REPORT ON HEART ATTACK PREDICTION USING MACHINELEARNING BY PYTHON

Table of Contents:

ABSTRACT: Machine Learning is a versatile technology that finds applications in many domains, including healthcare. Predicting the onset or absence of health issues such as locomotor disorders and heart diseases is an area where Machine Learning can be particularly useful. Early detection of such conditions can provide invaluable insights to medical professionals, allowing them to tailor their treatment strategies to individual patients. Our focus is on predicting the likelihood of heart diseases in individuals using Machine Learning algorithms. To achieve this, we perform a comparative analysis of various classifiers, such as SVM, KNN, and logistic regression, in order to identify the models that yield the highest accuracy and predictive power.
.

INTRODUCTION: Machine learning is proving to be a valuable tool in the healthcare industry, particularly in making informed decisions and predictions based on the vast amounts of data generated. This study focuses on predicting the likelihood of future heart disease by utilizing a machine learning algorithm to analyze patient data. While heart disease can manifest in different ways, there are common risk factors that determine a patient's likelihood of developing the condition. By gathering and categorizing data from multiple sources and analyzing it with machine learning techniques, we can extract meaningful insights and identify key factors that contribute to heart disease risk.

Problem Statement: Detecting heart disease is a major challenge due to the limitations of existing tools that are either costly or ineffective in accurately assessing the risk of heart disease in humans. Early detection of heart disorders is essential for reducing mortality rates and overall negative consequences. However, due to the constraints of time, intelligence, and experience, doctors cannot consult with patients on a 24/7 basis. Fortunately, the abundance of medical data in the modern era allows us to leverage various machine learning techniques to uncover hidden patterns that can aid in health diagnosis.

METHODOLOGY:
Heart disease is a silent killer that can strike without showing any symptoms, and early detection is crucial to reducing the mortality rate and overall impact of the disease. As such, various tools and techniques have been developed to predict the likelihood of heart disease, but many are either costly or ineffective. Machine learning methods offer a promising solution to this problem, as they can help uncover hidden patterns in vast amounts of medical data that can aid in diagnosis.

To develop a system for predicting heart disease, data must be collected and preprocessed into a suitable format, before being divided into training and testing sets. Machine learning algorithms can then be applied to
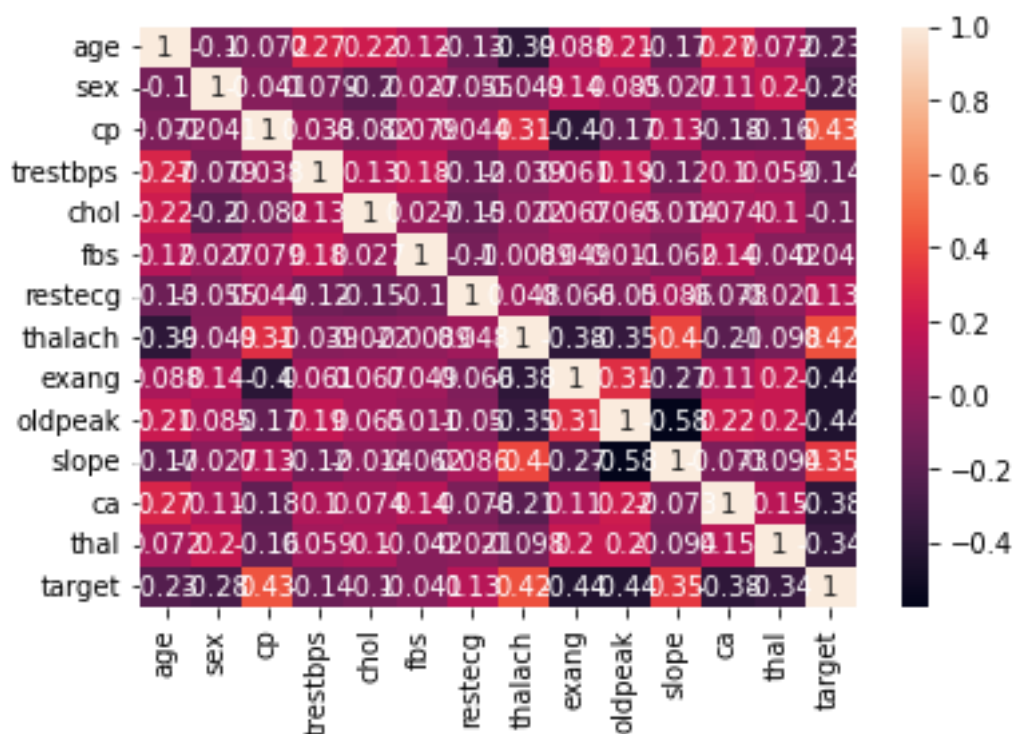
train the model on the training data and evaluate its accuracy using the testing data. The proposed system includes four modules: dataset collection, data preprocessing, data balancing, and disease prediction.

