Christopher LaJon Morgan

CS 470: BZRFlags Tutorial

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**Problem 13.3, part a and b.**

**Problem 13.8, part a and b.**

**Long Winded**

This problem comes from G. Gigerenzer, "Calculated Risks: How To Know When Numbers Deceive You", Simon and Schuster Press, 2002. Give the answer and show how you obtain the results using Bayes rule.

To diagnose colorectal cancer, the hemoccult test --- among others --- is conducted to detect occult blood in the stool. This test is used from a particular age on, but also in routine screening for early detection of colorectal cancer. Imagine you conduct a screening using a hemoccult test in a certain region. For symptom-free people over 50 years old who participate in screening using the hemoccult test, the following information is available for this region.

The probability that one of these people has colorectal cancer is 0.3 percent. If a person has colorectal cancer, the probability is 50 percent that this person will have a positive hemoccult test. If a person does not have colorectal cancer, the probability is 3 percent that this person will still have a positive hemoccult test. Imagine a person (over age 50, no symptoms) who has a positive hemoccult test in your screening. What is the probability that this person actually has colorectal cancer.