

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. 20

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I. NUMERICAL DATASET

1. Project Introduction

a. Dataset Name

Mobile Price

LINK: <https://www.kaggle.com/iabhishekofficial/mobile-price-classification?select=train.csv>

b. Number of classes and their labels

Number of classes: 4

their labels: (0,1,2,3)

c. Dataset Samples Numbers

Total number of samples: 2000

d. Training, Validation and Testing

No of Training: 1445

No of Validation: 300

No of testing: 255

2.Implementation Details

a. Extracted Features

No of Features:20

Their names:

- 1- battery_power
- 2- blue
- 3- clock_speed
- 4- dual_sim
- 5- fc
- 6- four_g
- 7- int_memory
- 8- m_dep
- 9- mobile_wt
- 10- n_cores
- 11- pc
- 12- px_height
- 13- px_width
- 14- ram
- 15- sc_h
- 16- sc_w
- 17- talk_time
- 18- three_g
- 19- touch_screen
- 20- wifi

b. Cross-validation

No

c. Artificial Neural Network (ANN)

⌘ Hyper-parameters

Learning rate: 0.01

Optimizer: sgd

Regularization: uniform

Batch size: 12

No of epochs: 100

d. Support Vector Machine (SVM)

⌘ Hyper-parameters

Optimizer: none

Regularization

1- kernel: linear

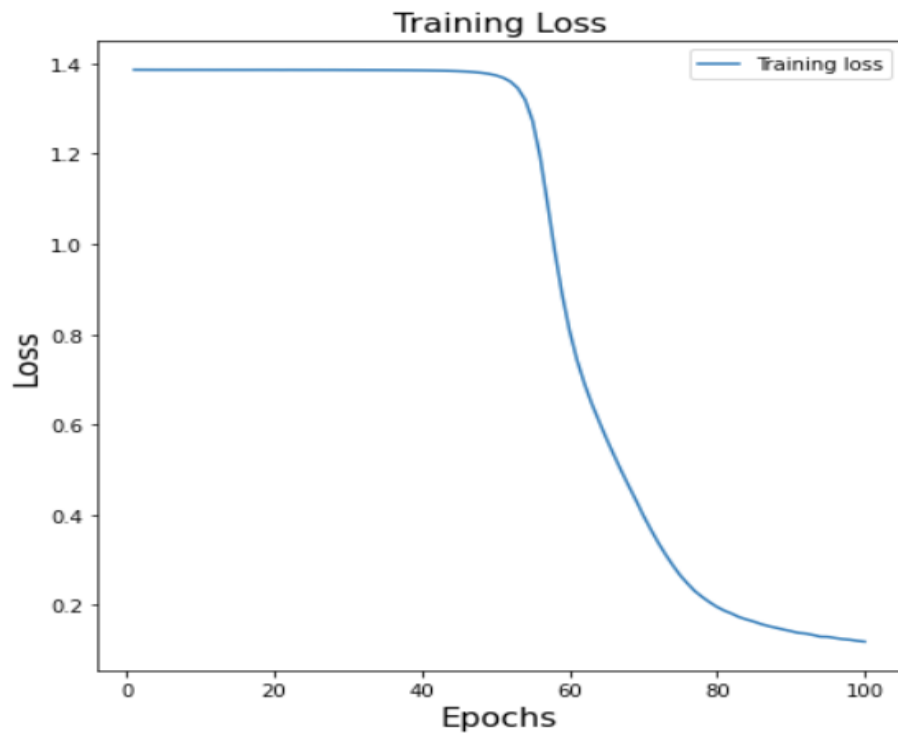
2- gamma: 0.001

3- c: 1

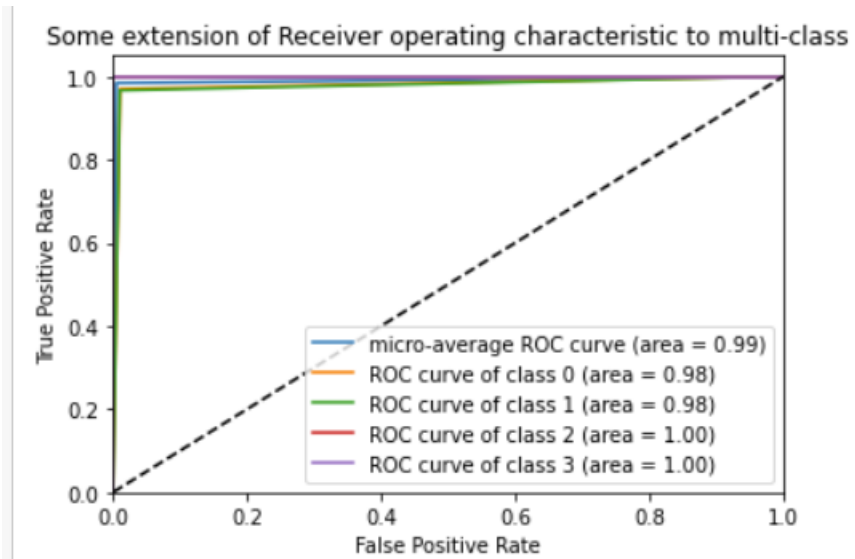
3. Models Results

a. ANN Results

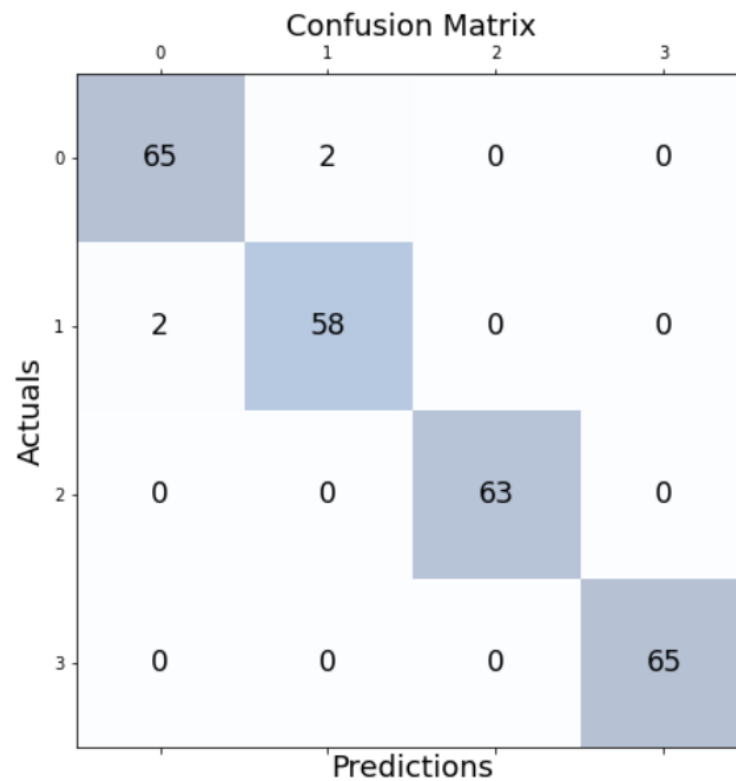
- **Loss curve:**



- **ROC Curve:**



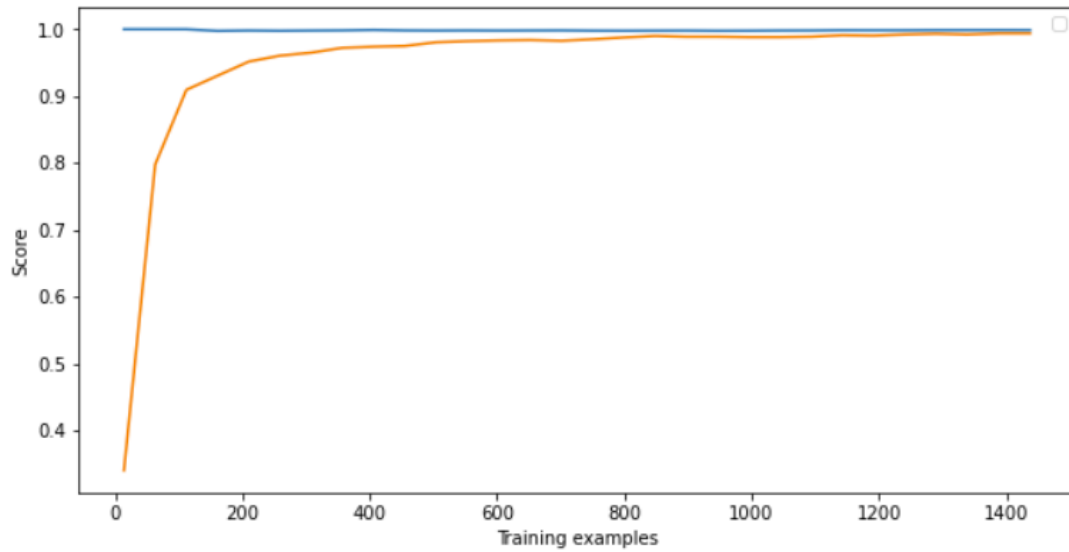
- Confusion matrix:**



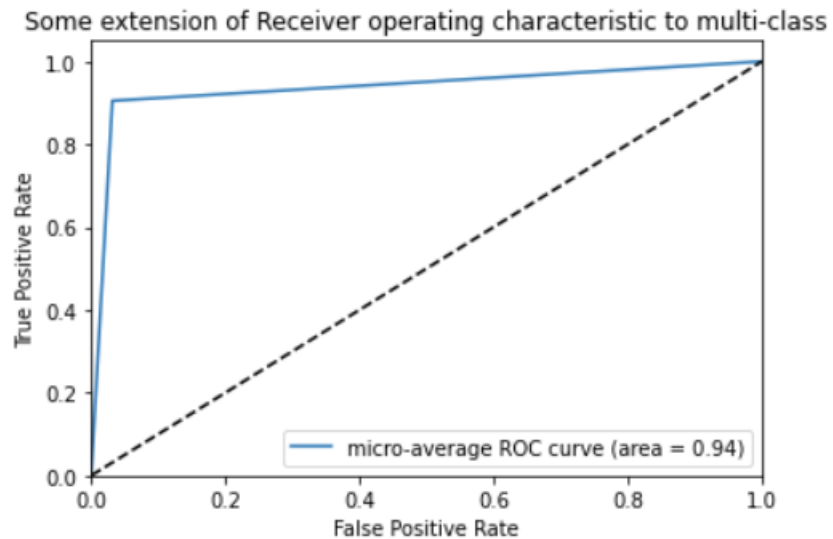
- Accuracy: 97.3%**

b. SVM Results

- Learning curve:



- Roc Curve:



- **Confusion matrix:**

```
confusion_matrix
```

```
[[51  0  0  0]  
 [11 40  0  0]  
 [ 0  7 44  0]  
 [ 0  0  1 46]]
```

- **Accuracy:90.5%**

II. IMAGE DATASET

1. Project Introduction

a. Dataset Name

Malaria Cell Images Dataset

LINK: <https://lhncbc.nlm.nih.gov/LHC-downloads/downloads.html#malaria-datasets>

b. Number of classes and their labels

Two classes (Parasitized, Uninfected)

Labels:

Parasitized: label (1)

Uninfected: label (0)

c. Dataset Images Numbers and size

Number of images: 27558

Size = 40 x 40

d. Training, Validation and Testing

Training: 17636

Testing : 5512

Validation: 4410

2. Implementation Details

a. Extracted Features

No Of features: 96

b. Cross-validation

No

c. Artificial Neural Network (ANN)

⌘ Hyper-parameters

initial learning rate: 0.001

optimizer: Adam

regularization: 0

batch size: 30

no. of epochs: 250

d. Support Vector Machine (SVM)

