Potential Ideas:

1. Compressive strength algorithm and model of different rock types, to aid directional drilling by estimating the required weight on bit, differential pressure and rotary settings to drill at the fastest rate of penetration without damaging the downhole motor or bit. This would minimize motor and bit failures and avoid the drilling rig from tripping out of the hole to replace these components mid well.
2. Dip calculation algorithm and model to estimate formation dip in real time while drilling a well.
3. Stratigraphic formation tops model to predict where desired tops appear on a type log. Input would be a type log with gamma ray curve and no tops, after model is run the type log would have desired formation tops labeled.

Problem Statement:

I want to build a multiclass classification model (Decision Tree, SVM, KNN) that will input a geologic type log and be able to pick the desired geologic formation tops and return the values to the user. And possibly warn the user if there is a section missing which we call a fault.

Audience:

My audience would be geologist's who work at oil companies who pick these tops as part of their job. It would be really beneficial to them if they had a program to help them predict these tops on numerous wells they are working on simultaneously. And if a problem is detected (missing section, or increase in section) it could alert them to examine that well immediately to adjust potential landing target. Missing a target landing can cost an oil company millions in extra expenses!

Data:

I have already collected numerous example wells I helped drill in the past to work with, which contain the location of the formation tops in total vertical depth and the required gamma ray curves used to pick said tops. The data is clean already, it may have some missing values which I will have to think about what I want to do there. The modelling should be the majority of the work on this project. The file types are xlsx and LAS files.

Conclusion:

I will know if the model is successful if it returns the correct values of the desired formation tops! This is a reasonable project given the time constraints, something I would like to work toward and may be a "stretch" goal is be able to predict the tops using streaming data. So be able to pick the tops as a rig drills a curve, not just pick them off a well that has already been drilled. This would be much more complicated, but also equally more useful!