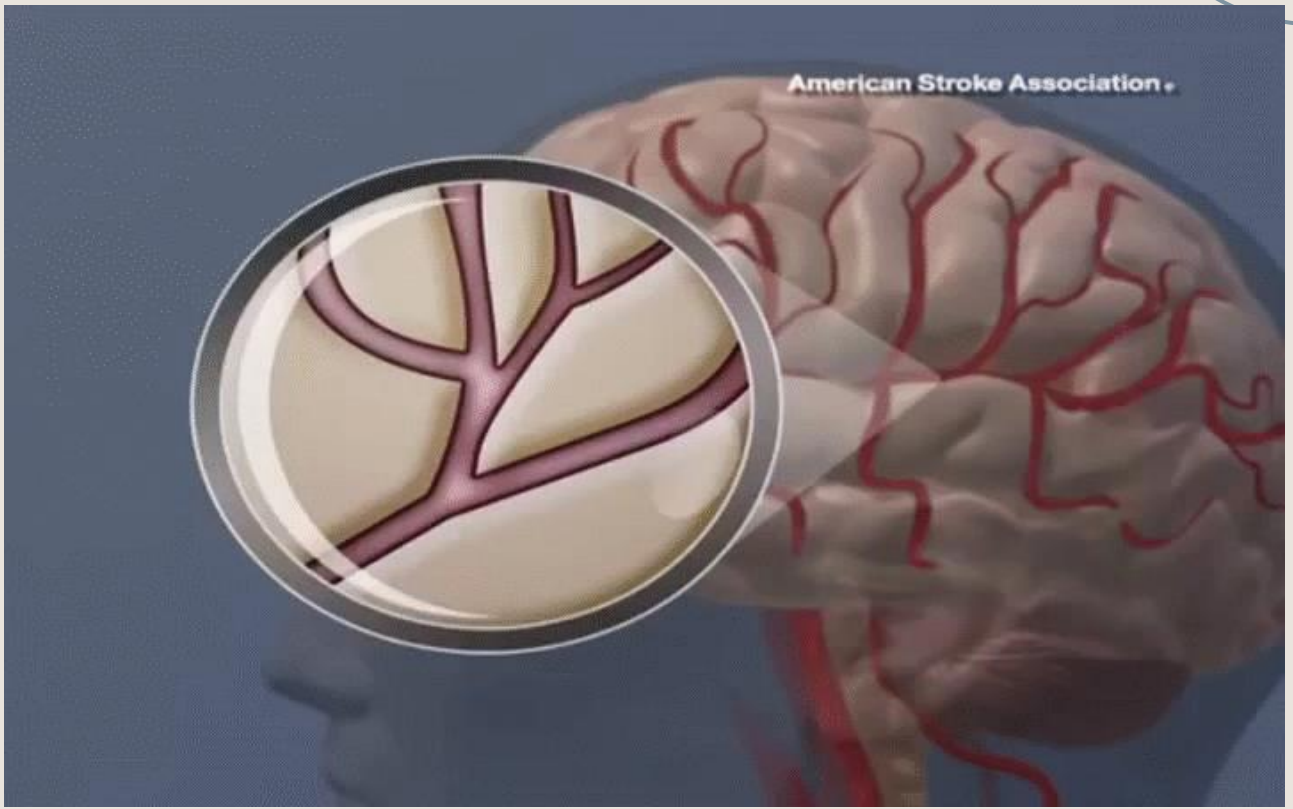
Stroke Classification

Introduction

A stroke occurs when the blood supply to part of the brain is interrupted or reduced, preventing brain tissue from getting oxygen and nutrients. Brain cells begin to die in minutes.

A stroke is a medical emergency, and prompt treatment is crucial. Early action can reduce brain damage and other complications.


American Stroke Association

Objective

build a classification model to detect stroke and evaluate the model using some performance metrics

Methodology

Problem understanding

Gathering data

EDA

Data preparation

Classification algortims

Data descrebtion

database is provided by Kaggle. It provided in .CSV format and contains 5110 rows and 12 columns. Only 10 column are used.

