Heart Disease Prediction

Goal:

Aim of the project is to determine if the patient has the heart disease or not based on the culture blood test report .

Data

This database contains 14 physical attributes based on physical testing of a patient. Blood samples are taken and the patient also conducts a brief exercise test. The "goal" field refers to the presence of heart disease in the patient. It is integer (0 for no presence, 1 for presence). In general, to confirm 100% if a patient has heart disease can be quite an invasive process, so if we can create a model that accurately predicts the likelihood of heart disease, we can help avoid expensive and invasive procedures.

Content

Attribute Information:

- age
- sex
- chest pain type (4 values)
- resting blood pressure
- serum cholestoral in mg/dl
- fasting blood sugar > 120 mg/dl
- resting electrocardiographic results (values 0,1,2)
- maximum heart rate achieved
- exercise induced angina
- oldpeak = ST depression induced by exercise relative to rest
- the slope of the peak exercise ST segment
- number of major vessels (0-3) colored by flourosopy
- thal: 3 = normal; 6 = fixed defect; 7 = reversable defect
- target:0 for no presence of heart disease, 1 for presence of heart disease

Original Source: https://archive.ics.uci.edu/ml/datasets/Heart+Disease

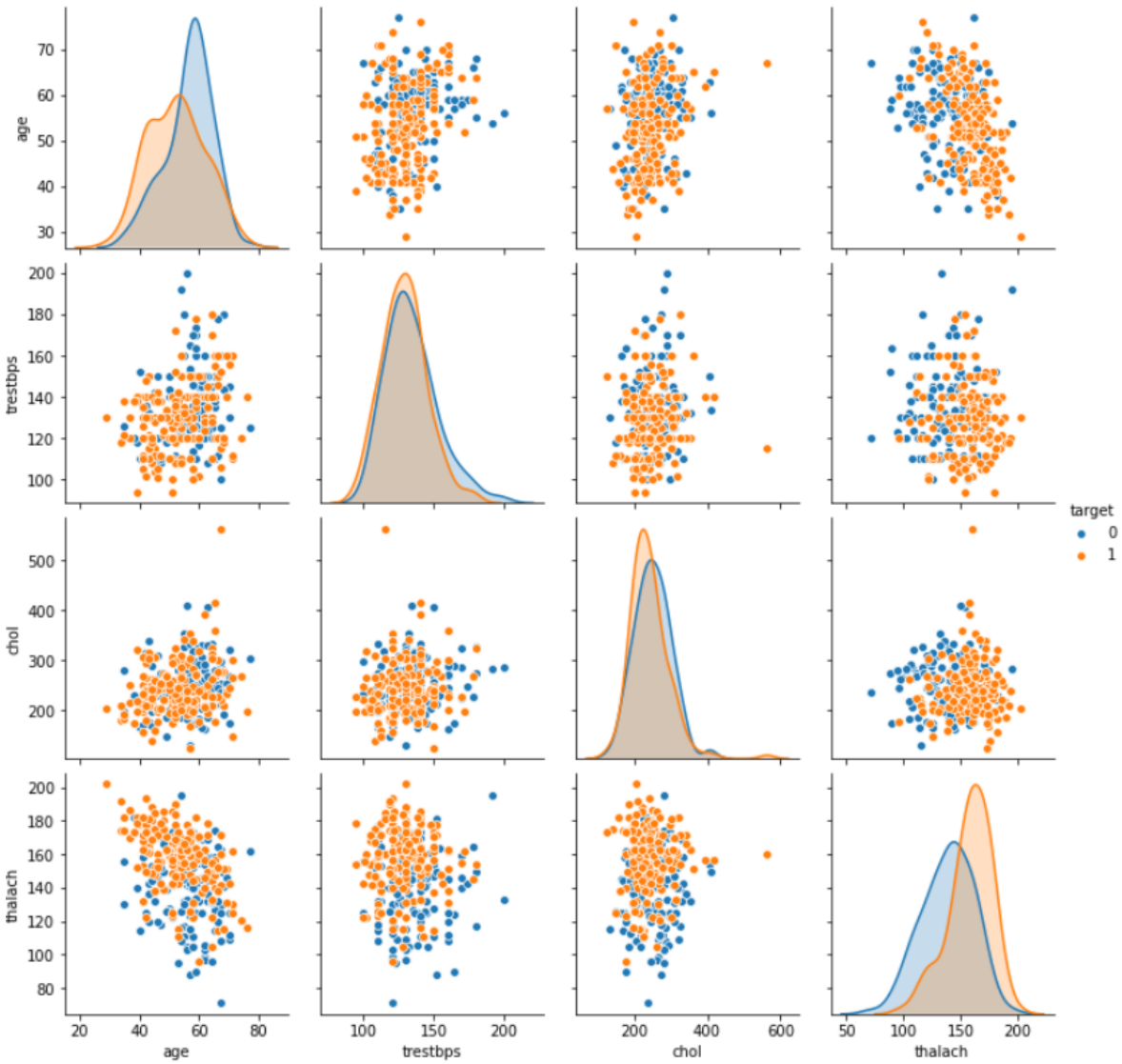
Creators:

