#

# -------------- Chapter 16: Lining Up Our Models -------------

#

#

#type <- c("truck","truck","van","van","van","van","car","truck","van","van","van","car","truck","car")

oilChanges <- c(3,5,2,3,1,4,6,4,3,2,0,10,7,8)

repairs <- c(300, 300, 500, 400, 700, 420, 100, 290, 475, 620, 600, 0, 200, 50)

miles <- c(20100, 23200, 19200, 22100, 18400, 23400, 17900, 19900, 20100, 24100, 18200, 19600, 20800, 19700)

oil <- data.frame(oilChanges, repairs, miles)

head(oil)

plot(oil$oilChanges, oil$repairs)

plot(oil$miles, oil$repairs)

model1 <- lm(formula=repairs ~ oilChanges, data=oil)

summary(model1)

plot(oil$oilChanges, oil$repairs)

abline(model1,col="red")

model3 <- lm(formula=repairs ~ miles, data=oil)

summary(model3)

plot(oil$miles, oil$repairs)

abline(model3,col="red")

model2 <- lm(formula=repairs ~ oilChanges + miles, data=oil)

summary(model2)

#oil$type <- type

#oil$type[type=="car"] <- 1

#oil$type[type=="truck"] <- 2

#oil$type[type=="van"] <- 2

#m <- lm(formula=repairs ~ oilChanges + miles+type, data=oil)

#summary(m)

#ggplot(oil, aes(x = type, y = repairs)) +

# geom\_point(aes(shape=type))

oil$oilChangeCost <- oil$oilChanges \* 350

oil$totalCost <- oil$oilChangeCost + oil$repairs

model1 <- lm(formula=totalCost ~ oilChanges, data=oil)

plot(oil$oilChanges, oil$totalCost)

abline(model1)

test = data.frame(oilChanges=0)

predict(model1,test, type="response")

test = data.frame(oilChanges=5)

predict(model1,test, type="response")

test = data.frame(oilChanges=10)

predict(model1,test, type="response")

library(ggplot2)

ggplot(oil, aes(x = oilChanges, y = totalCost)) +

geom\_point() +

stat\_smooth(method = "lm", col = "red")

### Plot Predicted values model1

#

library(lattice)

#

oil$model1pred<-oil$oilChanges\*-71.99+652.19

head(oil)

plot(oil$oilChanges, oil$model1pred,xlab="oil changes", ylab="predicted repair cost")

xyplot(oil$model1pred ~ oil$oilChanges, data = oil, type = c("p","r"), col.line = "red",xlab="oil changes", ylab="predicted repair cost")

#

#

# Plot predicted values model2

#

oil$model2pred<-(oil$oilChanges\*-71.98)+(oil$oilChanges\*.01508)+343.26567

head(oil)

plot(oil$oilChanges, oil$model2pred,xlab="oil changes & miles", ylab="predicted cost" )

xyplot(oil$model2pred ~ oil$oilChanges, data = oil, type = c("p","r"), col.line = "red",xlab="oil changes & miles", ylab="predicted repair cost")

#