⌘ Hyper-parameters

Optimizer: None

Regularization

1- kernel: RBF

2- gamma: auto

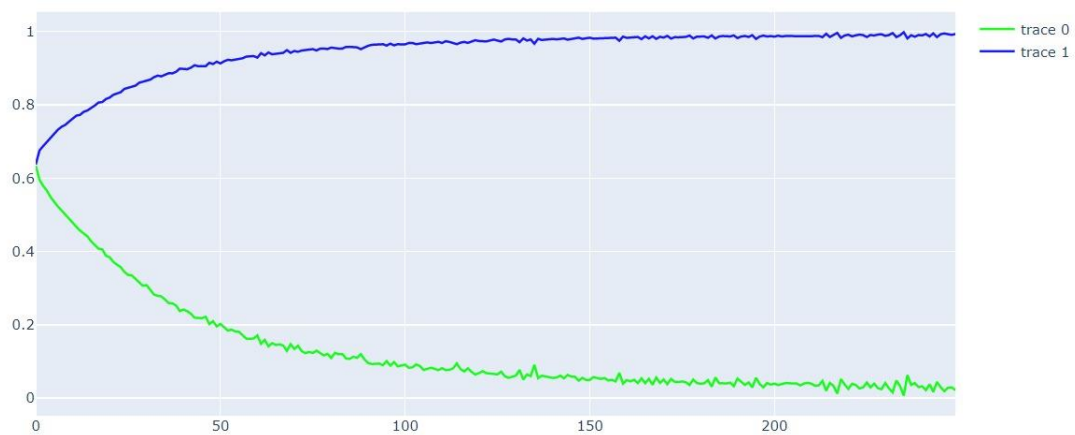
3- c: 100

3. Models Results

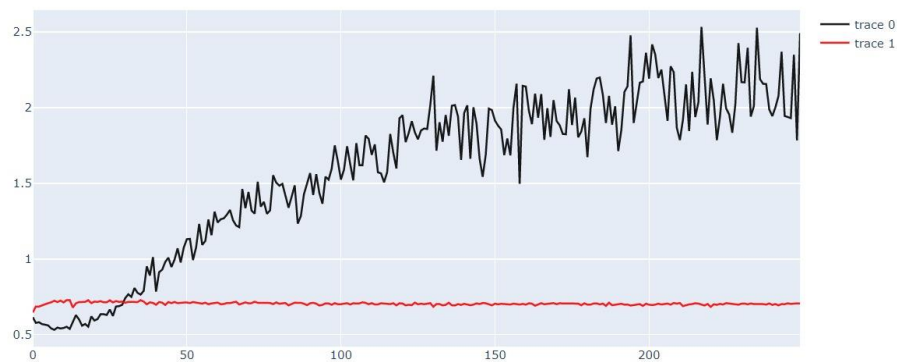
a. ANN Results

- **Loss curve:**

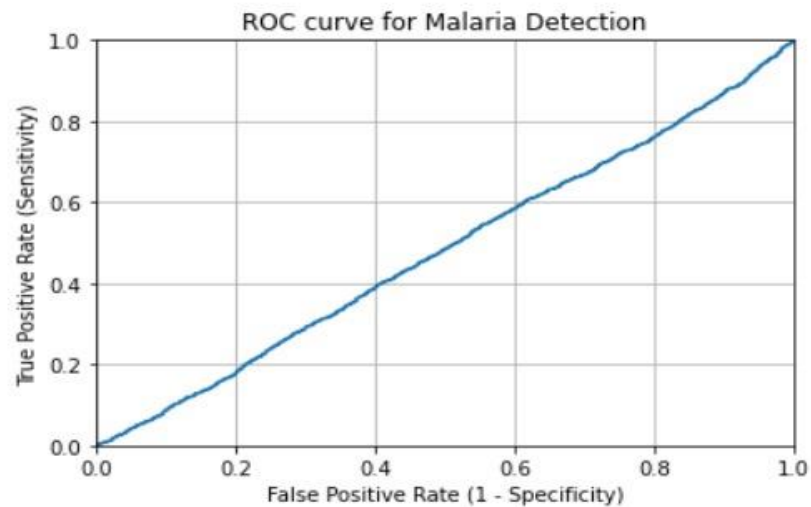
Training Accuracy and Loss



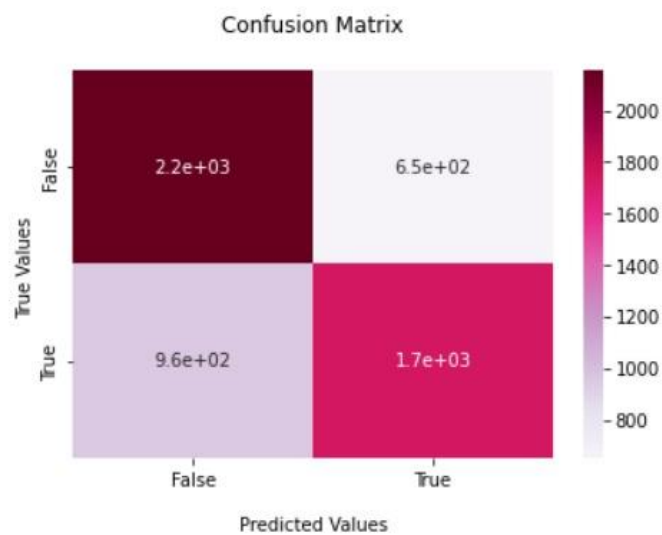
