

Interpretation

1 - In Figure 1 we have a data distribution, the dots represent the sparse data for the axis X and Y, and the lines represent the fit of a hypothetical classification model. Based on the distributions of Figure 1:

- Which distribution has the best balance between bias and variance?

Response: The C sample

- Describe your thoughts about your selection.

Response: In the first sample (A) we can see that the model has a high bias where the model can't capture patterns into the data causing underfit

In the second one sample (B) you can see that the model has a high variance where the model is overfitting, the model is not generalized

In the last one you can see the perfect tradeoff of bias and variance where the model can find patterns in the data but at the same time is generalized to work with new data

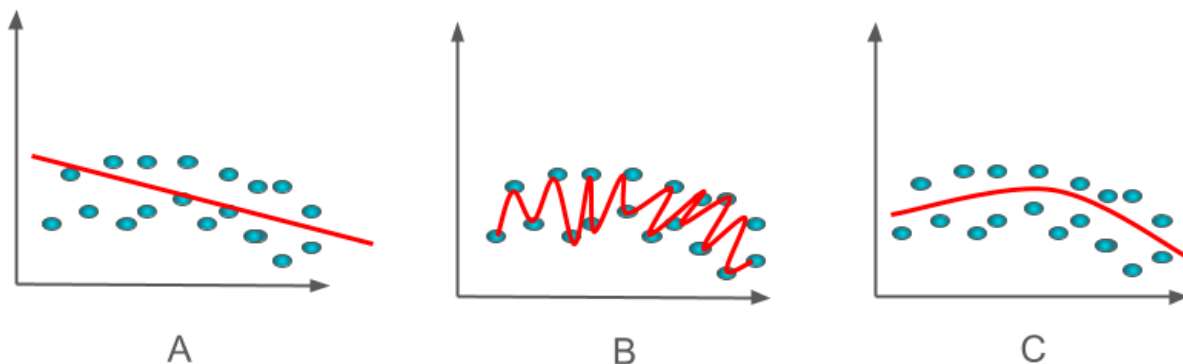


Figure 1 - Data distribution samples

2 - Figure 2 presents a simple graph with 2 curves and 1 line. In model selection and evaluation:

- What is the purpose of this graph and its name?

Response: This is a AUC-ROC graph that represents the tradeoff of TPR and FPR in different thresholds, the purpose is to see with the model can separate well the classes

- What kind of model result does the dashed line represent?

Response: It's a score of 0.5 meaning that the model cannot separate well the classes

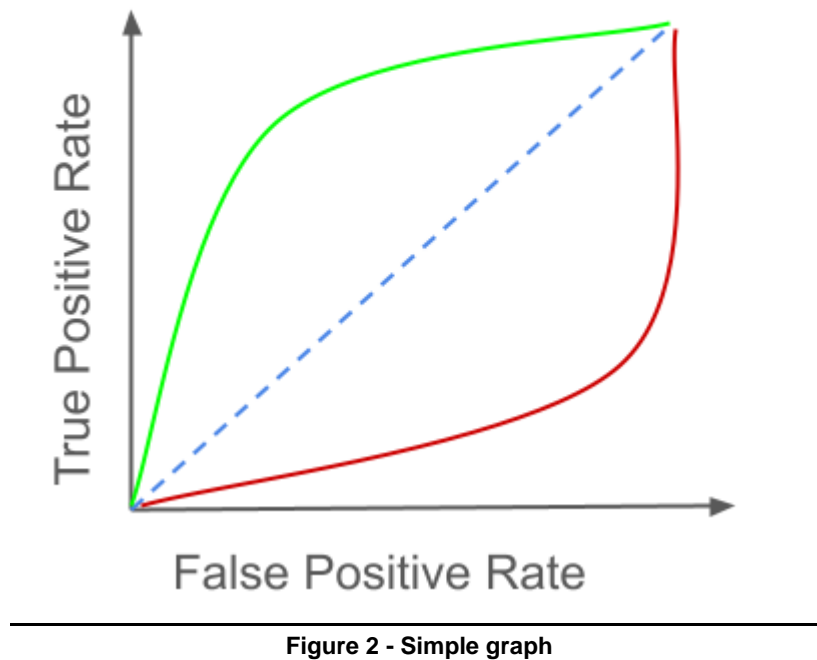
- Which curve represents a better fit, the red or the green? Why?

