**Economic Modeling – list 7**

**1**.Week’s expenses on food have a normal distribution  . It is thought , that average value of this expense is superior higher than 40 $.

a) Can we say, that it is true, if the sample mean calculated on the basis of 10 randomly chosen families is 48$ and s=10,8$ ? Level of significance: 

b) Can we say at the level of significance  that the variance of week’s expenses on food is greater than 81 $ if sample standard deviation based on 10 randomly chosen families is 10,8$.

**2.** Active time of battery has a normal distribution N(m,70). The sample mean calculated on the basis of 16 randomly chosen batteries is 560 hours. Can we say, that the average active time of battery is greater than 500 hours, if the level of significance is 0,05?

**3**. The table shows the age of clients of a shop

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| age | 20-30 | 30-40 | 40-50 | 50-60 |
| number of clients | 150 | 250 | 300 | 300 |

Can it be said , at the level of significance , that 80% of clients are between 30-50 years old?

**4.** Apple size is normal distributed. Can we say at the level of significance  that the variance of an apple size is greater than 1 cm2, if a sample variance calculated on the basis of 25 apples equals 1,5 cm2.

**5**. In the 2 factories distributions of a plate diameter are normal with the same variance. From the first factory n1 = 20, and from the 2nd n2 = 25 plates has been randomly chosen. Sample means calculated on that bases are = 27 cm,  = 28 cm and standard deviations= 2 cm,  = 3 cm respectively. Assuming α = 10%, do the diameters differ?

**6**. 1000 people have been asked about changes in their financial situation. Following answers have been collected: no changes – 760, better – 100, worse – 140,

For α = 5% verify a hypothesis that situation over 75% is the same.

**7.** For the data from exercise 5: is the variance in the 2nd factory greater than in the 1st? α = 10%.

**8**. For exercises 1 – 3 calculate p-value.

**9.** For exercises 4 – 6 calculate p-value

**10**. After the statistical test it turned out that p-value is smaller than level of significance. Should the null hypothesis be rejected?