Helwan University

كلية الحاسبات والذكاء الإصطناعي
Faculty of Computers & Artificial Intelligence

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

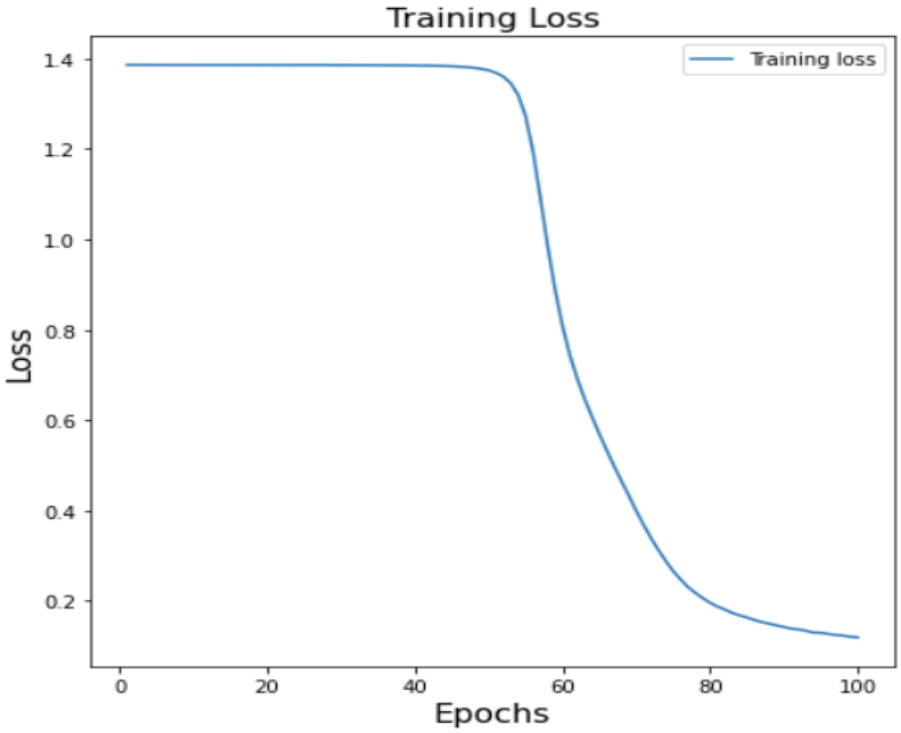
Optimizer: none
Regularization

1- kernel: linear
