第七章

设置目录

```
setwd("D:\\data\\chapter 7")
```

例 7-1

```
 mean1<-6.76*10^9
  sd1<-1.36*10^9
  n1<-36
  alpha<-0.05
  t1<-qt(1-alpha/2,n1-1,lower.tail = TRUE)
  t1
```

```
## [1] 2.030108
```

```
  c(mean1-sd1*t1/sqrt(n1),mean1+sd1*t1/sqrt(n1))
```

```
## [1] 6299842203 7220157797
```

例 7-2

```
  mean2<-172.2
  sd2<-4.5
  n2<-90
  alpha<-0.05
  z1<-qnorm(1-alpha/2,mean=0,sd=1,lower.tail = TRUE)
  z1
```

```
## [1] 1.959964
```

```
  c(mean2-sd2*z1/sqrt(n2),mean2+sd2*z1/sqrt(n2))
```

```
## [1] 171.2703 173.1297
```

例 7-3

```
  mean0<-4*10^9
  alpha<-0.05
```

```
  t2<-(mean1-mean0)/(sd1/sqrt(n1))
  t2
```

```
## [1] 12.17647
```

```
  qt(1-alpha,n1-1,lower.tail = TRUE)
```

```
## [1] 1.689572
```

```
  1-pt(t2,df=35)
```

```
## [1] 1.931788e-14
```

例 7-4

```
 data7.4<-read.csv("7-4.csv")
 t.test(data7.4$sq, data7.4$sh, paired=TRUE)$conf.int
```

```
## [1] 5.630050 8.204495
## attr(,"conf.level")
## [1] 0.95
```

例 7-5

```
  a<-t.test(data7.4$sq,data7.4$sh,paired=TRUE)
  a$statistic
```

```
##        t
## 11.97357
```

```
  alpha2<-0.001
  n3<-11
  qt(1-alpha2/2,n3-1,lower.tail = TRUE)
```

```
## [1] 4.586894
```

```
  a$p.value
```

```
## [1] 2.982617e-07
```

例 7-6

```
  mean4<-27.2
  sd4<-0.9
  n4<-44
```

```
  mean5<-27.3
  sd5<-0.8
  n5<-48
  t4<-qt(1-alpha/2,n4+n5-2,lower.tail = TRUE)
  t4
```

```
## [1] 1.986675
```

```
  sw<-sqrt((((n5-1)*sd5^2+(n4-1)*sd4^2)/(n4+n5-2))*(1/n5+1/n4))
  c((mean5-mean4)-t4*sw,(mean5-mean4)+t4*sw)
```

```
## [1] -0.2521342  0.4521342
```

例 7-7

```
mean6<-2.9
  sd6<-0.3
  n6<-10
  mean7<-2.8
  sd7<-0.1
  n7<-29
  sw2<-sqrt(sd6^2/n6+sd7^2/n7)
  sw2
```

```
## [1] 0.09666865
```

```
  v<-(sd6^2/n6+sd7^2/n7)^2/((sd6^2/n6)^2/(n6-1)+(sd7^2/n7)^2/(n7-1))
  v
```

```
## [1] 9.698291
```

```
  t5<-qt(1-alpha/2,round(v,0),lower.tail = TRUE)
  t5
```

```
## [1] 2.228139
```

```
  c((mean6-mean7)-t5*sw2,(mean6-mean7)+t5*sw2)
```

```
## [1] -0.1153912  0.3153912
```

例 7-8

```
data7.8<-read.csv("7-8.csv")
  colnames(data7.8)<-c("gdb","ddb")
  b<-t.test(data7.8$gdb,data7.8$ddb,var.equal = TRUE)
  b$statistic
```

```
##        t
## 1.891436
```

```
  b$p.value
```

```
## [1] 0.07573013
```

