**EXECUTIVE SUMMARY**

The term "heart disease" is often used interchangeably with the term "cardiovascular disease." Cardiovascular disease generally refers to conditions that involve narrowed or blocked blood vessels that can lead to a heart attack, chest pain (angina) or stroke.

Symptoms can include chest pain, chest tightness, chest pressure and chest discomfort (angina) , shortness of breath , pain, numbness, weakness or coldness in your legs or arms if the blood vessels in those   
parts of your body are narrowed , pain in the neck, jaw, throat, upper abdomen or back.

Medical diagnosis is the process of determining which disease best explains the symptoms and signs of a person. To address various challenges we are leveraging various machine learning algorithms to study the symptoms and predict the probability of heart disease by optimising the algorithms and calculating their accuracies.

This software system will be doing the comparative analysis of 4 machine learning algorithms namely Gaussian Naïve Bayes, Support Vector Machine, Decision Tree, and Random Forest Algorithm calculating accuracy for each of the algorithms and then with the help of logistic regression fit the model and calculate the probability for the risk of heart disease. This system will be designed to immediately diagnose by providing tools to assist the patient and doctor, which would otherwise have to be performed manually. By this, we will be able to quick diagnose a person and give reports about that person that is easy to understand and use. In case of having any symptom related to heart disease if a patient rushes to the hospital, then instead of getting a direct appointment to the cardiologists which is very difficult to get the nurse or the physician with the help of this system can identify the risk and then take a further step accordingly that is recommending the specialist doctor that the patient needs thus saving doctor’s and patient’s time. More specifically, our system is designed to allow a patient to diagnose himself and it will analyse every symptom and give a complete report of his illness. This software will keep a complete record of the patients’ history and his medical problems. It will also help the doctors to quickly analyse the disease and will help to decide the medicine.

At first we will be doing the graphical analysis of various algorithms followed by optimizing and calculating the logistic regression coefficients to predict the probability of heart disease. We will be predicting accuracy of 54algorithms:Gaussian Naïve Bayes, Support Vector Machine,   
Decision Tree, Random Forsest. We will be developing a front end where the values for attributes or symptoms of the patient can be   
entered and the probability of heart disease is calculated and displayed.

In order to predict the probability of heart disease we are using logistic regression by selecting the most effective features to maximize the accuracy score. A website where we will see the accuracy of heart disease using input by the patients.