Homework #6

6.18.a

> prop <- read.table(file.choose(), header=F)

> names(prop) <- c("age","operating\_cost","vacancy\_rates","total\_sq\_footage","rental\_rates")

> stem(prop$age)

The decimal point is at the |

10 | 55

11 | 5

12 | 005

13 | 00055888

14 | 0000000033555555568

15 | 000000000333355555669

16 | 00003555555558888

17 | 000258

18 | 08

19 | 33

> stem(prop$operating\_cost)

The decimal point is at the |

0 | 0000000000000000

2 | 00000000000000000000000

4 | 00000

6 | 0

8 | 0

10 | 00

12 | 00000

14 | 0000000000000

16 | 0000000000

18 | 000

20 | 00

> stem(prop$vacancy\_rates)

The decimal point is at the |

2 | 0

4 | 080003358

6 | 012613

8 | 00001223456001555689

10 | 013344566677778123344666668

12 | 00011115777889002

14 | 6

> stem(prop$total\_sq\_footage)

The decimal point is 1 digit(s) to the left of the |

0 | 0000000000000000000000000000002333333333334444445555556678889

1 | 023444469

2 | 1223477

3 | 3

4 |

5 | 7

6 | 0

7 | 3

6.18.b

> with(prop, pairs(data.frame("RENTALS" = prop$rental\_rates, "AGE" = prop$age, "OPERATING COST" = prop$operating\_cost, “VACANCIES”= prop$vacancy\_rates, “FOOTAGE”= prop$total\_sq\_footage)))

> with(prop, cor(data.frame("RENTALS" = prop$rental\_rates, "AGE" = prop$age, "OPERATING COST" = prop$operating\_cost, "VACANCIES"= prop$vacancy\_rates, "FOOTAGE"= prop$total\_sq\_footage)))

RENTALS AGE OPERATING.COST VACANCIES FOOTAGE

RENTALS 1.00000000 0.53526237 0.2885835 0.4406971 0.08061073

AGE 0.53526237 1.00000000 -0.2502846 0.4137872 0.06652647

OPERATING.COST 0.28858350 -0.25028456 1.0000000 0.3888264 -0.25266347

VACANCIES 0.44069713 0.41378716 0.3888264 1.0000000 -0.37976174

FOOTAGE 0.08061073 0.06652647 -0.2526635 -0.3797617 1.00000000

6.18.c

> prop.lm <- lm(prop$rental\_rates ~ prop$age + prop$operating\_cost + prop$vacancy\_rates + prop$total\_sq\_footage, data = prop)

> summary(prop.lm)

Y = -521828 +38000X1 + 7428X2 + 3755X3 + 152945X4 + error

6.18.d

> e <- prop.lm$residuals

> boxplot(e)

6.18.e

> plot(prop$rental\_rates,e)

> plot(prop$age,e)

> plot(prop$operating\_cost,e)

> plot(prop$vacancy\_rates,e)

> plot(prop$total\_sq\_footage,e)

> plot(prop$age+prop$operating\_cost,e)

> plot(prop$age+prop$vacancy\_rates,e)

> plot(prop$age+prop$total\_sq\_footage,e)

> plot(prop$vacancy\_rates+prop$operating\_cost,e)

> plot(prop$total\_sq\_footage+prop$operating\_cost,e)

> plot(prop$total\_sq\_footage+prop$vacancy\_rates,e)

> qqnorm(e)

6.18.f

Yes

6.19.a

H0: B1=B2=B3=B4=0, HA: At least one predictor does not equal 0, MSE = 5815516051, MSR = 117764200035, F\* = MSR/MSE = 20.25, t(.95,4)=2.132, if |t\*| <= 2.132, conclude H0, otherwise conclude HA. Conclude H0

6.19.c

> ssr <- sum(e^2)

> sst <- ssr + mean(e^2)

> r <- ssr/sst

[1] 0.9878049

Thus, we have a close fit since R2 is close to one

6.21.1

> newdata1 <- read.table(file.choose())

> predict(prop.lm,newdata1,interval="confidence", level=.95)

6.21.2

> predict(prop.lm,newdata1,interval="predict", level=.95)



