

Depression Detection

Early Detection For Your Protection

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Index

- 1 Introduction
- 2 Project objective
- 3 Our Project
- 4 Our Application
- 5 Future plan

An Introduction to depression



What is a depression?

Depression is a mental health disorder characterized by persistent feelings of sadness, hopelessness, loss of interest or pleasure in activities, changes in appetite or sleep patterns, fatigue, difficulty concentrating, and sometimes thoughts of self-harm or suicide. It is a common and serious condition that can negatively impact a person's thoughts, emotions, and daily functioning.



Substance Abuse

Environmental Factors

Biological Factors

Medical Conditions

Depression can be influenced by a combination of factors

Risks of depression

- 1 Health Effects
- 2 social isolation
- 3 suicide
- 4 Impact on personal relationships
- 5 Work and academic performance



PROJECT OBJECTIVES

Early detection of depression

Provide hotlines for patients

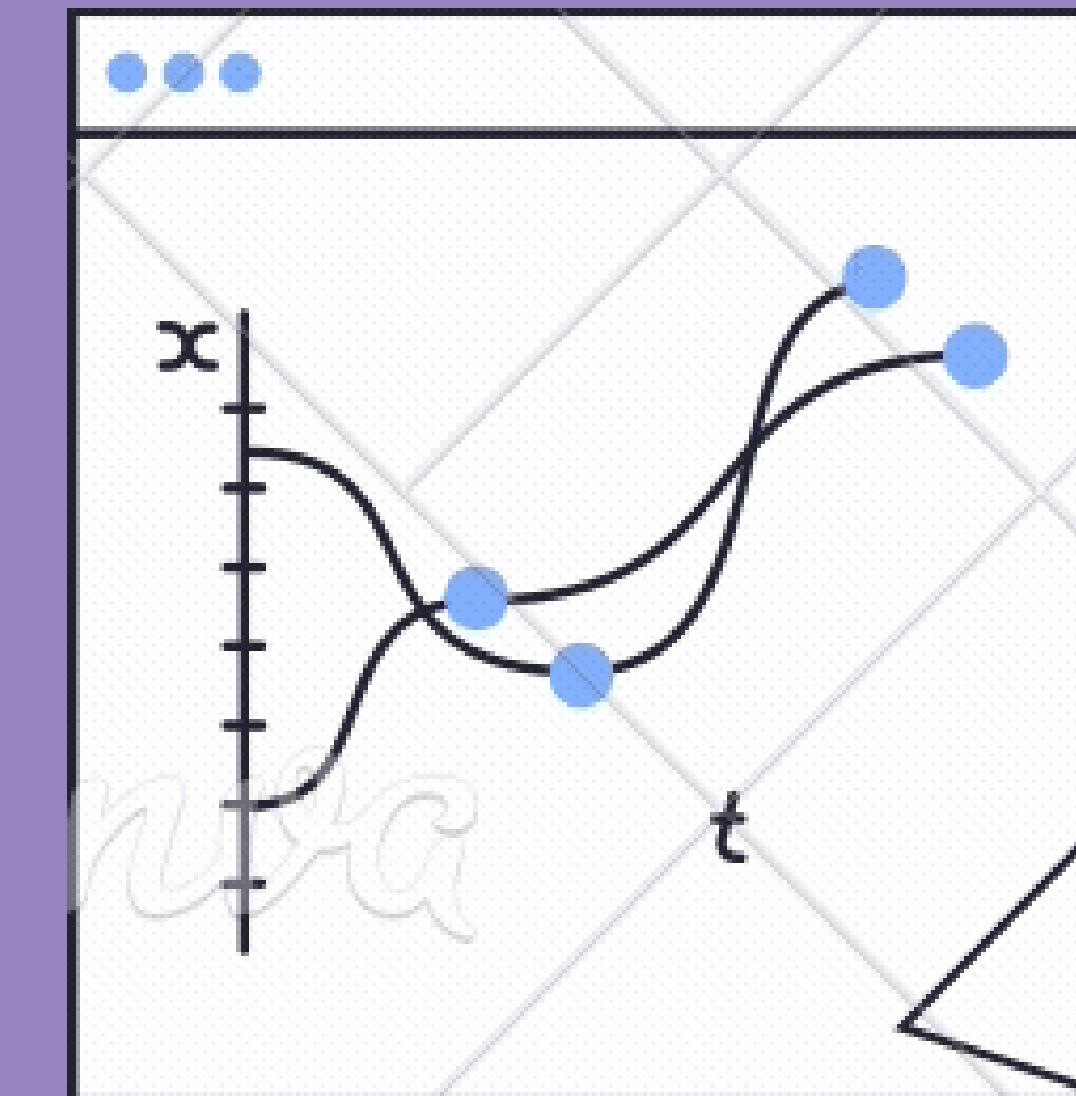
Guidance information

self examination

Detect depression from text

Detect depression from image

Our Project



1-Artificial intelligence



We used two tests to predict depression



image test

No one understands what I'm going through, and I feel very lonely and isolated.

