Homework assignment 07

Use black text (if possible) for everything you include in this document. Keep both your answers and the original questions. Save this document in PDF format and submit it on Canvas. Please follow the general requirements described in the grading rubric.

1. Show a documentation header. Include your name, the purpose of the program, and the conditions under which others may or may not use your results.

2. Using the data file caries-detection (or referring to Table2 in the publication) calculate the sensitivity and specificity for the overall caries results (first five rows of data). You can calculate these by hand, inside of SPSS, using a spreadsheet program, or any other reasonable approach.

3. Explain which paper has the best results for ruling in a diagnosis. Which paper has the best results for ruling out a diagnosis.

4. Calculate the likelihood ratio for a positive result and for a negative result the overall caries diagnosis in the Sutapak paper.

5. Prevalence of caries depends on a variety of factors. Refer to Table 2 in the paper on dental caries published by the National Institute of Dental and Craniofacial Research. The overall prevalence of untreated decay is 26%. What factors might cause you to increase or decrease this prevalence?

6. Calculate the post-test odds and post-test probabilities if you estimate the pre-test probability as 25% and the AI diagnostic test in the Sutapak paper comes out positive.

7. I am not a dentist, but presume that you would only treat a patient if the post-test probability is 40% or higher. What value for the pre-test probability is so small that you would not want to use the AI diagnostic test proposed in the Sutapak paper?