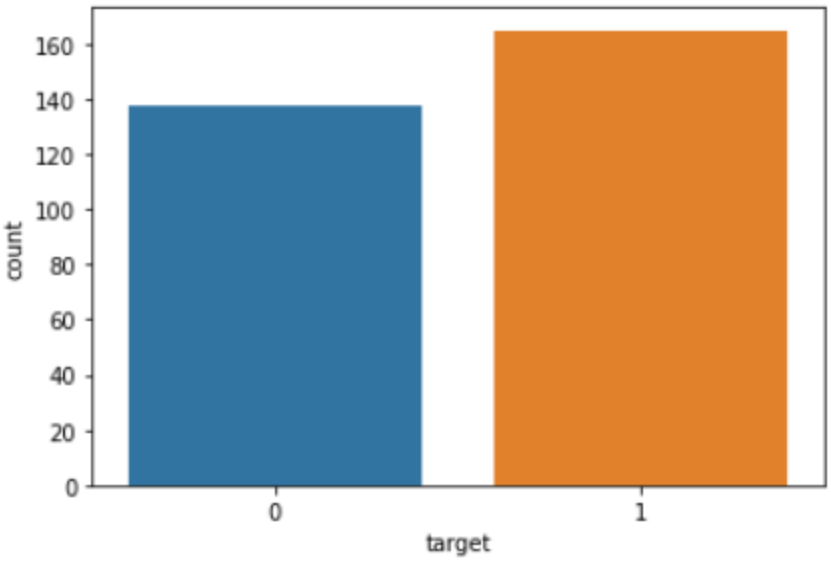
Hungarian Institute of Cardiology. Budapest: Andras Janosi, M.D. University Hospital, Zurich, Switzerland: William Steinbrunn, M.D. University Hospital, Basel, Switzerland: Matthias Pfisterer, M.D. V.A. Medical Center, Long Beach and Cleveland Clinic Foundation: Robert Detrano, M.D., Ph.D.

