Cover Sheet

SELECTED TOPICS CS-1 PROJECTS_FALL2022

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Team ID : 44

Numerical Dataset is “Churn_Modulling”

Image Dataset is “UTK”

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1.NUMERICAL DATASET

a. Dataset Details

- Our numerical Dataset is “Churn-modelling”
- The total number of samples in dataset is 10000.
- The number of samples used in training is 7000
- The number of samples used in validation and

testing is 3000.

b. Implementation Details

a. Logistic regression

The final Accuracy of this model is :

In v1 = 81.35

In v2 = 98.05

we implement our LR model with next hyperparameter:

penalty= 'elasticnet'

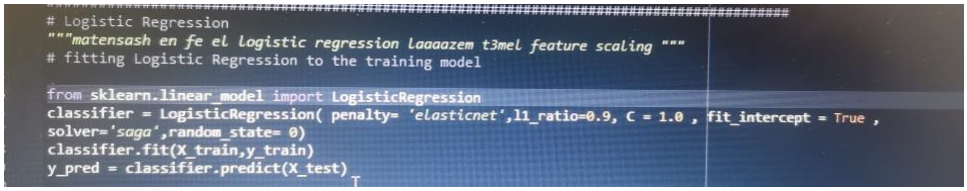
l1_ratio=0.9

C = 1.0 C which is ‘regularizer’

fit_intercept = True

solver = 'saga' solver which is ‘optimizer’