2- gamma: 0.001
3- c: 1

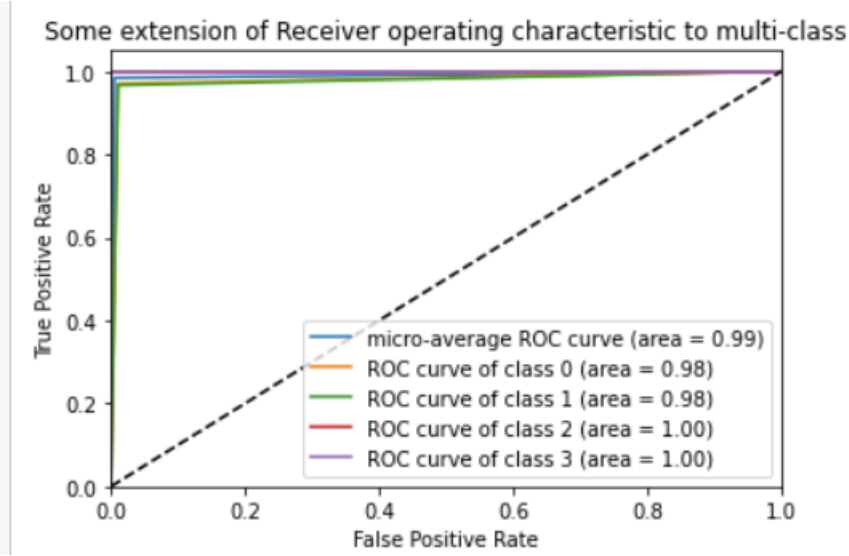
3. Models Results

a. ANN Results

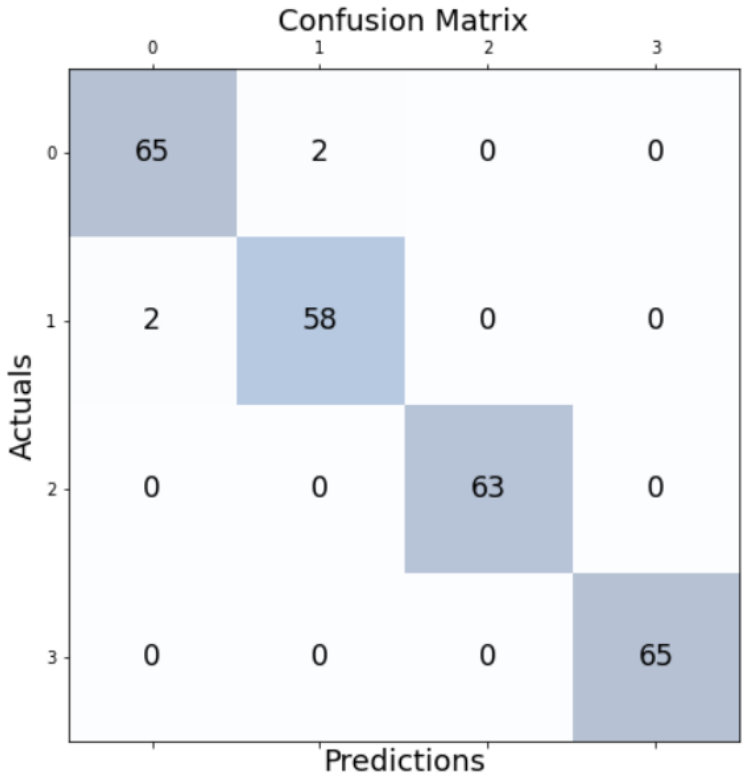
- **Loss curve:**



- **ROC Curve:**



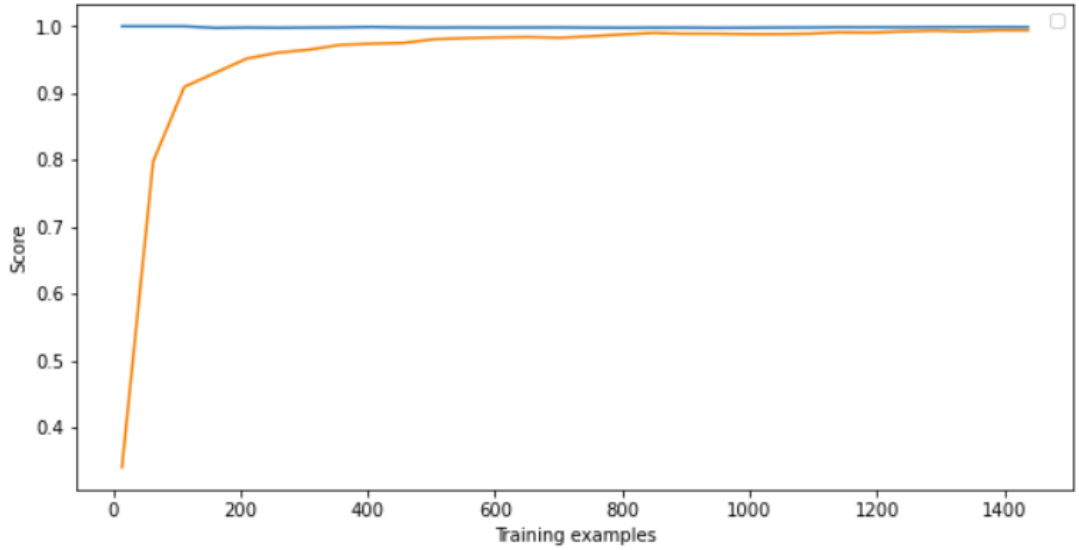
- **Confusion matrix:**



