1.

twilci <- function(data)

{

fitttest <- t.test(data);

estcittest <- c(fitttest$est,fitttest$conf.int);

fitwil <- wilcox.test(data,conf.int=T);

estciwil <- c(fitwil$est,fitwil$conf.int);

matrix <- rbind(estcittest,estciwil);

return(matrix);

}

2.

Cross = c(23.500,12.000,21.000,22.000,19.125,21.550,22.125,20.375,18.250,21.625,23.250,21.000,22.125,23.000,12.000)

Self = c(17.375,20.375,20.000,20.000,18.375,18.625,18.625,15.250,16.500,18.000,16.250,18.000,12.750,15.500,18.000)

diff = Cross-Self

twilci(diff)

mean of x

estcittest 2.6200 0.007114427 5.232886

estciwil 3.1375 0.500000000 5.212500

t.test’s analysis of CI is more spread out and has smaller mean as compared to wilcox.test

3.

twilci2 <- function(data)

{

fitttest <- t.test(data);

estcittest <- c(fitttest$est,fitttest$conf.int);

print("t.test analysis");

if(0<estcittest[2] || 0>estcittest[3]

{

if(estcittest[1]>0)

{

ans <- "The confidence interval does not contain 0, and at this conf. the mean of X is positive";

}

else

{

ans <- "The confidence interval does not contain 0, and at this conf. the mean of X is negative";

}

}

else

{

ans <- "The confidence interval contains 0, so the result is inconclusive";

}

print(ans);

fitwil <- wilcox.test(data,conf.int=T);

estciwil <- c(fitwil$est,fitwil$conf.int);

print("wilcox.test analysis");

if(0<estciwil[2] || 0>estciwil[3])

{

if(estciwil[1]>0)

{

ans <- "The confidence interval does not contain 0, and at this conf. the mean of X is positive";

}

else

{

ans <- "The confidence interval does not contain 0, and at this conf. the mean of X is negative";

}

}

else

{

ans <- "The confidence interval contains 0, so the result is inconclusive";

}

print(ans);

matrix <- rbind(estcittest,estciwil);

return(matrix);

}

sample1= c(83,74,18,39,58,44,45,74,93,63);

sample2= c(-83,-74,-18,-39,58,44,45,74,93,63);

sample3= c(-83,-74,-18,-39,-58,-44,-45,-74,-93,-63);

Running twilci2.R for three different samples:

twilci2(sample1)

[1] "t.test analysis"

[1] "The confidence interval does not contain 0, and at this conf. the mean of X is positive"

[1] "wilcox.test analysis"

[1] "The confidence interval does not contain 0, and at this conf. the mean of X is positive"

mean of x

estcittest 59.10000 42.75097 75.44903

estciwil 59.49994 41.50007 78.00000

twilci2(sample2)

[1] "t.test analysis"

[1] "The confidence interval contains 0, so the result is inconclusive"

[1] "wilcox.test analysis"

[1] "The confidence interval contains 0, so the result is inconclusive"

mean of x

estcittest 16.30000 -29.54992 62.14992

estciwil 13.50001 -38.99998 68.49999

twilci2(sample3)

[1] "t.test analysis"

[1] "The confidence interval does not contain 0, and at this conf. the mean of X is negative"

[1] "wilcox.test analysis"

[1] "The confidence interval does not contain 0, and at this conf. the mean of X is negative"

mean of x

estcittest -59.10000 -75.44903 -42.75097

estciwil -59.49999 -78.00000 -41.50007

4.

Cross = c(23.500,12.000,21.000,22.000,19.125,21.550,22.125,20.375,18.250,21.625,23.250,21.000,22.125,23.000,12.000);

Self = c(17.375,20.375,20.000,20.000,18.375,18.625,18.625,15.250,16.500,18.000,16.250,18.000,12.750,15.500,81.000);

diff=Cross-Self;

diff

[1] 6.125 -8.375 1.000 2.000 0.750 2.925 3.500 5.125 1.750

[10] 3.625 7.000 3.000 9.375 7.500 -69.000

Results:

twilci(diff)

mean of x

estcittest -1.5800 -12.15189 8.991891

estciwil 3.1375 -1.12500 5.212500

twilci2(diff)

[1] "t.test analysis"

[1] "The confidence interval contains 0, so the result is inconclusive"

[1] "wilcox.test analysis"

[1] "The confidence interval contains 0, so the result is inconclusive"

mean of x

estcittest -1.5800 -12.15189 8.991891

estciwil 3.1375 -1.12500 5.212500

Comments:

Changing even a single value changes the result of t.test function very much as the it gives the mean estimate and mean is much more sensitive to error than the median which is the estimate in wilcox.test.

Thus wilcox.test is much better test to perform.