Quiz

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Quiz fecha límite Jul 13, 2022 19:00 CEST

Question #1

1 punto posible (calificable)

Consider the code snippet below:

```
       > head(mtcars$mpg)
[1] 21.0 21.0 22.8 21.4 18.7 18.1
> head(mtcars$hp)
[1] 110 110  93 110 175 105
```

This is a snippet of the mtcars dataset that shows the miles per gallon (mpg) and horsepower (hp) data.

If you wanted to compare the mpg and hp values against each other, what kind of plot would you use?

- ◯ Box plot
- ◯ Scatter plot
- ◯ Pie chart
- ◯ Bar plot

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Question #2

1 punto posible (calificable)

Examine the Wilcoxon test statistic for x and y+10 and for x and y+100. Because the Wilcoxon works on ranks, once the two groups show complete separation, that is all points from group `y` are above all points from group `x`, the statistic will not change, regardless of how large the difference grows. Likewise, the p-value has a minimum value, regardless of how far apart the groups are. This means that the Wilcoxon test can be considered less powerful than the t-test in certain contexts. In fact, for small sample sizes, the p-value can't be very small, even when the difference is very large.

What is the p-value if we compare `c(1,2,3)` to `c(4,5,6)` using a Wilcoxon test?

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Question #3

1 punto posible (calificable)

What is the p-value if we compare `c(1,2,3)` to `c(400,500,600)` using a Wilcoxon test?

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Load the NYC marathon data used in a previous assessment, and create a vector `time` of the sorted times:

```
data(nym.2002, package="UsingR")
time = sort(nym.2002$time)
```

Compare the following two plots.

1) A plot of the ratio of times to the median time, with horizontal lines at twice as fast as the median time, and twice as slow as the median time.

```
plot(time/median(time), ylim=c(1/4,4))
abline(h=c(1/2,1,2))
```

2) A plot of the log2 ratio of times to the median time. The horizontal lines indicate the same as above: twice as fast and twice as slow.

```
plot(log2(time/median(time)),ylim=c(-2,2))
abline(h=-1:1)
```

Note that the lines are equally spaced in Figure #2.

Question #4

1 punto posible (calificable)
Why do we see this relationship?

- Because log transformations always spread out the data
- Because log ratios transform to differences of logs

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