二、参数估计

1.矩估计

男生身高服从正态分布，其矩估计量为样本均值176.07，方差矩估计量为样本方差40.48。

1. 极大似然估计量

正好为矩估计量。

1. 区间估计

方差未知：

男生身高均值的区间估计：

male\_height<-c(185, 173, 175, 182, 173, 181, 184, 179, 181, 187, 169, 178,

183, 168, 181, 175, 175, 186, 186, 182, 178, 177, 172, 168,

173.5, 184, 183, 175, 168, 174, 181, 170, 166, 178, 177, 181,

163, 172, 160, 173, 185, 172, 183, 180, 175, 178, 169, 175,

165, 169, 170, 183, 184, 174, 170, 173, 170, 182, 178, 170,

179)

t.test(male\_height)

One Sample t-test

data: male\_height

t = 216.14, df = 60, p-value < 2.2e-16

alternative hypothesis: true mean is not equal to 0

95 percent confidence interval:

174.4442 177.7033

sample estimates:

mean of x

176.0738

均值未知

男生身高方差的区间估计：

interval\_var1<-function(x,mu=Inf,alpha=0.05){

n<-length(x)

if (mu<Inf){

S2 <- sum((x-mu)^2)/n; df <- n

}

else{

S2 <- var(x); df <- n-1

}

a<-df\*S2/qchisq(1-alpha/2,df)

b<-df\*S2/qchisq(alpha/2,df)

data.frame(var=S2, df=df, a=a, b=b)

}

male\_height<-c(185, 173, 175, 182, 173, 181, 184, 179, 181, 187, 169, 178,

183, 168, 181, 175, 175, 186, 186, 182, 178, 177, 172, 168,

173.5, 184, 183, 175, 168, 174, 181, 170, 166, 178, 177, 181,

163, 172, 160, 173, 185, 172, 183, 180, 175, 178, 169, 175,

165, 169, 170, 183, 184, 174, 170, 173, 170, 182, 178, 170,

179

)

###认为均值未知

interval\_var1(male\_height)

var df a b

1 40.48197 60 29.15949 60.00032

4.贝叶斯估计