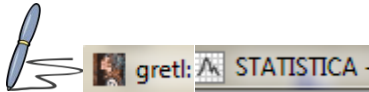# Tests of the variance and proportion
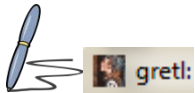
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Task 1. The researchers randomly selected the group of 500 students from universities. They asked them a question. Where do you want to work after the graduation? On this question 100 students answer, that they want to work in the banking sector. Verify the hypothesis that 25% of students fron universities want to work in banking sector. Accept the level of significance 0.05.

Task 2. It is to check whether the workers from administration (population 1) and the manual workers (population 2) belong to the social organization. Verify the hypothesis that the fraction of workers who belong to the social organization is the same in both populations. The researchers randomly selected 300 workers from administration. In this sample there were 180 workers which belong to the social organization. Next, The researchers randomly selected 500 manual workers. In this sample there were 400 workers which belong to the social organization. Accept the level of significance 0.05.

Task 3. Fuel consumption of cars of the brand "Fiat Punto" should deviate from the average consumption by + / 2 liters per 100 km. Researchers randomly selected 20 cars of this type, for which the standard deviation of fuel consumption was 2.5 liters per 100 km. Verify the hypothesis that the actual variance (dispersion) of fuel is not significantly different than the expected. Accept the level of significance 0.05.

Task 4. The researchers randomly selected 100 households in Poznań in 2003. The weekly average cost of food consumption in each household was 200 zł per person and the dispersion was 30%. Verify the hypothesis that the standard deviation of the food consumption in every household in Poznań is greater than 50 zł per person. Accept the level of significance 0.05.

Task 5. Two competitors ran in 2003 the distance of 400 m. The results are shown below.

Runner A: ten starts, 47,2; 46,5; 46,7; 46; 45,8; 45,5; 45,9; 46; 45,9; 46,5.

Ruunner B: seven starts, 47; 46,5; 45,5; 45,5; 46; 46,5; 47,1.

Can we say that runner A is more regular than the runner B? Accept the level of significance 0.05.