

## 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. 24

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# I. NUMERICAL DATASET

## 1. Project Introduction

### a. Dataset Name

**heart.csv**

**Link: <https://www.kaggle.com/fedesoriano/heart-failure-prediction>**

### b. Number of classes and their labels

**2 Classes**

**their labels: heart failure or not ( 0 , 1)**

### c. Dataset Samples Numbers

**Number of rows in the dataset 918**

### d. Training, Validation and Testing

**(The number of samples used in training, validation and testing.)**

**The number of samples used in training: 550 sample (60%)**

**The number of samples used in testing: 184 sample (20%)**

**The number of samples used in validation: 184 (20%)**

## **2.Implementation Details**

### **a. Extracted Features**

**Number of Features = 11**

### **b. Cross-validation**

**NO Cross-validation**

### **c. Artificial Neural Network (ANN)**

**⌘ Hyper-parameters**

**Optimizer: adam**

**Batch size = 32**

**Epochs = 100**

## **d. Support Vector Machine (SVM)**

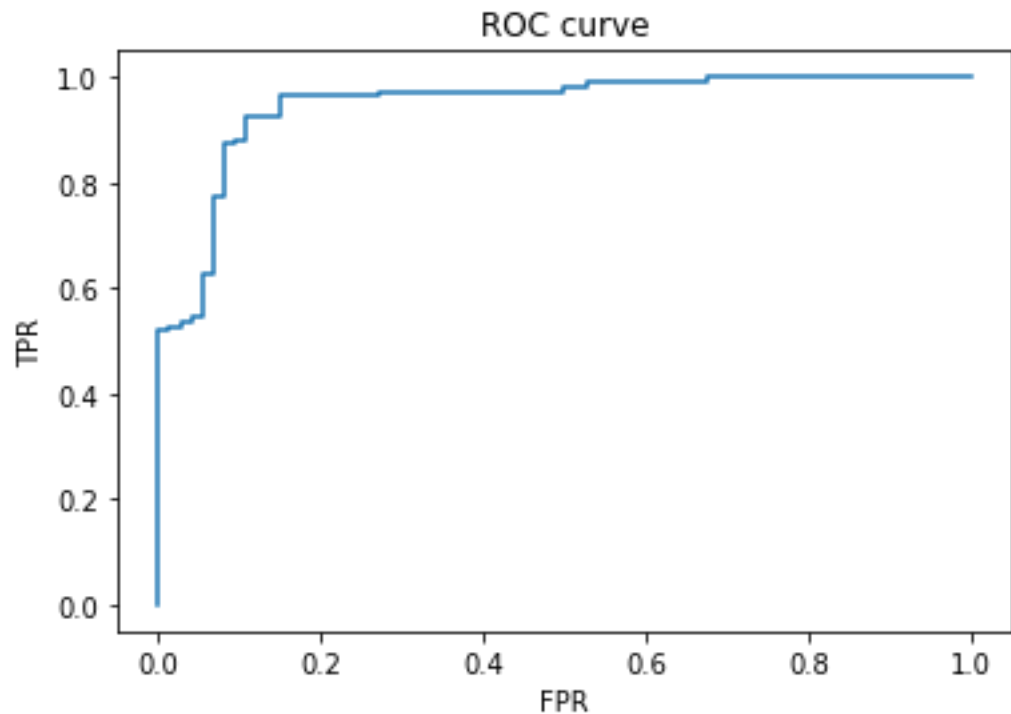
⌘ **Hyper-parameters**

```
C= 10.0,  
kernel= 'rbf',  
degree= 3,  
gamma= 'scale',  
shrinking= True,  
probability= False,  
tol= 0.001,  
cache_size = 200,  
class_weight = None,  
verbose = False,  
max_iter= -1,  
random_state= 2
```

### 3. Models Results

#### a. ANN Results

**ROC curve:**



**Accuracy: 90%**

**Confusion matrix:**

```
[[40 1 1 ... 0 0.0 2]
 [49 0 2 ... 0 1.0 1]
 [37 1 1 ... 0 0.0 2]
 ...
 [57 1 0 ... 1 1.2 1]
 [57 0 1 ... 0 0.0 1]
 [38 1 2 ... 0 0.0 2]]
```

