```
#R Code for HW1
                                         ###  Sta108, Fall 2007, Utts
#Problem 1.27
#LINES PRECEEDED WITH A # SIGN ARE COMMENTS AND ARE NOT ACTED ON BY R.
#Read the data into R
Data = read.table("~/Documents/School/Sta108utts/CH01PR27.txt")

#Check that is read properly. Also check which column is Y.
Data

#Re-name the columns of the Data
#X=age, Y=muscle mass
names(Data) = c("Y","X")

#a) Fit the regression model. Obtain the estimates. Plot the estimated regression
function and the data
Muscle = lm(Y ~ X, data = Data)

#Print summary of estimated coefficients
summary(Muscle)

#Plot data and regression line
plot(Data$X, Data$Y, main="Problem 1.19(a)",
        xlab="Age (years)", ylab="Measure of Muscle Mass", pch=19)
lines(Data$X, Muscle$fitted.values)

#OR:
#assign coefficients of regression fit to variables b0 and b1
b0 = Muscle$coefficients[1]
b1 = Muscle$coefficients[2]
#Plot data and regression line
plot(Data$X, Data$Y, main="Problem 1.19(a)",
        xlab="Age (years)", ylab="Measure of Muscle Mass", pch=19)
abline(b0,b1)

#b)
#(1) find estimate of slope
b1
#(2) find estimate of Y^h when Xh = 60
b0-b1*60
#(3) get 8th residual
Data$Y[8]-Muscle$fitted.values[8]
#OR: get the residual directly
Muscle$residuals[8]
#(4) find mse
#In summary() output read for Residual standard error, Square it:
summary(Muscle)
8.173^2
#OR: use ANOVA table, anova() output, read inside table for [Mean Square] of
[Residuals]
anova(Muscle)
```

```r
#Problem From Ch.2

#a)
#Test statistic, t*, is printed as t-value in summary() output
#For decision rule: Find t-value (based on given alpha=0.05) used in decision
rule:
#we have a left-tailed test: so need the left tail of t-distr. to be 0.05:
#t(alpha, n-2)=t(.05,58)
qt(0.05,58)

#c)  Find condifence intervals for Beta1
#Multiplier is t(1-alpha/2, n-2)
qt(1-0.05/2,58)
#CI:
b1 - qt(1-0.05/2,58)*0.0902
b1 + qt(1-0.05/2,58)*0.0902
#OR: get confidence interval of both parameters Beta0 and Beta1 by command:
confint(), read the second line
confint(Muscle)
```