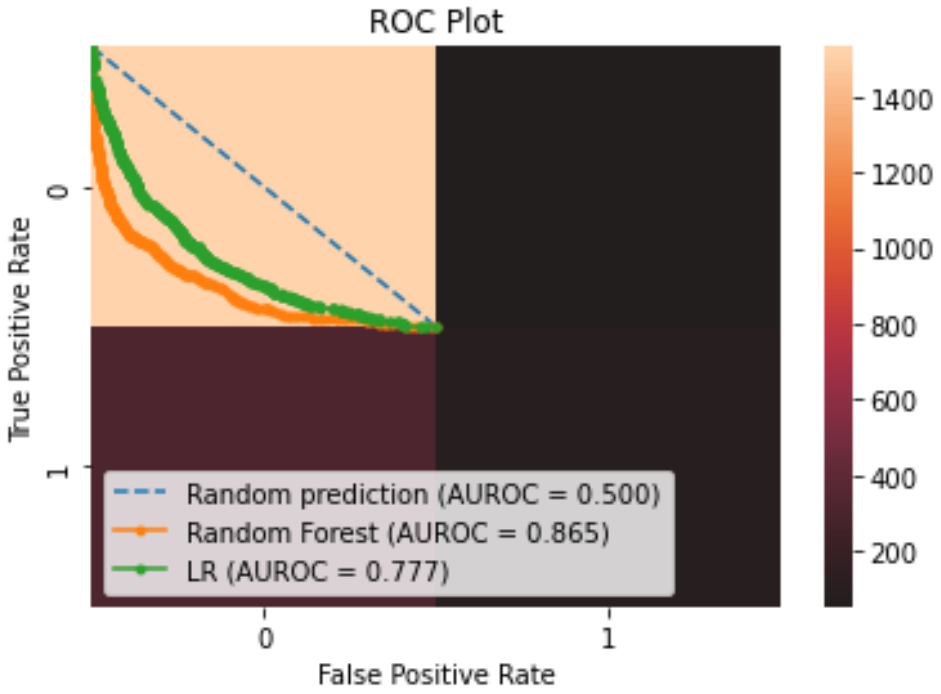
random_state= 0



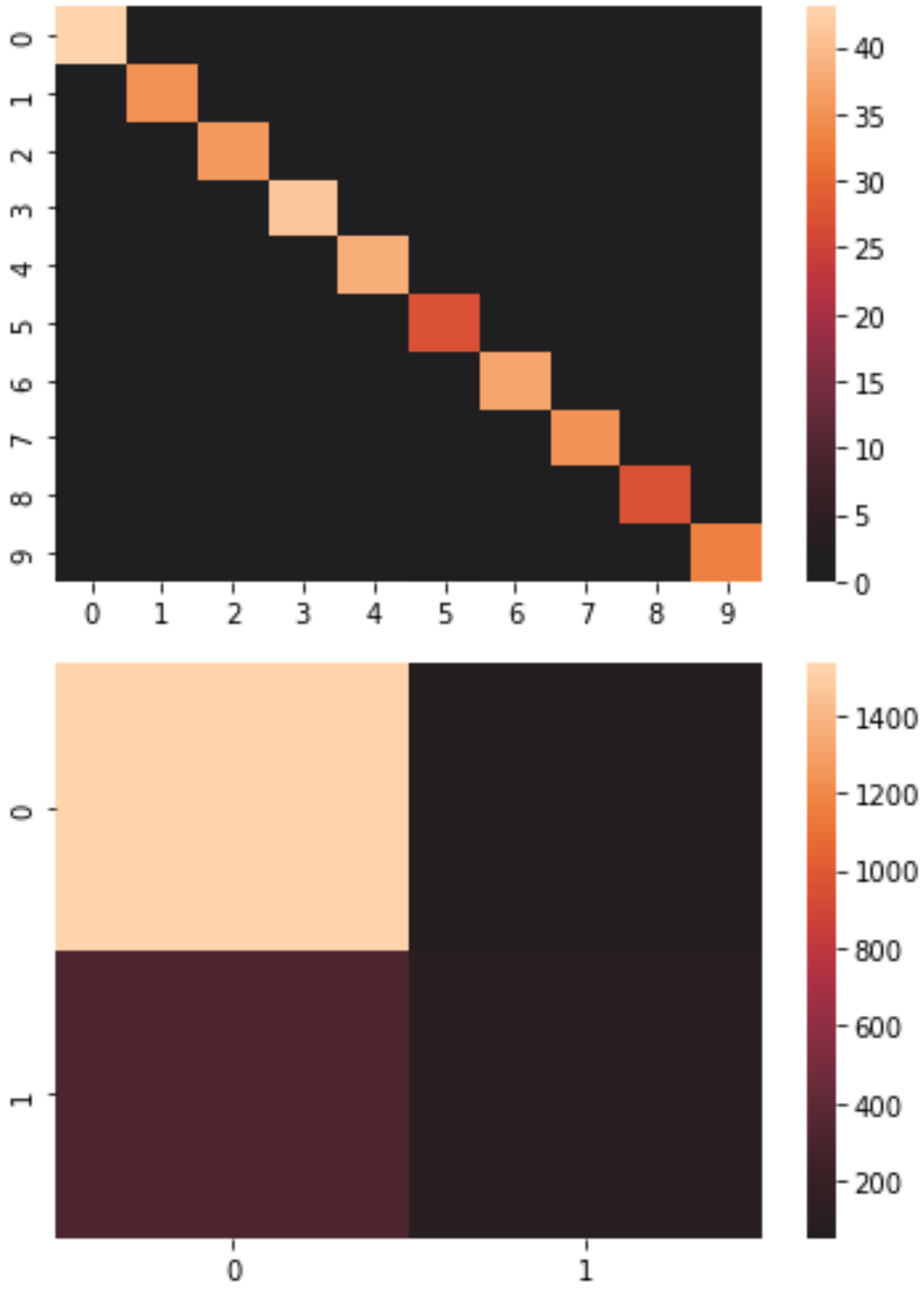
```
# Logistic Regression
"""matensash en fe el logistic regression laaaazem t3mel feature scaling """
# fitting Logistic Regression to the training model

from sklearn.linear_model import LogisticRegression
classifier = LogisticRegression( penalty= 'elasticnet',l1_ratio=0.9, C = 1.0 , fit_intercept = True ,
solver='saga',random_state= 0)
classifier.fit(X_train,y_train)
y_pred = classifier.predict(X_test)
```

- **ROC of LR**


ROC Plot
True Positive Rate
False Positive Rate
0
1
0
1
Random prediction (AUROC = 0.500)
Random Forest (AUROC = 0.865)
LR (AUROC = 0.777)
1400
1200
1000
800
600
400
200

Confusion Matrix of LR



b. SVM

The final Accuracy of this model is :

