11. seminar

Problem 1
The score of two subjects of eight randomly drawn students are recorded.

1	2	3	4	5	6	7	8
80	50	36	58	42	60	56	68
65	60	35	39	48	44	48	61

At the significance level 0.05 carry out the test that the results in considered two subjects are not positively correlated.

Problem 2
A ferrum content was determined in an iron ore sample of size 600 by two analytic methods, where the sample correlation coefficient was $R_{12} = 0,85$. A technical literature states that the correlation coefficient between considered methods is $\varrho = 0,9$. At the significance level 0.05 carry out a test $H_0 : \varrho = 0,9$ against $H_1 : \varrho \neq 0,9$.

Problem 3
An officer of human resources department of particular firm is interested in a relationship between a number of absence days due to illness per year (variable Y) and age of employee (variable X). Therefore the data about 10 employees were drawn randomly.

1	2	3	4	5	6	7	8	9	10
27	61	37	23	46	58	29	36	64	40
15	6	10	18	9	7	14	11	5	8

Under the assumption that $\binom{X}{Y}$ follows bivariate normal distribution do following tasks:

a) Calculate sample correlation coefficient.

b) At the significance level 0.05 carry out a test that X and Y are independent.

c) Determine the 95% confidence interval for correlation coefficient ϱ.

Problem 4
A medical research observed the concentration of substances A and B in urine of patients with particular kidney illness. In a sample of 100 healthy individuals the sample correlation coefficient between concentration of A and B was 0,65. In a sample of 142 individuals with mentioned kidney illness the sample correlation coefficient was 0,37. At the significance level 0.05 test the hypothesis that the true correlation coefficients are equal.

Problem 5
in supplement