

I'm not a bot



Mann whitney test r

Two data samples are independent if they come from distinct populations and the samples do not affect each other. Using the Mann-Whitney-Wilcoxon Test, we can decide whether the population distributions are identical without assuming them to follow the normal distribution. In the data frame column mpg of the data set mtcars, there are gas mileage data of various 1974 U.S. automobiles. `> mtcars$mpg` [1] 21.0 21.0 22.8 21.4 18.7 ... Meanwhile, another data column in mtcars, named am, indicates the transmission type of the automobile model (0 = automatic, 1 = manual). In other words, it is the differentiating factor of the transmission type. `> mtcars$am` [1] 1 1 0 0 0 0 ... In particular, the gas mileage data for manual and automatic transmissions are independent. Without assuming the data to have normal distribution, decide at .05 significance level if the gas mileage data of manual and automatic transmissions in mtcars have identical data distribution. The null hypothesis is that the gas mileage data of manual and automatic transmissions are identical populations. To test the hypothesis, we apply the `wilcox.test` function to compare the independent samples. As the p-value turns out to be 0.001817, and is less than the .05 significance level, we reject the null hypothesis.

```
> wilcox.test(mpg ~ am, data=mtcars)
Wilcoxon rank sum test with continuity correction
data: mpg by am
W = 42, p-value = 0.001871
alternative hypothesis: true location shift is not equal to 0
Warning message:
In wilcox.test.default(x = c(21.4, 18.7, 18.1, 14.3, 24.4, 22.8, ...)) :
cannot compute exact p-value with ties
At .05 significance level, we conclude that the gas mileage data of manual and automatic transmissions in mtcars are nonidentical populations. A Mann-Whitney U test (sometimes called the Wilcoxon rank-sum test) is used to compare the differences between two independent samples when the sample distributions are not normally distributed and the sample sizes are small (n
```