例 7-9

```
 mean8<-0.345
  sd8<-0.053
  n8<-25
  mean9<-0.362
  sd9<-0.083
  n9<-15
  alpha=0.05
  tt<-(mean9-mean8)/sqrt(sd8^2/n8+sd9^2/n9)
  tt
```

```
## [1] 0.7110378
```

```
  v1<-(sd8^2/n8+sd9^2/n9)^2/((sd8^2/n8)^2/(n8-1)+(sd9^2/n9)^2/(n9-1))
  v1
```

```
## [1] 20.95649
```

```
  qt(1-alpha/2,round(v1,0),lower.tail = TRUE)
```

```
## [1] 2.079614
```

```
  1-pt(tt,round(v1,0))
```

```
## [1] 0.2424421
```

例 7-10

```
  f<-sd6^2/sd7^2
  f
```

```
## [1] 9
```

```
  alpha3<-0.10
  qf(1-alpha3,n6-1,n7-1,lower.tail = TRUE)
```

```
## [1] 1.865199
```

```
  1-pf(f,n6-1,n7-1,lower.tail = TRUE)
```

```
## [1] 3.09081e-06
```

例 7-13

```
  total<-166
  yang<-41
  p<-yang/total
  p
```

```
## [1] 0.246988
```

```
  z1<-qnorm(1-alpha/2,mean=0,sd=1,lower.tail = TRUE)
  c(p-z1*sqrt(p*(1-p)/total),p+z1*sqrt(p*(1-p)/total))
```

```
## [1] 0.1813836 0.3125923
```

例 7-14

```
total2<-8
  yang2<-5
  pp<-(yang2+2)/(total2+4)
  pp
```

```
## [1] 0.5833333
```

```
  z1<-qnorm(1-alpha/2,mean=0,sd=1,lower.tail = TRUE)
  c(pp-z1*sqrt(pp*(1-pp)/(total2+4)),
    pp+z1*sqrt(pp*(1-pp)/(total2+4)))
```

```
## [1] 0.3043937 0.8622730
```

例 7-15

```
 p0<-0.0043
  total3<-500
  yang3<-16
  c<-binom.test(yang3,total3,p=p0,alternative = c( "greater"))
  c$p.value
```

```
## [1] 1.106037e-09
```

例 7-16

```
p01<-0.0739
 total4<-3909
 yang4<-1121
 d<-prop.test(yang4,total4,p01,alternative=c("greater"))
 sqrt(d$statistic)
```

```
## X-squared
##  50.84444
```

```
 d$p.value
```

```
## [1] 0
```

例 7-17

```
total5<-1430
 yang5<-313
 p1<-yang4/total4
 p1
```

```
## [1] 0.2867741
```

```
 p2<-yang5/total5
 p2
```

```
## [1] 0.2188811
```

```
 z1<-qnorm(1-alpha/2,mean=0,sd=1,lower.tail = TRUE)
 c((p1-p2)-z1*sqrt(p1*(1-p1)/total4+p2*(1-p2)/total5),
   (p1-p2)+z1*sqrt(p1*(1-p1)/total4+p2*(1-p2)/total5))
```

```
## [1] 0.04219690 0.09358909
```

例 7-18

```
total6<-4
 yang6<-3
 pp1<-(yang6+1)/(total6+2)
 pp1
```

```
## [1] 0.6666667
```

```
  total7<-3
  yang7<-2
  pp2<-(yang7+1)/(total7+2)
  pp2
```

```
## [1] 0.6
```

```
  z1<-qnorm(1-alpha/2,mean=0,sd=1,lower.tail = TRUE)
  sw1<-sqrt(pp1*(1-pp1)/(total6+2)+pp2*(1-pp2)/(total7+2))
  sw1
```

```
## [1] 0.2916111
```

```
  c((pp1-pp2)-z1*sw1,(pp1-pp2)+z1*sw1)
```

```
## [1] -0.5048806  0.6382139
```

例 7-19

```
  total8<-c(total4,total5)
  yang8<-c(yang4,yang5)
  e<-prop.test(yang8,total8)
  pc<-(yang4+yang5)/(total4+total5)
  pc
```

```
## [1] 0.2685896
```

```
  sqrt(e$statistic)
```

```
## X-squared
##  4.921586
```

```
  e$p.value
```

```
## [1] 8.584585e-07
```