

STAT1010: EXERCISE SHEET 1

Real Statistics Homepage: www.real-statistics.com

You can start the Real Statistics Analysis Toolpack either by choosing ‘Data Analysis Tool’ from ‘Real Statistics’ in the ‘Add-In’ Ribbon or faster by pressing ‘Ctrl-M’.

Exercises:

- The following table sorts 214 persons according to gender and whether they drink alcohol or not.

	Yes	No
Men	68	34
Women	86	26

Test for dependence of gender and alcohol by calculating the relevant χ^2 -statistics and assess its strength by calculating Cramer’s V .

Do this exercise both by pen and paper calculations and in Excel.

- Use Excel in order to estimate a) Spearman’s rank correlation coefficient ρ_S , b) Kendall’s τ , and c) Pearson’s linear correlation coefficient ρ from the following table of intelligence (IQ) and test results and investigate, in how far they deviate significantly from zero (that is, get two-sided p -values).

IQ	110	113	102	99	123	107	98	106	118	104
Test	25	28	18	20	30	29	19	24	15	27

Calculate Kendall’s τ also by hand and compare its p -value with the one obtained from using the approximation on the bottom of page 25.

- The table below shows how many years it took for several inventions until they were generally used.
 - Find the intercept and the slope of a regression of lag to general use upon year of invention using both Excel’s own regression tool (Data → Data Analysis → Regression) and the Multiple Linear Regression tool from the Real Statistics toolpack.
 - Use the parameter estimates in order to forecast how long it would take an invention made in year 2025 until it will be generally used.
 - Apply the ANOVA table from the regression output in order to cross-check the values of R^2 and $\overline{R^2}$ by pen and paper calculations.
 - Generate a scatterplot (line fit plot) of the data in Excel, including the regression line obtained above.

Invention	Year of Invention	lag to general use
Home electricity	1873	46
Telephone	1875	35
Car	1885	55
Airoplane	1903	54
Television	1925	26
Video	1952	34
Microwave	1953	30
PC	1975	15
Mobile Phone	1983	13