The Heart Disease UCI dataset, which includes 12 attributes, was used to train and test the prediction model. Data preprocessing was performed to remove noise, duplicates, and missing values and ensure the data was in the correct format. To balance the dataset, two methods were considered: under sampling and over sampling. The most accurate machine learning algorithm was chosen based on a comparison of several models, including SVM, Logistic Regression, and KNN.

Overall, this system offers a promising solution to the challenge of predicting heart disease using machine learning methods, with the potential to improve the accuracy of diagnoses and reduce the impact of this devastating illness
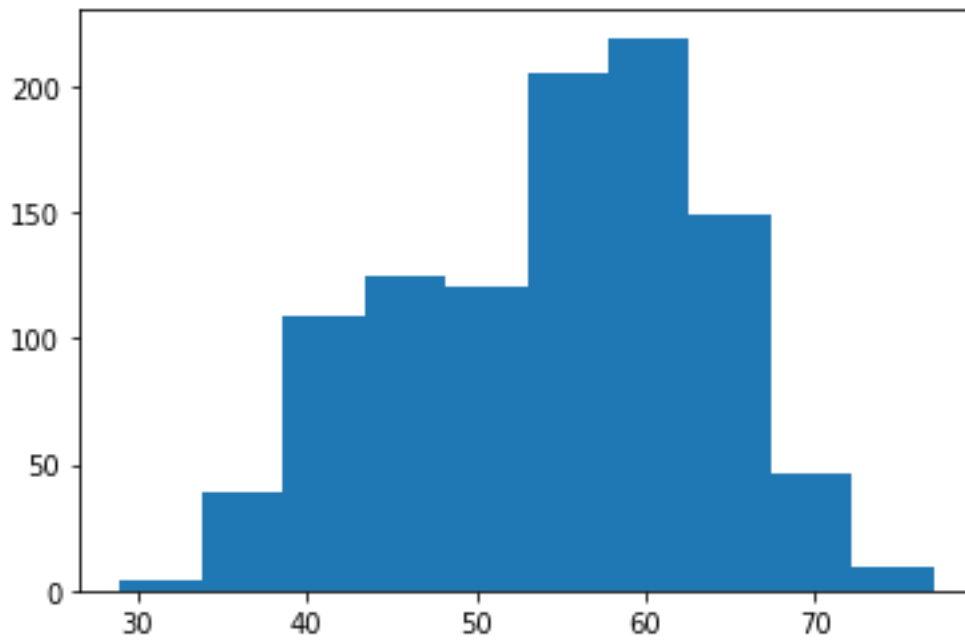
OBSERVATIONS AND RESULTS