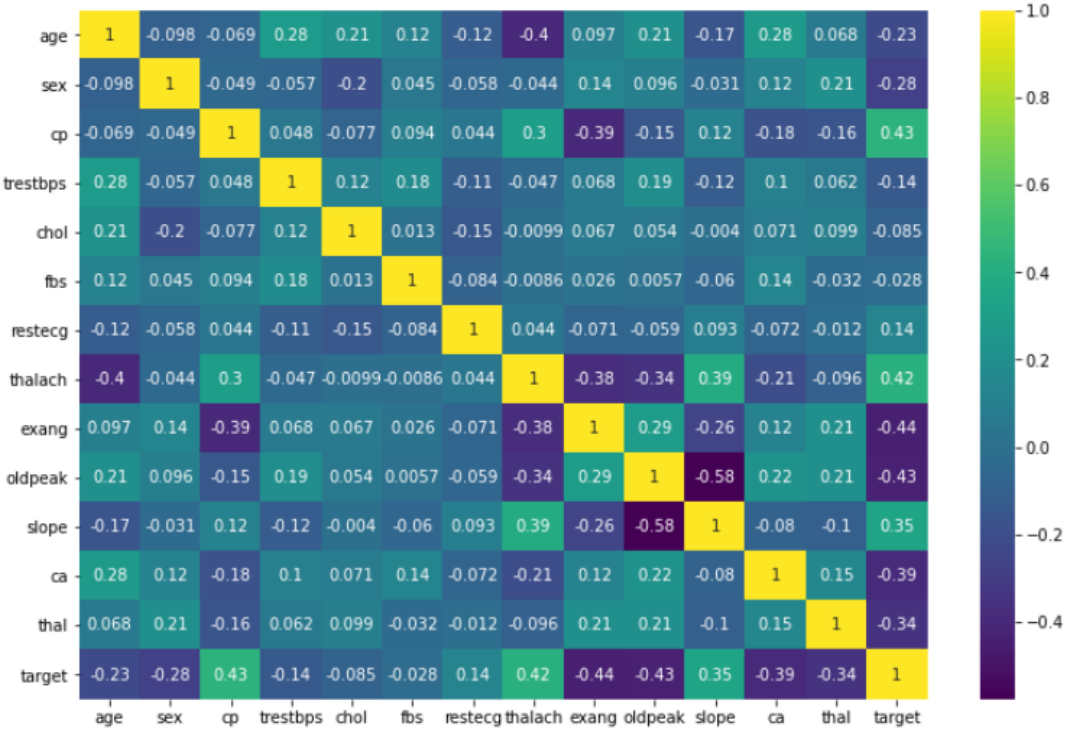
#1 Perfor Exploratory analysis

#2 Check Missing data ,Duplicates

#3 Data Visualizations







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#4 Train | Test Split and Scaling

#5 Perform a train test split on the data, with the test size of 10% and a random_state of 101

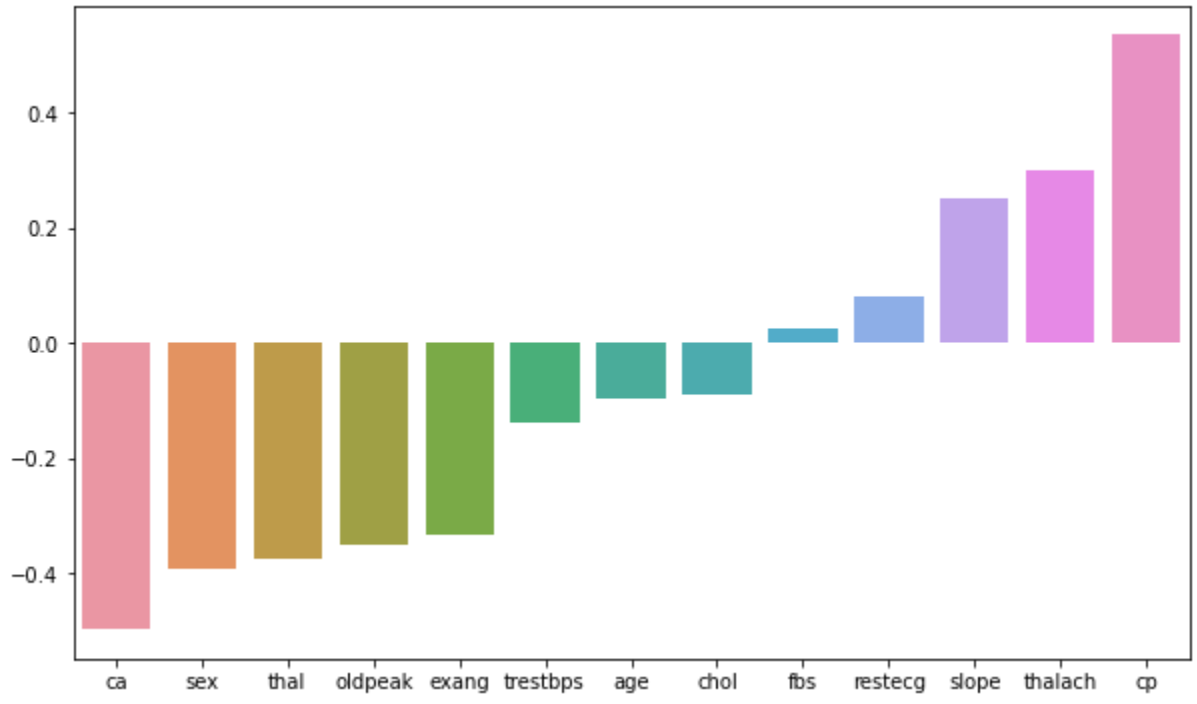
#6 **Create a StandardScaler object and normalize the X train and test set feature data. Make sure you only fit to the training data to avoid data leakage (data knowledge leaking from the test set).**

#7 Create a Logistic Regression model and use Cross-Validation to find a well-performing C value for the hyper-parameter search. You have two options here, use *LogisticRegressionCV* OR use a combination of *LogisticRegression* and *GridSearchCV*. The choice is up to you.

#8 Report back your search's optimal parameters, specifically the C value.

