

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

	ID	Name	Grade
1.	201900174	Omnia Sayed Hamed Abdelrahman	
2.	201900022	Ahmed Hatem Fathy Khedr	
3.	201900309	Rewaa Ragab Mahmoud Mogazy	
4.	201900274	Hala TagElser Rabia AbdElaziz	
5.	201900245	George Elamir Mkram Sleem	
6.	201900863	Mo'men Emad Elden Abdel Fattah Abdel Ghaffar	
7.	201900823	Mustafa Abdalnasser Abdulfattah Essa	

Delivered to:

Dr. Wessam El-Behaidy

Eng. Islam Gamal

Eng. Muhammed Kamal

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

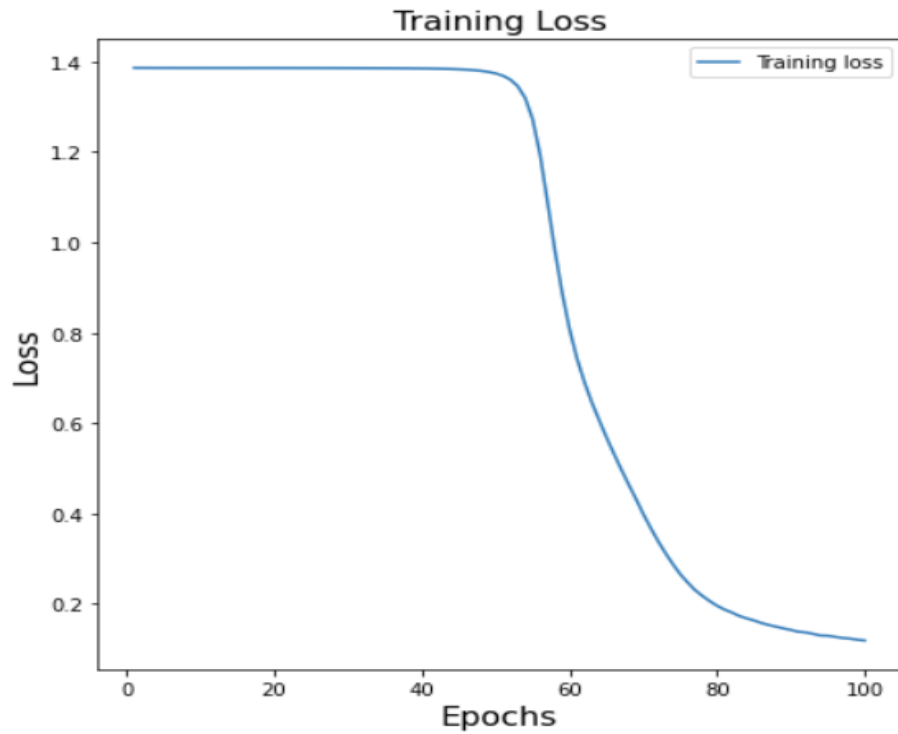
2- gamma: 0.001

3- c: 1

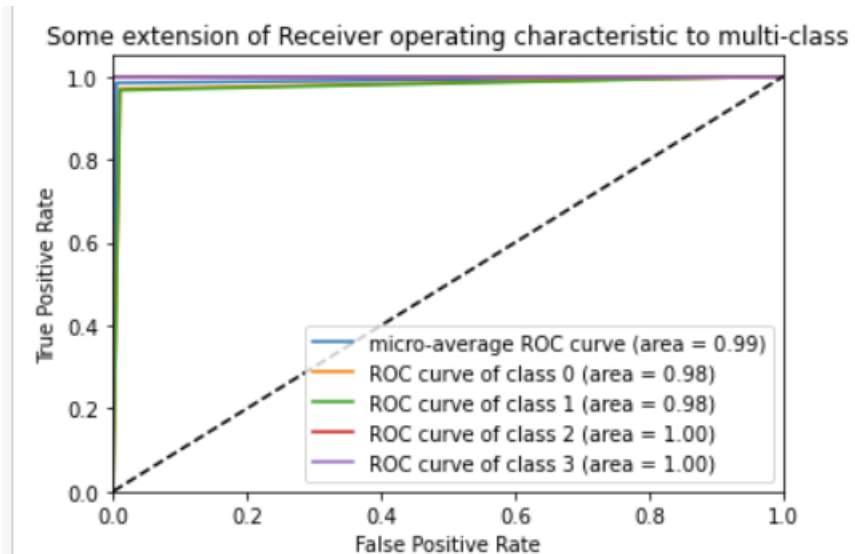
3. Models Results

a. ANN Results

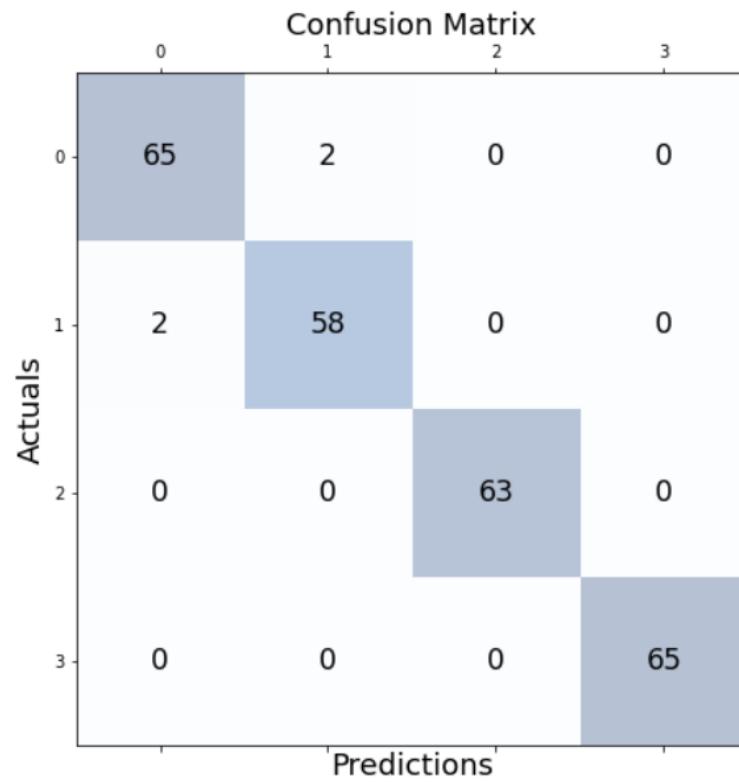
- **Loss curve:**