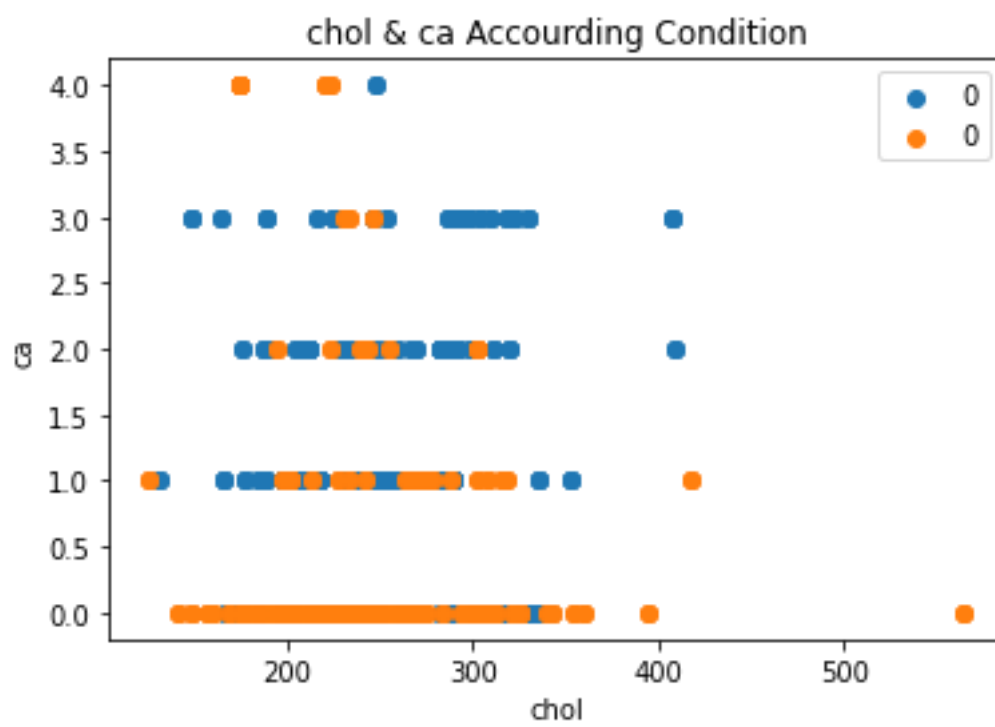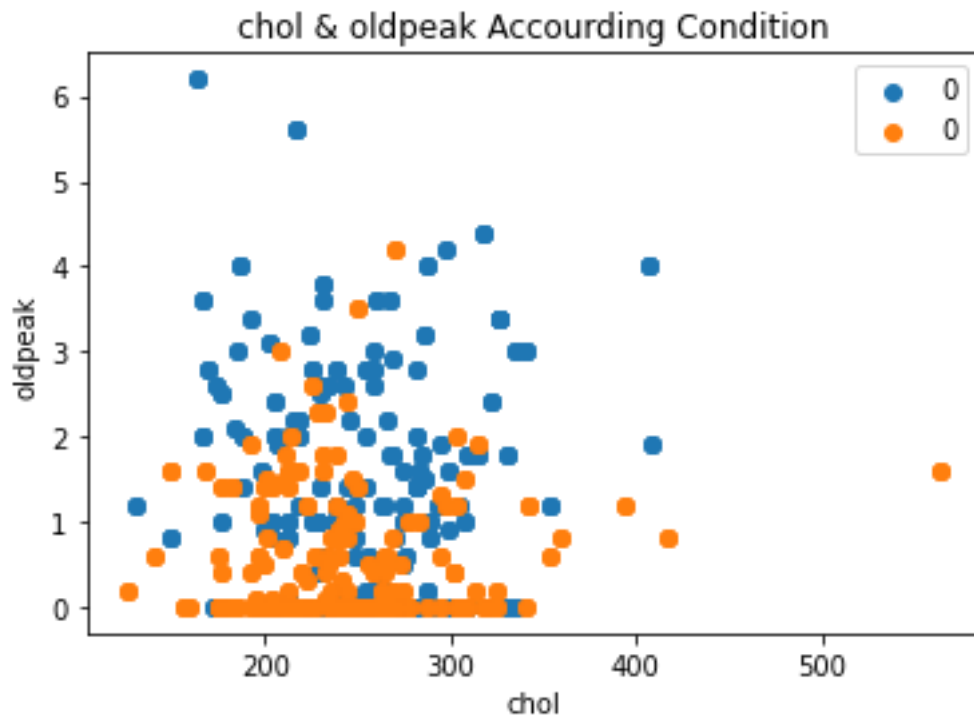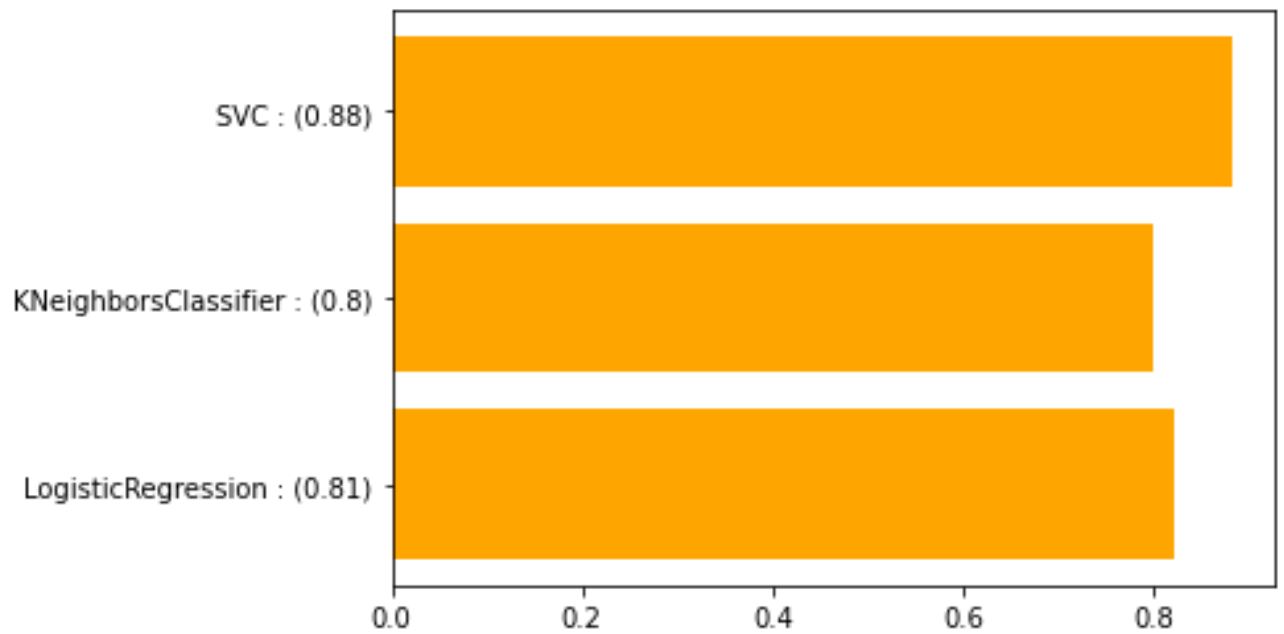.confusion