Utility - What Matters Most?

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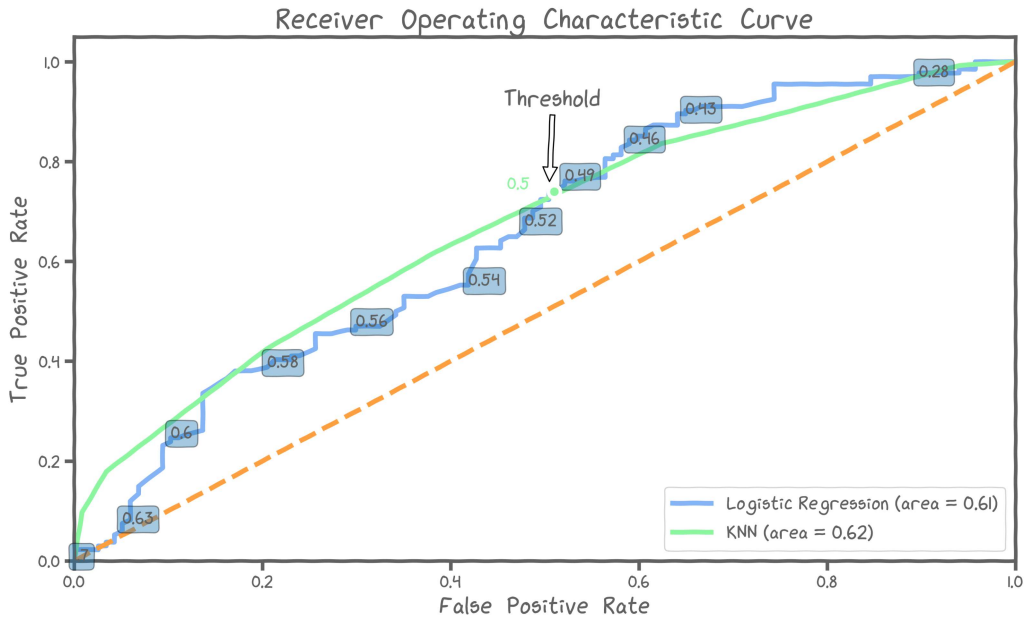
Even with the ROC curve as a tool, we cannot really tell which model to use. As you can see in the graph below, the two models are very similar. At a false positive rate of 0.5 they even have the exact same value for true positives.



Hence, we need to ask an important question: what do we care about the most?

> **Reminder**
>
> These are *examples*, not the actual way that each country handled the pandemic. While the strategies we describe below are simplified versions of each country's approach, we do not know how they actually decided on their COVID-19 responses.

Scenario 1 - Brazil

In Brazil, the new COVID variant is contagious and infects many citizens. Brazilian officials, however, dictate that hospitals do not classify many people at 'high' risk to avoid bad press and subsequent political global backlash. To model this scenario well, we need the best classifier with the following restriction:

$$TPR + FPR \leq 0.5$$

Scenario 2 - Germany

German officials want the fatality ratio to be as low as possible. Thus, it is imperative to find cases that need urgent attention and give them the best chance of survival. Therefore, we need the best classifier with the following restriction:

$$0.8 \leq TPR \leq 0.9$$

Scenario 3 - India

India has only 1 million beds left and there are already 2 million people suspected of having the disease. Officials need to work out a strategy to find the people who are in the most need of urgent care. This scenario leads to the following restriction:

$$TPR + FPR \leq 1$$

This is a case for a balanced dataset

Discussion Board (External resource)

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