text test

Project Diagram

We will see how to use our application to understand the input "image" of the face and the input "text" for label prediction

Dataset

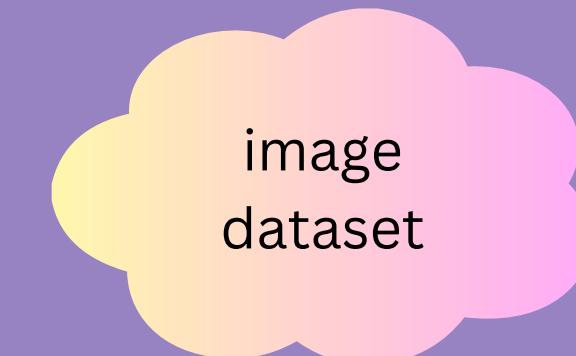
Preprocessing

classifier

Label

DATASET

<https://www.kaggle.com/datasets/muhammadusmansaeed/depression?select=train>



<https://www.kaggle.com/datasets/nikhileswarkomati/suicide-watch>



image
dataset

Depression

Train (12102)
class0:Depressed(4938)
class1:Non Depressed(7164)

Test (2964)
class0:Depressed
class1:Non Depressed

Class 1



Class 0



Class 1



Class 0



text
dataset

Suicide and Depression Detection

class0:Depressed(116037)
class1:Non Depressed(116037)

What you guys
gaming? Any
good games your
playing?

