

## quality assurance problem....

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*Source:* <http://sci.tech-archive.net/Archive/sci.stat.math/2008-04/msg00263.html>

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  - *Date:* Fri, 25 Apr 2008 02:06:50 -0700 (PDT)
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I have a set of 10000 elements to buy; I want to do some quality assurance activity in order to avoid to buy invalid elements. I cannot check all the elements by eye because it would require too much effort; hence I'd like to prioritize the elements to focus my effort on the most urgent elements to check. I have an automatic test that provides the probability of correctness of an element; moreover I know that the test gives a 20% of false positive and a 30% of false negative.

1) Suppose that I have an element of which the test estimates a probability of correctness of 75%; which is the posterior probability?

I'm afraid I'm unable to apply the Bayesian theorem because I do not know the number of correct elements. My instinct tells me to count the frequency in the past in which an element was really correct when the estimated probability by the tool was less or equal than 75%; suppose that such frequency is 50%. Consequently, my instinct will say that an element of which the test estimates a probability of correctness of 75% has a posterior probability to be correct of 50%. Am I right???

2) Suppose that I cannot check all the elements by eye but I need to use the automatic test to prioritize the elements to check by eye; suppose that I run the automatic test on all the elements and then I order the elements according to the probability of correctness provided by such a test; suppose that I've analyzed all the elements (in case the 43%) with a probability (provided by the test) of correctness lower than 65%;

How to calculate the actual quality of the entire set of elements? Is it the probability that there are incorrect elements in the remaining (57%) ones (i.e. the ones with a probability of correctness higher than 70%)???

Please help me!

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