Prelab8

Shu Zhou

2020/11/17

```
##This is the Prelab8 of STATS 413
##Author: Shu Zhou
##UMID: 19342932
```

(a.)

```
library(ISLR)
data(Hitters)
Hitters<-na.omit(Hitters)
```

(b.)

```
library(leaps)
```

```
## Warning: package 'leaps' was built under R version 4.0.3
```

```
regfit.full=regsubsets (Salary~.,Hitters )
summary(regfit.full)
```

```
## Subset selection object
## Call: regsubsets.formula(Salary ~ ., Hitters)
## 19 Variables  (and intercept)
##             Forced in Forced out
## AtBat           FALSE      FALSE
## Hits            FALSE      FALSE
## HmRun           FALSE      FALSE
## Runs            FALSE      FALSE
## RBI             FALSE      FALSE
## Walks           FALSE      FALSE
## Years           FALSE      FALSE
## CAtBat          FALSE      FALSE
## CHits           FALSE      FALSE
## CHmRun          FALSE      FALSE
## CRuns           FALSE      FALSE
## CRBI            FALSE      FALSE
## CWalks          FALSE      FALSE
## LeagueN         FALSE      FALSE
## DivisionW       FALSE      FALSE
## PutOuts         FALSE      FALSE
## Assists         FALSE      FALSE
## Errors          FALSE      FALSE
## NewLeagueN      FALSE      FALSE
## 1 subsets of each size up to 8
## Selection Algorithm: exhaustive
##          AtBat Hits HmRun Runs RBI Walks Years CAtBat CHits CHmRun CRuns CRBI
```

```
## 1  ( 1 ) " "   " "  " "   " "  " " " " " "   " "   " "    " "   " "    " "   "*"
## 2  ( 1 ) " "   "*"  " "   " "  " " " " " "   " "   " "    " "   " "    " "   "*"
## 3  ( 1 ) " "   "*"  " "   " "  " " " " " "   " "   " "    " "   " "    " "   "*"
## 4  ( 1 ) " "   "*"  " "   " "  " " " " " "   " "   " "    " "   " "    " "   "*"
## 5  ( 1 ) "*"   "*"  " "   " "  " " " " " "   " "   " "    " "   " "    " "   "*"
## 6  ( 1 ) "*"   "*"  " "   " "  " " " " "*"   " "   " "    " "   " "    " "   "*"
## 7  ( 1 ) " "   "*"  " "   " "  " " " " "*"   " "   "*"    "*"   "*"    " "   " "
## 8  ( 1 ) "*"   "*"  " "   " "  " " " " "*"   " "   " "    " "   "*"    "*"   " "
##           CWalks LeagueN DivisionW PutOuts Assists Errors NewLeagueN
## 1  ( 1 ) " "    " "     " "       " "     " "     " "    " "
## 2  ( 1 ) " "    " "     " "       " "     " "     " "    " "
## 3  ( 1 ) " "    " "     " "       "*"     " "     " "    " "
## 4  ( 1 ) " "    " "     "*"       "*"     " "     " "    " "
## 5  ( 1 ) " "    " "     "*"       "*"     " "     " "    " "
## 6  ( 1 ) " "    " "     "*"       "*"     " "     " "    " "
## 7  ( 1 ) " "    " "     "*"       "*"     " "     " "    " "
## 8  ( 1 ) "*"    " "     "*"       "*"     " "     " "    " "
```

```
regfit.full=regsubsets (Salary~.,data=Hitters,nvmax =19)
reg.summary =summary (regfit.full)
names(reg.summary)
```

```
## [1] "which"  "rsq"    "rss"    "adjr2"  "cp"     "bic"    "outmat" "obj"
```

```
par(mfrow =c(2,2))
plot(reg.summary$rss ,xlab=" Number of Variables ",ylab=" RSS",
type="l")
plot(reg.summary$adjr2 ,xlab =" Number of Variables ",
ylab=" Adjusted RSq",type="l")

which.max (reg.summary$adjr2)
```

```
## [1] 11
```