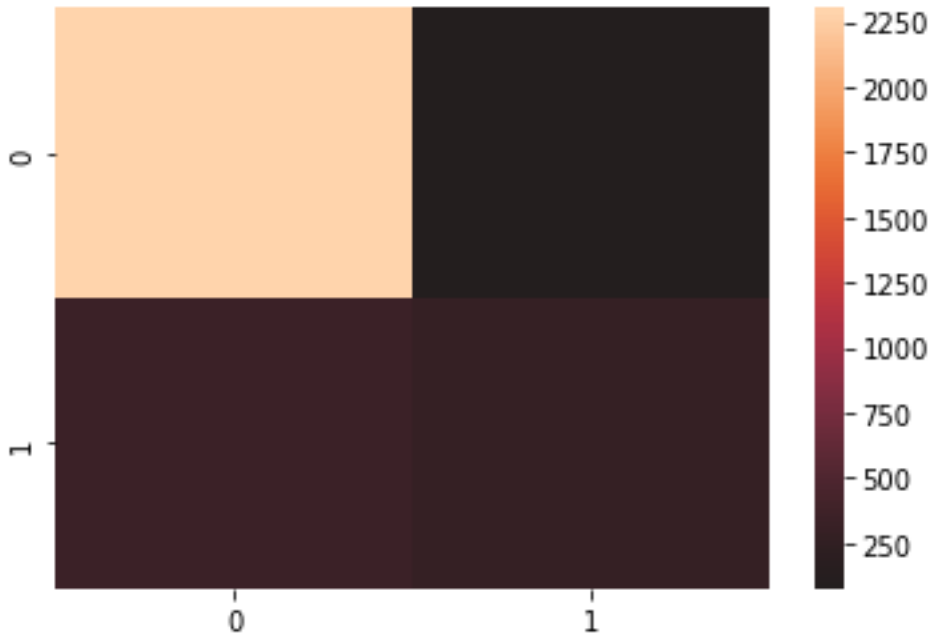
In v1 = 86.4

In v2 = 98.2

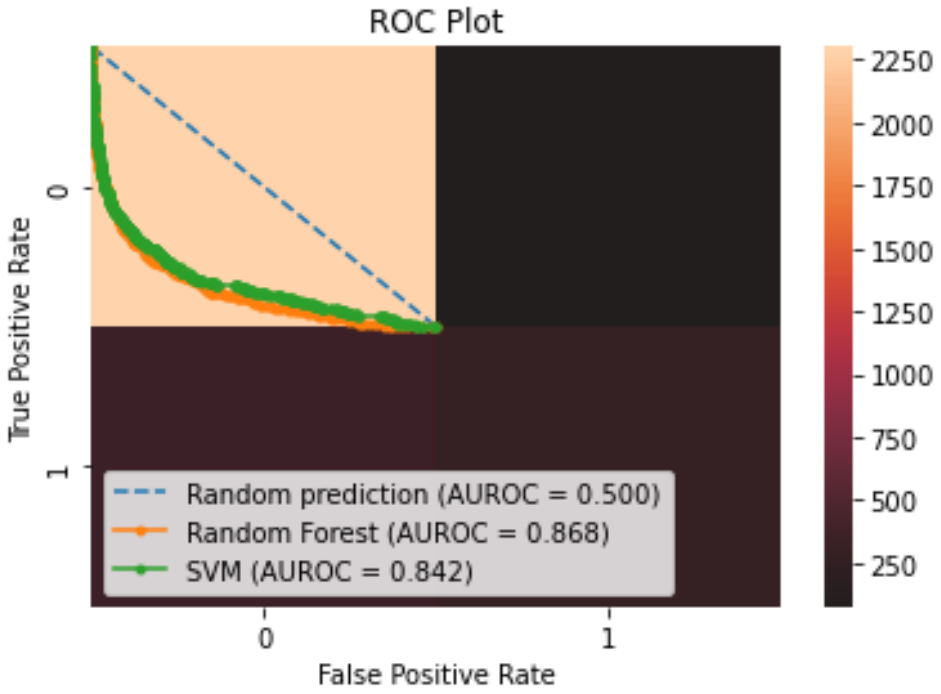
we implement our SVM model with next hyperparameter :
kernel ='rbf'
shrinking = True
C = 1.0
degree = 3
coef0 = 0.001
gamma='scale'
probability = True
random_state = 0

```
90  # Support Vector Machine (SVM)
91
92  # fitting SVM to the training model
93
94  from sklearn.svm import SVC
95  classifier = SVC( kernel ='rbf' , shrinking = True , C = 1.0 , degree = 3 , coef0 = 0.001 ,
96  gamma='scale' ,probability = True , random_state = 0)
97  classifier.fit(X_train,y_train)
98
99  # predicting the test set resultsof SVM
100
101 y_pred = classifier.predict(X_test)
102
```

