Exercise 5.4: Problem 2

(a).

We can know that choosing the observations from original sample is a classical model of probability, so the probability of the first bootstrap observation is the *j*th observation = 1/n, so the probability that the first bootstrap observation is not the *j*th observation is 1-(1/n) = (n-1)/n.

(b).

The probability that the first bootstrap observation is not the *j*th observation is also (n-1)/n.

(c).

Since each choosing is independent, so the joint probability = ((n-1)/n)^n.

(d).

P(in)=1-P(out)=1-(4/5)^5=0.67

(e).

P(in)=1-P(out)=1-(99/100)^100=0.63

(f).

P(in)=1-P(out)=1-(9999/10000)^10000=0.63

Exercise 6.8: Problem 1

(a).

The model from best subset has the smallest training RSS, since model form best subset method choose *k* predictors independently, it need not contain predictors form *k-1* model.

(b).

We do not know; it depends on the method of validation and the training and test set.

(c).

i. True. According to the definition of forward stepwise.

ii. True. According to the definition of backward stepwise.

iii. False. Two methods are independent. For example, the forward method may choose x1, x3 in the k model (k=2), but the backward method may choose x1, x2 and x4 in k+1 model.

iv. False, two methods are independent.

v. False. Every step in best subset method is independent.