## Loss curve:



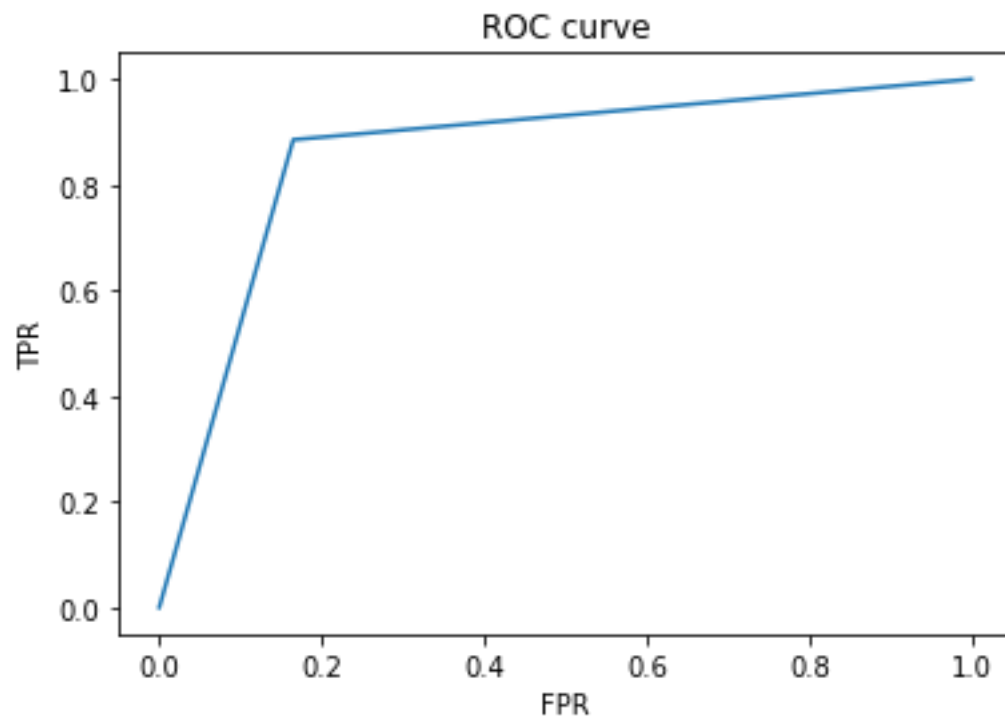
## b.SVM Results

**Accuracy: 92 %**

**Confusion matrix:**

```
[[172  34]
 [ 29 224]]
```

Roc curve:



## II. IMAGE DATASET

### 1. Project Introduction

#### **a. Dataset Name**

Cats vs Dogs

<https://www.kaggle.com/chetankv/dogs-cats-images>

#### **b. Number of classes and their labels**

2 classes

Cat or Dog

#### **c. Dataset Images Numbers and size**

ANN:

1200 image

#### **d. Training, Validation and Testing**

ANN:

Train:- 800 image

Test:- 200 image

Valid :- 200 image



## 2. Implementation Details

### **a. Extracted Features**

2500 feature (50 x 50) ANN

### **b. Cross-validation**

Ratio :- 20%

### **c. Artificial Neural Network (ANN)**

#### **⌘ Hyper-parameters**

Epochs:- 250

Patch size:- 32

Optimizer:- 'adam'

Loss :- 'binary\_crossentropy'

