SVM-Classifier and MLP-Classifier

Builds a SVM clasifier and MLP classifier to predict death after 1 year of performing Thoraric Surgery using ThoracicSurgery.arff dataset

Table of Contents

Requirements

Running this script requires python3+ and pandas,random,numpy,scipy,sklearn,matplotlib libraries of python3 to be installed on running machine
Use sklearn library with version 0.23.2 because code implemented here using sklearn.util.testing might mot work properly for higher versions Use the .arff file as input dataset

Setup

Run on command line

```
 sudo apt-get update
sudo apt-get install python3.6
pip3 install pandas
pip3 install random
pip3 install numpy
pip3 install scipy
pip3 install sklearn
pip3 install matplotlib
```

This will install all required libraries to run this script on the machine
If few of the libraries are already installed,run only the required commands from above To get sklearn version,run on command line

```
 python3
import sklearn
sklearn.__version__
```

This will give the current version of sklearn

Running the Program

Run on command line

```
python3 script.py
```

By default,the program executes all two parts asked in question

Part-1

Program first loads the data into pandas dataframe and normalises it with StandardScaler class methods ,uses SVC function from sklearn library to build SVM classifier for linear ,quadratic([poly,2]),radial basis function(rbf) kernels, prints the corresponding test and train accuracies for different values of C and displays two tables with test and train accuracies in each and finally prints the best accuracy for each kernel.

Part-2

Programs loads data into pandas array dataframe and performs normalisation,implements MLP classifier for different architectures provided in assignment description by varying hidden layers and nodes and prints corresponding train and test accuracies and displays graphs for learning rates vs test accuracy for each model and model vs test accuracy for each learning rate and finally prints the best model and its corresponding model architecture and hyperparameters.

Running each part seperately

Open script.py provided in folder, go to the main function(at the bottom of the file) and comment out corresponding lines to check results of only individual parts. (Each part is described in comments in the file)
Part-1 : Comment out all the lines of code from the comment marked by Part-2
Part-2 : Comment out the lines of code between comments marked by Part-1 and Part-2 in the file