

# Machine learning

## Assignment 3 Report

### Submitted By:

- Anurag Saraswat (M20CS066)

### About Data Set

Name : Heart Failure Clinical Records Dataset

Cardiovascular diseases (CVDs) are the number 1 cause of death globally, taking an estimated 17.9 million lives each year, which accounts for 31% of all deaths worldwide.

Heart failure is a common event caused by CVDs and this dataset contains 12 features that can be used to predict mortality by heart failure.

Most cardiovascular diseases can be prevented by addressing behavioural risk factors such as tobacco use, unhealthy diet and obesity, physical inactivity and harmful use of alcohol using population-wide strategies.

People with cardiovascular disease or who are at high cardiovascular risk (due to the presence of one or more risk factors such as hypertension, diabetes, hyperlipidaemia or already established disease) need early detection and management wherein a machine learning model can be of great help.

**Goal:** Predicting Death Event or heart failure using features such as platelets , ejection fraction using various machine learning methods.

**Data Preparation:** First shuffle data frame then split dataset into a training set and a test set. Using splits: 70:30 (70% training, 30% testing), 80:20 and 90:10 split and then normalize data sets.

### Method Used

1. Half Space Classifier
2. Logistic Regression
3. Support Vector Machine

**Observation:**

Script is repeatedly run many times. Since data is randomly shuffled every time script runs before splitting, therefore output is different every time.

Following Observation is concluded:

1. In all the case prediction score/ accuracy is more in case of 80:20 and 90:10 split than 70:30 split
2. Accuracy in case of the Gaussian Kernel is found to be highest.
3. Number of support vectors in case of the Gaussian Kernel is generally more than in other cases.
4. Highest accuracy achieved is around 85 percent and lowest accuracy achieved is 75 percent.
5. Accuracy of all methods varies as sample size changes.