1. In the file "salaries.txt" (available on e-class assignments site) you will find a normally distributed random sample of 22 data pairs. Precisely the data represent the average salaries per gender (1000$/year) for assistant professors at the same college or university in USA.

(a) Provide a 95% confidence interval for the average salaries of men.

(b) Provide a 95% confidence interval for the average salaries of women.

(c) Provide a 90% confidence interval for mean difference of the average salaries between the two genders.

(d) Examine the following hypothesis test:

$$H_0 : \mu_m = \mu_B$$
$$H_1 : \mu_A < \mu_B$$

where μ_A and μ_B are the average salaries for women and men respectively. The level of significance is $\alpha = 0.05$.

(e) Provide a hypothesis test ($\alpha = 0.01$) for the equality of variances of the average salaries per gender.

(f) In a significance level of 10%, test if there is statistical effect of gender on average salaries.

2. In the file "inquiries.xls"(available on e-class assignments site) you will find the recorded variables "day" of week (Monday through Friday), "section" of newspaper (news, business and sports) and the number of inquiries resulting from advertisement (numeric assuming normality).

(a) Provide boxplots of the number of inquiries per day and per section.

(b) Fit an One-Way ANOVA model with the number of inquiries as response and the days of the week (as factor). Interpret the model parameters.

(c) In the ANOVA model of **(b)**, is the expected difference between Tuesdays and Wednesdays significant?

(d) Fit an One-Way ANOVA model for the number of inquiries as response and sections. Interpret the model parameters. Are all parameters

significant?

(e) Exclude the non-significant treatments of the model **(d)** and re-estimate the parameters.

(f) Fit a Two-Way ANOVA model of main effects. Provide the interpretation for the parameters.

(g) Using the stepwise method, choose a model based on the AIC criterion starting from the full main effects model. Are all coefficients significant?

(h) Compare the constant model against the main effects model. Are the models different?