- **ROC Curve:**



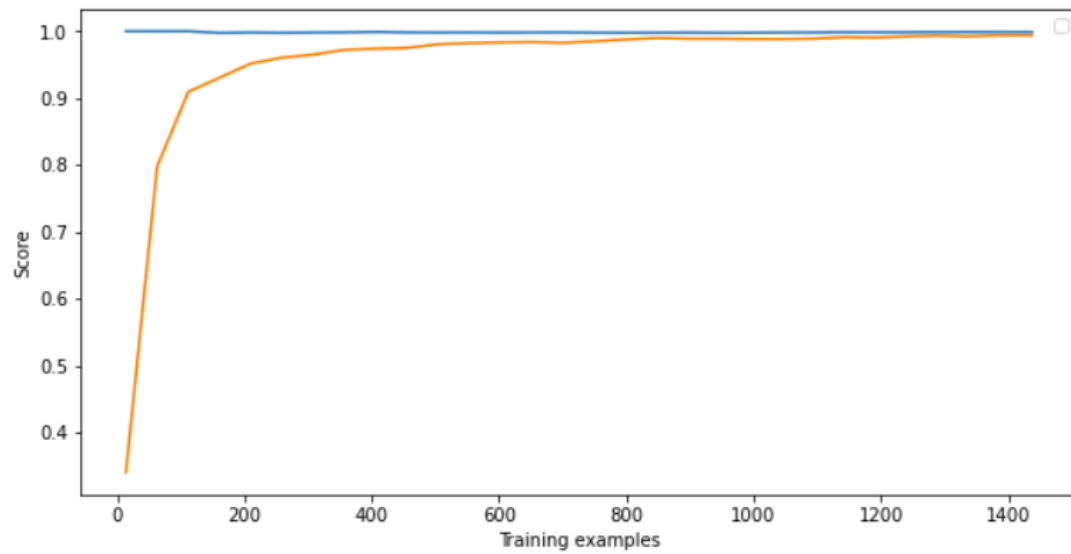
- **Confusion matrix:**



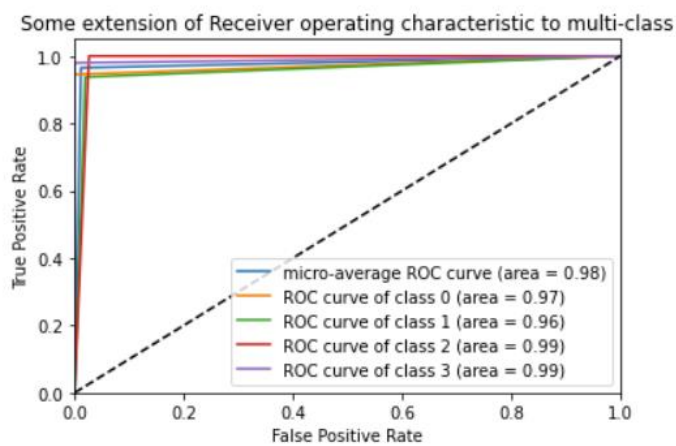
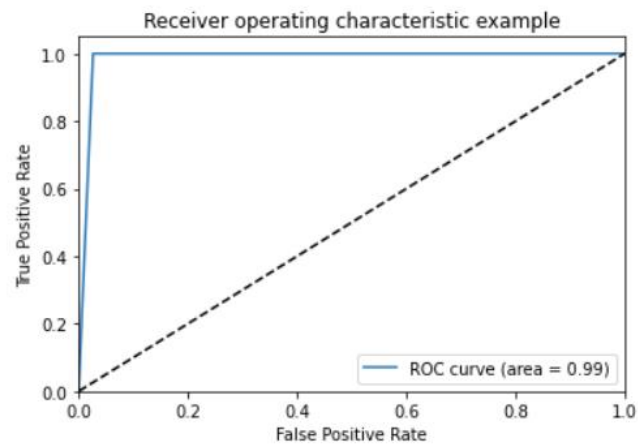
- **Accuracy:** 97.3%

b. SVM Results

- **Learning curve:**



- **Roc Curve:**



- **Confusion matrix:**

confusion_matrix

```
[[52  0  0  0]
 [ 3 45  0  0]
 [ 0  3 48  1]
 [ 0  0  0 48]]
```

