**Spearman Correlation**

In statistics most of the time we want to find if two variables are correlated or not. For example, there is positive correlation between weather temperature and sales of ice cream i.e. if weather temperature increases, sales of ice cream increases as well. To find correlation between these kind of variables, we usually use Pearson correlation. We can find Pearson correlation using Correl() function in Excel.

But to use Pearson correlation variables must be normally distributed, that’s why we cannot always use it. If variables are not normally distributed, we use Spearman correlation. Spearman correlation in works in the following way. We sort the variable by X, give rank to X starting from 1 to length of the observations. Then we sort it by Y and give ranks to Y variable.

Now we have ranks for X and Y, so we can calculate Spearman correlation coefficient using the following formula

Here *d* is the difference between ranks of X and Y, and *n* is the numebr of observations.

The correlation coefficient will be between -1 and 1. -1 means perfect negative correlation, 1 means perfect positive correlation and 0 means no correlation at all.

This program calculates Spearman correlation using the formula and steps provided above.

