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**Statistical Methods for Economists – Week 2**

(Questions and Tasks)

The topic: ***Hypothesis testing***

1.) Explain what is a statistical hypothesis, and what is a null hypothesis.

2.) Explain what is a statistical significance and p-value.

3.) What 4 main steps are involved when testing a hypothesis?

4.) Explain the difference between a parametric and a non-parametric test.

5.) (One-sample t-test for the population mean) Test the hypothesis that an average bank loan is 25 000 Euro in a certain bank, if the sample of bank loans (obtained randomly) is: 30 000; 15 000; 22 000; 50 000; 20 000; 18 000; 15 000; 30 000 Euro.

6.) (Two-sample t-test of pop. means with equal variances) Test the hypothesis that the consumption of salt and sugar per month in ten randomly chosen households is the same.

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***household no.*** | ***1*** | ***2*** | ***3*** | ***4*** | ***5*** | ***6*** | ***7*** | ***8*** | ***9*** | ***10*** |
| salt (kg) | 1.5 | 2.2 | 4.0 | 3.6 | 2.2 | 2.8 | 1.7 | 2.3 | 3.5 | 2.8 |
| sugar (kg) | 3.3 | 4.1 | 2.7 | 3.5 | 3.6 | 2.8 | 3.9 | 2.5 | 2.4 | 3.8 |

7.) Use F-test to test the hypothesis about equality of variances (salt vs sugar) in the previous Problem 6.

8.) Explain how Chi-test is used for testing hypothesis.

9.) (Chi-square test) In the table below there is a statistics of car crashes in a town X. Test the hypothesis that the number of crashes in each month is the same.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Month | January | February | March | April |
| Car crashes | 15 | 22 | 17 | 24 |

10.) (Chi-square test) In the table below there are numbers of men and women visiting (or not) local wellness (based on a random sample). Test the hypothesis that women and men visit the wellness equally.

|  |  |  |
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|  | visit wellness | do not visit |
| Men | 50 | 54 |
| Women | 68 | 48 |