- ***Confusion matrix of SVM***



- ***ROC of SVM***



2.Image Dataset

a.Dataset Details

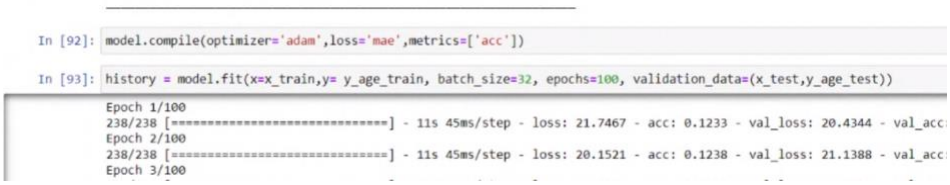
- Our Image Dataset is 'UTK'
- The total number of samples in dataset is 10137
- The size is 852mb , 128 X 128
- The number of samples used in training is 7602 and
- the number of samples used in validation and testing is 2535

b. Implementation Details

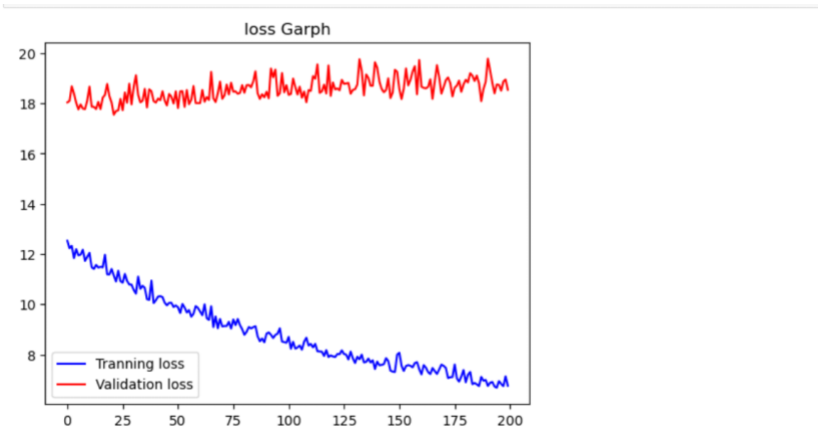
a.ANN model :

- There are 2 feature extraction , their name : 1 - gray scale , 2- resize
- Hyperparameters used in the model is :-

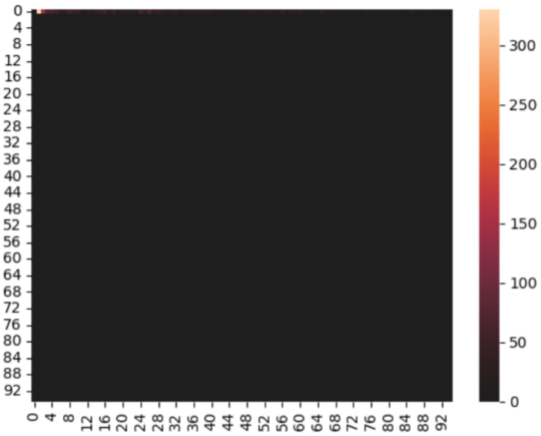
Optimizer
batch size
epochs = 200

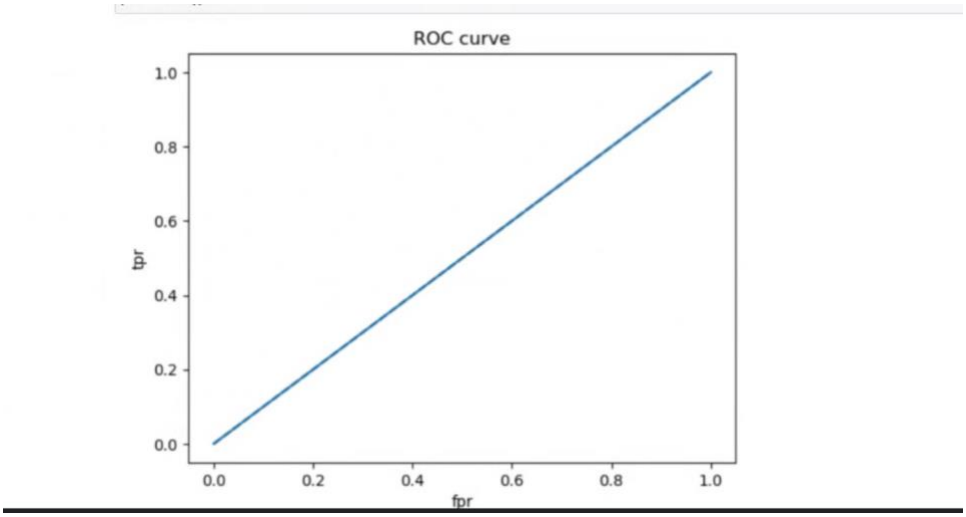


Result details :



confusion matrix





Accuracy = .12