The strength of the model for the rating of roller coasters and the algorithm being used mainly include the following aspects:

The methods applied in this model includes both qualitative and quantitative analysis, and different conclusions from various methods can be obtained through our modeling process. As for the qualitative analysis, for instance, from the results of Bayes Distinction, we can figure out the trend that the roller coasters which are in the place far away from North America tend to have a high score and that the roller coasters made from wood are more likely to have a higher score. A newly opened roller coasters are more welcomed. If the roller coaster is relatively higher, it is more possible to achieve a better score. 2 and a half minutes and 60 mph are a proper time for a loop and a satisfactory speed respectively etc. All of these are obtained through the qualitative analysis which provide us with valuable information. As for the quantitative analysis, it is obvious that nearly all the algorithms being applied need the input of the data base and the whole rating process our model depends on needs the analysis and testing of quantitative property of every roller coasters. Far from the common evaluating methods based on the riders' subjective inputs currently, our model is based on facts, analysis and trainings, which will definitely provide more accurate and scientific results on the ranking.

Our methods take into consideration both continuous and discrete variables, the fact of which make our model especially suitable for the question's requirement. For instance, in our optimized model, the data of discrete independent variables, like the material used for construction of the roller coasters, are mainly analyzed by Principal Component Analysis, which is suitable for the processing of discrete data. On the other hand, Bayes Distinction mainly served to analyze the continuous variables including average speed, maximum height, etc. For the XG Boosting algorithm, it is suitable for all independent variables and can successfully synthesize the result of the optimized model. Thus, our model has sufficiently taken into account the property of different types of data, and the result yielded will in turn be highly persuasive.

Another outstanding point of the whole modeling process is the variety of methods being used---from the basic statistics and linear regression to the optimized model of BP Network Fitting and XG Boosting algorithm. The final ranking is produced through exploration on various methods, and we have been continuously evaluating the viability of different models and thinking about the how to further improve our results through more advanced methods. It is our strive for excel that guarantees a more accurate and suitable method as a whole for the quantitative analysis of the rating. The multiplicity of methods not only shows our clear logic chain from the perspective of pragmatic problem solving, but also ensures a more stable and precise result.

The model is also propagable as an common method for the rating of any new roller coaster given. In other words, beside the 300 roller coasters provided in the table, if any new roller coaster with basic properties given are added to the data base of our whole modeling process, a rating can also be produced and be added to the original ranking.

Furthermore, our model is highly flexible and can be applied to various situation. For instance, if another new property, no matter continuous or discrete, is added to all the roller coasters, the method and logic behind of our modeling can also be applied, since the ranking is based on a whole series of analysis instead of randomly assigning weight to each property. Thus, a different ranking is likely to be produced. Besides, it is also worth noticing that if more roller coasters with ratings are added to the training set in the XG Boosting algorithm, a more accurate result will be produced. This is due to the fact that certain optimized methods like XG Boosting algorithm yield results based on the self-learning of data input, which indicates more data analysis and more source for learning will boost the accuracy and stability of the method. Therefore, the model we proposed can learn constantly from the additional data input, so it is highly flexible and makes possible the dynamic adjustments, which makes the model suitable for being applied under various circumstances.

Finally, our model yields the precise rating results instead of just the ranking of the top 10. Actually, it is also possible to produce the quantitative result of any roller coaster given. This will definitely be better than the vague ranking result which is a much weaker conclusion compared. The accurate rating can reflect the difference in a quantitative way between each roller coasters and give the potential riders more appreciable information.

The weakness of our model mainly includes the aspects below:

The data of the roller coasters given is sometimes not ample and sufficient enough for the evaluation of one particular independent variable. This will in turn cause the data input being inaccurate since some information is missing and cannot be applied to analysis. Though interpolation is done during the data cleaning process, there are still some data left vacancy because of the insufficiency of existed data, for the loss of large quantity of data will make the interpolation process meaningless. So the loss of data will affect our final rating, even though the methods we applied have considered to maintain the original information as much as possible.

Besides, there are only 300 pieces of information given for the learning and testing of data, the fact of which will unavoidably makes the method like XG Boosting not accurate enough. For methods like this, more pieces of data being learned will further boost the accuracy. However, despite some deficiency, it is still a suitable method for the synthesis of the optimized result and provide us with the relative more stable and precise rating result.