matrix: gives correlation between attributes.
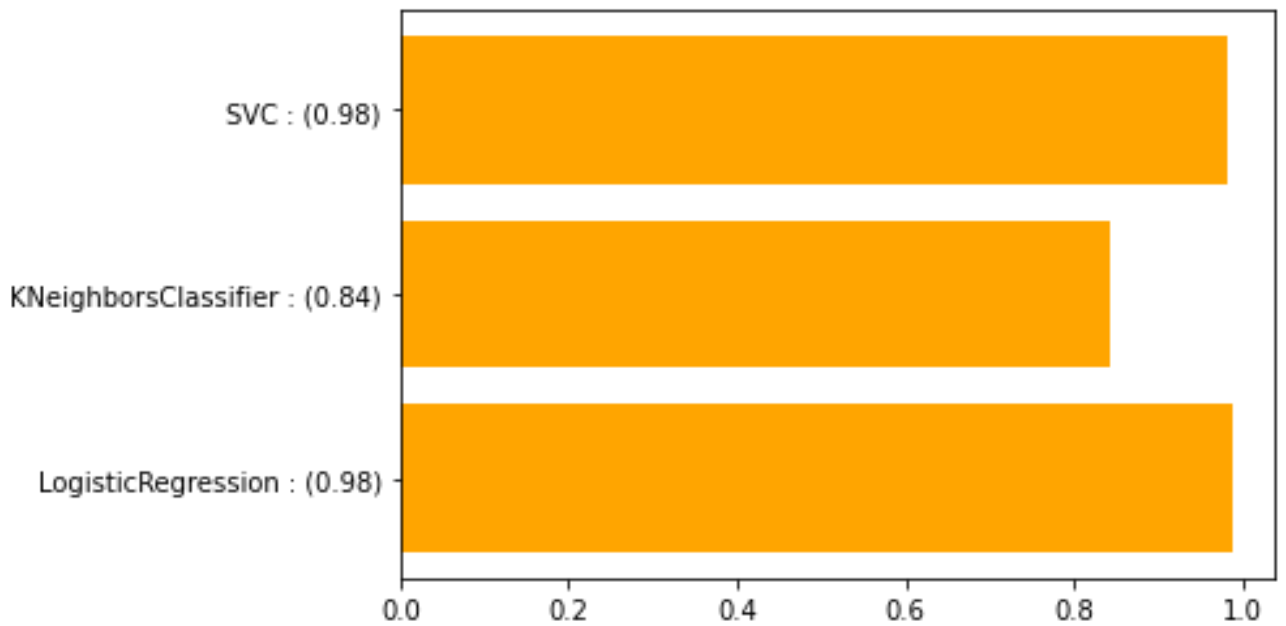
pair-plot