Verbos:- 1

### **d. Support Vector Machine (SVM)**

#### **⌘ Hyper-parameters**

C = 0.5

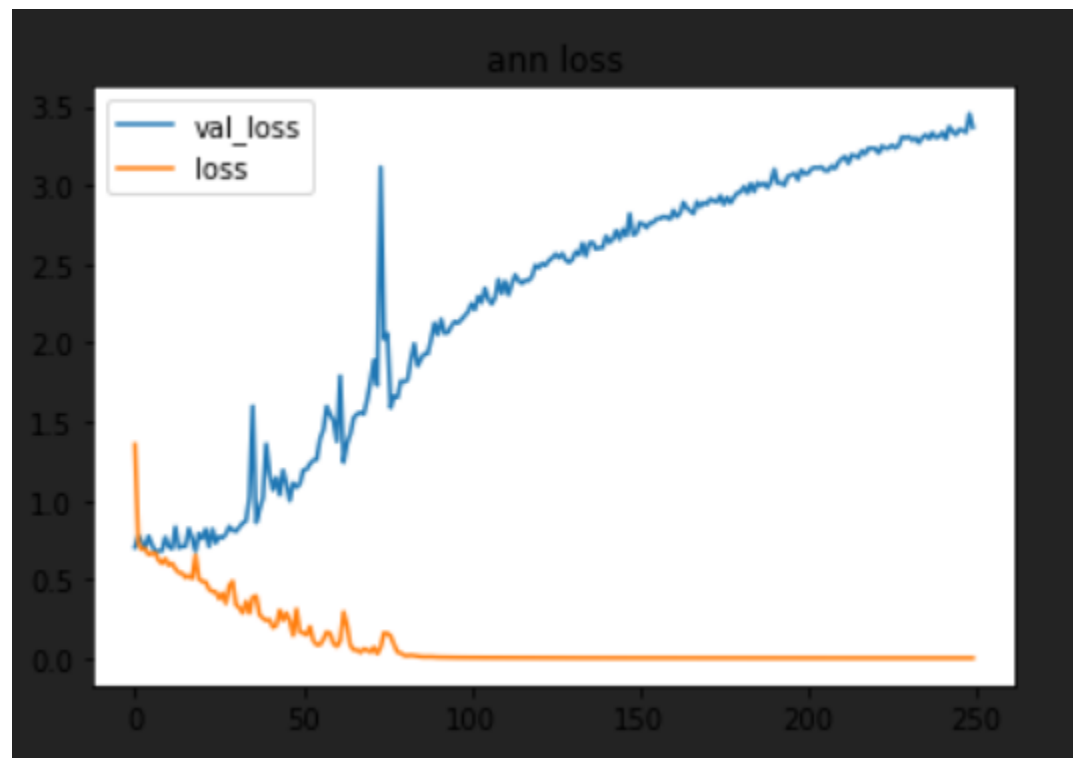
### 3. Models Results

For each model you should show all these results for your model on testing data

#### a. ANN Results

Accuracy :- 91%

