Statistics Exercises

Covariance, correlation, the t-test

1. Consider the following data:

x	0	2	4	5	7	8	10
y	4	3	1	1	2	1	0

   Calculate the correlation coefficient between variables x and y.

2. Consider the following data:

x	0	2	4	6	8
y	0	1	2	3	4

   Calculate the correlation coefficient between variables x and y. What does this mean?

3. We want to check if on average a cup of butter contains 250 grams or less. A sample test of 25 cups reveals an average of 248.2 grams and a standard deviation of 2.5 grams. Check whether the smaller mean is a significant difference for a significance threshold of 5%.

4. We want to find out if persons of 40 years old are on average heavier than persons of 30 years old. We have taken two independent sample sets, given as follows:

30y weight	77	65	73	58	63	49	51	82	103	69				
40y weight	102	73	56	55	83	72	88	70	81	85	44	71	62	78	75

   Give an analysis of this situation and use the t-test to find out whether our hypothesis is valid for a significance threshold of 10%.

5. We want to check if a marketing strategy for playing on-line games has worked. For 8 subjects, we have measured the number of hours they spend per week on on-line games before and after the marketing strategy. This data is given as follows:

hours played before	2	3	1	4	6	2	12	8
hours played after	3	2	0	4	7	4	10	10

   Find out whether the marketing strategy works with a significance threshold of 5%.