Understanding correlation

MathsNET
A joined up approach to teaching and learning mathematics

0.1 Level 1

This exercise is revision: Use the block below to generate 20 pairs of uniform random variables X_i and Y_i that each lie between 0 and 1. Then plot each of these pairs of random variables at (X_i, Y_i). All the points you show should have $0 < X_i < 1$ and $0 < Y_i < 1$.

0.2 Level 2

Now see if you can generate and plot 20 pairs of uniform random variables that all lie inside the box shown in the graph on the right.

0.3 Level 3

Now see if you can generate and plot 20 pairs of uniform random variables that all lie inside the box shown in the graph on the right.

0.4 Level 4

Now see if you can generate and plot 20 pairs of uniform random variables that all lie inside the box shown in the graph on the right.

0.5 Level 5

Now see if you can generate and plot 10 pairs of uniform random variables that all lie inside the box shown in the graph on the right.

0.6 Level 6

Now see if you can generate and plot 20 pairs of uniform random variables that all lie inside the box shown in the graph on the right.

0.7 Level 7

All the variables we have generated thus far have been uncorrelated. Lets now make things more dificult by introducing correlated random variables. Can you generate and plot 20 pairs of random variables that lie between the lines shown here.

0.8 Level 8

Can you generate and plot 20 pairs of random variables that lie between the lines shown here.

0.9 Level 9

Can you generate and plot 20 pairs of random variables that lie between the lines shown here.

0.10 Level 10

Now try to generate and plot 20 pairs of random variables that lie between the lines at $y_1 = x^2 - 0.2$ and $y_2 = x^2 + 0.2$ that are shown here.

0.11 Level 11

Now try to generate and plot 20 pairs of random variables that lie between the lines at $y_1 = \sin(4x) - 0.1$ and $y_2 = \sin(4x) + 0.1$ that are shown here. Notice that x in these formulas is given in radians.