- **Accuracy:96.5%**

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

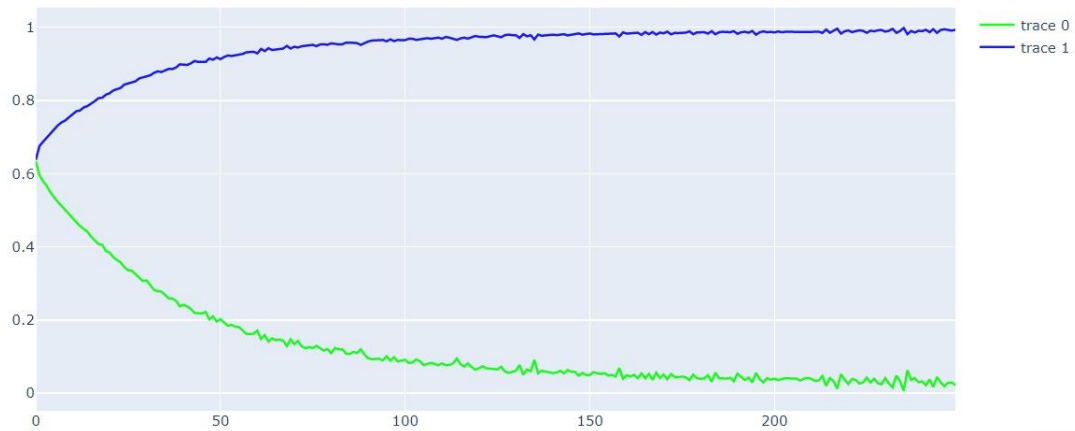
3- c: 100

3. Models Results

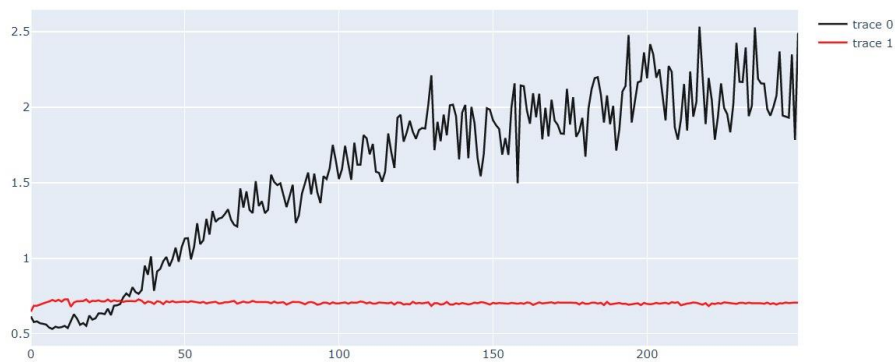
a. ANN Results

- **Loss curve:**

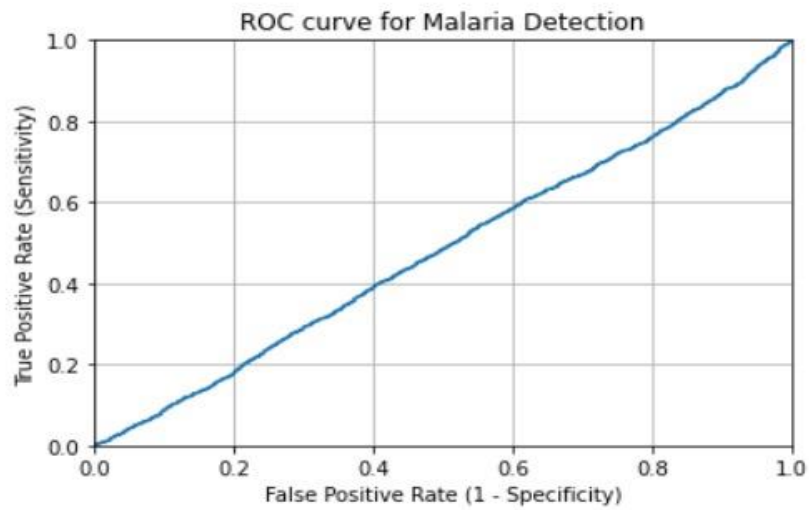
Training Accuracy and Loss



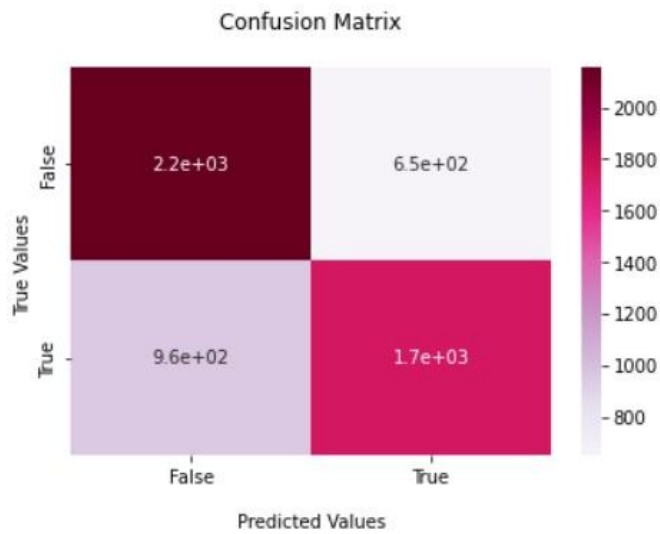
Validation Accuracy and Loss



