Individual Assignment 5

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R Markdown

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#Exercise 6.8: Problem 8 #(a)

```
set.seed(114514)
X = c(rnorm(100))
N = c(rnorm(100))
```

#(b)

```
β0=114
β1=514
β2=1919
β3=810
Y = c(β0 + β1*X + β2*X^2 + β3*X^3 + N)
```

#(c)

```
df=data.frame(X,X^2,X^3,X^4,X^5,X^6,X^7,X^8,X^9,X^10,Y)
library(leaps)
best=regsubsets(Y~., data=df, nvmax=10)
which.min(summary(best)$cp)
```

```
## [1] 3
```

```
which.min(summary(best)$bic)
```

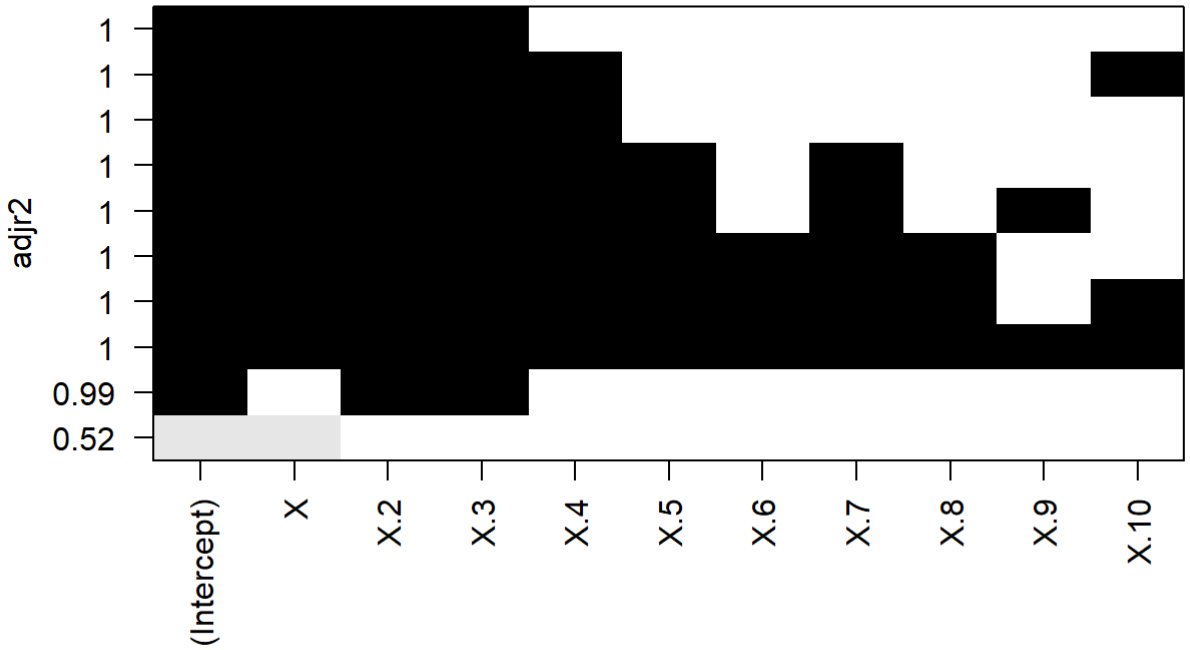
```
## [1] 3
```

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

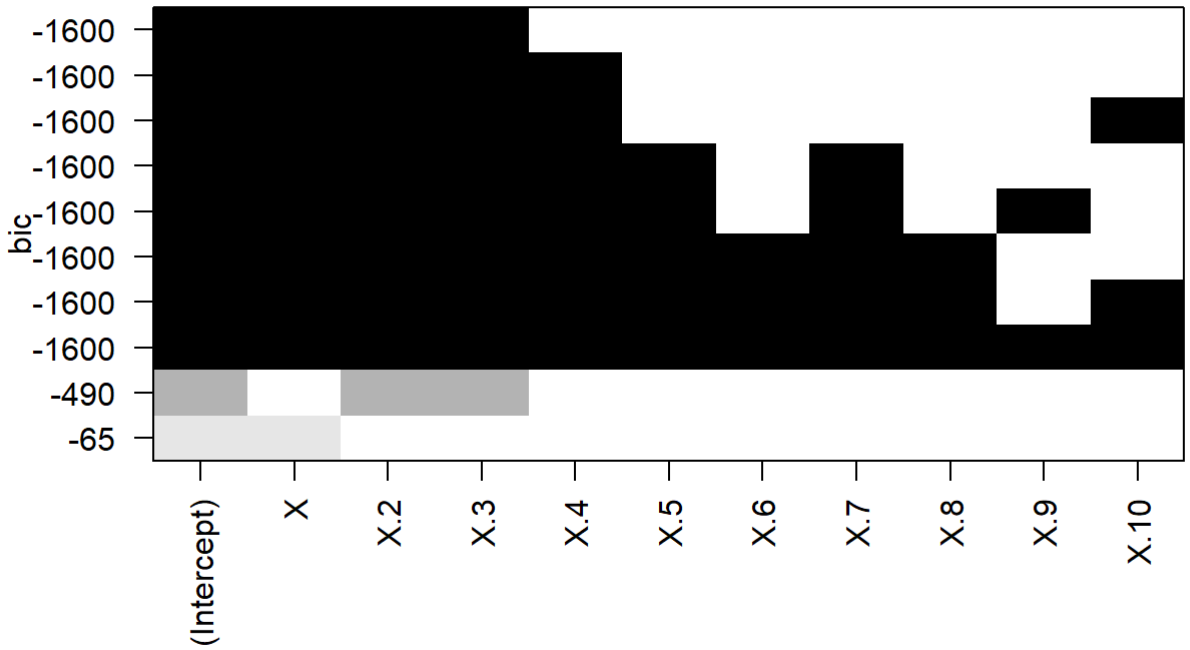
```
## [1] 3
```

```
We can see that all three method to choose model choose the model with three observations.
```

