4.- Kruskall-Wallis $H$ test

- A test for ranked data when there are more than two independent groups.
- Can be used instead of One-Way ANOVA when assumptions of normality are violated
- Non-directional test

Kruskall-Wallis $H$ test

- The larger the differences are in ranks among groups, the larger the value of $H$, and the more suspect will be the null hypothesis
- CV is obtained from a $\chi^2$ distribution with $df = k - 1$

\[ H = \frac{12}{n(n+1)} \sum \frac{R_i^2}{n_i} - 3(n+1) \]  

\[ \text{df} = \text{number of groups} - 1 \]  

II. Inferential Statistics

- (a parametric epilogue)
- Other uses of the $t$ distribution
- Testing the null hypothesis of zero correlation in the population

$H_0: \rho = 0$
**t test for the population correlation coefficient ρ**

- How do we test if a correlation coefficient between two variables is statistically significant?
  - e.g., $H_0: \rho = 0$

**H$_0$: $\rho \neq 0$**

- The sampling distribution of the correlation coefficient $r$ is symmetrical and approximately normal when the population correlation $\rho$ is zero.
- When $\rho = 0$, the sampling distribution is the $t$ distribution with $n-2$ degrees of freedom.
- $t$ statistic for a single population correlation coefficient:

$$t = \frac{r - \rho_{hyp}}{\sqrt{\frac{1 - r^2}{n - 2}}}$$

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**t test for pop. correlation**

- Example: