HW#2 problem 5

- You are to compute the averages of the following, averaged over the three classes:
  - true positive rate
  - false positive rate
  - error rate
  - the accuracy
  - the precision
- That is, compute each one for class A, each for class B, and each one for class C, then average all three
  - E.g., $TPR = (TPR_A + TPR_B + TPR_C)/3$
  - $FPR = (FPR_A + FPR_B + FPR_C)/3$
  - …
- But how to compute these for a three-class problem?

Two-class:

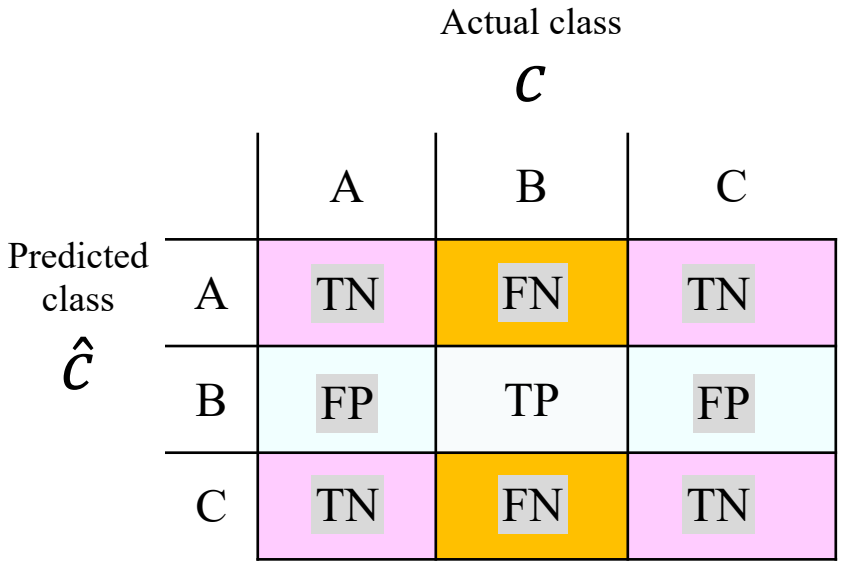
Predicted class $\hat{c}$	Actual class c: 1	Actual class c: 0	
1	TP	FP	*Estimated positive* $\hat{P}$
0	FN	TN	*Estimated negative* $\hat{N}$
	Positives P	*Negatives* N	TOTAL

Three-class, for class A:

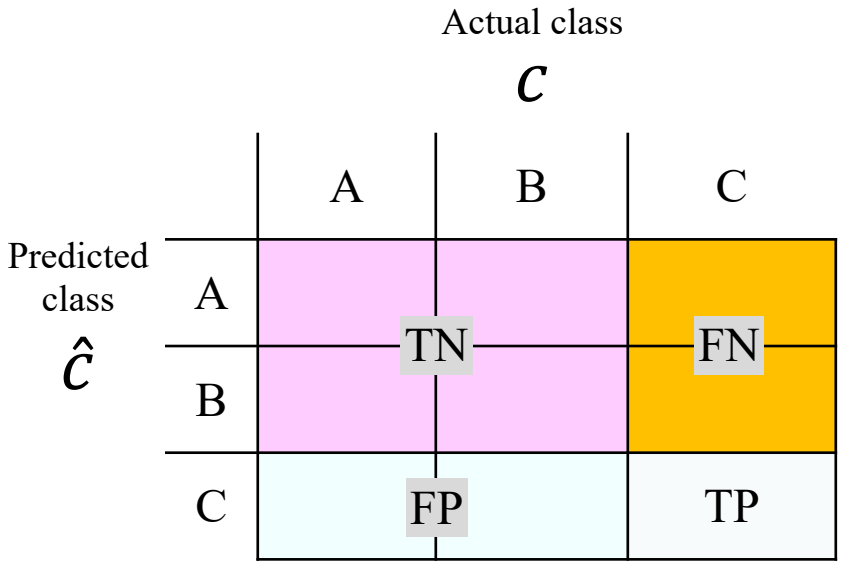
Predicted class $\hat{c}$	Actual class c: A	Actual class c: B	Actual class c: C
A	TP	FP	FP
B	FN	TN	TN
C	FN	TN	TN

True positives in white entry
False negatives – sum the orange entries
False positives – sum the blue entries
True negatives – sum the pink entries

Three-class, for class B:



Three-class, for class C:



True positives in white entry
False negatives – sum the orange entries
False positives – sum the blue entries
True negatives – sum the pink entries