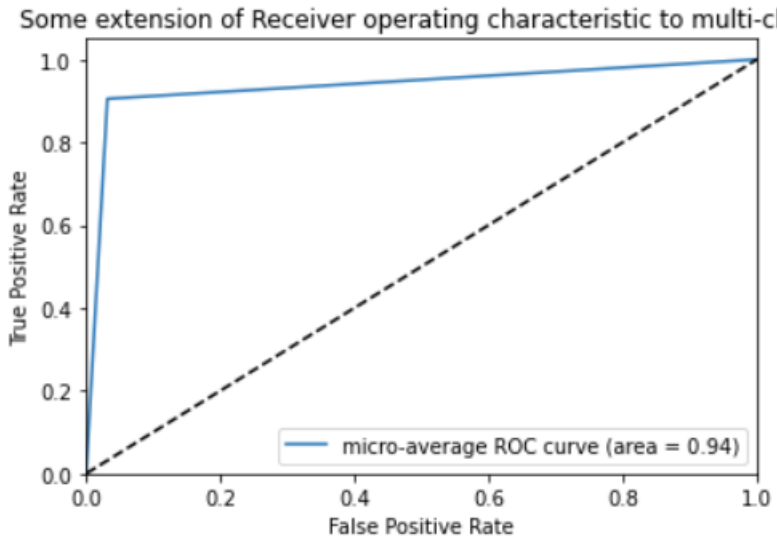
- **Accuracy:** 97.3%

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

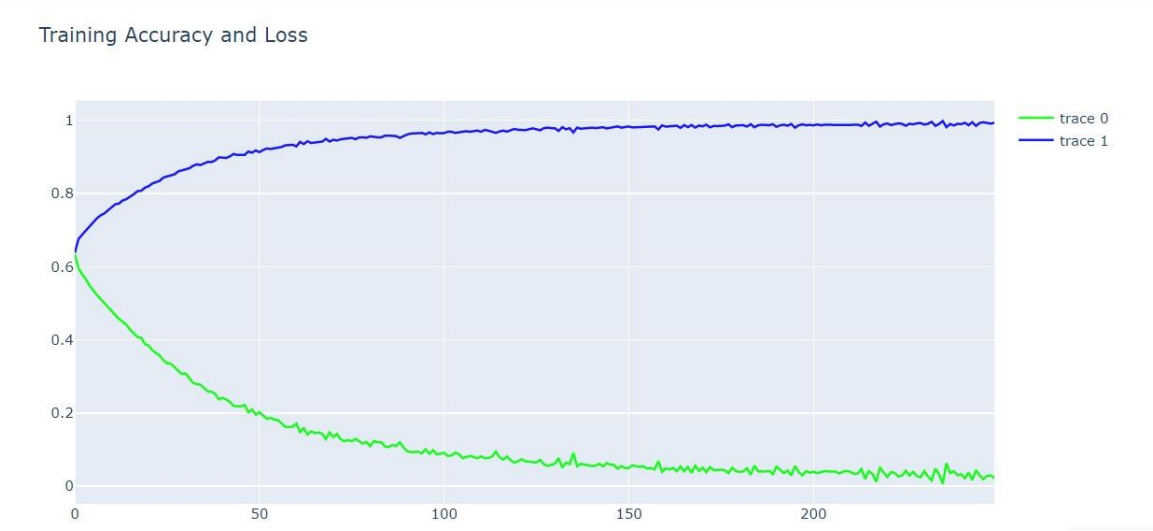
Optimizer: None
Regularization

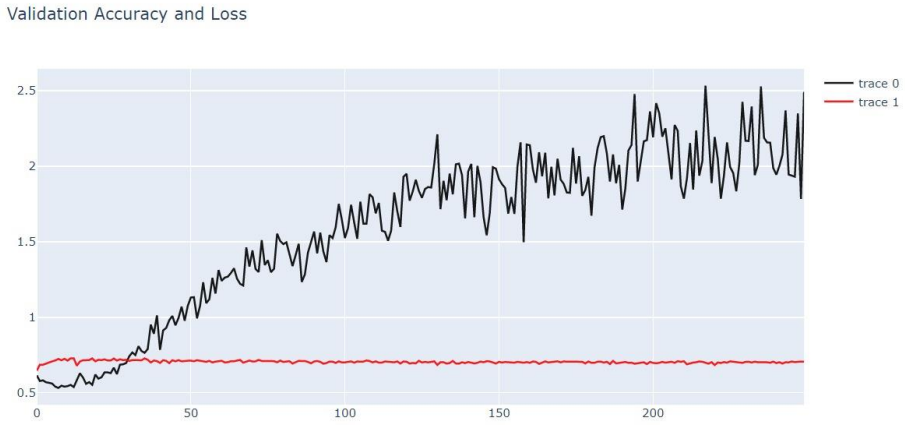
1- kernel: RBF
