

Faculty of Computers and Artificial Intelligence

Computer Science Department

2021/2022

CS 395 Selected Topics in CS-1

Research Project

Report Submitted for Fulfillment of the Requirements and ILO's
for Selected Topics in CS-1 course for Fall 2021

Team No. 44

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I. NUMERICAL DATASET

1. Project Introduction

a. Dataset Name

[online_shoppers_intention](#)

<https://www.kaggle.com/roshansharma/online-shoppers-intention>

b. Number of classes and their labels

17 class & 1 label

c. Dataset Samples Numbers

12330

d. Training, Validation and Testing

Training (60%): 7891

Validation (20%): 1973

Testing (20%):2466

Training 80% 9864 sample		Testing 20% 2466 sample
Training 60% 7891 sample	Validation 20% 1973 sample	

2.Implementation Details

a. Extracted Features

(How many features were extracted, their names, the dimension of resulted features)

11 Features

Names: - Administrative , Administrative_Duration
Informational , Informational_Duration , ProductRelated
BounceRates , PageValues , SpecialDay , Weekend
Visitor_New_Visitor , Visitor_Returning_Visitor

the dimension of resulted features: 12330

b. Cross-validation

(Is cross-validation is used in any of implemented models? If yes, specify the number of fold and ratio of training/validation)

NO need cross validation because dataset is big

c. Artificial Neural Network (ANN)

⌘ Hyper-parameters

(Specify all the hyper-parameters (initial learning rate, optimizer, regularization, batch size, no. of epochs...) with their specified value in implementation)

Initial Learning: - 0.001

Optimizer: - Adam (adaptive optimizer)

Regularization : No need Regularization because no overfitting

Batch Size: 400

NO.OF.EPOCHS: 100

d. Support Vector Machine (SVM)

⌘ Hyper-parameters

(Specify all the hyper-parameters (optimizer, regularization, ...) with their specified value in implementation)

C=1

Kernel = linear

Regularization : no regularization as there is no overfitting

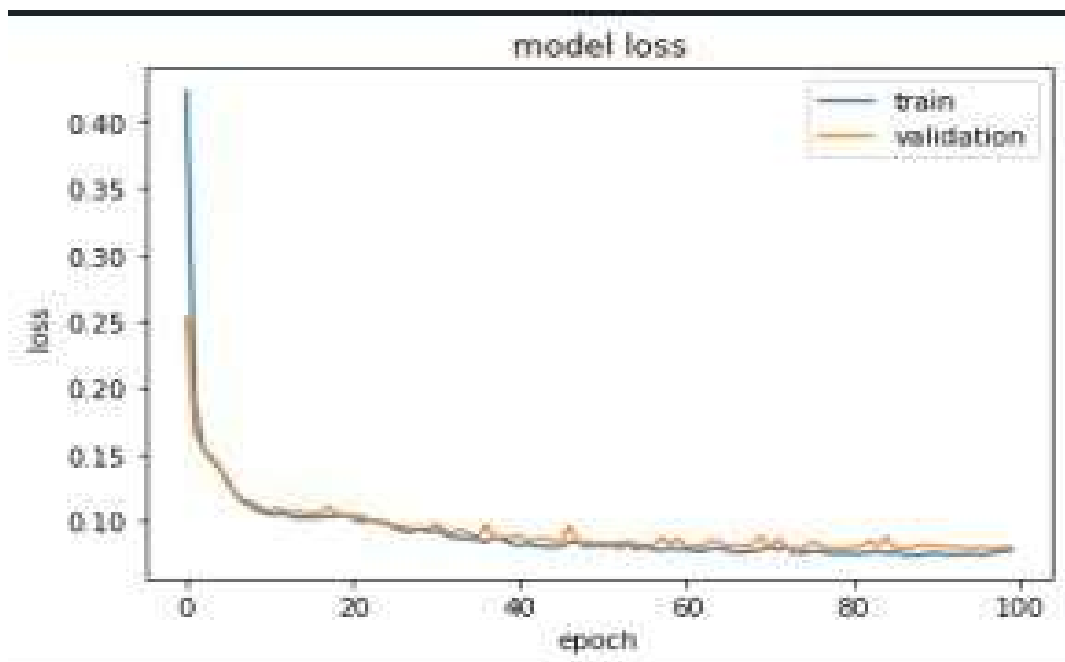
Gamma : default value (scale)

