

Due: Thursday, February 14, 2019

- This set of problems are from Kutner et al., *Applied Linear Regression Models* 4th edition (or, *Applied Linear Statistical Models*, 5th edition). You can find Chapter 14 of the book on Blackboard.
- You will need to use software to finish this assignment. You can use the R code on Blackboard as example, if you plan to use R.

1. Kutner et al, Problem 14.20

- Use the Bonferroni method for “joint confidence interval.” For a family of k confidence intervals, to achieve a joint (or family, or simultaneous) confidence level of $(1 - \alpha)100\%$, use $(1 - \alpha/k)100\%$ as the confidence level for each interval.

2. Kutner et al, Problem 14.22 (c, d)

Remarks:

- You don’t need to compare your results to part (a) and (b).
- In R, when you conduct variable selection in a model that includes categorical predictors or higher order terms (eg, quadratic term, interactions, etc.), I recommend you declare the dummy variables or higher orders when you set up the model. This way, R can treat the dummy variables as a “group,” and remove higher order terms (if needed) before removing the lower order terms.

For instance, I will use:

```
> reg.new2 <- glm(shot~age+aware+as.factor(gender)+I(age^2)
+I(aware^2)+age*aware,family=binomial(link=logit),
data= mydataname)
```

- For variable selection using step() in R, if you want to "grow" a model (i.e., forward), you can use

```
> reg.null<-
glm(shot~1,family=binomial(link=logit),data=mydataname)
```

```
> step(reg.null, scope=list(lower=~1,  
  upper=~age+aware+gender+I(age^2)+I(aware^2)+age*aware),  
  direction="forward")
```

- To use BIC for stepwise variable selection in R, you need to find the sample size of the data set and use: (replace “samplesize” by the actual sample size of the data set.)

```
> step(glmout, direction="both", k=log(samplesize))
```

3. I received _____ points in HW #1.

This is the end of HW 3.