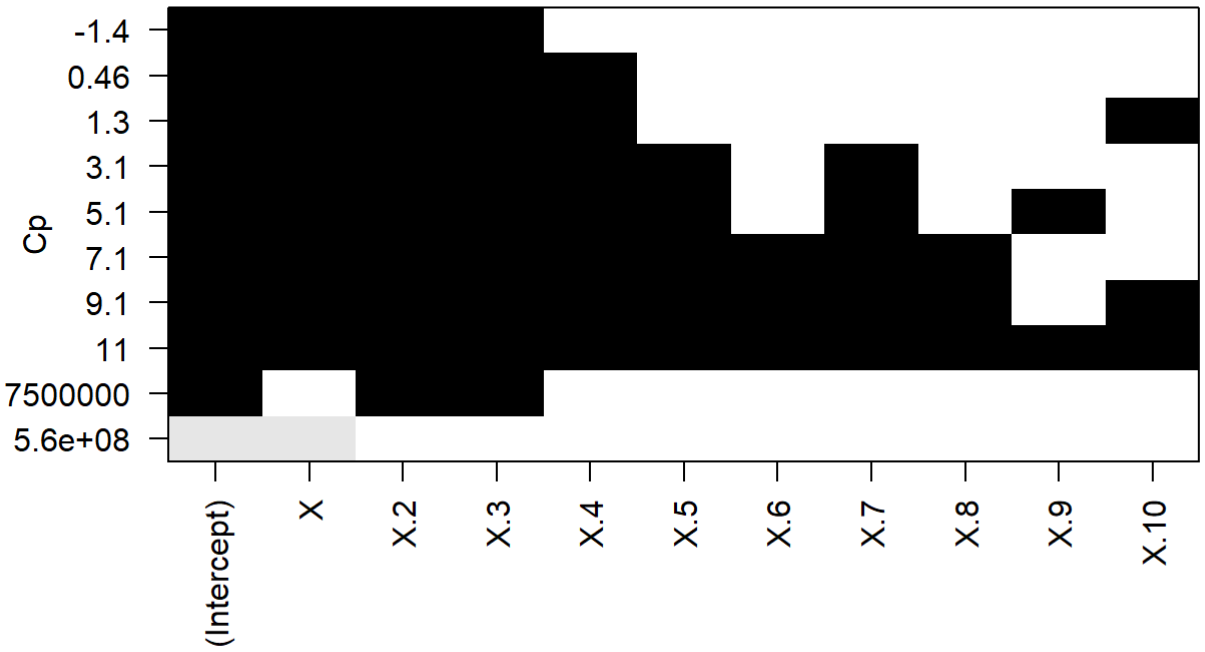
```
plot(best, scale = 'adjr2')
```




```
plot(best, scale = 'bic')
```



```
plot(best, scale = 'Cp')
```




```
coef(best,3)
```

```
## (Intercept)           X         X.2         X.3
##    113.8265    514.1812   1919.0360    809.9246
```

#(d)

```
best.for= regsubsets(Y~.,data=df,nvmax=10,method='forward')
best.back= regsubsets(Y~.,data=df,nvmax=10,method='backward')
which.min(summary(best.for)$cp)
```

```
## [1] 3
```

```
which.min(summary(best.for)$bic)
```

```
## [1] 3
```

```
which.max(summary(best.for)$adjr2)
```

```
## [1] 3
```

```
which.min(summary(best.back)$cp)
```

```
## [1] 3
```

```
which.min(summary(best.back)$bic)
```

```
## [1] 3
```

```
which.max(summary(best.back)$adjr2)
```

```
## [1] 3
```

We can see that backforward and forward selection choose the same model as best subset method.