UPPSALA UNIVERSITET
Matematiska Institutionen
Statistics for biology. Spring semester 2015.
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Fifth set of exercises: Correlation and linear regression.

1. Compute the covariance and the correlation coefficient of the following paired sample:

-0.53	-2.08	-0.98	-0.28	-1.20
-2.63	-6.41	-0.77	-1.93	-3.67

   Plot these points.

2. Compute the covariance and the correlation coefficient of the following paired sample:

-1.81	0.46	0.56	1.15	1.02
3.30	0.22	0.33	1.34	1.05

   Plot these points.

3. Compute the z-points of the previous two exercises. Also, plot them.

4. Compute the coefficients of the linear regression, and the coefficient of determination, of the following table:

0.79	0.24	0.01	0.73	0.92
2.59	1.49	1.02	2.46	2.86

5. Can we accept that the points in the second exercise are uncorrelated? (Use $\alpha = 0.05$). And what about the points in the first exercise?

6. Compute a confidence interval for the correlation coefficient for the data in the second exercise.

7. Compute confidence intervals for the coefficients of the linear regression done in the fourth exercise.

8. Some theoretical reasons suggest that the data in the second exercise could satisfy a formula of the type
$$Y = a \cdot X^2 + b + \epsilon,$$
   where ϵ is an unknown random variable with zero mean (noise/error). Compute the coefficients a, b and also their confidence intervals.