Car Accident and Stroke Risk Classification Models

Predicting Car Accident Outcomes and Identifying Stroke Risk Factors by Peter Skotte

Stakeholders and Problem Statement

Stakeholder: Insurance Companies and Healthcare Providers

Insurance Companies: Improve risk assessment and optimize premium pricing by accurately predicting car accident outcomes

Healthcare Providers: Enhance patient care by focusing on early intervention and prevention through identifying patients at risk of stroke

Problem Statement: For insurance companies: Develop a classification model to predict car accident outcomes and optimize risk assessment and premium pricing. For healthcare providers: Develop a classification model to identify patients at risk of stroke for early intervention and prevention

Data Introduction

Car Accident Data: Features: Age, Gender, Driving Experience, Vehicle Type, and more

Target: Outcome (Crash/No Crash)

Data Source: Kaggle

Stroke Data: Features: Age, Hypertension, Heart Disease, Smoking Status, and more

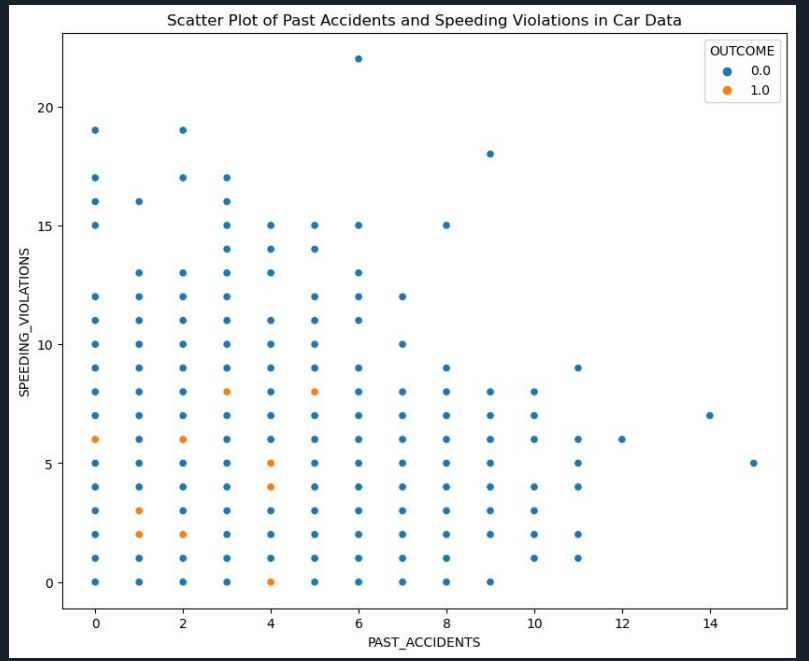
Target: Stroke (Yes/No)

Data Source: Kaggle

Key Findings - Car Accident Data

Finding: There is a moderate positive correlation between past accidents and speeding violations, indicating that drivers with more speeding violations are more likely to have been in past accidents.

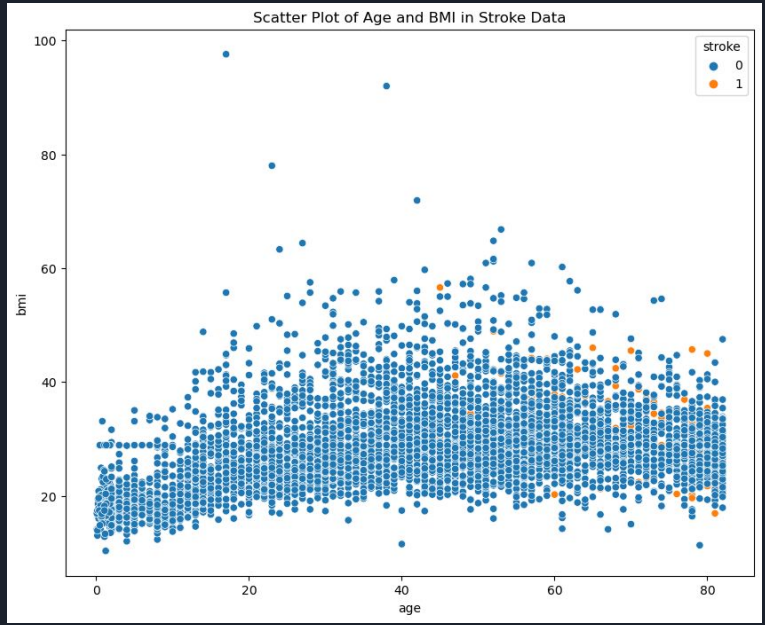
Implication: Understanding the relationship between past accidents and speeding violations can help insurance companies better assess risk and set pricing. Focusing on drivers with a history of speeding violations could lead to better insurance policies and targeted safety interventions.



Key Findings - Car Accident Data

Finding: There is a weak positive correlation between age and BMI, indicating that older drivers tend to have higher BMI values.

Implication: Understanding the relationship between age and BMI can provide additional insights into the factors affecting car accidents. This information can help insurance companies refine their risk assessment and pricing strategies, leading to more tailored insurance policies and safety recommendations.



Model Strengths, Limitations, and Impact on Stakeholders

Model Strengths: Accurate predictions for both car accidents and stroke risks

Identifies important features that contribute to accident outcomes and stroke risks

Model Limitations: Potential overfitting in some models (e.g., Decision Tree)

Class imbalance may affect model performance

Impact on Stakeholders: Car Accident Model: False positives and false negatives can affect premium pricing and risk assessment; considering the relationships between age, BMI, past accidents, and speeding violations is crucial for accurate predictions Stroke Risk Model: False negatives may result in missed early interventions, while false positives could lead to unnecessary treatments; addressing class imbalance is essential for model effectiveness

Final Recommendations

Car Accident Model:

Use the best performing model to assess risk and optimize premium pricing

Consider the relationships between age, BMI, past accidents, and speeding violations for targeted safety interventions and insurance products

Stroke Risk Model:

Implement the best performing model for early identification of patients at risk

Address class imbalance to improve model effectiveness