3. Models Results

For each model you should show all these results for your model on testing data (loss curve, accuracy, confusion matrix, ROC curve)

a. ANN Results

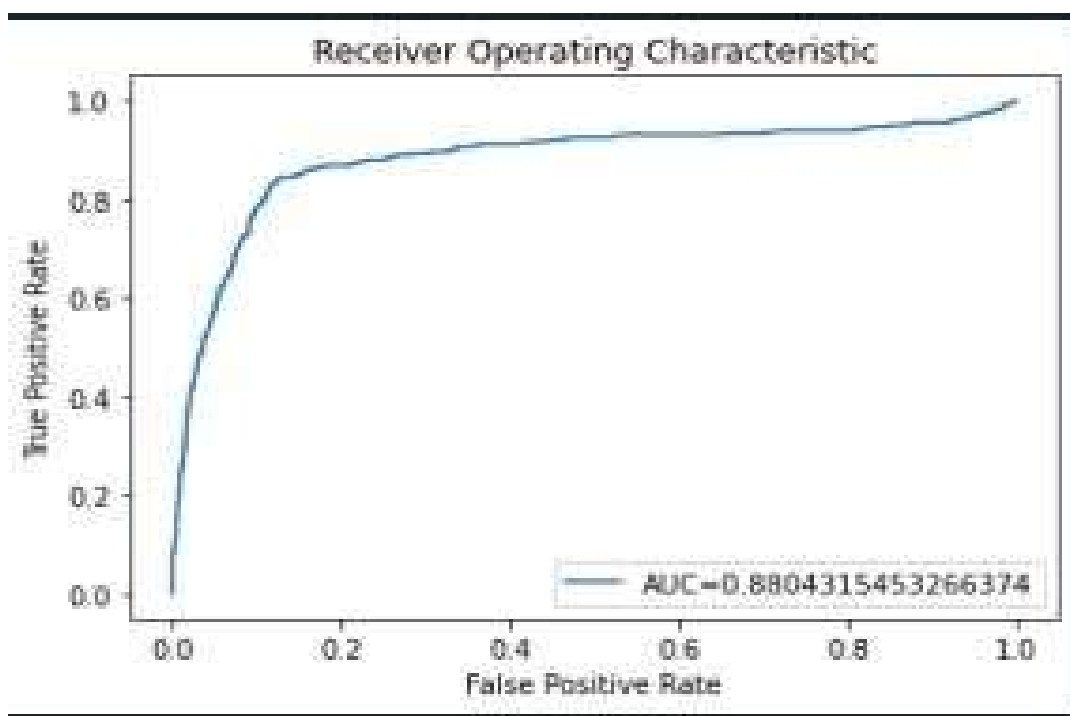
Loss Curve



Accuracy & confusion matrix

```
[[1955  113]
 [ 160  238]]
0.889294403892944
```

