Worked out example for Kurskal Wallis test statistic

No.	1	2	3	4	5	6	7	8	9	10
Category/group is the independent variable and y is the dependent variable.										
Category	1	1	1	1	1	2	2	2	2	2
y	1	1	1	2	3	1	1	2	2	3
Step 1: Compute the ranks. For ties assign the average of a rank to a value (for example ranks of 1 are 1,2,3,4,5 whose average is 3).										
Rank	1	2	3	6	9	4	5	7	8	10
Rank after tie adjustment	3	3	3	7	9.5	3	3	7	7	9.5
Step 2: Average rank of a group										
Mean	5.1					5.9				

Step 3: Compute H

$$H = \frac{12}{N(N+1)} \sum_{i=1}^{k} n_i \bar{r}_i^{\,2} - 3(N+1)$$

H = 12/10/11 *(5*5.1*5.1+5*5.9*5.9)-3*(11)
H = 0.1745455

Step 3: There are ties in the observations so apply the correction. Ties are 1 (5 times), 2 (3 times), 3 (2 times)

$$H' = \frac{H}{1 - \frac{\sum_{j=1}^{G} (t_i^3 - t_i)}{N^3 - N}}$$

H' = 0.1745455/(1-((5^3-5)+(3^3-3)+(2^3-2))/(10^3-10))
H' = 0.2057143

Step 4: Check your answer in R by typing the following code

```
y = c(1,1,1,2,3,1,1,2,2,3)
label = c(1,1,1,1,1,2,2,2,2,2)
kruskal.test(y~label)
```

Output in R is:

```
Kruskal-Wallis rank sum test

data:  y by label
Kruskal-Wallis chi-squared = 0.20571, df = 1, p-value =
0.6501
```

Phew!! **Last step:** Heave a sigh of relief! We have the correct understanding of the computation of the H statistic. That's so cool!