

```
R Console
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Platform: x86_64-w64-mingw32/x64 (64-bit)

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Natural language support but running in an English locale

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Type 'q()' to quit R.

[Previously saved workspace restored]

> library(ISLR)
> set.seed(10)
> train=sample(392,196) # train is the name of our random subset
> lm.fit=lm(mpg~horsepower,data=Auto,subset=train)
> attach(Auto)
> |
```

01.The estimated test MSE for the above linear regression fit is

0 points

- ☐ A.19.87043
- ☐ B.26.43531
- ☐ C.20.26584
- ☐ D.27.31222

02.The error rate for the corresponding quadratic regression fit is

0 points

- ☐ A.19.87043
- ☐ B.26.43531
- ☐ C.20.26584
- ☐ D.27.31222

03.The error rate for the corresponding cubic regression fit is

0 points

- ☐ A.19.87043
- ☐ B.26.43531
- ☐ C.20.26584
- ☐ D.27.31222

LEAVE ONE OUT VS k-FOLD

04. The following commands refers to

```
set.seed(10)
cv.error.7=rep(0,7) # initialize the vector
for (i in 1:7){ # for loop
  glm.fit=glm(mpg~poly(horsepower,i),data=Auto) #run a glm function
  cv.error.7[i]=cv.glm(Auto,glm.fit,K=7)$delta[1] # storage the data
}
cv.error.7
```

- ☐ A. Leave-One-Out Cross Validation
- ☐ B. k-Fold Cross Validation
- ☐ C. I can not Determine
- ☐ Other:

05. The following commands refers to

0 points

```
> cv.error=rep(0,6)
> for (i in 1:6){ # for loop
+   glm.fit=glm(mpg~poly(horsepower,1),data=Auto)# run a glm function
+   cv.error[i]=cv.glm(Auto,glm.fit)$delta[1]# storage the data
+ }
> |
```

- ☐ A. Leave-One-Out Cross Validation
- ☐ B. k-Fold Cross Validation
- ☐ C. I can not Determine

06. Select True Or False: K-Fold method is faster than Loocv

0 points

- ☐ A. TRUE
- ☐ B. FALSE

BOOTSTRAP

07. The following commands and output refers to

0 points

```
R Console
> library(boot)
> # The Bootstrap
>
> alpha.fn=function(data,index){
+   X=data$X[index]
+   Y=data$Y[index]
+   return((var(Y)-cov(X,Y))/(var(X)+var(Y)-2*cov(X,Y)))
+ }
> alpha.fn(Portfolio,1:100)
[1] 0.5758321
> set.seed(2)
> alpha.fn(Portfolio,sample(100,100,replace=T))
[1] 0.5539377
> boot(Portfolio,alpha.fn,R=1000)

ORDINARY NONPARAMETRIC BOOTSTRAP

Call:
boot(data = Portfolio, statistic = alpha.fn, R = 1000)

Bootstrap Statistics :
      original      bias      std. error
t1*  0.5758321  0.0009480333   0.09303824
```

- ☐ A. Estimating the Accuracy of a Linear Regression Model
- ☐ B. Estimating the Accuracy of a quadratic Regression Model
- ☐ C. Estimating the Accuracy of a Statistic of Interest
- ☐ D. I can not determine

08. The following commands and output refers to

0 points

```
R Console
> boot.fn=function(data,index){
+   return(coef(lm(mpg~horsepower, data=data, subset=index)))
+ }
> boot.fn(Auto,1:392)
(Intercept) horsepower
39.9358610   -0.1578447
> set.seed(1)
> boot.fn(Auto,sample(392,392,replace=T))
(Intercept) horsepower
40.3404517   -0.1634868
> boot.fn(Auto,sample(392,392,replace=T))
(Intercept) horsepower
40.1186906   -0.1577063
> boot(Auto,boot.fn,1000)

ORDINARY NONPARAMETRIC BOOTSTRAP

Call:
boot(data = Auto, statistic = boot.fn, R = 1000)

Bootstrap Statistics :
      original      bias      std. error
t1*  39.9358610  0.0544515229  0.861289790
t2*  -0.1578447 -0.0006170901  0.007343073
```

- ☐ A. Estimating the Accuracy of a Linear Regression Model
- ☐ B. Estimating the Accuracy of a quadratic Regression Model
- ☐ C. Estimating the Accuracy of a Statistic of Interest
- ☐ D. I can not determine

09. The following commands and output refers to

0 points

```
> boot.fn=function(data, index)
+   coefficients(lm(mpg~horsepower+I(horsepower^2), data=data, subset=index))
> set.seed(2)
> boot(Auto, boot.fn, 1000)
```

ORDINARY NONPARAMETRIC BOOTSTRAP

Call:
boot(data = Auto, statistic = boot.fn, R = 1000)

Bootstrap Statistics :

	original	bias	std. error
t1*	56.900099702	3.645148e-02	2.1141468558
t2*	-0.466189630	-3.801225e-04	0.0339713089
t3*	0.001230536	1.423356e-06	0.0001233043

- ☐ A. Estimating the Accuracy of a Linear Regression Model
- ☐ B. Estimating the Accuracy of a quadratic Regression Model
- ☐ C. Estimating the Accuracy of a Statistic of Interest
- ☐ D. I can not determine

10. Select True Or False: The bootstrap approach does not rely on any assumptions, and so it is likely to give a more accurate estimate of the standard errors of the slope and the constant than the linear regression approach

0 points

- ☐ A. TRUE
- ☐ B. FALSE