## 対応のないt検定

setwd("C:/Users/moskg/Downloads/R") #ワーキングディレクトリの設定

library(tidyverse)

x<-read.csv("ttestSample1.csv")　　　#データの読み込み

#記述統計をする

library(psych)

describeBy(x[,3],x$Group)

Descriptive statistics by group

group: A

vars n mean sd median trimmed mad min max range skew kurtosis se

X1 1 10 4.2 2.15 4.5 4.25 2.97 1 7 6 -0.05 -1.65 0.68

---------------------------------------------------------------

group: B

vars n mean sd median trimmed mad min max range skew kurtosis se

X1 1 10 7 1.56 7 7.12 1.48 4 9 5 -0.31 -1.03 0.49

#t検定

t.test(x$Result~x$Group)   
#t検定をしたい列のデータを前に、まとめる基準にしたいデータ列を後ろに

#2列目「Group」ごとにまとめた3列目「Result」のデータについてt検定

Welch Two Sample t-test

data: x$Result by x$Group

t = -3.3308, df = 16.439, p-value = 0.004108

alternative hypothesis: true difference in means between group A and group B is not equal to 0

95 percent confidence interval:

-4.578208 -1.021792

sample estimates:

mean in group A mean in group B

4.2 7.0

#効果量を求める

library(effsize)

effsize::cohen.d(x$Result~x$Group)  
 #t検定をしたい列のデータを前に、まとめる基準にしたいデータ列を後ろに

Cohen's d

d estimate: -1.489586 (large)

95 percent confidence interval:

lower upper

-2.5514809 -0.4276921

**〇等分散性の検定ありver.**

#データ読み込み

#記述統計

#等分散性の検定

var.test(x$Result~x$Group)

F test to compare two variances

data: Result by Group

F = 1.8909, num df = 9, denom df = 9, p-value = 0.3565

alternative hypothesis: true ratio of variances is not equal to 1

95 percent confidence interval:

0.4696751 7.6127890

sample estimates:

ratio of variances

1.890909

#studentのt検定

t.test(x$Result~x$Group, var.equal=T)​

Two Sample t-test

data: Result by Group

t = -3.3308, df = 18, p-value = 0.003719

alternative hypothesis: true difference in means between group A and group B is not equal to 0

95 percent confidence interval:

-4.566108 -1.033892

sample estimates:

mean in group A mean in group B

4.2 7.0

## 対応のあるt検定

setwd("C:/Users/moskg/Downloads/R")　#ワーキングディレクトリの設定

library(tidyverse)

x2<-read.csv("ttestSample2.csv")　　　　#データの読み込み

#記述統計をする

library(psych)

describe(x2[,c("Pre","Post")])

t.test(x2$Pre~x2$Post,paired=T)　 #対応ありであることを指定する

vars n mean sd median trimmed mad min max range skew kurtosis se

Pre 1 10 4.5 1.08 4.5 4.50 0.74 3 6 3 0.00 -1.48 0.34

Post 2 10 7.1 1.37 7.0 7.12 1.48 5 9 4 0.07 -1.55 0.43

#効果量を求める

library(effsize)

effsize::cohen.d(x2$Pre,x2$Post,parired=T)　

Cohen's d

d estimate: -2.107339 (large)

95 percent confidence interval:

lower upper

-3.2790089 -0.9356683

## 

## 

## 

## 練習問題

setwd("C:/Users/moskg/Downloads/R")　　#ワーキングディレクトリの設定

library(tidyverse)

x3<-read.csv("ttestSample3.csv")　#データの読み込み

#対応なしの2標本のデータについて記述統計

library(psych)

describeBy(x3[,3],x3$Gender)

Descriptive statistics by group

group: f

vars n mean sd median trimmed mad min max range skew kurtosis se

X1 1 15 85.53 8.83 84 85.54 5.93 71 100 29 0.27 -1.12 2.28

---------------------------------------------------------------

group: m

vars n mean sd median trimmed mad min max range skew kurtosis se

X1 1 15 94.13 8.88 93 93.85 10.38 82 110 28 0.4 -1.2 2.29

#t検定

with(x3,t.test(point~Gender))

Welch Two Sample t-test

data: point by Gender

t = -2.6598, df = 27.999, p-value = 0.01279

alternative hypothesis: true difference in means between group f and group m is not equal to 0

95 percent confidence interval:

-15.223242 -1.976758

sample estimates:

mean in group f mean in group m

85.53333 94.13333

#効果量を求める

library(effsize)

with(x3,effsize::cohen.d(point~Gender))

Cohen's d

d estimate: -0.971212 (large)

95 percent confidence interval:

lower upper

-1.7620516 -0.1803724

## 1標本t検定

x4<-read.csv("ttestOneSample.csv")　#データの読み込み​

mu0=0　#帰無仮説の設定（mu0の後ろに任意の値、値域を設定できる）​

t.test(x4$result, mu=mu0) #t検定

One Sample t-test

data: x4$result

t = 3.6799, df = 9, p-value = 0.005076

alternative hypothesis: true mean is not equal to 0

95 percent confidence interval:

0.8976775 3.7623225

sample estimates:

mean of x

2.33