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| **Method** | **Advantages** | **Disadvantages** |
| 1. **RF MODEL** | * It helps in showing non-linear relationships between predictor variables and the response variable. * It also provides feature importance scores that can help identify the most important factors contributing to landslide susceptibility. * It generally performs well on small datasets and often produces accurate predictions with relatively little data. | * It does not work well when the number of trees in the forest is too large or the complexity of the trees is too high. * It is difficult to get accurate results while having a large amount of data. * As this model is not transparent, it is difficult to know how it predicts landslides. |
| 1. **Support Vector Machine** | * They can handle data points that are far from the majority of the data and still produce accurate predictions. * It can handle non-linear relationships between the predictor variables and the response variable through the use of kernel functions. * It can handle both linear and non-linear relationships. * It only uses a subset of the predictor variables used to make the prediction | * SVM models can be computationally intensive, especially when dealing with large datasets. * SVM models require the optimization of several hyperparameters, such as the choice of kernel function and regularization parameter, to produce optimal results. * SVM models can be difficult to interpret. * SVM models can be sensitive to noise in the data, meaning that small variations in the data can greatly impact the predictions. |
| 1. **Boosted Regression Tree** | * BRT models can handle non-linear relationships between the predictor variables and the response variable, making them well-suited for landslide susceptibility analysis * BRT models can handle high-dimensional data with many predictor variables. * BRT models can achieve improved model performance compared to other machine learning methods. * BRT models can be computationally efficient, especially when compared to more complex machine learning methods like artificial neural networks. * It's possible to determine which predictor variables are driving the predictions. | * Overfitting occurs when the model fits the training data too closely, leading to poor performance on unseen data. * BRT models can be complex and difficult to interpret, especially when the number of trees used in the model is high * BRT models require careful selection of model parameters, such as the number of trees and the learning rate which can be a time-consuming process. * BRT models can be sensitive to the initial conditions and may not always find the global optimum solution. |