1.

(a)

> x=c(23.1,32.8,31.8,32,30.4,24.0,39.5,24.2,52.5,37.9,30.5,25.1,12.4,35.1,31.5,21.1)

> y=c(10.5,16.7,18.2,17.0,16.3,10.5,23.1,12.4,24.9,22.8,14.1,12.9,8.8,17.4,14.9,10.5)

> model=lm(y~x)

> model

Call:

lm(formula = y ~ x)

Coefficients:

(Intercept) x

0.5180 0.5016

The assumption is **

> anova(model)

Analysis of Variance Table

Response: y

Df Sum Sq Mean Sq F value Pr(>F)

x 1 309.927 309.927 101.54 8.496e-08 \*\*\*

Residuals 14 42.731 3.052

---

Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

(b)

> confint(model,level=0.9)

5 % 95 %

(Intercept) -2.2427613 3.2788045

x 0.4139049 0.5892431

2.

(a)

> library(MASS)

> data(Cars93)

> dim(Cars93)

[1] 93 27

(b)

> model=lm(Cars93$MPG.city~Cars93$EngineSize+Cars93$Weight+Cars93$Passengers+Cars93$Price)

> model

Call:

lm(formula = Cars93$MPG.city ~ Cars93$EngineSize + Cars93$Weight +

Cars93$Passengers + Cars93$Price)

Coefficients:

(Intercept) Cars93$EngineSize Cars93$Weight Cars93$Passengers Cars93$Price

46.389413 0.196119 -0.008207 0.269622 -0.035804

(c)

(d)

> step <- stepAIC(model, direction="both")

Start: AIC=212.87

Cars93$MPG.city ~ Cars93$EngineSize + Cars93$Weight + Cars93$Passengers +

Cars93$Price

Df Sum of Sq RSS AIC

- Cars93$EngineSize 1 1.04 824.89 210.99

- Cars93$Passengers 1 3.77 827.62 211.29

- Cars93$Price 1 4.96 828.82 211.43

<none> 823.85 212.87

- Cars93$Weight 1 349.67 1173.52 243.77

Step: AIC=210.99

Cars93$MPG.city ~ Cars93$Weight + Cars93$Passengers + Cars93$Price

Df Sum of Sq RSS AIC

- Cars93$Passengers 1 3.20 828.10 209.35

- Cars93$Price 1 4.84 829.74 209.53

<none> 824.89 210.99

+ Cars93$EngineSize 1 1.04 823.85 212.87

- Cars93$Weight 1 627.12 1452.01 261.57

Step: AIC=209.35

Cars93$MPG.city ~ Cars93$Weight + Cars93$Price

Df Sum of Sq RSS AIC

- Cars93$Price 1 11.96 840.05 208.68

<none> 828.10 209.35

+ Cars93$Passengers 1 3.20 824.89 210.99

+ Cars93$EngineSize 1 0.47 827.62 211.29

- Cars93$Weight 1 1050.34 1878.44 283.52

Step: AIC=208.68

Cars93$MPG.city ~ Cars93$Weight

Df Sum of Sq RSS AIC

<none> 840.05 208.68

+ Cars93$Price 1 11.96 828.10 209.35

+ Cars93$Passengers 1 10.31 829.74 209.53

+ Cars93$EngineSize 1 0.06 839.99 210.67

- Cars93$Weight 1 2065.52 2905.57 322.09

3.