A research done for a non-profit Christian the NGO :
Victorious Living

BREATHE AGAIN

YOU CAN QUIT SMOKING

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Project Overview

This is a classification problem , whose main aim is to classify whether or not someone is a smoker or not using bio-signals. The project will focus in on the main tell signs that someone is a smoker and how you to help a smoker quit.

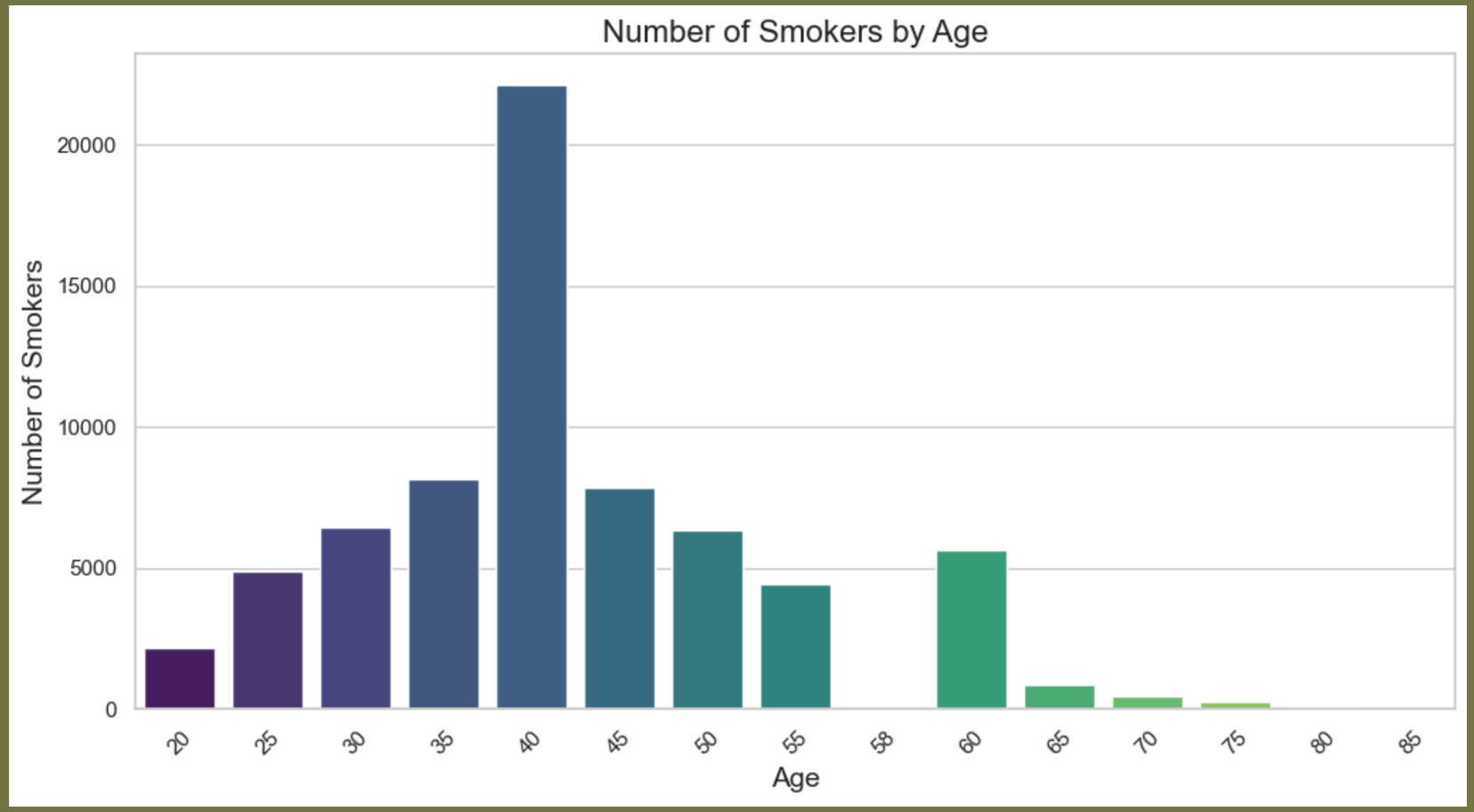
Business Understanding

Victorious Living is a non profit Christian organization which is in the business of helping as many people as possible find abundant life in Christ and live Victoriously! As Jesus said in John 10 : 10 ,"The thief does not come except to kill, to steal and to destroy, but I have come that they may have life and that they may have it more abundantly. Too many people are stuck in the menace of smoking,and many die as a result of the diseases caused by smoking.From this project, Victorious Living aims to identify the major health risks that are brought about by smoking and thereafter use this data to sensitize people against smoking in the hope that more people will be able to 'breathe again' and live Victorious Lives in Christ.

Objectives

- Identify the best classification model to use for accurately precting the smoking status of an individual based on bio-signals.
- Identify the distribution of smokers by age.
- Identify the effects of smoking on the body systems.

