ph1855_hw4_ygu5

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Hollander et al. Nonparametric Statistical Methods 2014

P168 Q1

```r
# calculate p-value
1-pnorm(1.622)
```

```
## [1] 0.05240167
```

P180 Q14

```r
# enter data
X = c(.80, .83, 1.89, 1.04, 1.45, 1.38, 1.91, 1.64, .73, 1.46)
Y = c(1.15, .88, .90, .74, 1.21)
# conduct test
library(NSM3)
MillerJack(X, Y)
```

```
## [1] 2.780546
```

```r
# p-value
1-pnorm(2.781)
```

```
## [1] 0.002709587
```

P188 Q25

```r
# enter data
Pre_ctrl =  c(1.3, 1.3, 5.8, 2.0, 2.7, 1.7, 1.8, 1.7, 1.8, 4.7)
Pre_trt =   c(1.2, 1.2, 5.8, 0.3, 3.3, 2.2, 4.1, 1.2, 6.4, 1.8, 1.8, 5.2, 1.3)

Post_ctrl = c(19.0, 40.0, 3.8, 6.5, 16.0, 13.0, 18.0, 2.6, 18.0, 5.8)
Post_trt = c(5.1, 7.2, 14.0, 4.0, 25.0, 15.0, 10.0, 7.6, 10.0, 10.0, 8.0, 40.0, 21.0)
# conduct Lepage test
pLepage(Pre_ctrl, Pre_trt)
```

```
## Ties are present, so p-values are based on conditional null distribution.
## Number of X values: 10 Number of Y values: 13
## Lepage D Statistic: 2.976
## Monte Carlo (Using 10000 Iterations) upper-tail probability: 0.2186
```

```
pLepage(Post_ctrl, Post_trt)
```

```
## Ties are present, so p-values are based on conditional null distribution.
## Number of X values: 10 Number of Y values: 13
## Lepage D Statistic: 1.5642
## Monte Carlo (Using 10000 Iterations) upper-tail probability: 0.4672
```

```
# additional validation from Wilcoxon
wilcox.test(Pre_ctrl, Pre_trt)
```

```
## Warning in wilcox.test.default(Pre_ctrl, Pre_trt): cannot compute exact p-value
## with ties
```

```
##
##  Wilcoxon rank sum test with continuity correction
##
## data:  Pre_ctrl and Pre_trt
## W = 67.5, p-value = 0.9008
## alternative hypothesis: true location shift is not equal to 0
```

```
wilcox.test(Post_ctrl, Post_trt)
```

```
## Warning in wilcox.test.default(Post_ctrl, Post_trt): cannot compute exact
## p-value with ties
```

```
##
##  Wilcoxon rank sum test with continuity correction
##
## data:  Post_ctrl and Post_trt
## W = 64.5, p-value = 1
## alternative hypothesis: true location shift is not equal to 0
```

```
# additional validation from Anasari-Bradley
pAnsBrad(Pre_ctrl, Pre_trt)
```

```
## Ties are present, so p-values are based on conditional null distribution.
## Number of X values: 10 Number of Y values: 13
## Ansari-Bradley C Statistic: 67.5
## Monte Carlo (Using 10000 Iterations) upper-tail probability: 0.9629
## Monte Carlo (Using 10000 Iterations) two-sided p-value: 0.0742
##
```

```
pAnsBrad(Post_ctrl, Post_trt)
```

```
## Ties are present, so p-values are based on conditional null distribution.
## Number of X values: 10 Number of Y values: 13
## Ansari-Bradley C Statistic: 91.5
## Monte Carlo (Using 10000 Iterations) upper-tail probability: 0.1187
## Monte Carlo (Using 10000 Iterations) two-sided p-value: 0.2374
##
```

```r
# approximate Lepage p-value
1-pchisq(2.976,2)
```

```
## [1] 0.2258239
```

```r
1-pchisq(1.5642,2)
```

```
## [1] 0.4574444
```

P199 Q38

```r
2*(1-pnorm(1.739))
```

```
## [1] 0.08203476
```