

# CSDS 440: Assignment 3

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## Problem 13

Because ROC graph is plotting TP Rate =  $\frac{TP}{TP+FN}$  against FP Rate =  $\frac{FP}{FP+TN}$ . As we are lowering the classification threshold, more examples will be classified as *Positive*. This implies there will be more  $TP$  and  $FP$  (for a typical model) as the threshold being lower – and since both  $TP + FN$  and  $FP + TN$  are constant for all time – we will have a larger numerators on the same denominators. Which will result in an increase on both axes and the statement is therefore proven.