

Exercise 2

Accuracy criteria

A supervision classification program has been run on a training set of 100,000 medical images in order to train an algorithm for identifying the images corresponding to a cancer diagnostic. The result of the classification is as follows

Actual	Predicted	
	Negative	Positive
Negative	94,000	500
Positive	3,500	2,000

1. What is the accuracy of the trained algorithm on the Training Set?

The accuracy is the proportion of proper predictions:

$$Accuracy = \frac{94,000 + 2,000}{100,000} = 96\%$$

2. What is the recall of the trained algorithm on the Training Set?

Recall is the proportion of actual positive which are properly predicted:

$$Recall = \frac{2,000}{5,500} = 36\%$$

3. What is the precision of the trained algorithm on the Training Set?

Precision is the proportion of predicted positive which are properly predicted:

$$Recall = \frac{2,000}{2,500} = 80\%$$

4. What is the F1-Score of the trained algorithm on the Training Set?

F1-Score is the harmonic average of Precision and Recall:

$$F1 = 2 \times \frac{\textit{Precision} \times \textit{Recall}}{\textit{Precision} + \textit{Recall}} = 53\%$$

5. Are you satisfied with the results? Why?

The Recall value is not satisfactory it is too low: we do not want to miss 64% of the Positive cancer cases.