Smoker Distribution by Age

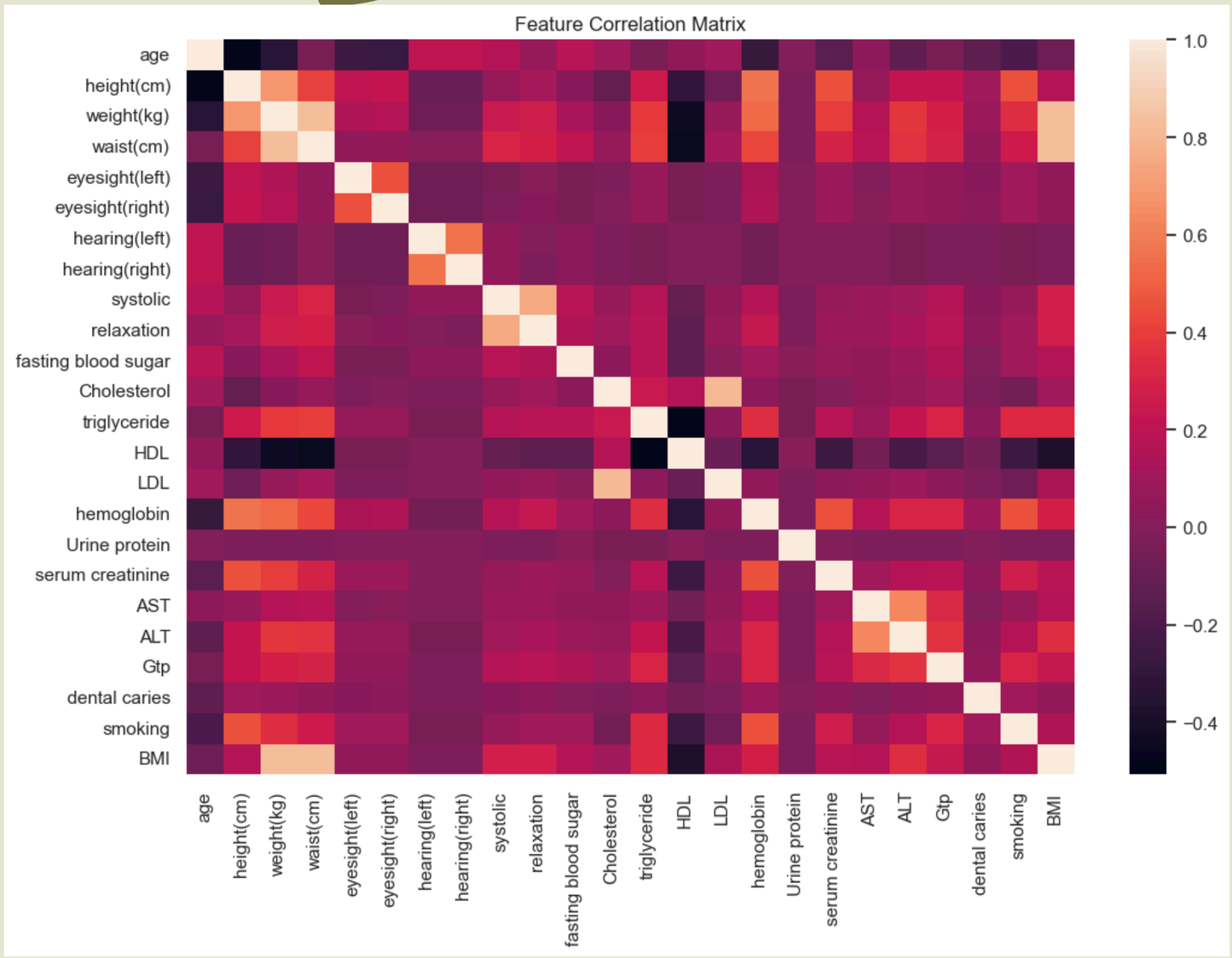


The largest population of smokers are in their 40's

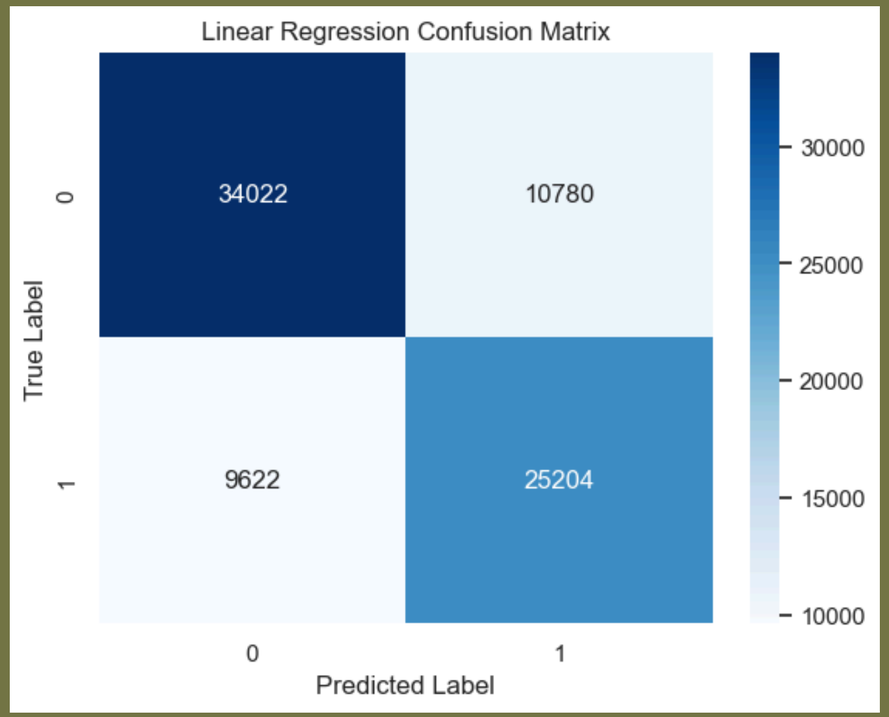
Effect of smoking on Body Systems

Cholestrol and LDL(Low Density Lipoprotein aka bad cholestrol) are highly correlated.

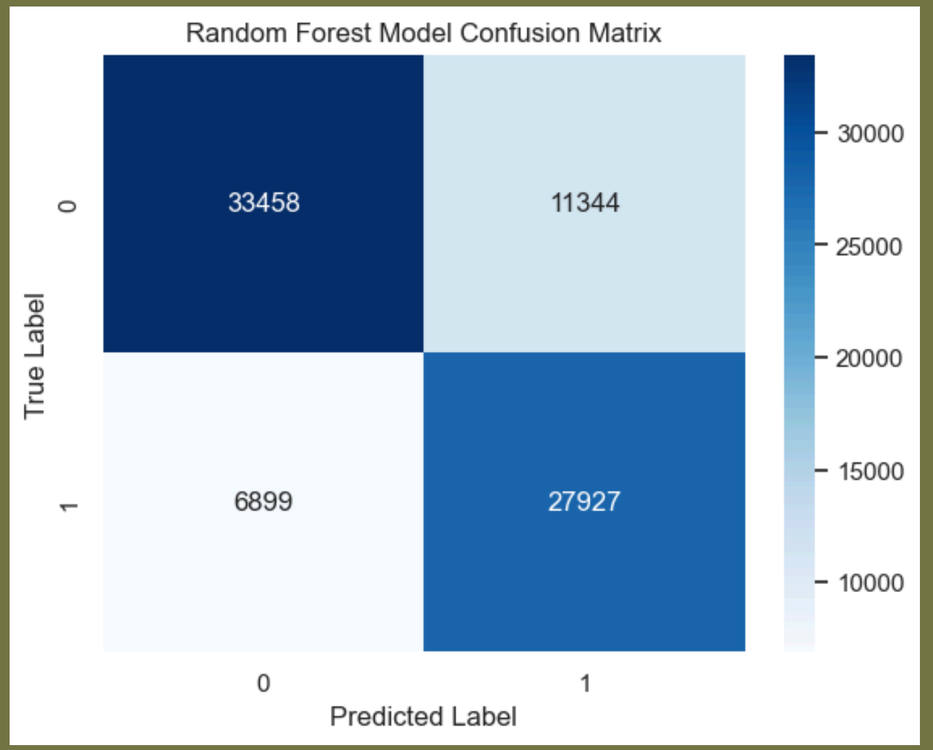
More on this below in the research findings



Classification Models



Accuracy score : 74%



Accuracy score : 77%

Random Forest has a better accuracy on predictig smoker status based on bio signal data.

Research Findings

Smoking is closely linked to elevated levels of bad cholestrol(LDL). When one smokes, it triggers a series of biochemical processes that negatively affect cholestrol levels and cardiovascular health.

- **Below are some effects of Smocking to the body.**

1. Oxidative Stress:

Smoking increases oxidative stress which damages the walls of blood vessels. The damage encourages the accumuulation of LDL cholestrol on the arterial walls, contributing to an increased risk of
LDL buildup.

2. Decrease in HDL Cholesterol

- Smoking reduces levels of high-density lipoprotein(HDL) also known as "good" cholesterol. HDL helps remove LDL from the bloodstream, so lower HDL levels leads to increased risk of LDL buildup.

3. Impaired Lipid Metabolism

- Smoking affects how the body metabolizes fats, leading to an increase in the levels of triglycerides, another type of fat that contributes to heart disease. This can in turn lead to the increase in LDL Cholesterol levels.

4. Inflammation

- Smoking causes inflamation which makes LDL cholesterol more likely to become oxidized - a form that is a particularly harmful and more likely to contribute to atherosclerosis, a condition characterised by hardened and narrowed arteries.

U.S. Department of Health and Human Services. (2020). Smoking and Cardiovascular Disease: A Report of the Surgeon General. Washington, DC: U.S. Government Printing Office. Available at (https://www.cdc.gov/tobacco/data_statistics/sgr/2020-smoking-cardiovascular-disease/index.html.

Recommendations

Below are the recommendations that Victorious living should take into consideration in their drive to sensitize people against smoking.

Use Random Forest Classification Model

Point out the negative health effects of smoking to the body.

Start Sensitizing those over the age of 40 who will in turn mentor those younger than them.

Thank You

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