2- gamma: auto
3- c: 100

3. Models Results

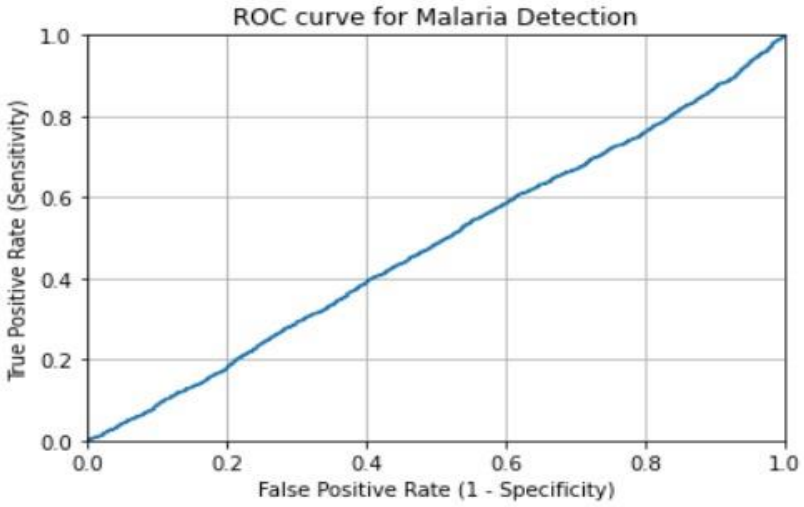
a. ANN Results

- **Loss curve:**

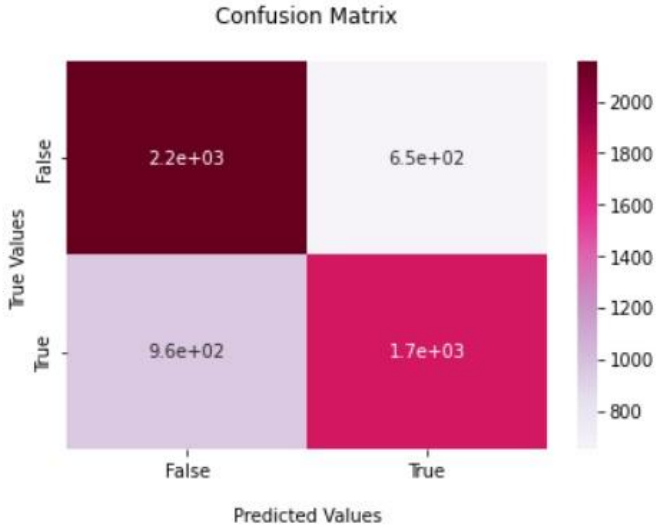




- **ROC Curve:**



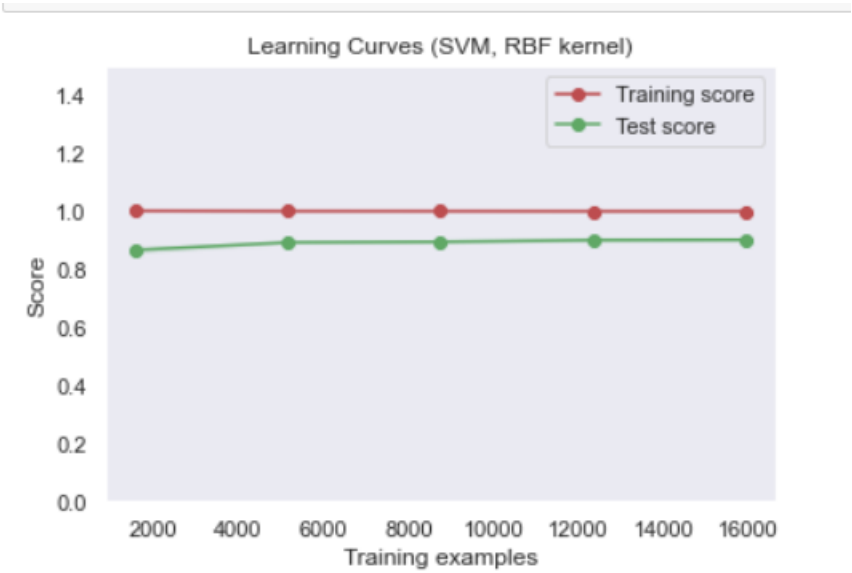
- **Confusion Matrix:**



