Homework #5

Glenn Clapp

7.2.2 (3pts)

subjects = data.frame(  
 age = c(62,62,68,48,51,60,51,57,57,41,62,50,53,34,62,61)  
)  
  
t.test(subjects$age,var.equal=T,mu=60)

##   
## One Sample t-test  
##   
## data: subjects$age  
## t = -2.2822, df = 15, p-value = 0.03749  
## alternative hypothesis: true mean is not equal to 60  
## 95 percent confidence interval:  
## 50.20944 59.66556  
## sample estimates:  
## mean of x   
## 54.9375

favstats(subjects$age)

## min Q1 median Q3 max mean sd n missing  
## 34 50.75 57 62 68 54.9375 8.872946 16 0

Yes, a 95% confidence interval estimates the true mean to be between 50.21 and 59.67. The entirety of that interval is less than 60.

7.2.4 (3pts)

n\_visits=25  
xbar\_visits = 4.8  
s\_visits = 2  
  
ts <- -qt((1-.95)/2,lower.tail=TRUE,df=n\_visits-1)  
standard\_error = s\_visits/n\_visits^0.5  
print(ts)

## [1] 2.063899

#pt(ts,df=n\_visits-1)  
lower.ci=xbar\_visits-ts\*standard\_error  
upper.ci=xbar\_visits+ts\*standard\_error  
  
print(lower.ci)

## [1] 3.974441

print(upper.ci)

## [1] 5.625559

Can it be concluded from these data that the population mean is greater than four visits per patient? NO.

What assumptions are necessary? Random sample selection and normally distributed population.

7.3.2 (3pts)

n\_fract = 31  
n\_healthy = 31  
  
xbar\_fract = 76.9  
s\_fract = 12.6  
  
xbar\_healthy = 90.9  
s\_healthy = 12.5  
  
xbar\_paired = xbar\_healthy - xbar\_fract  
s\_paired = ((s\_fract^2+s\_healthy^2)/n\_fract)^0.5 #Same sample size simplification  
  
standard\_error = s\_paired/n\_fract^0.5  
ts <- -qt((1-.95)/2,lower.tail=TRUE,df=n\_fract-1)  
print(ts)

## [1] 2.042272

lower.ci=xbar\_paired-ts\*standard\_error  
upper.ci=xbar\_paired+ts\*standard\_error  
  
print(lower.ci)

## [1] 12.83073

print(upper.ci)

## [1] 15.16927

Is the healthy group higher? Yes. The 95% confidence interval in a paired t-test is entirely positive.

7.3.4 (3pts)

hypertension <- read.csv('EXR\_C07\_S03\_04.csv')  
  
t.test(Length~Group,data=hypertension,var.equal=T)

##   
## Two Sample t-test  
##   
## data: Length by Group  
## t = 3.9531, df = 172, p-value = 0.0001125  
## alternative hypothesis: true difference in means is not equal to 0  
## 95 percent confidence interval:  
## 10.77439 32.26394  
## sample estimates:  
## mean in group 1 mean in group 2   
## 214.7143 193.1951

Can we conclude that patients with primary hypertension on average havehigher cholesterol levels than normotensive patients? Yes. The true difference in peans is not equal to 0 p = 0.0001125

7.3.12 (3pts)

Can we conclude that, on the average, lymphocyctes and tumor cells differ in size? Yes.

tumors <- read.csv('EXR\_C07\_S03\_12.csv')  
  
t.test(Size~Group,data=tumors,var.equal=T)

##   
## Two Sample t-test  
##   
## data: Size by Group  
## t = -21.049, df = 88, p-value < 2.2e-16  
## alternative hypothesis: true difference in means is not equal to 0  
## 95 percent confidence interval:  
## -12.005692 -9.934308  
## sample estimates:  
## mean in group 1 mean in group 2   
## 6.95 17.92

7.4.2 (3pts)

wellbeing <- read.csv('EXR\_C07\_S04\_02.csv')  
  
t.test(wellbeing$Base-wellbeing$Follow,data=tumors,var.equal=T)

##   
## One Sample t-test  
##   
## data: wellbeing$Base - wellbeing$Follow  
## t = 2.2909, df = 65, p-value = 0.02522  
## alternative hypothesis: true mean is not equal to 0  
## 95 percent confidence interval:  
## 0.1943063 2.8359968  
## sample estimates:  
## mean of x   
## 1.515152

Is there sufficient evidence to indicate that quality of physical well-being significantly decreases in the first week of discharge among patients who receive a phone call? No.3

7.9.2 (3pts)

7.10.2 (3pts)

13.4.2 (3pts) 13.6.2 (3pts)