- **ROC Curve:**



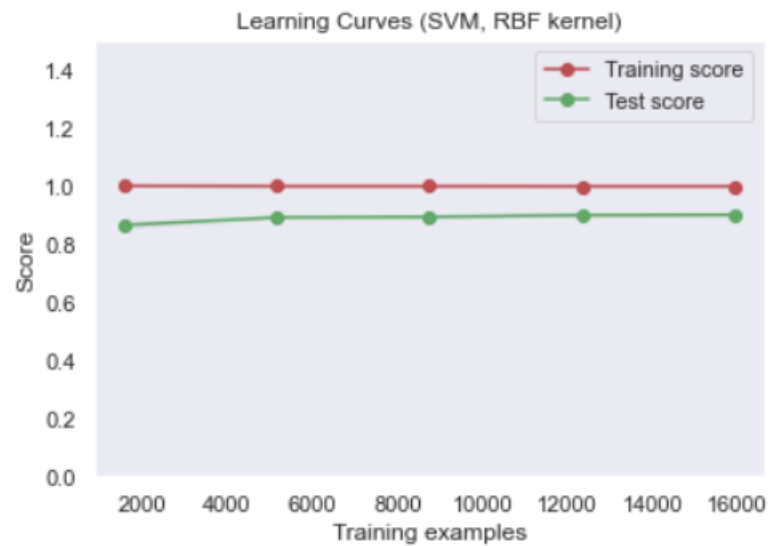
- **Confusion Matrix:**



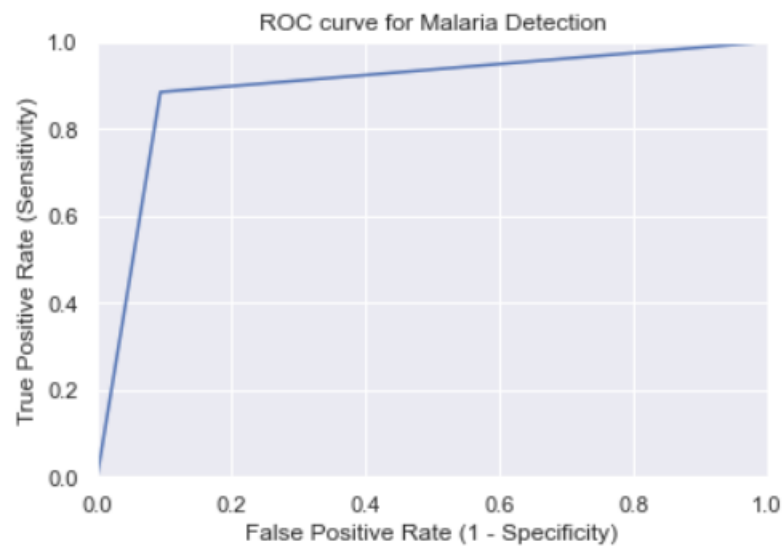
- **Accuracy: 70.8 %**

b.SVM Results

- Learning curve:

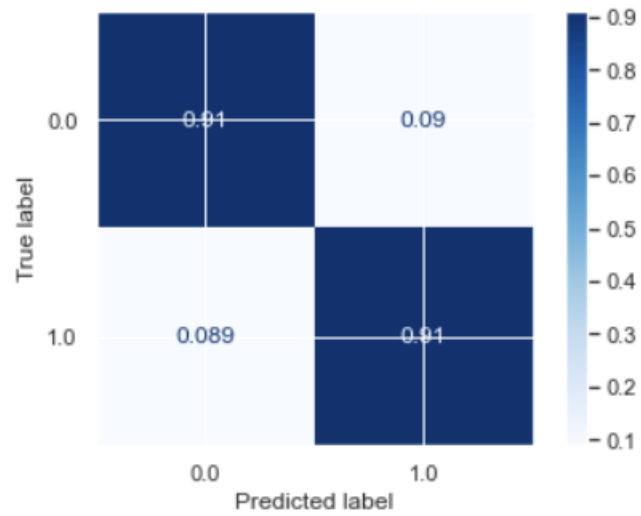


- Roc Curve:



- **Confusion matrix:**

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



- **Accuracy:90%**