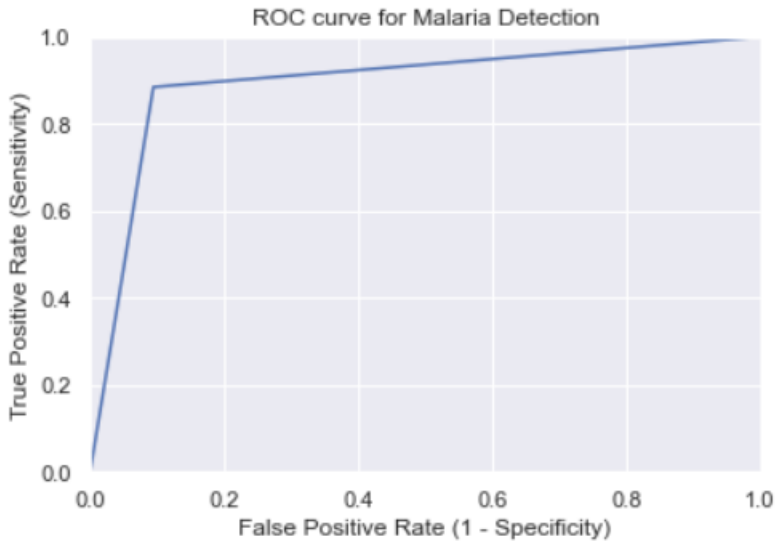
- **Accuracy:** 70.8 %

b. SVM Results

- **Learning curve:**

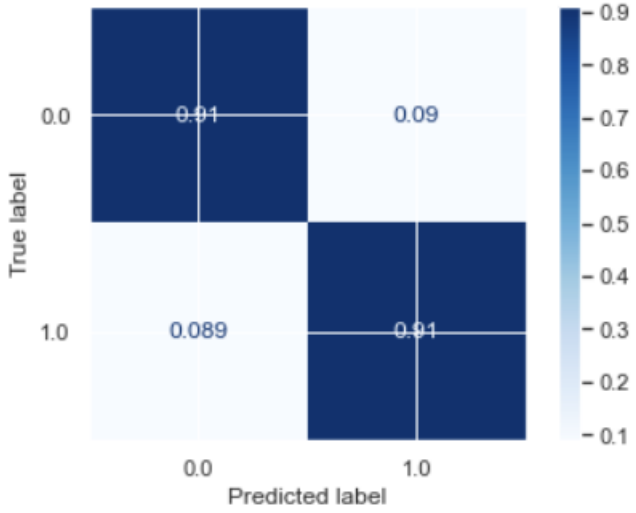


- **Roc Curve:**



- **Confusion matrix:**

```
[[1913  189]
 [ 180 1852]]
```



- **Accuracy:**90%