Predicting fetal deseases with Machine Learning

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Description of the project

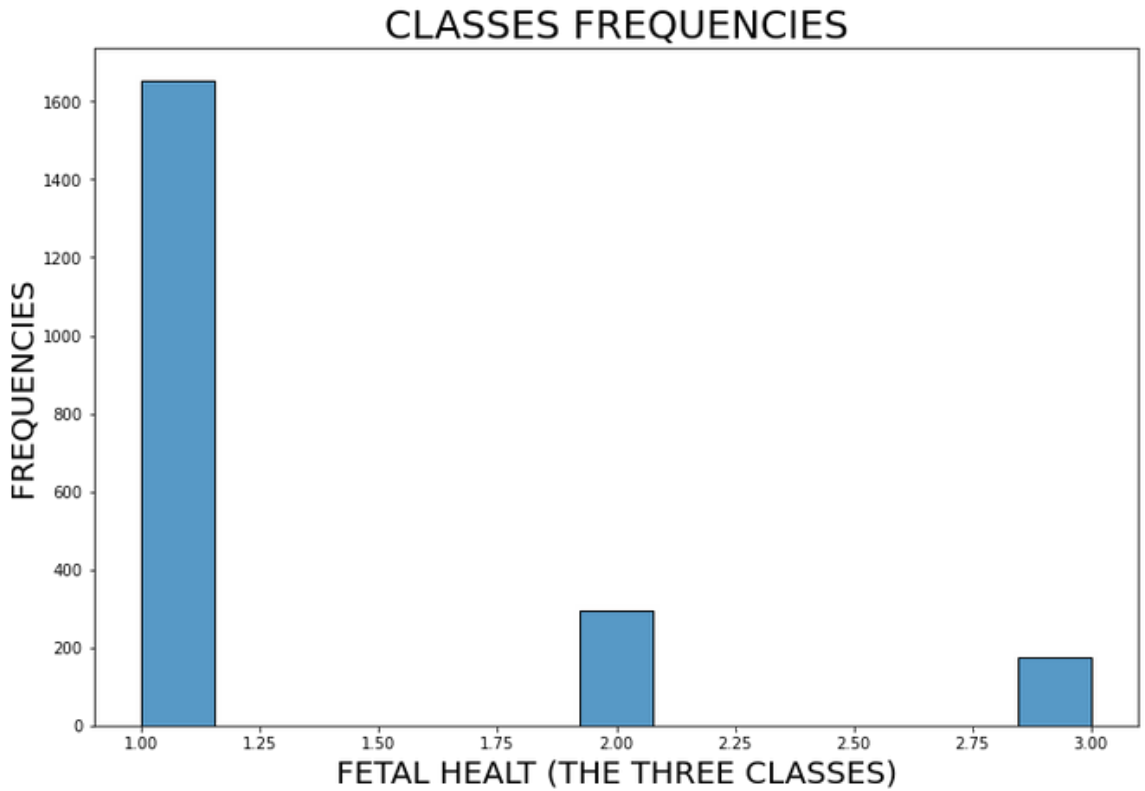
In this project I analyzed a fetal dataset and, through Machine Learning, I was able to predict the probability of developing a certain fetal disease.

As a father of two girls, I threw myself into this project. I did not have precise information from the data available (it is not possible to say what type of disease I've predicted, nor are all the input data clear), but I asked myself: what if it was possible to use an AI to predict the development of certain diseases during childbirth and, perhaps, the intervention of doctors can prevent a pathological condition thanks to a software controlled by an AI?

I couldn't back down from this project!

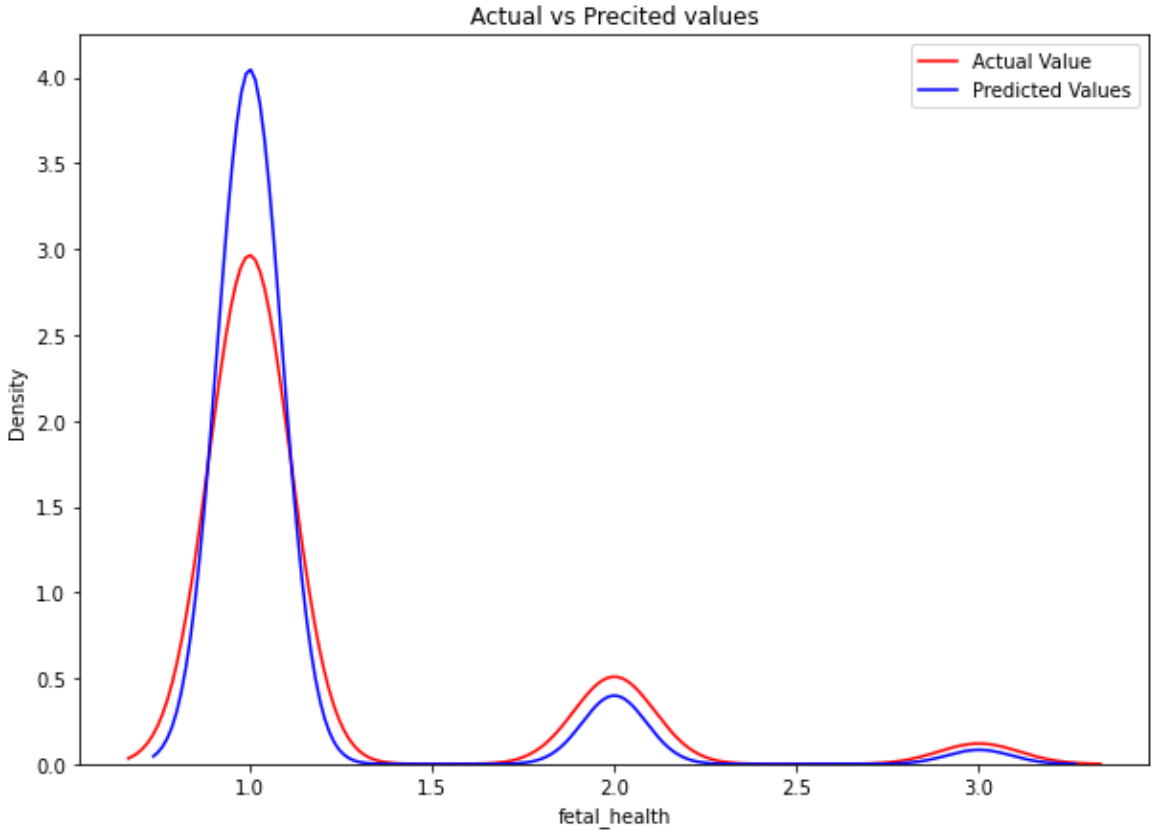
Data preparation

As expected, the problem is multiclass, i.e. the ML model predicts the probability of falling into one of the following classes:
- normal (left column)
- suspect (central column)
pathological (right column)



Choice of the final model

I analyzed different ML models in different ways and, in the end, I chose the best one. In particular, the best model predicts very well the probability of falling back into a pathological condition ("bell" on the right, in which the red curve represents the real values and the blue one the values predicted by the model)



Conclusions

In this project, I was able to test myself in depth with different ML models, on a real case that was very close to my heart.

I also learned that the comparison between various ML models is important when experimenting in the field of Data Science because it allows us to have a broader view of the problem to be solved.