

Wald Wolfowitz Run Test

The **Wald Wolfowitz run test** is a non-parametric test or method that is used in cases when the parametric test is not in use. In this test, two different random samples from different populations with different continuous cumulative distribution functions are obtained. The null hypothesis assumed in is that there is no statistical [significant](#) difference between the two continuous cumulative distribution functions. In other words, the null hypothesis is that the two populations from which the two samples have been drawn are identical in nature. The observations from the two independent samples are ranked in increasing order, and each value is coded as a 1 or 2, and the total number of *runs* is summed up and used as the test statistics. Small values do not support suggest different populations and large values suggest identical populations (the arrangements of the values should be random).

Questions Answered:

Does the X group differ from the Y group in regards to the diet treatment implemented on both groups?

Let us now discuss the method of conducting the Wald Wolfowitz Run Test. Suppose the size of one population is 'm,' and the size of the other population is 'n, '. We will arrange the 'm' size population and the 'n' size population in increasing order of their size. The researcher from this arrangement of (m+n) values will keep the identity of each value by noting the population from which it comes. While notifying the population, the researcher should also label them with the respective name assigned to the population for distinguishing purpose. Suppose the two names are "X" and "Y". Then, an array of "X's" and "Y's" are considered and the number of runs is considered. Runs identify the sequence of the similar letters preceded or followed by a different letter, or no letter at all.

If the null hypothesis is true, then it means that the (m+n) values have come from the identical population. Therefore, the "X" and "Y" will be well mixed and the total number of runs will be relatively large. However, in the case of the null hypothesis being rejected, then the number of runs will be small. This indicates that the samples have been drawn from different populations.

There are also extreme cases in which the number of "Y's" are greater than the number of "X's," and vice versa. In such extreme cases, there are only two runs.

The Wald Wolfowitz Run Test helps the researcher to understand whether or not the two sets of measurements are likely to be observed as coming from an identical population. This test is useful in case the researcher wants to investigate whether or not the behavior of one group is defensive in comparison to the behavior of the other group.

Assumptions:

Data is collected from two independent groups.

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