#install.packages("ISLR")  
library(ISLR)

PrivateCollege <- College$Private[College$Private=='Yes']  
College$AcceptRate <- College$Accept/College$Apps

plot(College$Private, College$Outstate)  
summary(College)

plot(College$Private, College$AcceptRate)

PrivateColl <- College$Private[College$Private=='Yes']

PrivateOutstat <- College$Outstate[College$Private=='Yes']

print(PrivateOutstat)  
sum(PrivateOutstat)  
print(PrivateColl)

lm.fit=lm(Outstate~Private, data = College)  
summary(lm.fit)

lm(formula = College$Outstate ~ College$Private)

lm(formula = PrivateColl  ~ PrivateOutstat)

tapply(College$AcceptRate)

College$AcceptRate <- College$Accept/College$Apps  
tapply(College$AcceptRate,College$Private,FUN=mean)

college\_private <- subset(College,Private=="Yes");  
college\_public <- subset(College,Private=="No");

 mean(college\_private$AcceptRate)  
 mean(college\_public$AcceptRate)  
   
 lm.fit = lm(college\_private$AcceptRate~college\_public$AcceptRate,data=College)  
summary(lm.fit)  
plot(College$Private, College$AcceptRate)

using=c("perc.alumni","Expend","Grad.Rate")

data=College[using]  
c("Outstate","perc.alumni","Expend","Grad.Rate")  
data=College[using]  
attach(data)  
l-m;  
plot(College$Outstate, perc.alumni, main="Scatterplot", xlab="outstate ", ylab="alumni ", pch=19)

plot(College$Outstate, Expend, main="Scatterplot", xlab="outstate ", ylab="Expend ", pch=19)

plot(College$Outstate, Grad.Rate, main="Scatterplot", xlab="outstate ", ylab="Grad.Rate ", pch=19)

a <- (perc.alumni+Expend+Grad.Rate)  
out=lm(College$Outstate~perc.alumni+Expend+Grad.Rate,data=data)  
out  
summary(out)

lm.fit = lm(College$Outstate~a,data = data)  
summary(lm.fit)  
plot(perc.alumni+Expend+Grad.Rate,College$Outstate)  
abline(lm.fit)  
linear\_pred <- predict(lm.fit,data=data)  
lm.resid = resid(lm.fit)  
plot(lm.resid)  
predict(lm.fit)-resid(lm.fit)  
lm.in = lm(College$AcceptRate~College$Private,data=College)  
lm.in  
summary(lm.in)  
using=c("perc.alumni","Expend","Grad.Rate")

data=College[using]  
c("Outstate","perc.alumni","Expend","Grad.Rate")  
attach(data)  
out=lm(College$Outstate~perc.alumni+Expend+Grad.Rate,data=data)  
out  
summary(out)  
lm.fit = lm(College$Outstate~a,data = data)  
summary(lm.fit)  
plot(perc.alumni+Expend+Grad.Rate,College$Outstate)  
abline(lm.fit)