Review Test Submission: Module 7 Online Assignment

User	BRIAN THOMAS LOUGHRAN
Course	EN.605.647.81.SP21 Neural Networks
Test	Module 7 Online Assignment
Started	3/10/21 7:38 PM
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Status	Completed
Attempt Score	16 out of 18 points
Time Elapsed	3 minutes
Results Displayed	Submitted Answers, Feedback, Incorrectly Answered Questions

Question 1

2 out of 2 points

Which expression is the correct expression for the Positive Predictive Value (PPV), the probability of an entity having a characteristic given that a positive test result was produced where the set *C* corresponds to the set of entities having a characteristic of interest and set *D* corresponds to the set of entities that are detected by a detector designed to detect the entities with the characteristic. Note that the bar above these set indicators means the negation of that set. For example, the symbol $\overline{C}$ corresponds to the set of entities that do not have the characteristic.

Selected Answer: $Pr\{C|D\}$

Response Feedback: Nice job. Now figure out what this is equal to in terms of true positives, false positives, etc.

Question 2

2 out of 2 points

Using the same approach as in the preceding question, find the proper expression for the Negative Predictive Value (NPV) where the NPV corresponds to the probability that an entity does not have the characteristic given that it is not detected.

Selected Answer: $Pr\{\overline{C}|\overline{D}\} = \frac{Pr\{\overline{C} \cap \overline{D}\}}{Pr\{\overline{D}\}}$

Response Feedback: Good job. Now determine the NPV in terms of the true positives, false positives, etc.

Question 3

2 out of 2 points

Select the answer that corresponds to the PPV in terms of true positives, false positives, true negatives and false negatives.

Selected Answer: $\frac{TP}{TP+FP}$

Response Feedback: Nice job!

Question 4

2 out of 2 points

Similar to the preceding question, what is the proper expression for the Negative Predictive Value in terms of true positives, true negatives, false positives and false negatives?

Selected Answer: $\frac{TN}{TN+FN}$

Response Feedback: Good job!

Question 5

0 out of 2 points

A neural network is used to classify patients based on a large number of patient histories and blood chemistries. Each patient's blood is tested for a series of biomarkers which then serves as inputs to a neural network to determine whether they have a particular disease based on the output of the neural network. Below is the confusion table indicating the test results from a large number of patients along with their respective disease states.

Test/Characteristic	Primary Aldosteronism	No Aldosteronism
Positive	20	100
Negative	250	300

Given this confusion table, what is the sensitivity of the detector? Answer to 3 significant decimal digits.

Selected Answer: 0.75

Question 6

2 out of 2 points

Given the preceding data in the table, what is the specificity? Answer to 3 significant decimal digits.

Selected Answer: 0.75

Question 7

2 out of 2 points

Using the same confusion table as in the preceding example, what is the PPV? Answer to 3 significant decimal digits.

Selected Answer: .166

Question 8

2 out of 2 points

Again, using the same confusion table as before, what is the NPV? Answer to 3 significant decimal digits.

Selected Answer: .545

Response Feedback: Good work!

Question 9

2 out of 2 points

In the preceding problem, you considered a confusion table with various values which you used to compute sensitivity, specificity, positive predictive and negative predictive values. Using the choices below, select the best answer to the following question: Is the diagnostic test reflected in the confusion table numbers a good test?

Selected Answer: The test is a very weak test as it detects less than 10% of cases and its PPV is 1/6 … very low for a credible test. It's NPV is similarly weak and only provides about even odds as to whether a negative test result could signal the absence of aldosteronism.

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