Label :

1- Gender

2- Age of the patient

3- Hypertension

4- Heart disease

5- Ever married

6- Residence type

7- avg glucose level

8- work type

9-body mass

10- smoking status

Target :

stroke

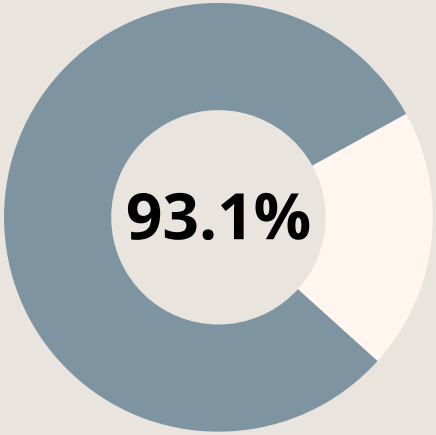
Feature Engineering

Depending on **age** column we add new column **age group** contain 3 category:

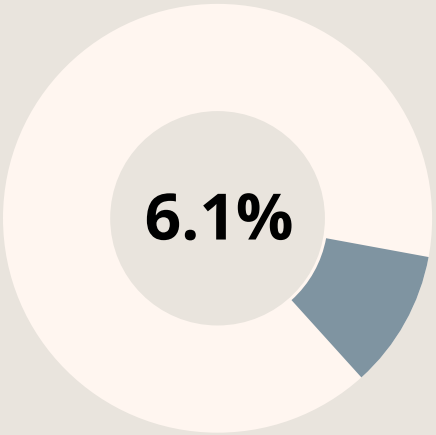
Old	Adult	Child

EDA

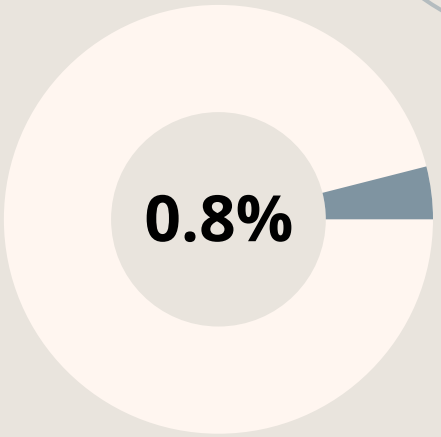
Which age group got stroke most ?



Old



Adult



Child

Which gender is got stroke most?