i need help just
help me im
crying so hard

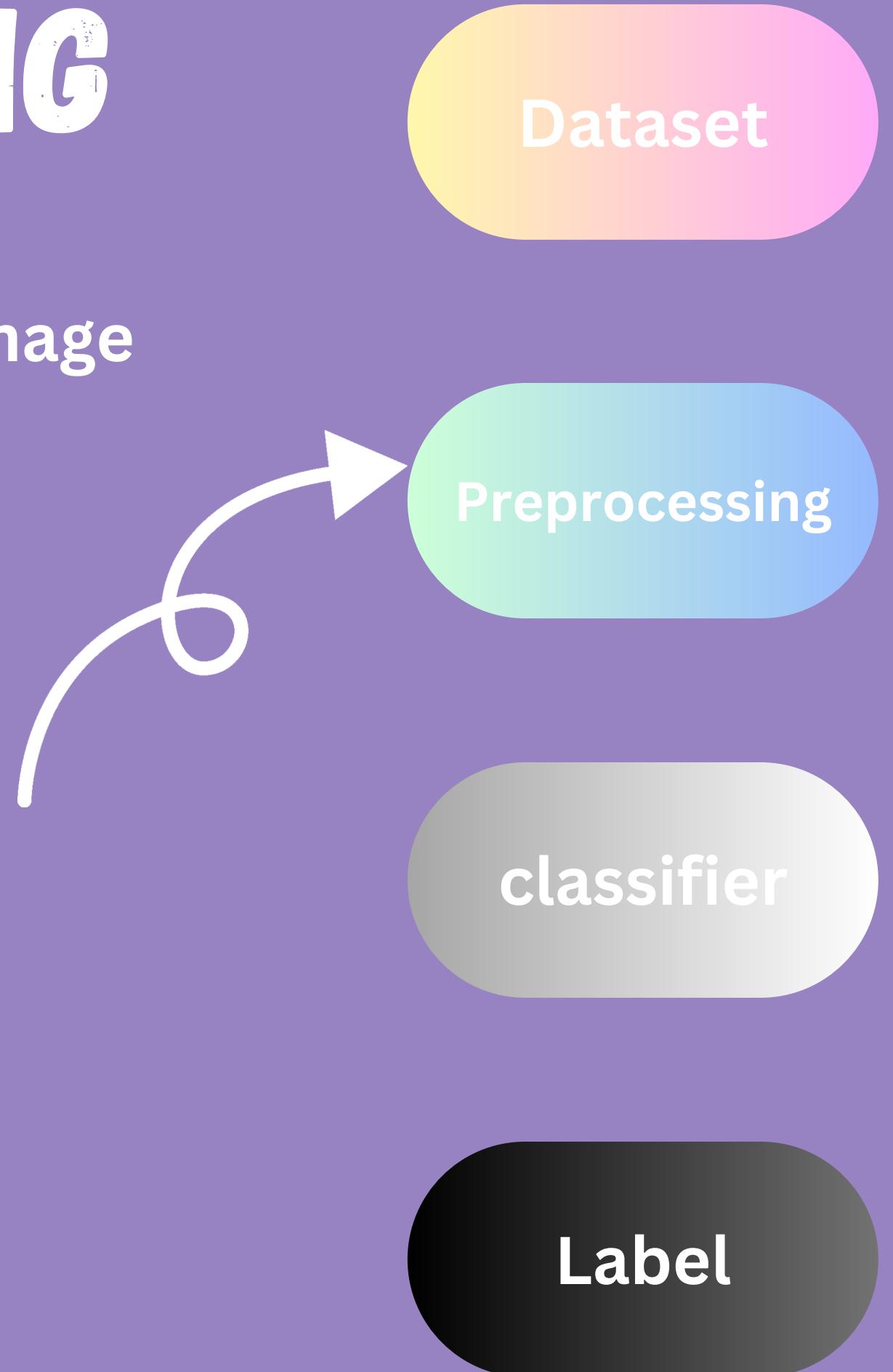
PREPROCESSING

We use preprocessing to improve the quality of image so we can analyze it in better way.

Techniques used:

