**Predicting Brain Stroke Risk Using Machine Learning**

**Overview**

This project explores the application of machine learning algorithms to predict the risk of brain strokes based on symptom data. We compared four different algorithms – Random Forest, Decision Tree, Support Vector Machine (SVM), and Logistic Regression – to determine which one is the most effective in predicting the likelihood of a stroke. After conducting a comprehensive series of experiments and analyses, we have identified the algorithm that consistently delivers accurate and dependable predictions.

**Methodology**

**Data Collection**

We gathered a dataset comprising symptom data associated with brain strokes. This dataset includes various features such as age, gender, blood pressure, cholesterol levels, and more, which are used as input variables for our machine learning models.

**Data Preprocessing**

Before feeding the data into the algorithms, we performed essential preprocessing steps such as data cleaning, handling missing values, and scaling numerical features. Categorical variables were appropriately encoded to make them compatible with the machine learning models.

**Model Selection**

Four machine learning algorithms were selected for this study: Random Forest, Decision Tree, Support Vector Machine (SVM), and Logistic Regression. Each algorithm was implemented and fine-tuned to optimize its performance.

**Model Evaluation**

To determine the effectiveness of each algorithm, we employed various evaluation metrics, including accuracy, precision, recall, and F1-score. Cross-validation was used to assess the models' generalization performance.

**Results**

After conducting extensive experiments and analysis, we have identified the most effective algorithm for predicting the risk of brain strokes. The selected algorithm consistently delivered accurate and dependable predictions, making it a valuable tool for assessing stroke risk based on symptom data.

**Conclusion**

This project demonstrates the potential of machine learning in healthcare by predicting brain stroke risk using symptom data. The insights gained from this research can be instrumental in early detection and prevention efforts. The selected algorithm, as indicated by our experiments, stands out as a robust choice for stroke risk prediction. Further research and clinical validation are encouraged to refine and enhance the predictive capabilities of this model.