43.4%

56.6%

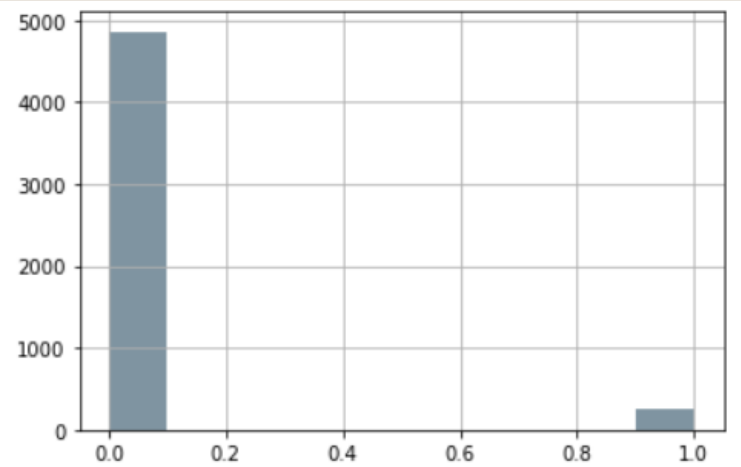
56.6%

Female stroke

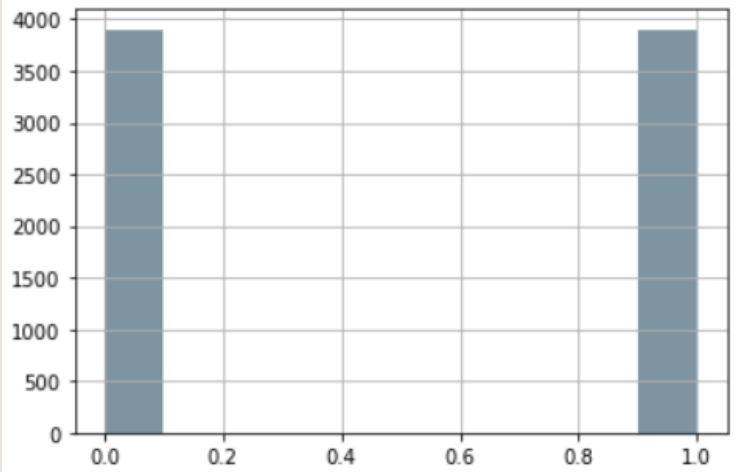
Depending on the data the female is get stroke more than male .

