

21-2 WEEK2

1.library, data

```
library(ISLR)
library(leaps)
library(mlbench)
data(BostonHousing)
head(BostonHousing)
```

	crim <dbl>	zn <dbl>	indus <dbl>	chas <fct>	nox <dbl>	rm <dbl>	age <dbl>	dis <dbl>	rad <dbl>	
1	0.00632	18	2.31	0	0.538	6.575	65.2	4.0900	1	
2	0.02731	0	7.07	0	0.469	6.421	78.9	4.9671	2	
3	0.02729	0	7.07	0	0.469	7.185	61.1	4.9671	2	
4	0.03237	0	2.18	0	0.458	6.998	45.8	6.0622	3	
5	0.06905	0	2.18	0	0.458	7.147	54.2	6.0622	3	
6	0.02985	0	2.18	0	0.458	6.430	58.7	6.0622	3	

6 rows | 1-10 of 15 columns

```
sum(is.na(BostonHousing))
```

```
## [1] 0
```

forward stepwise selection

```
regfit.fwd <- regsubsets(medv ~ ., data = BostonHousing, nvmax = ncol(BostonHousing),
method = 'forward')
summary(regfit.fwd)
```

```
## Subset selection object
## Call: regsubsets.formula(medv ~ ., data = BostonHousing, nvmax = ncol(BostonHousing),
##      method = "forward")
## 13 Variables (and intercept)
##      Forced in Forced out
## crim      FALSE      FALSE
## zn         FALSE      FALSE
## indus      FALSE      FALSE
## chas1      FALSE      FALSE
## nox        FALSE      FALSE
## rm         FALSE      FALSE
## age        FALSE      FALSE
## dis        FALSE      FALSE
## rad        FALSE      FALSE
## tax        FALSE      FALSE
## ptratio    FALSE      FALSE
## b          FALSE      FALSE
## lstat      FALSE      FALSE
## 1 subsets of each size up to 13
## Selection Algorithm: forward
##      crim zn  indus chas1 nox rm  age dis rad tax ptratio b  lstat
## 1  ( 1 ) " " " " " " " " " " " " " " " " " " " " " " " " " "
## 2  ( 1 ) " " " " " " " " " " "*" " " " " " " " " " " " " " "
## 3  ( 1 ) " " " " " " " " " " "*" " " " " " " " " " " " " " "
## 4  ( 1 ) " " " " " " " " " " "*" " " " "*" " " " " " " " " " "
## 5  ( 1 ) " " " " " " " " " " "*" "*" " " " "*" " " " " " " " "
## 6  ( 1 ) " " " " " " "*" "*" "*" " " " "*" " " " " " " " "
## 7  ( 1 ) " " " " " " "*" "*" "*" "*" " " " " " " " " " "
## 8  ( 1 ) " " "*" " " " "*" "*" "*" " " " "*" " " " " " " " "
## 9  ( 1 ) "*" "*" " " " "*" "*" "*" " " " "*" " " " " " " " "
## 10 ( 1 ) "*" "*" " " " "*" "*" "*" " " " "*" "*" " " " " " "
## 11 ( 1 ) "*" "*" " " " "*" "*" "*" " " " "*" "*" "*" " " " "
## 12 ( 1 ) "*" "*" "*" " "*" "*" "*" " " " "*" "*" "*" "*" " "
## 13 ( 1 ) "*" "*" "*" " "*" "*" "*" "*" "*" "*" "*" "*" " " " "
```

1-1 “dis”

```
coef(regfit.fwd, 4)
```

```
## (Intercept)      rm      dis      ptratio      lstat
## 24.4713576    4.2237922 -0.5519263 -0.9736458 -0.6654360
```

1-2 R^2

```
summary(regfit.fwd)$rsq[4]
```

```
## [1] 0.6903077
```