



Business Statistics (20116)

Exam Summerterm 2012

02.08.2012

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Please answer all of the following questions. Do not expect all numerical results to be integers. Please explain all of your answers briefly, so that calculations and derivations are completely clear. The use of calculators is permitted in accordance with the regulations of the faculty's examination office. The use of any other material, e.g. dictionaries, is not allowed.

The exam includes in total 29 points.

Task 1

You are given two randomly drawn samples of the number of children per woman in Germany and in the USA in the year 2010. Give 2 statistical tests (name and null hypothesis) to analyze whether there is a difference in the number of children per woman in these two countries. (4 points)

Task 2

Suppose that the mean income for all students in Magdeburg is 400 Euro per month and that the variance is 6400 Euro. Now, a sample of 64 students is selected.

- Sketch the sampling distribution of the mean income per month for the 64 students. (4 points)
- What is the probability that the mean income per month of the selected 64 students will be between 390 and 405 Euro? (4 points)

Task 3

You are given the following regression model:

$$y = \beta_0 + \beta_1 * x_1 + \beta_2 * x_2 + \beta_3 * x_3 + \epsilon$$

where

- y ... expected revenue of the auction in Euro
- x_1 ... number of days the auction runs [either 1, 3, 7 or 10 days]
- x_2 ... product [0 = CD; 1 = book; 2 = something else]
- x_3 ... starting price [0 = starting price is 1 Euro; 1 = starting price is greater than 1 Euro]

A statistics software gives you the following regression table for a sample of 99 randomly analyzed auctions:

	Const.	x_1	x_2	x_3
Coefficient	0.36	2.74	- 2.66	- 5.87
Standard error	2.44	1.21	24.52	0.67
F-value	222.22			
R^2	0.14			

- Determine the scale level of each independent variable and conclude whether one should exclude any. (6 points)

According to the regression table,

- Which auction of these two would you recommend and why: an auction which runs for 10 days but has a starting price of 10 Euro or an auction with starting price of 1 Euro which runs for 3 days? (5 points)
- Interpret the F-value and the R^2 -value for this regression table. How could the R^2 -value be increased? (6 points)