Classification

Handling Imbalance data



Imbalanced target



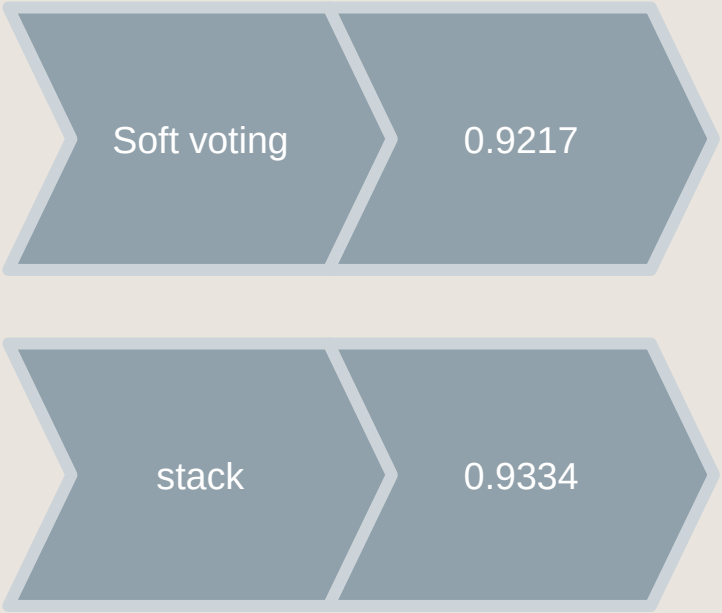
Balanced target

Model Evaluation

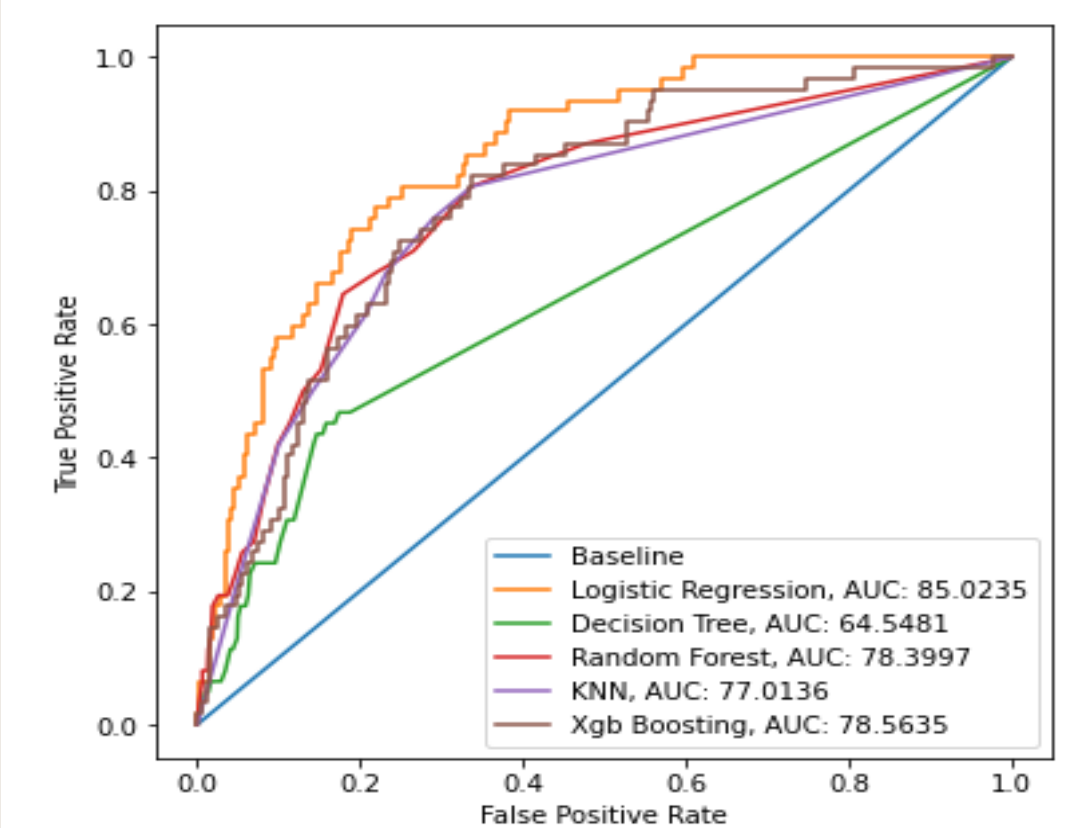
	Accurcy	F-1	precision	Recall
Logistic regression	0.7485	0.2801	0.1694	0.8064
Knn	0.8072	0.2676	0.1736	0.5806
Decision tree	0.9021	0.1666	0.1724	0.1612
Random forest	0.9344	0.0821	0.2727	0.0483
XGboost	0.9354	0.1538	0.375	0.0967

* All models after tuned

Voting & Stacking



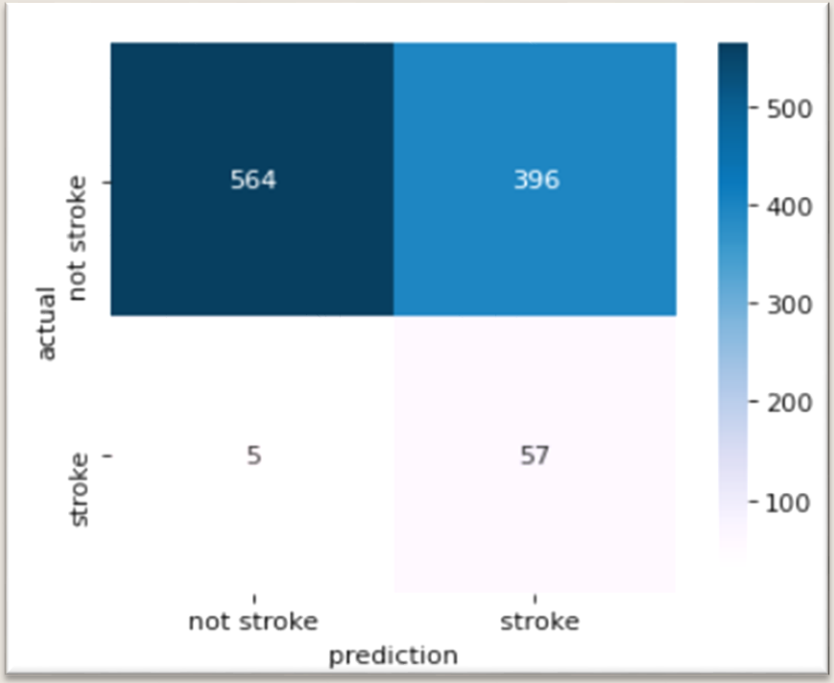
ROC CURVE



Logistic Regression

Is the beast model.

Best Model & Result



Logistic Regression

Accuracy: 74%
Recall: 91%
Precision: 12%
AUC: 85%

Conclusion:

- At the end from Roc curve, we can assume that the best model is Logistic Regression.
- In the feature work we want to improve accuracy for the best model.

Thanks

Do you have any questions?

Presented by Modhi and Razan