1    352.27 143.12 43.359
## <none>              495.39 66.192
## + V3    1     10.05 485.34 67.782
##
## Step:  AIC=38.71
## V4 ~ V2
##
##        Df Sum of Sq    RSS    AIC
## <none>              113.42 38.708
## + V1    1    3.4729 109.95 40.086
## + V3    1    2.3139 111.11 40.296

##
## Call:
## lm(formula = V4 ~ V2, data = bodyfat)
##
## Coefficients:
## (Intercept)           V2
##    -23.6345       0.8565
```

```r
step(object = bodyfat.full,
    direction = "backward",
    scope = list(lower = bodyfat.null, upper = bodyfat.full))
```

```
## Start:  AIC=39.87
## V4 ~ V1 + V2 + V3
##
##        Df Sum of Sq     RSS    AIC
## - V2    1    7.5293 105.934 39.342
## <none>              98.405 39.867
## - V3    1   11.5459 109.951 40.086
## - V1    1   12.7049 111.110 40.296
##
## Step:  AIC=39.34
```

```
## V4 ~ V1 + V3
##
##        Df Sum of Sq    RSS     AIC
## <none>              105.93 39.342
## - V3    1    37.19 143.12 43.359
## - V1    1   379.40 485.34 67.782


##
## Call:
## lm(formula = V4 ~ V1 + V3, data = bodyfat)
##
## Coefficients:
## (Intercept)          V1          V3
##      6.7916      1.0006     -0.4314
```

```
step(object = bodyfat.full,
    direction = "both",
    scope = list(lower = bodyfat.null, upper = bodyfat.full))
```

```
## Start:  AIC=39.87
## V4 ~ V1 + V2 + V3
##
##        Df Sum of Sq     RSS    AIC
## - V2    1    7.5293 105.934 39.342
## <none>               98.405 39.867
## - V3    1   11.5459 109.951 40.086
## - V1    1   12.7049 111.110 40.296
##
## Step:  AIC=39.34
## V4 ~ V1 + V3
##
##        Df Sum of Sq    RSS    AIC
## <none>              105.93 39.342
## + V2    1     7.53  98.40 39.867
## - V3    1    37.19 143.12 43.359
## - V1    1   379.40 485.34 67.782


##
## Call:
## lm(formula = V4 ~ V1 + V3, data = bodyfat)
##
```

```
## Coefficients:
## (Intercept)            V1              V3
##      6.7916        1.0006         -0.4314
```

```
# library(BeSS)
# PET <- read.table('PET.txt', header = TRUE)
# pet.bess <- bess(as.matrix(PET.train[,1:268]),
#                  PET.train$y,
#                  family = 'gaussian')
# print(pet.bess)
#
# bestmodel <- pet.bess$bestmodel
# summary(bestmodel)
#
# plot(pet.bess, type = "coefficients", break =TRUE)
```