



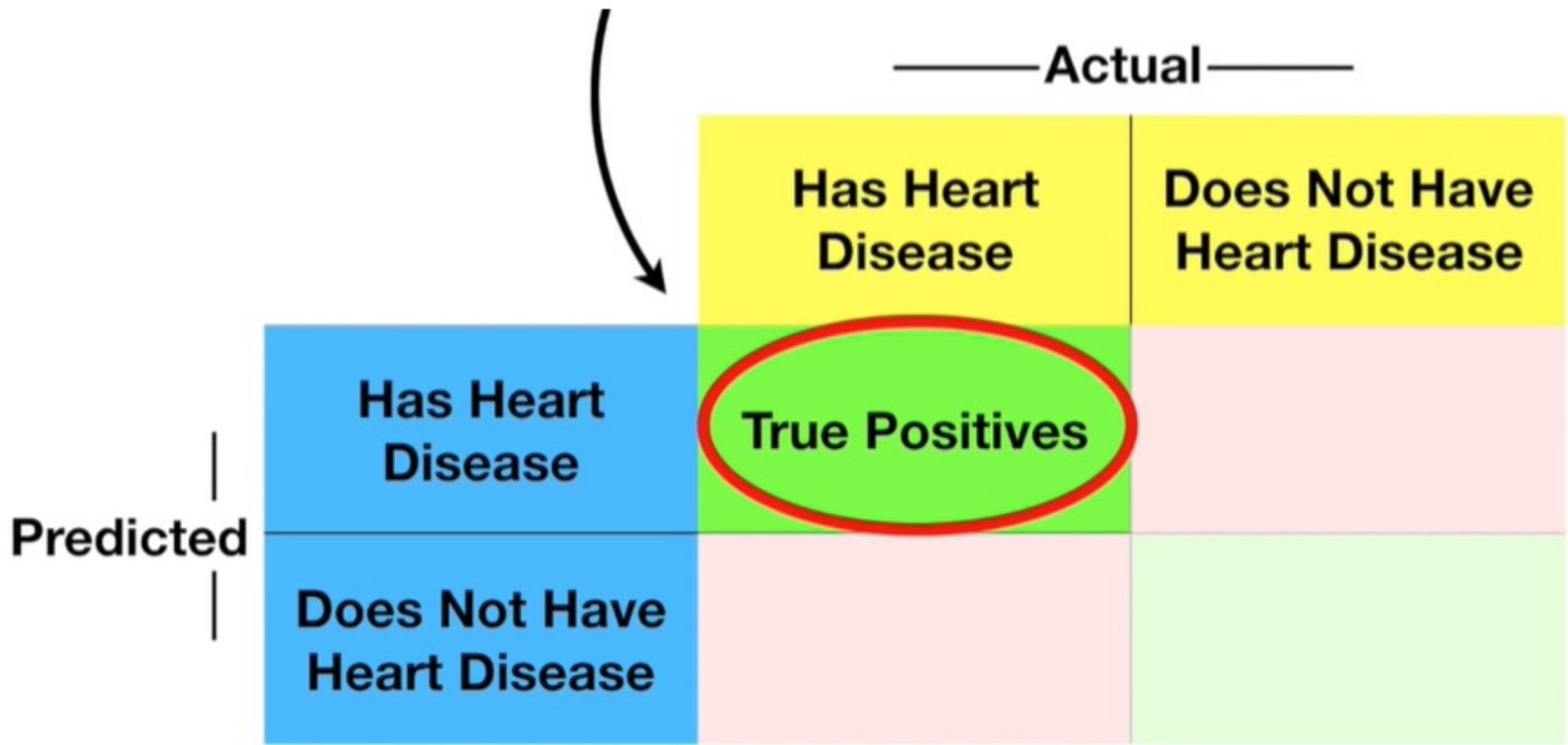
Confusion Matrix
Sensitivity
Specificity

Examples

When there are only two categories to choose from
(in this case, the two choices were
“Has Heart Disease” and
“Does not have Heart Disease”)...

		————Actual————	
		Has Heart Disease	Does Not Have Heart Disease
Predicted	Has Heart Disease		
	Does Not Have Heart Disease		

True positives



A confusion matrix for heart disease prediction. The matrix is a 2x2 grid. The columns are labeled 'Actual' and the rows are labeled 'Predicted'. The top-left cell (Actual: Has Heart Disease, Predicted: Has Heart Disease) is green and labeled 'True Positives' with a red oval. The top-right cell (Actual: Does Not Have Heart Disease, Predicted: Has Heart Disease) is pink. The bottom-left cell (Actual: Has Heart Disease, Predicted: Does Not Have Heart Disease) is light blue. The bottom-right cell (Actual: Does Not Have Heart Disease, Predicted: Does Not Have Heart Disease) is light green. A curved arrow points from the top-left cell to the 'True Positives' label.

Actual			
Predicted	Has Heart Disease	Does Not Have Heart Disease	
	Has Heart Disease	True Positives	
	Does Not Have Heart Disease		

True Negatives

		Actual	
		Has Heart Disease	Does Not Have Heart Disease
Predicted	Has Heart Disease	True Positives	
	Does Not Have Heart Disease		True Negatives

False Negatives

A confusion matrix for heart disease classification. The matrix is a 2x2 grid. The columns are labeled 'Actual' and the rows are labeled 'Predicted'. The cells are: Top-left (yellow): 'Has Heart Disease'; Top-right (yellow): 'Does Not Have Heart Disease'; Bottom-left (light green): 'True Positives'; Bottom-right (light pink): 'True Negatives'. A red oval highlights the 'False Negatives' cell, which is the intersection of 'Predicted: Does Not Have Heart Disease' and 'Actual: Has Heart Disease'. An arrow points from the title 'False Negatives' to this cell.

		Actual	
		Has Heart Disease	Does Not Have Heart Disease
Predicted	Has Heart Disease	True Positives	
	Does Not Have Heart Disease	False Negatives	True Negatives

False Positives

		Actual	
		Has Heart Disease	Does Not Have Heart Disease
Predicted	Has Heart Disease	True Positives	False Positives
	Does Not Have Heart Disease	False Negatives	True Negatives

Confusion matrix

		Actual	
		Has Heart Disease	Does Not Have Heart Disease
Predicted	Has Heart Disease	True Positives	False Positives
	Does Not Have Heart Disease	False Negatives	True Negatives

Sensitivity

- A measure of how well a machine learning model can detect positive instances.
- sensitivity measures the ability of a model to correctly identify positive examples
- Sensitivity is used to evaluate model performance because it allows us to see how many positive instances the model was able to correctly identify.
- True Positive Rate (TPR) or recall
- A model with high sensitivity will have few false negatives
- **The sum of sensitivity (true positive rate) and false negative rate would be 1.**

- **Sensitivity = (True Positive)/(True Positive + False Negative)**

Specificity

- Specificity measures the proportion of true negatives that are correctly identified by the model.
- High specificity means that the model is correctly identifying most of the negative results, while a low specificity means that the model is mislabeling a lot of negative results as positive.
- **Specificity = (True Negative)/(True Negative + False Positive)**

