

Type 1 and Type 2 Errors in Machine Learning

Prerequisite

- Confusion Matrix
- False Positives
- False Negatives

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

True Positives :

This is where actual y values are 1 and predicted y values are 1.

True Negatives :

This is where actual y values are 0 and predicted y values are 0.

False Positives :

This is where actual y values are 0 and predicted y values are 1.

False Negatives :

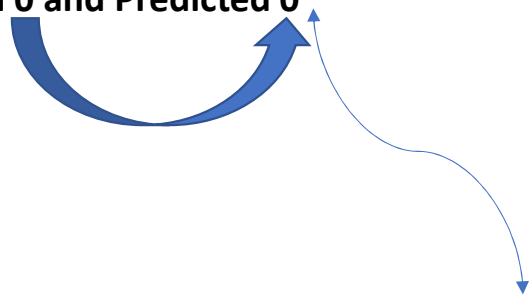
This is where actual y values are 1 and predicted y values are 0.

How to memorize this ?

- Check if both numbers match. If so they are TRUE and if they don't they are FALSE.
- If predicted number is **1** it is POSITIVE and if it is **0** then NEGATIVE.

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

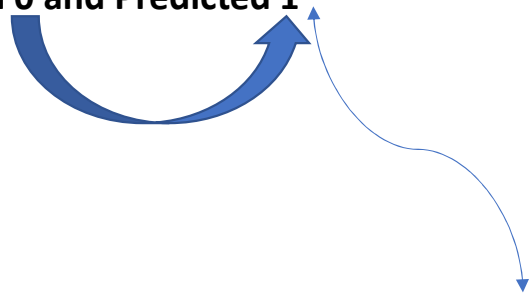
Actual 0 and Predicted 0



TRUE NEGATIVE

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

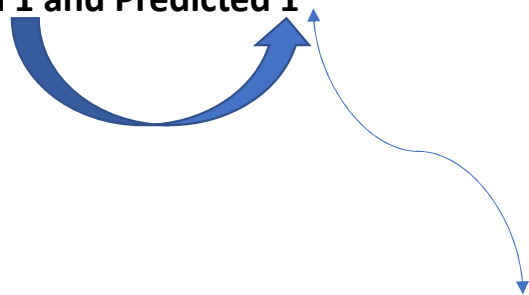
Actual 0 and Predicted 1



FALSE POSITIVE

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

Actual 1 and Predicted 1



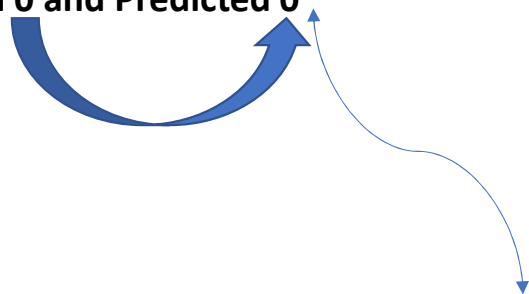
TRUE POSITIVE

Confusion Matrix

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

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

Actual 0 and Predicted 0

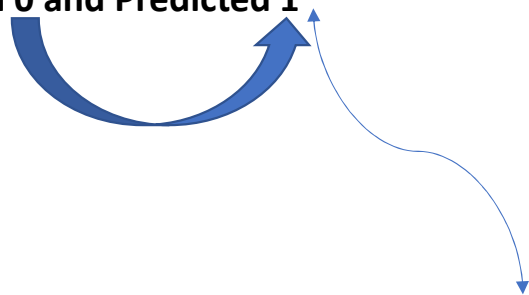


TRUE NEGATIVE

		PREDICTED	
		1/Positive	0/Negative
ACTUAL	1/Positive		
	0/Negative		1

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

Actual 0 and Predicted 1

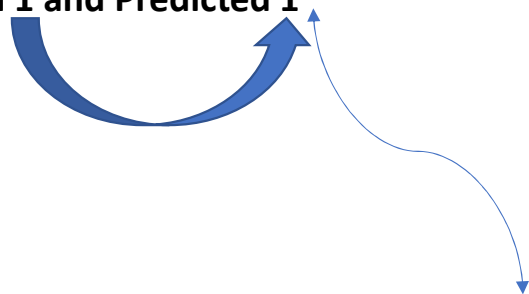


FALSE POSITIVE

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

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

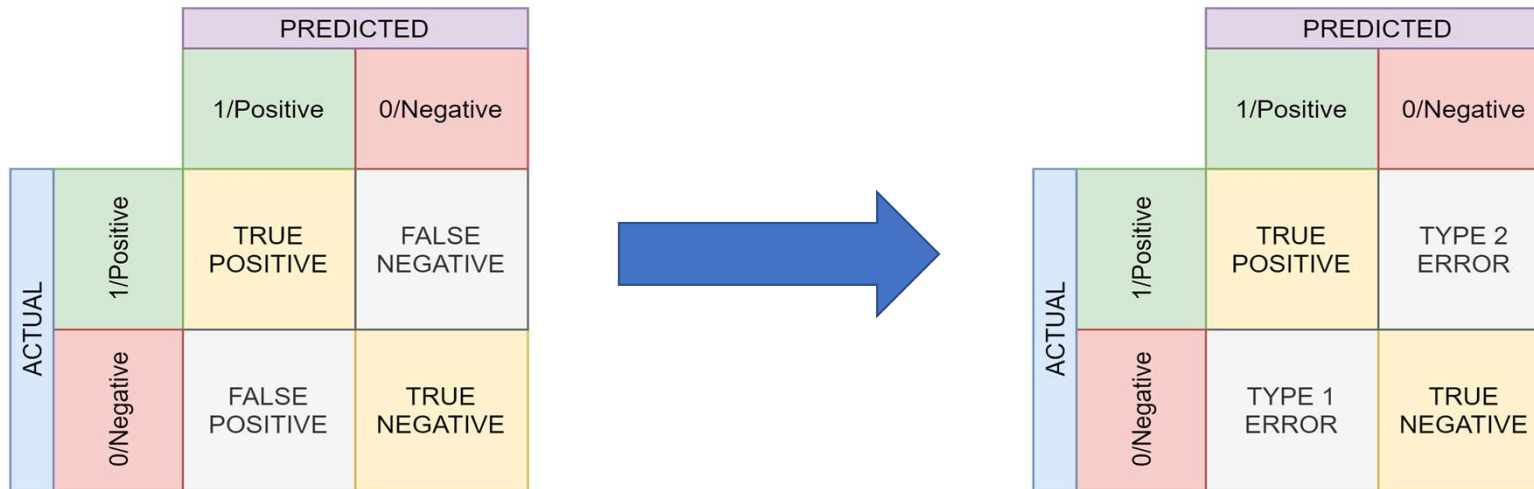
Actual 1 and Predicted 1



TRUE POSITIVE

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

So what is Type 1 and Type 2 Error



Type I Importance

- One person is tested Covid Negative yet the system tests the person is Covid Positive.
- Person does not have a weapon in their pockets, yet system tests the person has a weapon.

Type II Importance

- One person is tested Covid Positive yet the system tests the person is Covid Negative.
- Person has a weapon in their pockets, yet system tests the person does not have a weapon.