ROC curve



b. SVM Results

Confusion Matrix

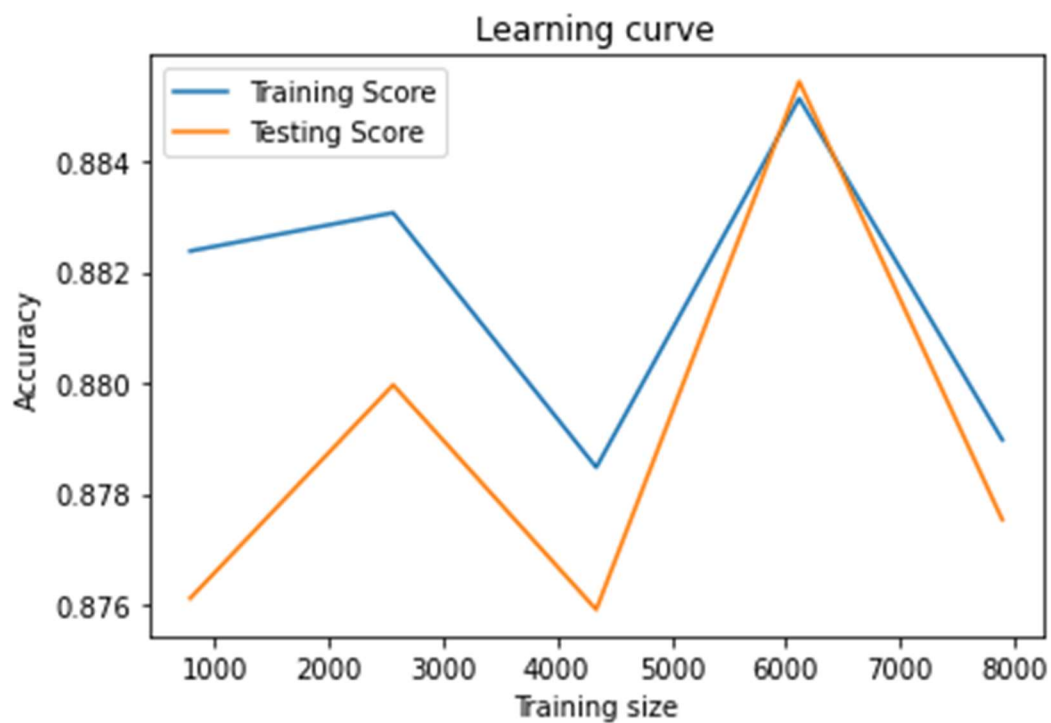
Accuracy : 88.07%

Confusion matrix :

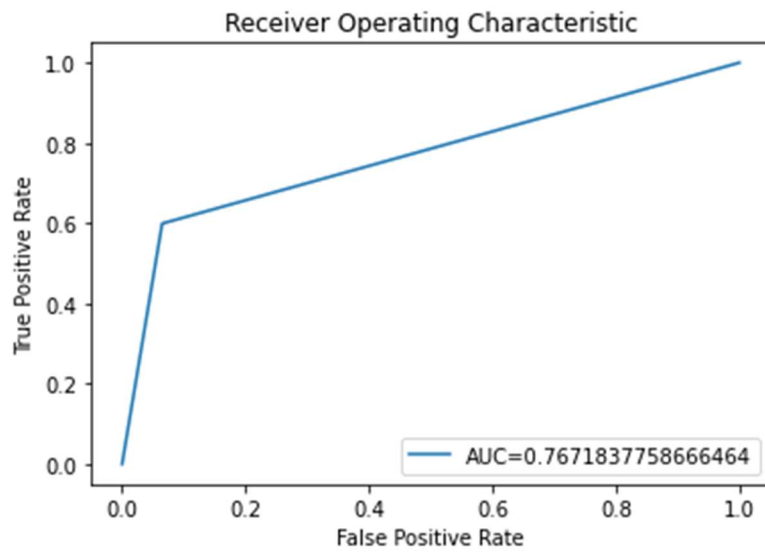
[[1860 214]

[80 312]]

Learning Curve



ROC



II. IMAGE DATASET

1. Project Introduction

a. Dataset Name

Fashion -minist

Trouser - T shirt

b. Number of classes and their labels

2 classes

Trouser

Tshirt

c. Dataset Images Numbers and size

14000

d. Training, Validation and Testing

Training: 12000

Testing: 2000

Training 72% 12000 sample	Testing 28% 2000 sample
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2. Implementation Details

a. Extracted Features

Image (28*28) and make image black White

b. Cross-validation

We do not use cross validation

c. Artificial Neural Network (ANN)

⌘ Hyper-parameters

(Specify all the hyper-parameters (initial learning rate, optimizer, regularization, batch size, no. of epochs...) with their specified value in implementation)

Initial learning rate:- 0.001

Optimizer : adam

No batch sizes

Epochs :- 10

d. Support Vector Machine (SVM)

⌘ Hyper-parameters

(Specify all the hyper-parameters (optimizer, regularization, ...) with their specified value in implementation)

