

Examination Statistics
Course of Study Computer Science
5.02.2008

Name : _____
Matriculation Number : _____

Problems	1	2	3	4	Summe	Note
Maximal scores	10	10	10	10	40	
Obtained scores						

Remarks:

1. Write on every page your name and your matriculation number.
2. Number the problems und the pages.
3. Please notice, not only the solution but the deriviation of the solution has to be given.

Good Luck!

Dr. Falkenberg

1. The table shows the first grades (denoted by X and Y resp.) of 10 students on two short quizzes in biology.

Grade on first quiz (X)	6	5	8	8	7	6	10	4	9	7
Grade on second quiz (Y)	8	7	7	10	5	8	10	6	8	6

- (a) Determine the covariance of X and Y, the coefficient of correlation and the coefficient of determination.
- (b) Find the least-squares regression line of Y on X.
2. The probability that there is a DNA match to a probe given that a person is innocent is estimated as $1/100000$. Assume that the probability that there is a match given that a person is guilty is 1. Suppose that the defendant in a trial lives in a city where there are 10000 people that could have committed the crime, and that there is a DNA match to the defendant.

Calculate the probability that the defendant is indeed guilty, given no other evidence except the DNA match.

3. Ten percent of the bolts that a machine produces are defective.
- (a) Find the probability that in a random sample of 400 bolts produced by this machine between 30 and 50 will be defective! Give the formula for the exact value and use a normal approximation to compute the probability.
- (b) Determine an upper bound for the number of defective bolts in a sample of 400 bolts, which holds in at least 90 % of all samples of size 400. Use a normal approximation!
4. In the past, the weights of packages filled by a certain machine can be assumed normally distributed with standard deviation of 0.32 ounce. A random sample of 25 packages showed a mean of 49,25 ounces.
- (a) Determine the upper 95% confidence limit for the mean.
- (b) Can you suppose that the mean is large than the former mean of 50 ounces? Formulate a suitable parameter test with significance level 95% und determine the decision rule. Compute the probability value of the sample result.