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Part B Probability Write-Up

STA 380

Professor Dpuelz

Part B Probability Write-Up

As stated in the problem question, we're looking for the probability that a person has the disease given that they test positive, or P(d|+). We can find this probability utilizing Bayes' rule and the total probability rule. Bayes' rule requires the sensitivity, probability of the disease, and probability of testing positive. Sensitivity and probability of getting the disease are given in the problem. To find the probability of testing positive, I used the rule of total probability. Not all values were included for this equation, so I did some simple algebra to find them. I calculated the probability of not having the disease by subtracting the probability of having the disease from one and calculated the probability of testing positive given that you do not have the disease by subtracting the given specificity from one. Once I found all these values, I calculated the total probability of testing positive, then plugged this value back into the Bayes' equation to find that the likelihood of having the disease given a positive test is 19.89% or 0.1989 as a decimal.