# TITLE : Brain Stroke Prediction System

## TEAM:

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# INTRODUCTION

A brain stroke occurs when blood flow to a part of the brain is interrupted, causing brain cells to die. It is a leading cause of death and long-term disability worldwide, requiring timely intervention to prevent severe outcomes.

## Significance of the Project :

Developing a brain stroke prediction system is crucial in healthcare as it can identify individuals at risk of stroke before it occurs. By utilizing machine learning algorithms and real-time data, this system can enhance early detection and allow for preventive measures, reducing stroke incidence and improving patient outcomes.

## Problem Statement :

Current methods for stroke risk assessment are often limited in accuracy and do not provide real-time, personalized insights. The motivation behind this project is to create an advanced predictive tool that leverages various data sources to accurately assess stroke risk, enabling timely intervention and potentially saving lives.

## OBJECTIVES

**1. Develop a Predictive Model :**Create a machine learning model that accurately predicts an individual's risk of experiencing a brain stroke based on clinical data, lifestyle factors, and real-time physiological information.

**2. Identify Key Risk Factors :** Analyze data to identify and prioritize the most significant risk factors contributing to stroke, providing valuable insights for clinical practice.

**3. Real-Time Monitoring :** Implement a system for continuous, real-time monitoring of stroke risk using data from wearable devices and electronic health records (EHRs).

**4. User-Friendly Interface** : Design an intuitive interface for healthcare providers and patients, facilitating easy access to risk assessments and personalized prevention recommendations.

**5. Validate and Refine the System** :Test and refine the predictive model and user interface in clinical settings to ensure accuracy, reliability, and usability.

## METHODOLOGY

**1. Data Collection:** Gather data from electronic health records (EHRs), public health datasets, wearable devices, and patient surveys to compile a comprehensive dataset on stroke risk factors.

**2. Data Preprocessing:** Clean and preprocess the data, including handling missing values, normalizing features, and splitting the dataset into training, validation, and test sets.

**3. Model Development**: Develop and train various machine learning algorithms (e.g., logistic regression, decision trees, neural networks) to create a predictive model for stroke risk.

**4. Real-Time Integration:** Build a system architecture for integrating real-time data from wearable devices and EHRs, allowing dynamic updates to risk assessments.

**5. User Interface Design:** Develop a user-friendly interface for healthcare providers and patients to access risk assessments and recommendations.

**6. Validation and Testing:** Conduct a pilot study in clinical settings to test the model's performance and usability, gathering feedback for further refinement.

**7. Data Privacy and Security:** Implement data protection measures compliant with HIPAA and GDPR to ensure the security and confidentiality of patient information.

**8. Tools and Software:** Utilize Python for data analysis and machine learning, Scikit-Learn and TensorFlow for model development, and web technologies for the user interface.

## Expected Outcomes

**1. Accurate Stroke Risk Prediction Model :**A machine learning model that effectively predicts stroke risk, improving early detection and enabling timely interventions.

**2. Insight into Risk Factors :** Identification of significant stroke risk factors, leading to refined clinical guidelines and enhanced prevention strategies.

**3. Real-Time Risk Monitoring:** A system that integrates real-time data for ongoing stroke risk assessment, allowing for proactive health management.

**4. User-Friendly Tool:** An intuitive interface for both healthcare providers and patients to easily access risk assessments and personalized recommendations.

**5. Validated System:** A tested and refined predictive system that demonstrates accuracy and usability in clinical settings.

## REFERENCES

1.Veena Potdar, Lavanya Santhosg, Yashu Raj Gowda CY, A survey on stroke disease classification and prediction using machine learning algorithms, IJERT, Vol. 10, 2021.

2. T.M, Geethanjali, Divyashree M.D, Monisha S.K, Sahana M.K, Stroke prediction using machine learning, JETIR, 2349-5162, 2014.

3. Asha Gaikar, Dr. Uttara Gogate, Amar Panchal, Review on Evaluation of Stroke Prediction Using Machine Learning Methods,(IJRASET),Volume 11, April 2023

## WEBSITES

**1.STROKE INFORMATION** - **https://en.wikipedia.org/wiki/Stroke**

**2.TYPES OF STROKE -** **https://www.medicalnewstoday.com/articles/7624.php**

**3.** **https://www.w3schools.com/python/python_ml_getting_started.asp**

**4.** **https://www.geeksforgeeks.org/machine-learning**