Median equalization

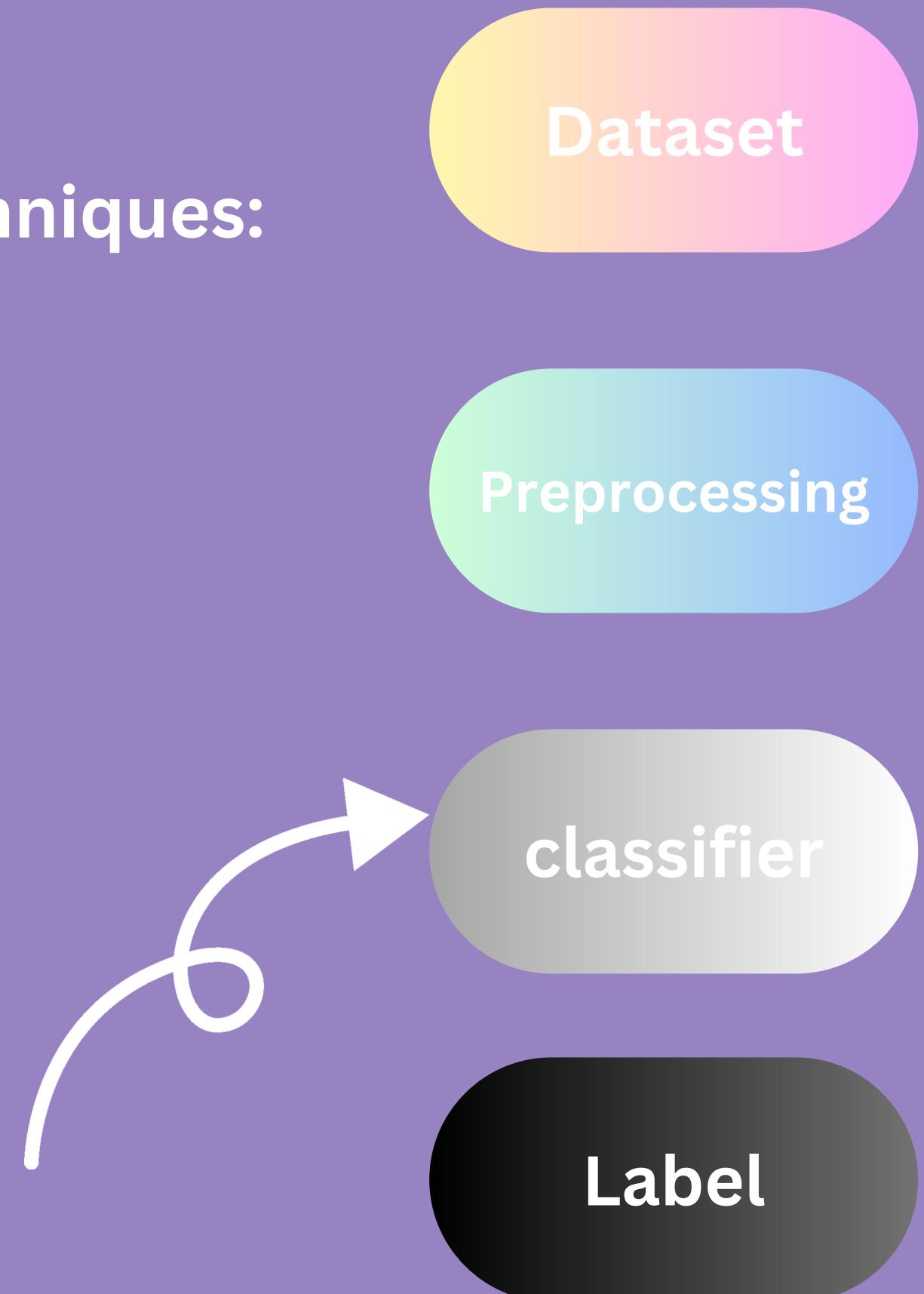
Image Data Generator

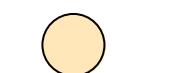


CLASSIFIER

We use some of important machine learning techniques:

