UDACITY

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Build a Model with Google AutoML

REVIEW

HISTORY

Meets Specifications

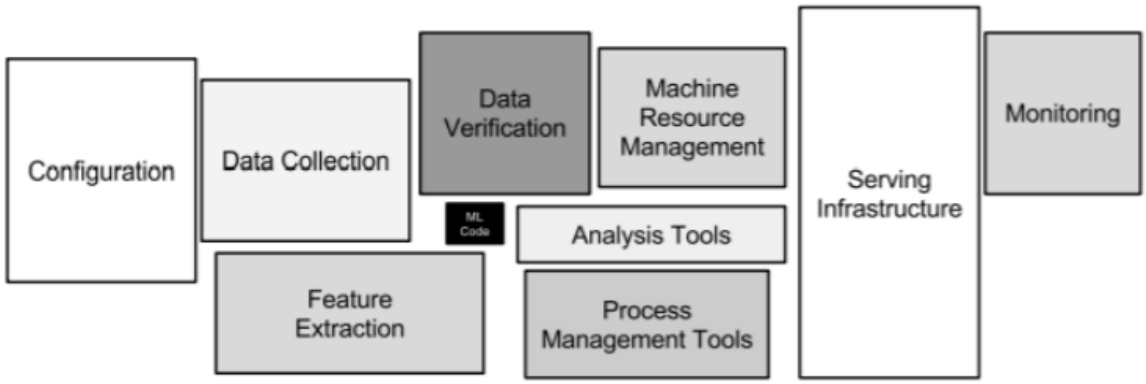
A great work and well done Nourah. Congratulations you've passed this second project 🏆!

Thanks for your re-submission, you've done well, your project submission is clear and concise. You're good in communicating your thoughts, well done ⭐

I'd encourage you to continue to explore Google AutoML while you're still fresh with it, please do read up the reference materials provided. This will help you to solidify your understanding. In your final project, I'd encourage you to write more, this allow your project stakeholders (and reviewers like myself) understand the context. Ready - Set - Go for your next more free flow final project.

A BROADER PERSPECTIVE

A few Google researchers build this diagram, essentially the 'blackbox model' is just one part of the puzzle, there is a lot more to learn. I hope this will set you to become more curious. Google search this rather interesting paper: Hidden Technical Debt of Machine Learning.



Only a small fraction of real-world ML systems is composed of the ML code, as shown by the small black box in the middle. The required surrounding infrastructure is vast and complex.

Source: https://proceedings.neurips.cc/paper/2015/file/86df7dcfd896fcaf2674f757a2463eba-Paper.pdf

Again congratulations Nourah, and you're off to your final project. All the best 🚀!

Greetings from

Submission is Complete

All questions in the AutoML Modeling Report have been completed. Screenshots of all 4 confusion matrices are included.

Clean/Balanced Data

The student correctly reports the number of images used for training and testing.

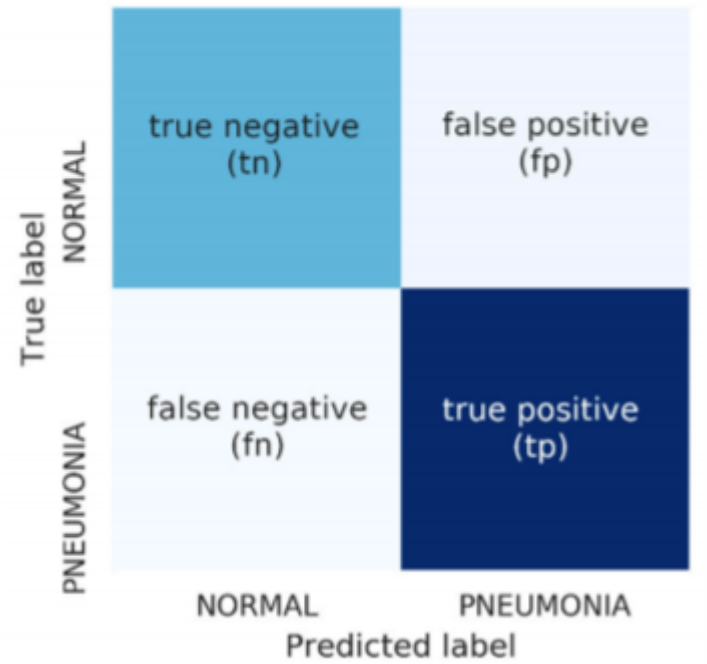
The student should explain the values observed in each of the four cells of the confusion matrix. The student correctly identifies the true positive rate for the “pneumonia” class and the false positive rate for the “normal” class.

WHAT WENT WELL

You've correctly call out the cells in the Confusion Matrix.

A DIFFERENT WAY OF DESCRIBING CONFUSION MATRIX

I'd like to share another way of articulating confusion matrix; here's an example for you:



Normal/Normal [Top Left]: means that the image was originally labelled normal and when class determined by the model it was determined correctly. This happened 100% of the times. (True negative)

Normal/Pneumonia [Top Right]: means that the image was originally labelled normal and when class determined by the model it was classified as pneumonia. This happened 0% of the times. (False Postive)

Pneumonia /Normal [Bottom Left]: means that the image was originally labelled pneumonia and when class determined by the model it was classified as normal. This happened 0% of the times. (False Negative)

Pneumonia /Pneumonia [Bottom Right]: means that the image was originally labelled pneumonia and when class determined by the model it was determined correctly. This happened 100% of the times. (True positive)

REFERENCE MATERIALS

Here's a bit more good reference on Confusion Matrix:

https://www.dataschool.io/simple-guide-to-confusion-matrix-terminology/
https://towardsdatascience.com/understanding-confusion-matrix-a9ad42dcfd62
https://kambria.io/blog/confused-about-the-confusion-matrix-learn-all-about-it/

The student correctly explains the meaning of precision and recall, and they report the precision and recall they observed.

The student correctly explains the effect of increasing the score threshold on precision and recall, and describes why.

Clean/Unbalanced Data

The student should have used 400 images (100 normal class and 300 pneumonia class) and correctly described how they are distributed between training and testing.

The student describes how the confusion matrix changed relative to the clean/balanced model, and explains what potentially caused these results.

The student reports the precision and recall they observed.

The student should note how unbalanced data impacted the model based on what they observed.

Dirty/Balanced Data

The student describes how the confusion matrix changed, and explains what potentially caused these results.

The student describes how precision and recall changed in this model, and evaluates which binary classification model produced the highest precision and recall.

The student provides a summary of what they observed and an appropriate interpretation of the impact of dirty data.

Three-Class Model

The student provides and correctly interprets the 3-class confusion matrix. The student provides an idea for how to improve the model.

The student reports their precision and recall, and correctly reports how 3-class precision and recall are calculated.

WHAT WENT WELL

That's the right calculations, well done!

The student correctly calculates the model's F1 score.

SOME GUIDANCE

The F1 formulation is correct. However the values that you've used is incorrect. For your future reference, please use these value instead:

- Precision 0.8666
- Recall 0.8666

F1 score sits between 0 and 1. Therefore your F1 score will be 0.9291

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