Sensitivity and Specificity

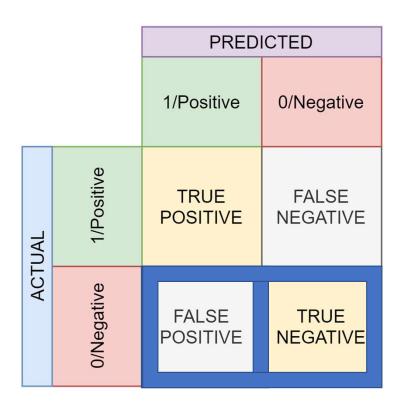|		PREDICTED	
		1/Positive	0/Negative
ACTUAL	1/Positive	TRUE POSITIVE	FALSE NEGATIVE
	0/Negative	FALSE POSITIVE	TRUE NEGATIVE

Sensitivity – True Positive Rate (TPR)

$$TPR = \frac{True\ Positives}{True\ Positives + False\ Negative}$$

Getting Started with ML ~ Raunak Joshi

Specificity

$$Specificity = \frac{True\ Negatives}{True\ Negatives + False\ Postives}$$

False Positive Rate - FPR

$$FPR = 1 - Specificity$$

$$FPR = 1 - \frac{True\ Negatives}{True\ Negatives + False\ Postives}$$

$$FPR = \frac{False\ Positives}{True\ Negatives + False\ Postives}$$
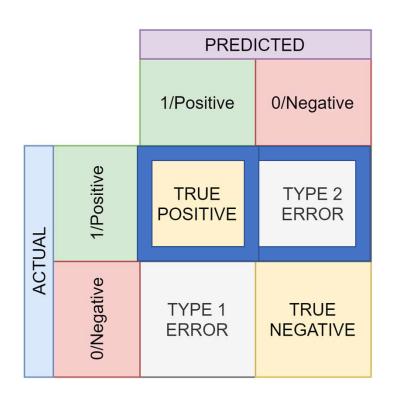
Specificity

$$Specificity = \frac{True\ Negatives}{True\ Negatives + False\ Positives}$$

↑ Specificity

↓ Type I Error

Sensitivity – True Positive Rate (TPR)

$$TPR = \frac{True\ Positives}{True\ Positives + False\ Negative}$$

Sensitivity

Type II Error

Actual y values	Predicted y values
0	0
0	1
0	1
1	1
1	1
1	1

$$Specificity = \frac{True\ Negatives}{True\ Negatives + False\ Positives}$$

$$= \frac{1}{1+2} = \frac{1}{3} \approx 33.33\%$$

$$Sensitivity \sim TPR = \frac{True\ Positives}{True\ Positives + False\ Negative}$$

$$= \frac{3}{1+0} = \frac{3}{3} \approx 100\%$$

		PREDICTED	
		1/Positive	0/Negative
ACTUAL	1/Positive	3	0
	0/Negative	2	1

Getting Started with ML ~ Raunak Joshi

Actual y values	Predicted y values
0	0
0	1
0	1
1	1
1	1
1	1

$$FPR = \frac{False\ Positives}{True\ Negatives + False\ Positives}$$

$$= \frac{2}{1+2} = \frac{2}{3} \approx 66.67\%$$

		PREDICTED	
		1/Positive	0/Negative
ACTUAL	1/Positive	3	0
	0/Negative	2	1

Getting Started with ML ~ Raunak Joshi