ph1855_hw2_ygu5

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#HW2: Chap3 Q1, 3, 6, 19, 22, 25, 27, 29, 46, 63 ## Page54 Q1

```
# conduct wilcoxon signed-rank test
# input data
x = c(350, 200, 240, 290, 90, 370, 240)
y = c(480, 130, 250, 310, 280, 1450, 280)

# run the paired wilcoxon signed-rank test
wilcox.test(x, y, paired = T, alternative = "greater")
```

```
##
##  Wilcoxon signed rank exact test
##
## data:  x and y
## V = 4, p-value = 0.9609
## alternative hypothesis: true location shift is greater than 0
```

Page58 Q19

```
# need to calculate theta-the HL estimator for treatment effects
# first input the data
x = c(350, 200, 240, 290, 90, 370, 240)
y = c(480, 130, 250, 310, 280, 1450, 280)
# calculate theta
# install.packages("NSM3")
library(NSM3)
owa(x, y)
```

```
## $owa
##  [1]  -70  -30  -25  -15   10   15   20   25   30   30   40   60   70   75   85
## [16]  100  105  115  130  160  190  505  545  550  560  605  635 1080
##
## $h.l
## [1] 80
```

Page58 Q22

```r
# input data
x = c(1.83, 0.50, 1.62, 2.48, 1.68, 1.88, 1.55, 3.06, 1.30)
y = c(0.878, 0.647, 0.598, 2.05, 1.06, 1.29, 1.06, 3.14, 1.29)
# calculate Walsh averages
owa(x, y)
```

```
## $owa
##  [1] -1.0220 -0.9870 -0.9520 -0.8210 -0.8060 -0.7860 -0.7710 -0.7560 -0.7260
## [10] -0.7210 -0.6910 -0.6200 -0.6050 -0.5900 -0.5550 -0.5400 -0.5250 -0.5160
## [19] -0.5100 -0.4900 -0.4810 -0.4710 -0.4600 -0.4375 -0.4360 -0.4300 -0.4025
## [28] -0.3150 -0.3000 -0.2700 -0.2550 -0.2500 -0.2365 -0.2215 -0.2200 -0.2050
## [37] -0.1750 -0.1715 -0.1415 -0.0100  0.0350  0.0685  0.0800  0.1135  0.1470
##
## $h.l
## [1] -0.46
```

Page62 Q27

```r
#input data
x = c(350, 200, 240, 290, 90, 370, 240)
y = c(480, 130, 250, 310, 280, 1450, 280)
# calculate the confidence interval given the exact coefficient
wilcox.test(y-x, conf.int = T, conf.level = 0.954)
```

```
##
##  Wilcoxon signed rank exact test
##
## data:  y - x
## V = 24, p-value = 0.1094
## alternative hypothesis: true location is not equal to 0
## 95.4 percent confidence interval:
##  -30 635
## sample estimates:
## (pseudo)median
##             80
```

Page62 Q29

```r
#input data
x = c(350, 200, 240, 290, 90, 370, 240)
y = c(480, 130, 250, 310, 280, 1450, 280)
# calculate the confidence interval given the exact coefficient
wilcox.test(y-x, conf.int = T, conf.level = 1 - 0.078)
```

```
##
##  Wilcoxon signed rank exact test
##
## data:  y - x
```

```
## V = 24, p-value = 0.1094
## alternative hypothesis: true location is not equal to 0
## 92.2 percent confidence interval:
##  -25 605
## sample estimates:
## (pseudo)median
##             80
```

Page74 Q46

```r
#input data
x = c(270, 150, 270, 420, 202, 255, 165, 220, 305, 210, 240, 300, 300, 70)
y = c(525, 570, 190, 395, 370, 210, 490, 250, 360, 285, 630, 385, 195, 295)
# calculate the confidence interval given the exact coefficient
wilcox.test(x, y, paired = T, alternative = "greater")
```

```
##
##  Wilcoxon signed rank exact test
##
## data:  x and y
## V = 18, p-value = 0.9877
## alternative hypothesis: true location shift is greater than 0
```

Page79 Q63

```r
#input data
x = c(350, 200, 240, 290, 90, 370, 240)
y = c(480, 130, 250, 310, 280, 1450, 280)
#calculate theta-tilt
z = y-x
median(z)
```

```
## [1] 40
```