Validation Accuracy and Loss



- **ROC Curve:**



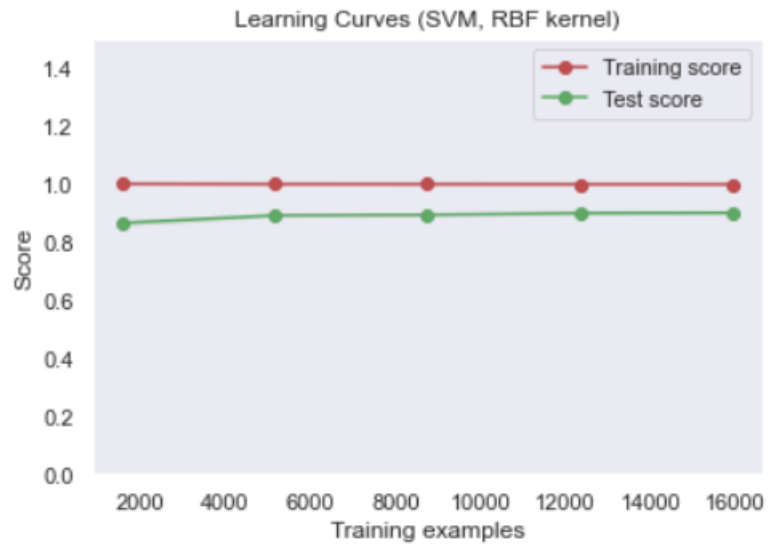
- **Confusion Matrix:**



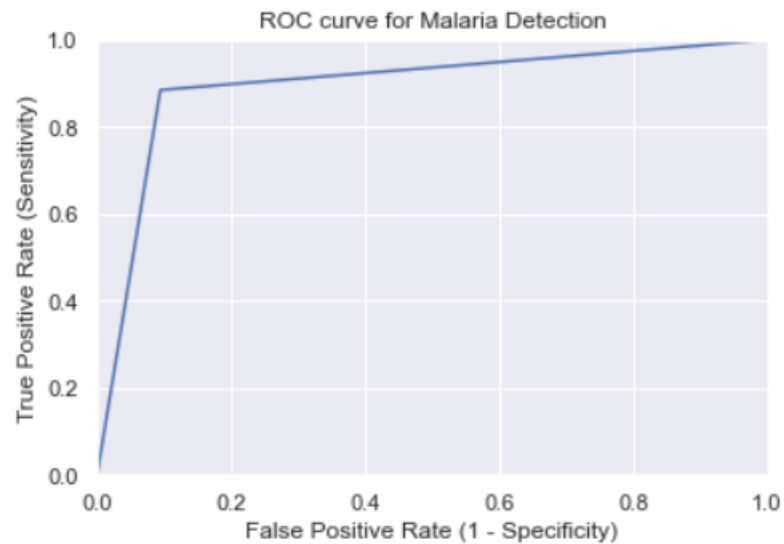
- **Accuracy: 70.8 %**

b.SVM Results

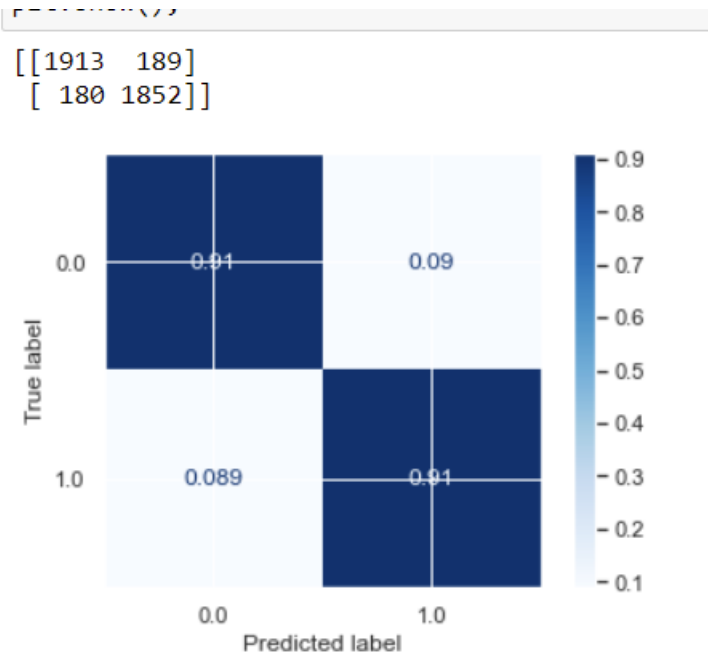
- Learning curve:



- Roc Curve:



- **Confusion matrix:**



- **Accuracy: 90%**