1. Supposed vector machine(SVM)
2. k nearest neighbor(KNN)
3. Random forest
4. logistic regression
5. naive Bayes





SVM



KNN



RANDOM FOREST



LOGISTIC
REGRESSION



NAIVE BAYE

• 0.90

• 0.85

• 0.80

• 0.75

• 0.70

• 0.65

• 0.60

• 0.55

• 0.50

ACCURACY

>

PRECISION

>

RECALL

>

F1_SCORE

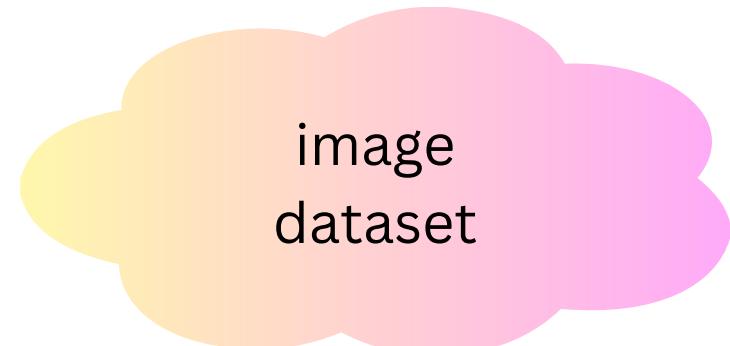
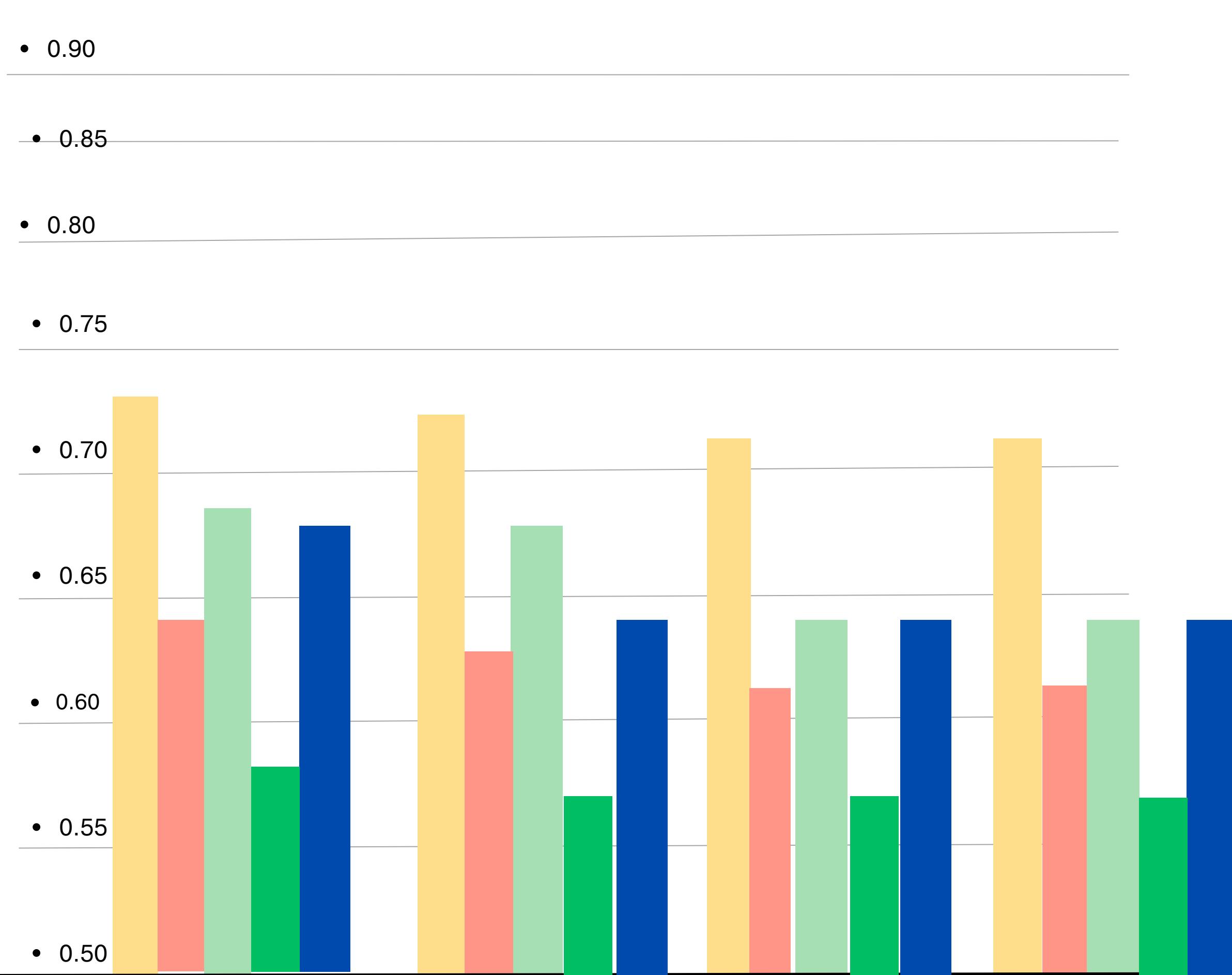
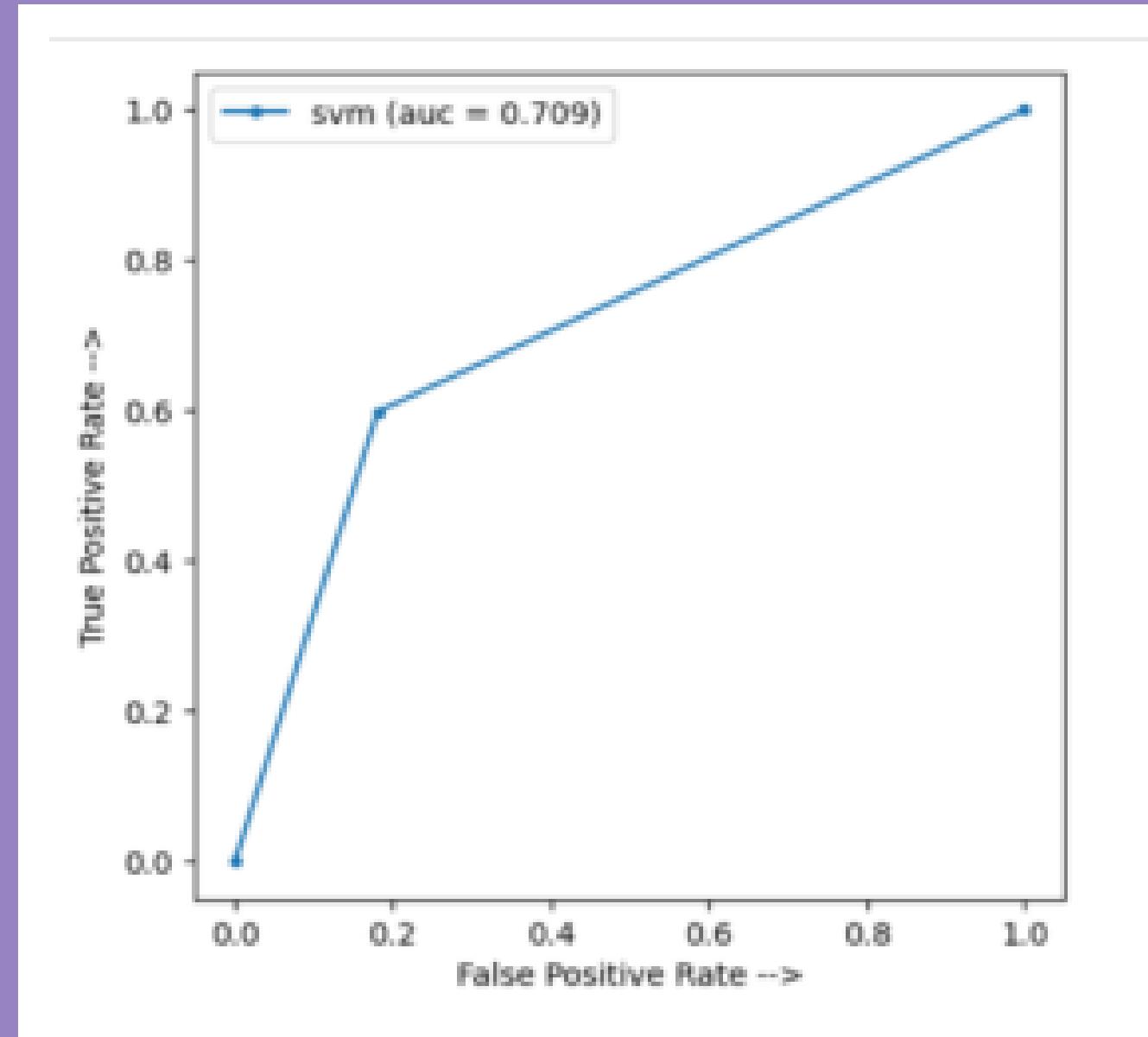
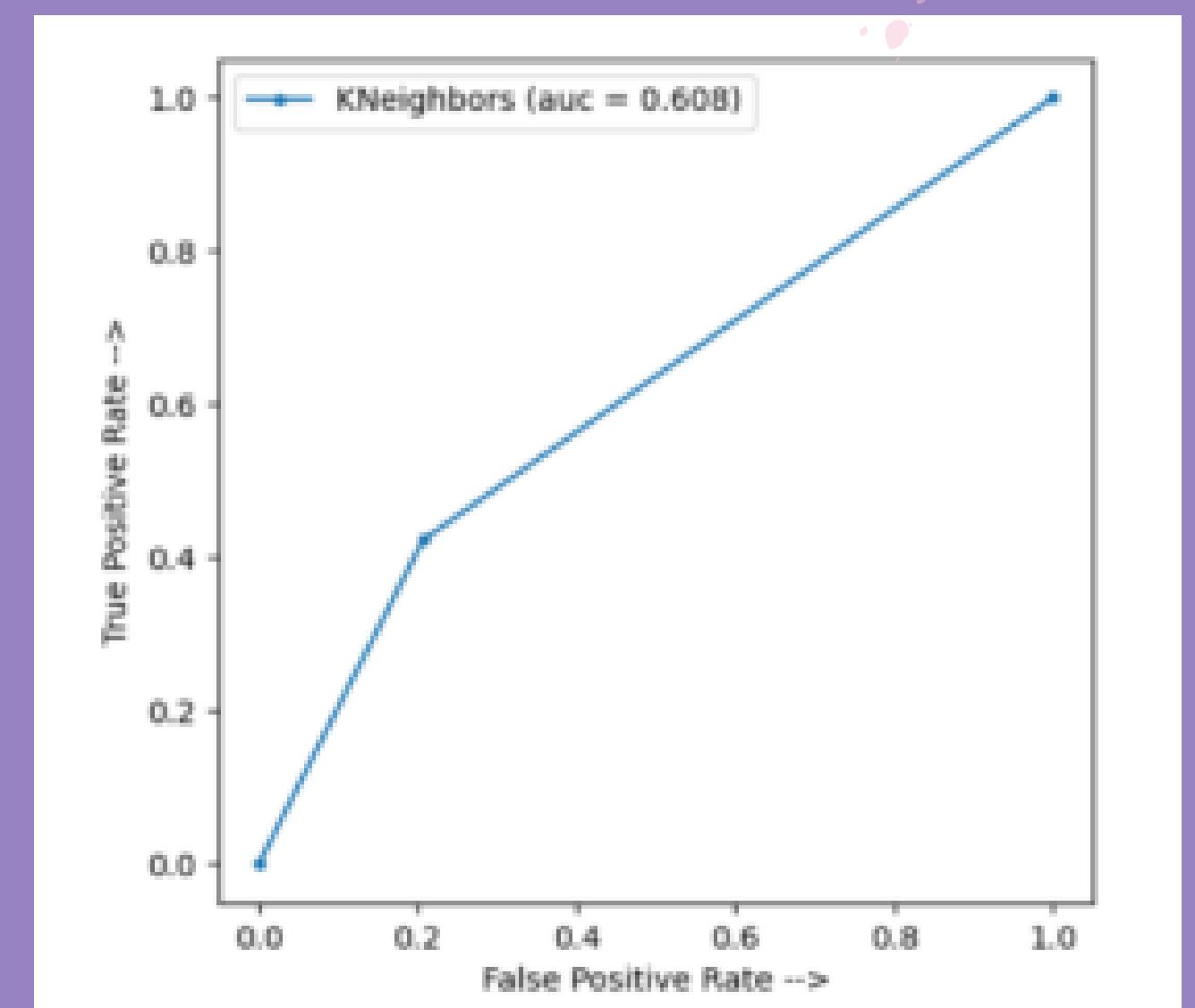


