### What is *Classification Threshold*?

### A Classification Threshold determines the cut off or specific point where the probability of output generated by sigmoid function classifies data samples as belonging to the positive or negative class.

### What does that mean?

### If the predicted probability of an observation belonging to the positive class is greater than or equal to the threshold, 0.5, the classification of the sample is the positive class.

### If the predicted probability of an observation belonging to the positive class is less than the threshold, 0.5, the classification of the sample is the negative class.

### *Let’s see with an example-*

### If the predicted probability of an individual with cancer is greater than or equal to the threshold 0.5, then it is classified as having cancer.

### If the predicted probability is less than 0.5, then it is classified as an individual that do not have cancer.

### 

### Sensitivity of threshold value

### We want to be more sensitive to the positive cases, signifying the classification of positive classes, than the negative classes.

### We can choose to change the threshold of classification based on the use-case of our model.

### A Classification Threshold of 0.5 is well suited to most problems, but particular classification problem could need a fine-tuned threshold in order to improve overall accuracy.

### We can choose to change the threshold of classification based on the use-case of our model.

*Don’t worry if you could not relate to the real life, let’s understand with the example and see how can the sensitivity plays a role in the classification decision.*

**Problem- Creation of a Logistic Regression model that classifies whether or not an individual has cancer.**

Now we want to be more sensitive to the positive cases, signifying the presence of cancer (because that is the main classification problem), than the negative cases.

In order to ensure that most patients with cancer are identified at early stage, we can move or modify the classification threshold down to 0.3 or 0.4 from 0.5, increasing the sensitivity of our model to predict a positive cancer classification.

While there are chances that this might result in more overall misclassifications and generalisation, we are now missing fewer of the cases we are trying to detect.

But, need of turning the threshold from 0.5 is done according the classification problems and desired results.

**Conclusion**

A Classification Threshold of 0.5 is taken by default and well suited to most problems, but particular classification problem could need a fine-tuned threshold in order to improve overall accuracy.