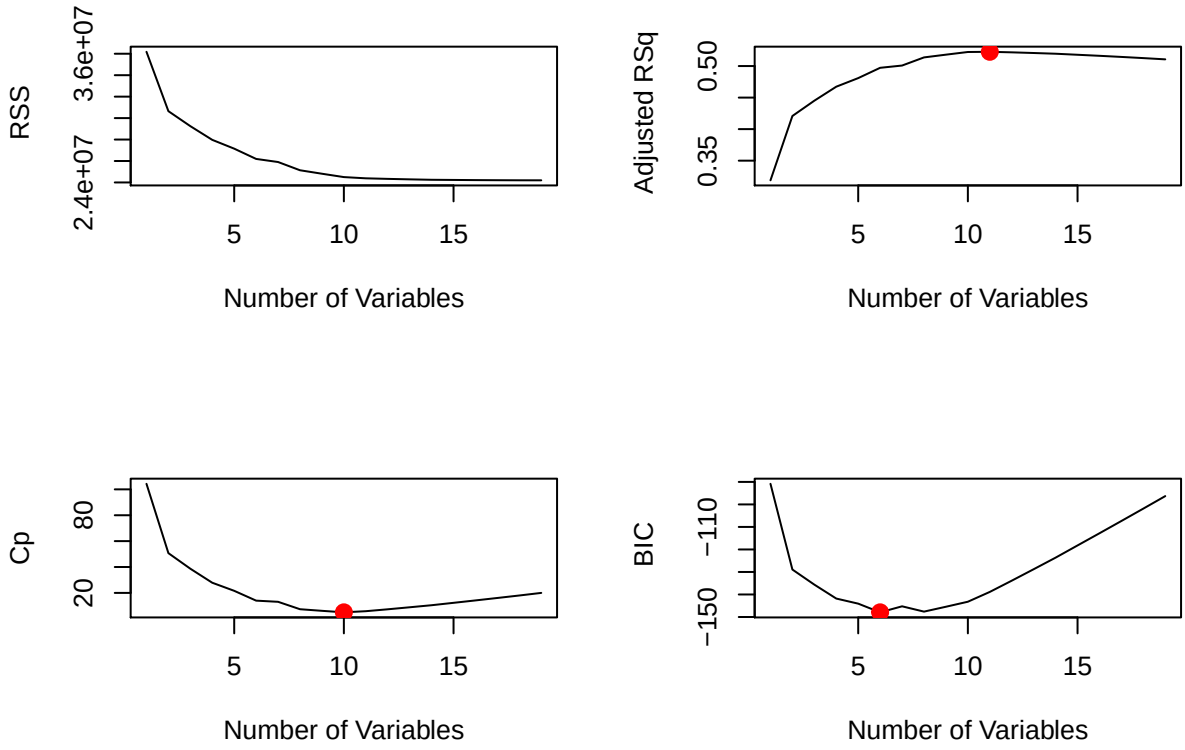
```
points (11, reg.summary$adjr2[11], col ="red",cex =2, pch =20)


plot(reg.summary$cp ,xlab =" Number of Variables ",ylab="Cp",
type="l")
which.min (reg.summary$cp )
```

```
## [1] 10
```

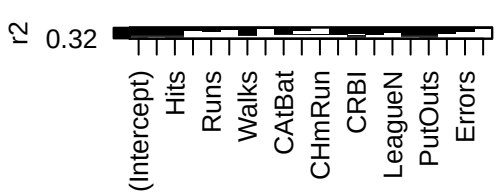
```
points (10, reg.summary$cp [10], col ="red",cex =2, pch =20)
which.min (reg.summary$bic )
```

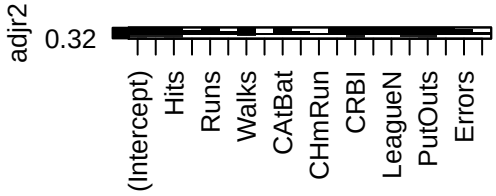
```
## [1] 6
```

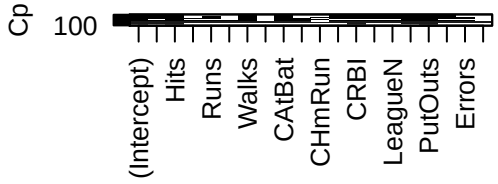
```
plot(reg.summary$bic ,xlab=" Number of Variables ",ylab=" BIC",
type="l")
points (6, reg.summary$bic [6], col =" red",cex =2, pch =20)
```

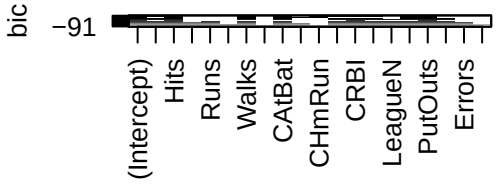



```
plot(regfit.full ,scale ="r2")
plot(regfit.full ,scale ="adjr2")
plot(regfit.full ,scale ="Cp")
plot(regfit.full ,scale ="bic")
```










```
coef(regfit.full ,6)
```

```
##  (Intercept)        AtBat         Hits        Walks         CRBI    DivisionW
##   91.5117981   -1.8685892    7.6043976    3.6976468    0.6430169 -122.9515338
##      PutOuts
##    0.2643076
```