Loss curve:-

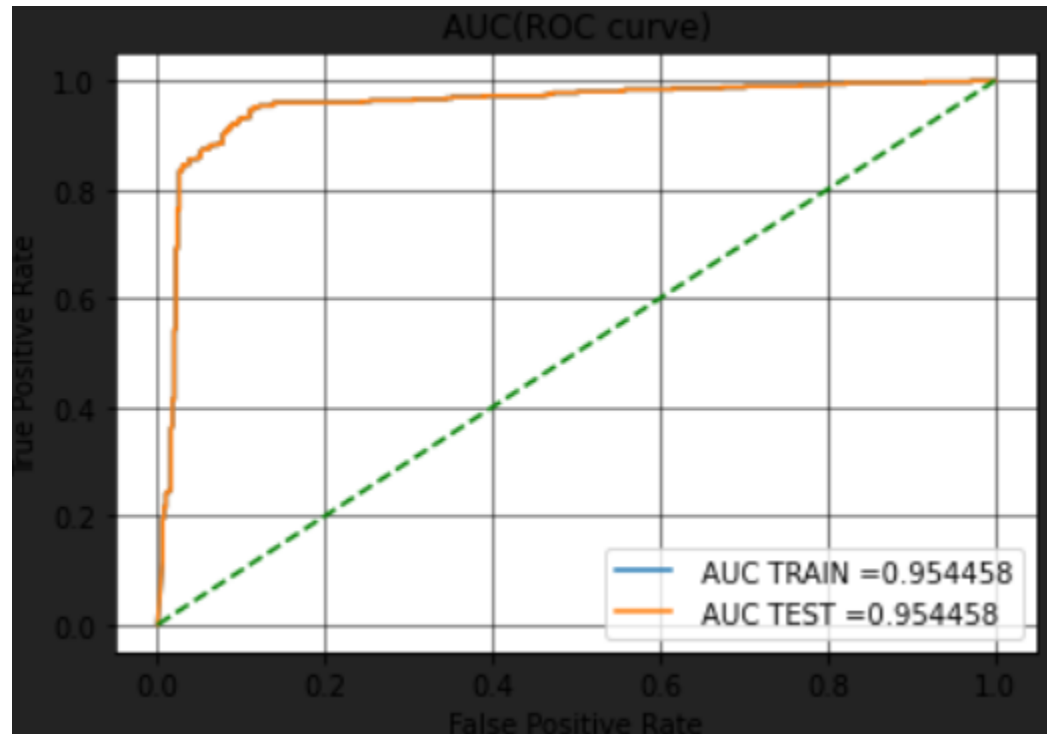


Confusion matrix:-

```
[[461 39]  
 [ 51 449]]
```

0.91

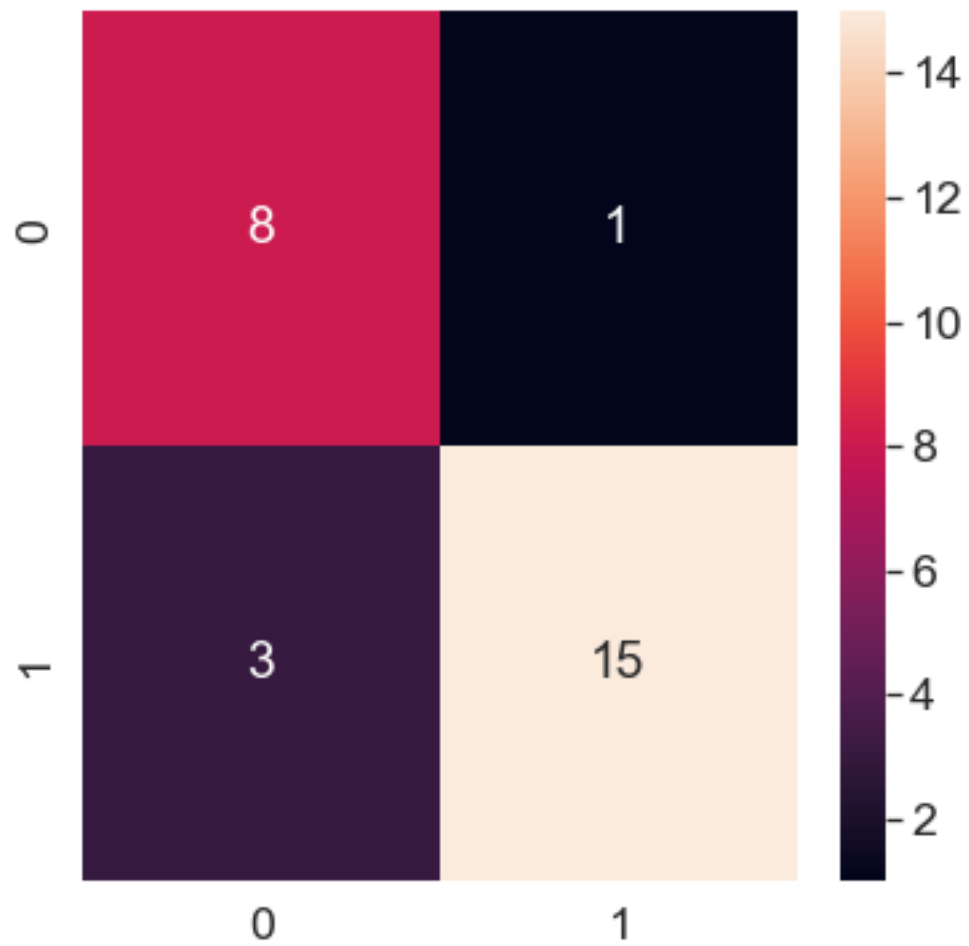
**ROC curve:-**



## b.SVM Results

**Accuracy :- 85%**

**Confusion matrix:-**



## ROC curve:-