C=1

Kernel = poly

Regularization : no regularization as there is no overfitting

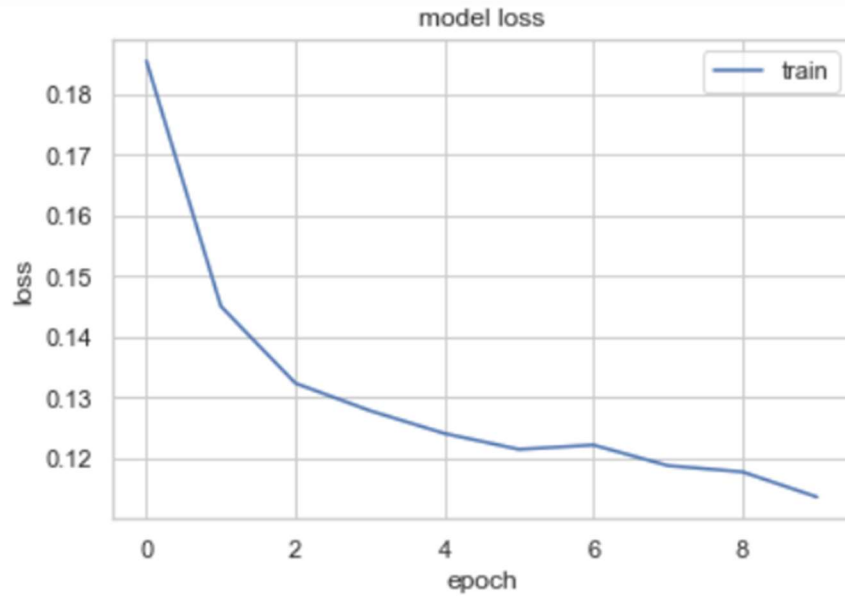
Gamma : auto

3. Models Results

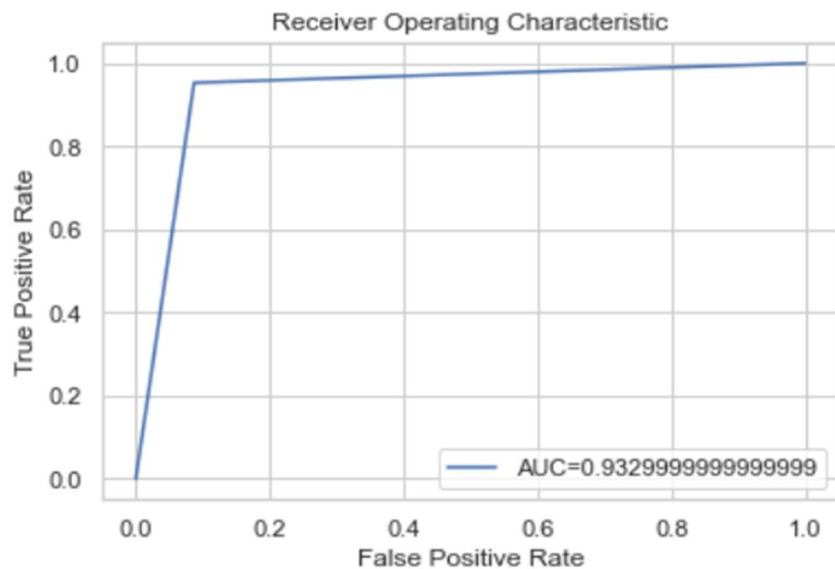
For each model you should show all these results for your model on testing data (loss curve, accuracy, confusion matrix, ROC curve)

a. ANN Results

Loss curve



Roc



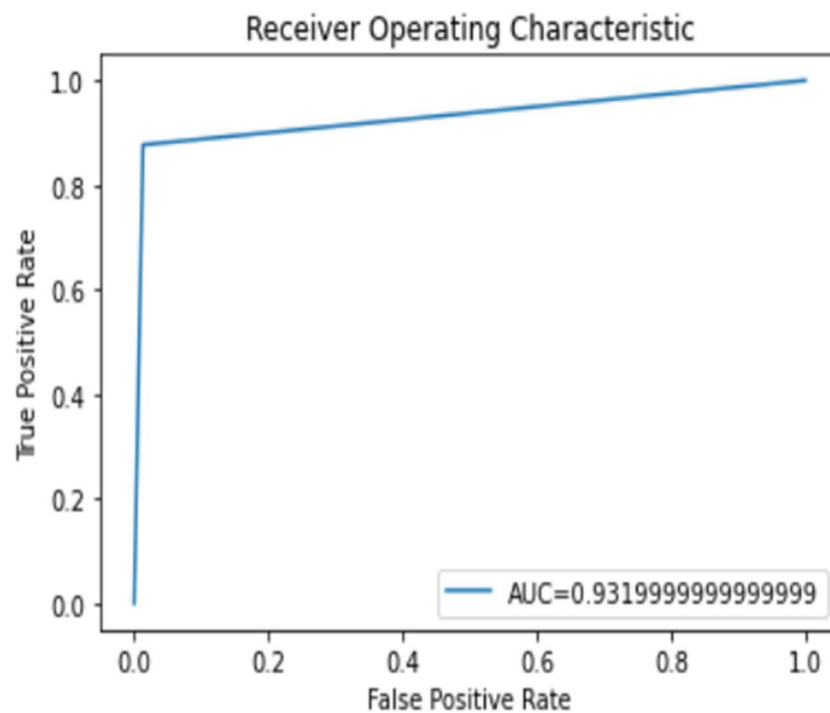
Confusion matrix

```
[[913  87]
 [ 47 953]]
```

```
Out[18]: 0.933
```

b.SVM Results

ROC Curve



Confusion Matrix

```
[[987  13]
 [123 877]]
```

Out[32]: 0.932