#9 Report back the model's coefficients

#10 Create a visualization of the coefficients by using a barplot of their values



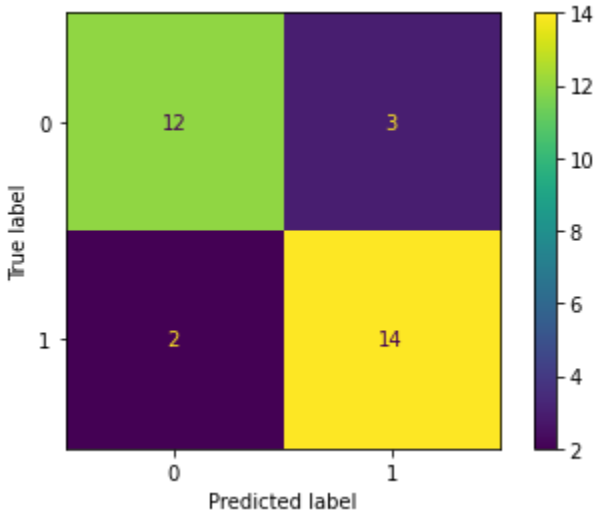
#11 Model Performance Evaluation

Create the following evaluations
*** Confusion Matrix Array**
*** Confusion Matrix Plot**
*** Classification Report**

*** Confusion Matrix Array**

array([[12, 3],
[2, 14]], dtype=int64)

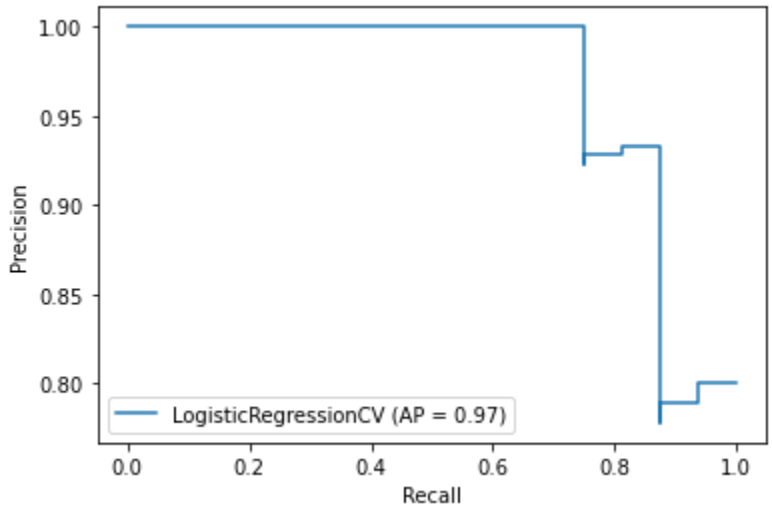
*** Confusion Matrix Plot**

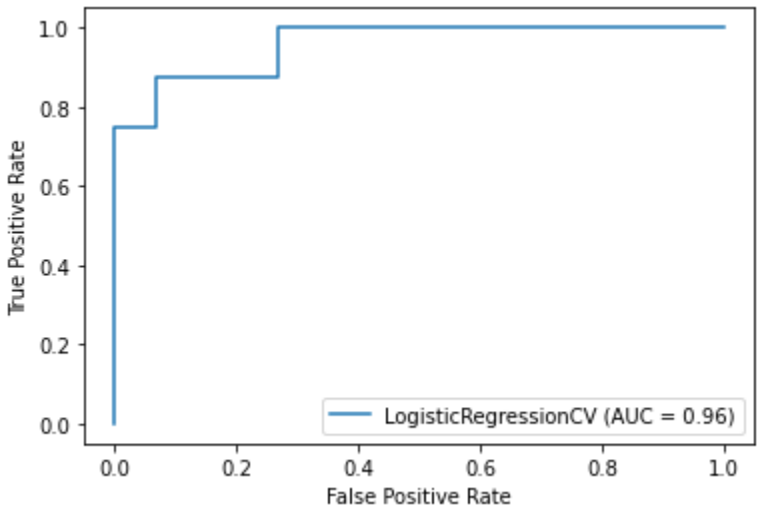


*** Classification Report**

	precision	recall	f1-score	support
0	0.86	0.80	0.83	15
1	0.82	0.88	0.85	16
accuracy			0.84	31
macro avg	0.84	0.84	0.84	31
weighted avg	0.84	0.84	0.84	31

Performance Curves





Finally do the Prediction for the following patient

A patient with the following features has come into the medical office:

age 48.0
sex 0.0
cp 2.0
trestbps 130.0

chol	275.0
fbs	0.0
restecg	1.0
thalach	139.0
exang	0.0
oldpeak	0.2
slope	2.0
ca	0.0
thal	2.0