

Assignment 1: Diagnostic Accuracy Calculation

1. Assignment 1 Part 2 - Anchor Problem: Diagnostic Accuracy Calculation Written Response

Test #	Test Case 1			Test Case 2		
	TPR	FPR	Score Value	TPR	FPR	Score Value
1	0.7	0.22	0.627979	0.7	0.22	0.627979
2	0.55	0	0.55	0.55	0	0.55
3	0.9	0.78	0.213616	0.9	0.78	0.213616
4	0.826794915	0.1	0.8	0.867712440	0.15	0.8
5	0.867712440	0.15	0.8	0.826794915	0.1	0.8
6	0	0	0	0	0	0
7	0	1	-0.414214	0	1	-0.414214
Final Output	Diagnostic test 4 has the best score of 0.8			Diagnostic test 4 has the best score of 0.8		

- Program will round values assigned to float variables outputted for Test 4 and 5 scores for both Test Case 1 and Test Case 2
- Due to reduced accuracy of float variable type, program cannot always identify best diagnostic test as expected
- Using a calculator that can display a greater number of digits, actual computed value of the diagnostic test where $TPR = 0.826794915$ and $FPR = 0.1$ is 0.79999999199523, while the test where $TPR = 0.826794915$ and $FPR = 0.1$ is 0.800000003673116
- Contradictory as Test 5 in Test Case 1 has best score (which is not what program outputs), but Test 4 in Test Case 1 does have best score (which is what the program outputs)
- Can be attributed to recency selection process
- Further, only reason Test 4 is outputted as the best score for both Test Cases due to fact that program is written to check whether new score is $>$ best score
 - o 0.8 is equal to, not greater than 0.8 so Test 4 value will remain assigned to *highestScore* variable

Program Output Screenshots

Test Case 1

```
PS C:\Users\amtam\OneDrive\Desktop\BME 121 Projects\Assignment1> ./dta3
Please enter the diagnostic test's true positive rate: 0.7
Please enter the diagnostic test's false positive rate: 0.22
The score for diagnostic test 1 is 0.627979
Please enter the diagnostic test's true positive rate: 0.55
Please enter the diagnostic test's false positive rate: 0
The score for diagnostic test 2 is 0.55
Please enter the diagnostic test's true positive rate: 0.9
Please enter the diagnostic test's false positive rate: 0.78
The score for diagnostic test 3 is 0.213616
Please enter the diagnostic test's true positive rate: 0.826794915
Please enter the diagnostic test's false positive rate: 0.1
The score for diagnostic test 4 is 0.8
Please enter the diagnostic test's true positive rate: 0.867712440
Please enter the diagnostic test's false positive rate: 0.15
The score for diagnostic test 5 is 0.8
Please enter the diagnostic test's true positive rate: 0
Please enter the diagnostic test's false positive rate: 0
The score for diagnostic test 6 is 0
Please enter the diagnostic test's true positive rate: 0
Please enter the diagnostic test's false positive rate: 1
The score for diagnostic test 7 is -0.414214
Please enter the diagnostic test's true positive rate: -1
Please enter the diagnostic test's false positive rate: -1
Diagnostic test 4 has the best score of 0.8
Exiting program.
```

Test Case 2

- PS C:\Users\amtam\OneDrive\Desktop\BME 121 Projects\Assignment1> ./dta3
Please enter the diagnostic test's true positive rate: 0.7
Please enter the diagnostic test's false positive rate: 0.22
The score for diagnostic test 1 is 0.627979
Please enter the diagnostic test's true positive rate: 0.55
Please enter the diagnostic test's false positive rate: 0
The score for diagnostic test 2 is 0.55
Please enter the diagnostic test's true positive rate: 0.9
Please enter the diagnostic test's false positive rate: 0.78
The score for diagnostic test 3 is 0.213616
Please enter the diagnostic test's true positive rate: 0.867712440
Please enter the diagnostic test's false positive rate: 0.15
The score for diagnostic test 4 is 0.8
Please enter the diagnostic test's true positive rate: 0.826794915
Please enter the diagnostic test's false positive rate: 0.1
The score for diagnostic test 5 is 0.8
Please enter the diagnostic test's true positive rate: 0
Please enter the diagnostic test's false positive rate: 0
The score for diagnostic test 6 is 0
Please enter the diagnostic test's true positive rate: 0
Please enter the diagnostic test's false positive rate: 1
The score for diagnostic test 7 is -0.414214
Please enter the diagnostic test's true positive rate: -1
Please enter the diagnostic test's false positive rate: -1
Diagnostic test 4 has the best score of 0.8
Exiting program.