histogram:

scatter-plot:

chol & oldpeak Accourding Condition
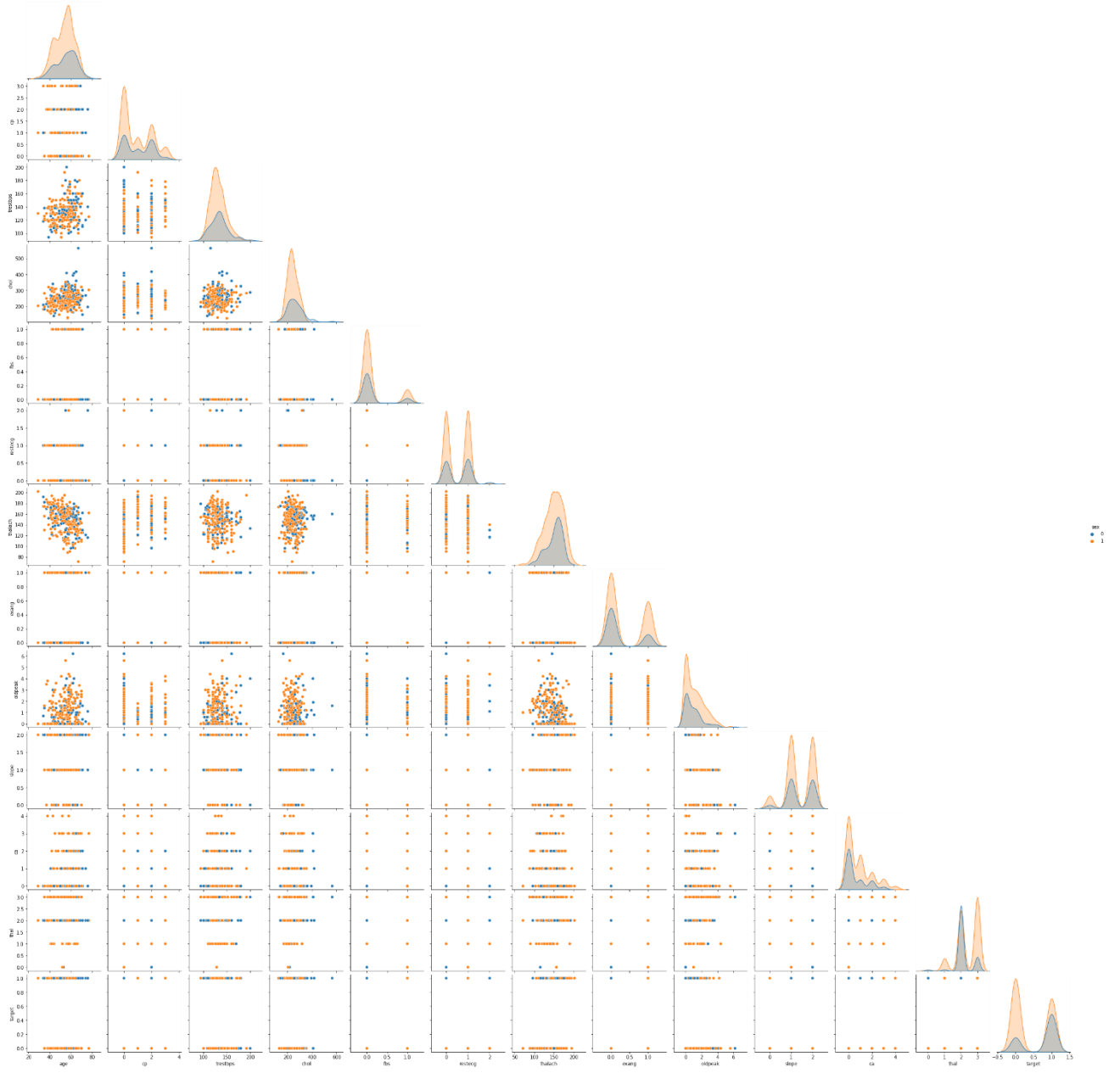
testing accuracy scores:

SVC : (0.88)

KNeighborsClassifier : (0.8)

LogisticRegression : (0.81)

validation score:

CONCLUSION: In conclusion, the early detection of heart disease can greatly benefit society by enabling high-risk patients to make informed decisions about lifestyle changes that can mitigate complications. With heart disease becoming a leading cause of death worldwide, it is crucial to incorporate cutting-edge technologies such as machine learning into healthcare. The study evaluated seven machine learning algorithms, including SVM, Logistic Regression, and KNN, to predict heart disease using 11 features from the Heart Disease UCI dataset. Through attribute selection, the system achieved a higher accuracy of 88% using the SVM algorithm. The study highlights the potential of machine learning in improving the accuracy of heart disease prediction and emphasizes the importance of early detection for effective disease management.