

Nonparametric statistics: Practical session II

1. Of 16 cars inspected during a safety campaign, 6 were found unsafe. Test the hypothesis that no more than 10% of the cars in the population are unsafe. Also obtain the 95% confidence interval for the probability of unsafe car.
2. Seventy chemical detection kits of one type are placed in a gas chamber together, for a fixed period of time, and a measured amount of a lethal gas is introduced into the chamber. Fifty-six kits register positive for the lethal gas, while the other 14 fail to register positive. Find a 90% confidence interval for the probability of registering positive under these conditions.
3. Entering college freshman have taken a particular high school achievement examination for many years, and the upper quartile is well established at a score of 193. A particular high school sends 15 of its graduates to college, where they take the exam and get the following scores 189, 233, 195, 160, 212, 176, 231, 185, 199, 213, 193, 174, 166, 248. Test the hypothesis that the above score come from the population whose upper quartile is 193.
4. Six students went on a diet in an attempt to lose weight, with the following results:

Student	1	2	3	4	5	6
Weight Before	174	191	188	182	201	188
Weight After	165	186	183	178	203	181

Is the diet an effective means of losing weight? Use sign test as well as Wilcoxon's signed-rank test (state all the assumptions).