Response: The green one, because when we work with AUC-Roc we aim to maximize a curve that approaches the top left, meaning that the model is close to 1.0 of score and can separate well between classes

- Describe your thoughts about your selection.

Response: As I said in this example we can see that the green line is close to the top left meaning that it has a high score no less than the 0.5 threshold in the other hand the

red one is under the threshold dashed line that represents the model cannot separate the classes well



3 - Figure 3 presents a classification model training and the evaluation. This model classifies 3 classes (A, B, C). Graph A represents the training accuracy over the epochs, Graph B represents the training loss over the epochs, and the table represents the evaluation of the model using some test samples, we used a confusion matrix to evaluate the classes trained.

- Can we say that the model has a good performance in the test evaluation?

Response: In the graphs we can see that the model had a great performance in the train but when we look at the results of the predictions (confusion matrix) we can see that the correct values the diagonal ones are not high, so the model don't has a great performance in the test evaluation it has a regular performance.

- What phenomenon happened during the test evaluation?

Response: The model Suffers from overfitting, we can see that the model is not generalize well, it has a good performance in the training set, but when it try to predicts test data it don't work well

- Describe your thoughts about your selection.

Response: Here we can see a good example of overfitting, where the model works great in the training set, but works poor in the test set.

We can try different methods to reduce the variance between the predictions and improve the model

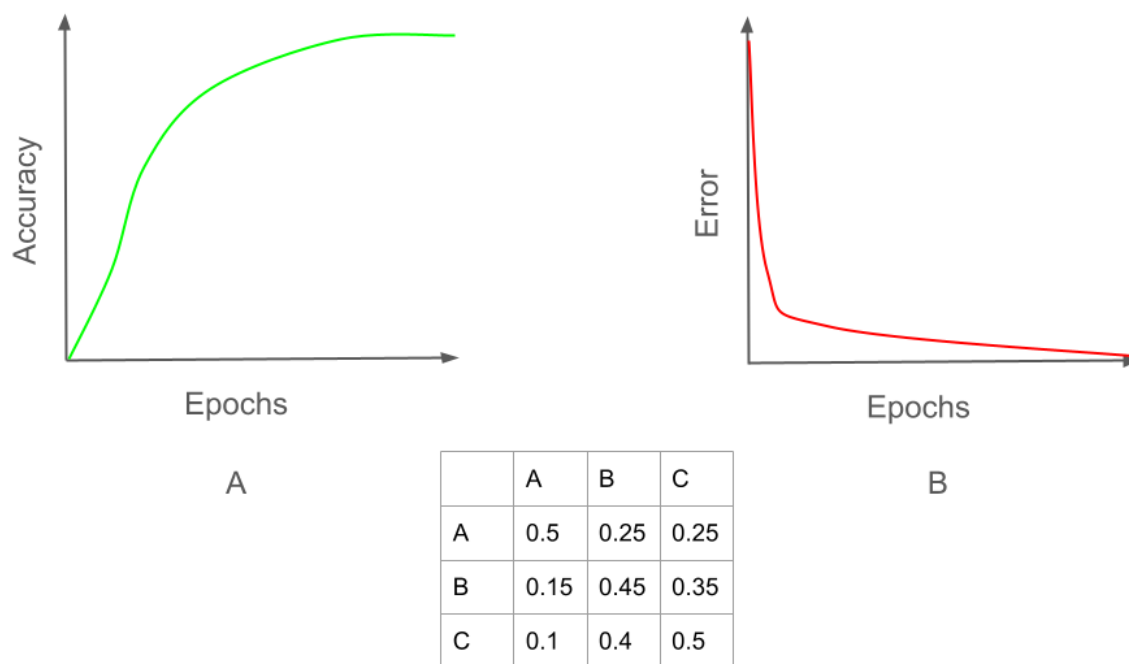


Figure 3 - Model train and evaluation pipeline