

Introduction to Machine Learning

Analysis report on **Assignment 7 (b) SMO SVM**

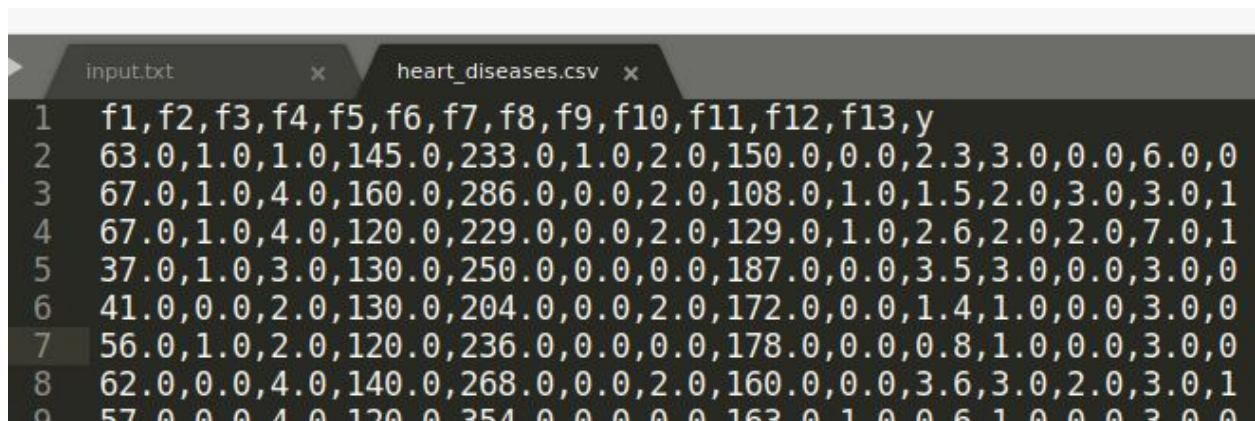
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Question:

To learn how to train and predict a soft margin-SVM with RBF kernel using SMO algorithm.

Dataset : Heart Disease Dataset(in CSV format)
303 rows, 14 columns



	f1	f2	f3	f4	f5	f6	f7	f8	f9	f10	f11	f12	f13	y
1	63.0	1.0	1.0	145.0	233.0	1.0	2.0	150.0	0.0	2.3	3.0	0.0	6.0	0
2	67.0	1.0	4.0	160.0	286.0	0.0	2.0	108.0	1.0	1.5	2.0	3.0	3.0	1
3	67.0	1.0	4.0	120.0	229.0	0.0	2.0	129.0	1.0	2.6	2.0	2.0	7.0	1
4	37.0	1.0	3.0	130.0	250.0	0.0	0.0	187.0	0.0	3.5	3.0	0.0	3.0	0
5	41.0	0.0	2.0	130.0	204.0	0.0	2.0	172.0	0.0	1.4	1.0	0.0	3.0	0
6	56.0	1.0	2.0	120.0	236.0	0.0	0.0	178.0	0.0	0.8	1.0	0.0	3.0	0
7	62.0	0.0	4.0	140.0	268.0	0.0	2.0	160.0	0.0	3.6	3.0	2.0	3.0	1
8	57.0	0.0	4.0	120.0	354.0	0.0	0.0	163.0	1.0	0.6	1.0	0.0	3.0	0

The following steps were taken to make a SVM model using the SMO algorithm.

Data Preprocessing:

- Data was splitted into features and prediction(X and Y)

- The data was shuffled.
- Data was feature scaled
- Data was splitted into 70% training and 30% test set.

Modelling:

The solution used a RBF kernel for the SVM classifier.

The data was input from a csv file and the output is projected on the standard output.

Analysis:

Both of the algorithms were run for 10 times as the data was shuffled before running the algorithm.

The results obtained were as follows.

1. The accuracy of the algorithm was around 90% on average.
2. The maximum accuracy obtained was 94% and the minimum obtained was 87%