image
dataset

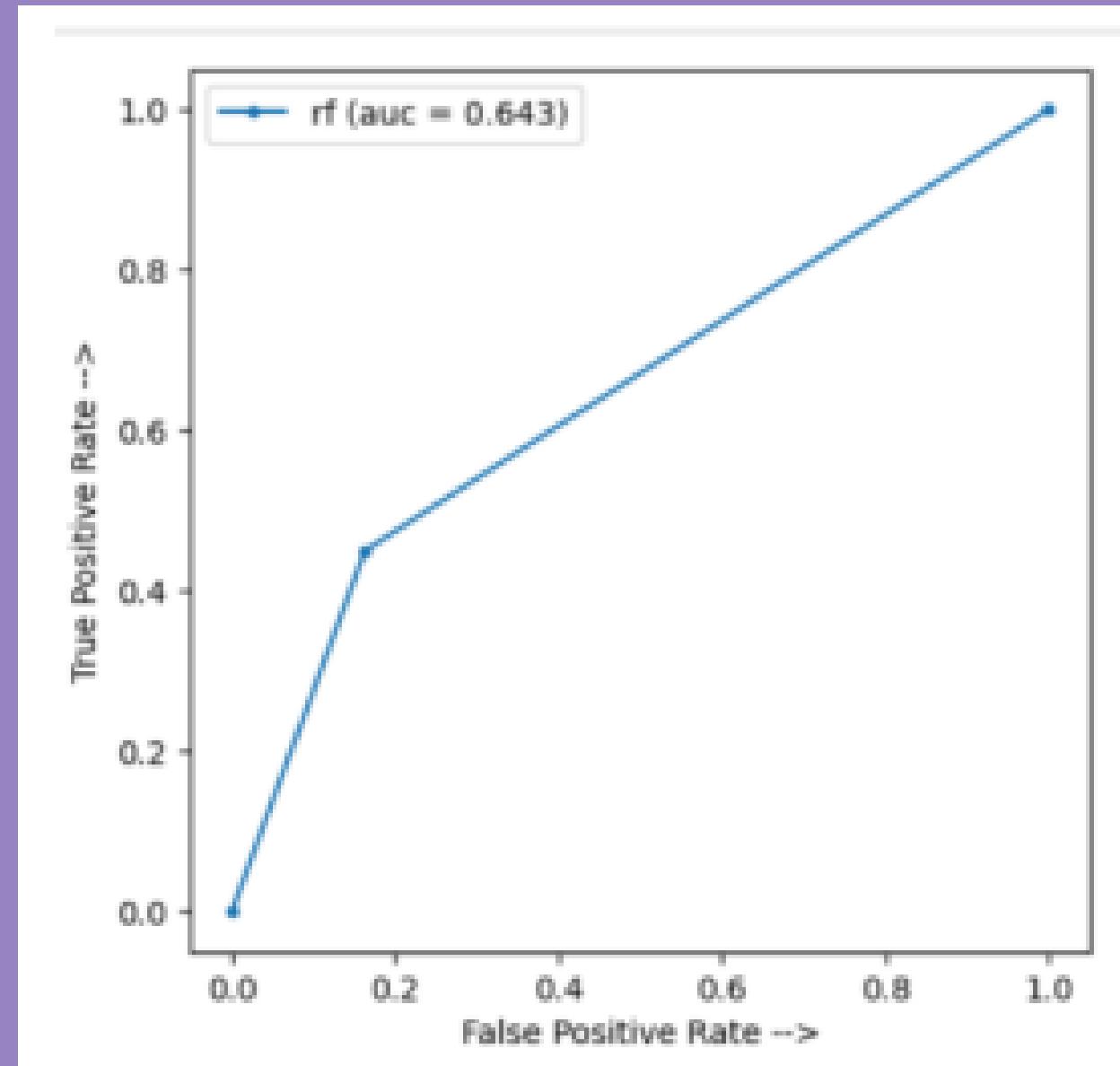




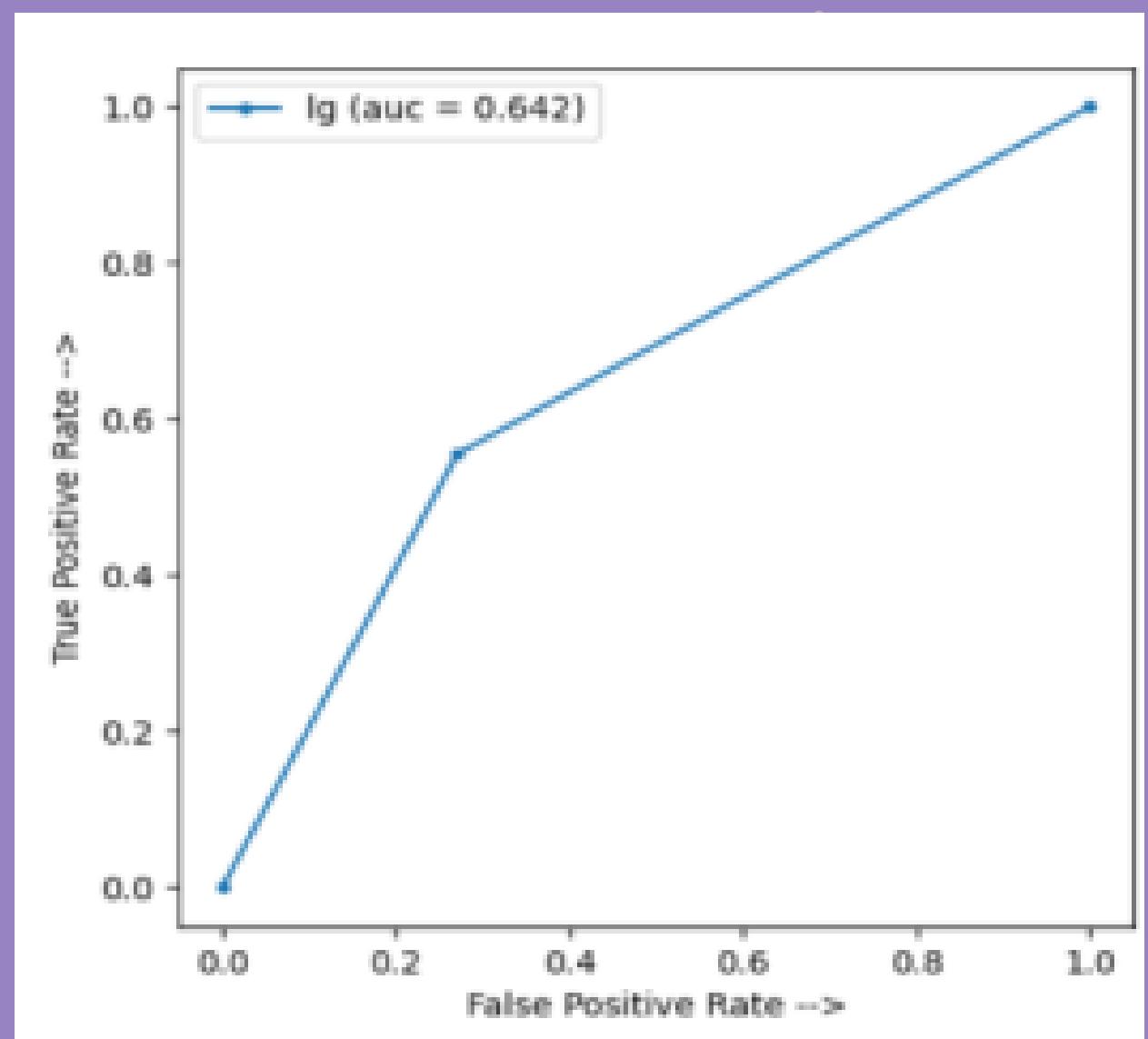
ROC curve of image in SVM



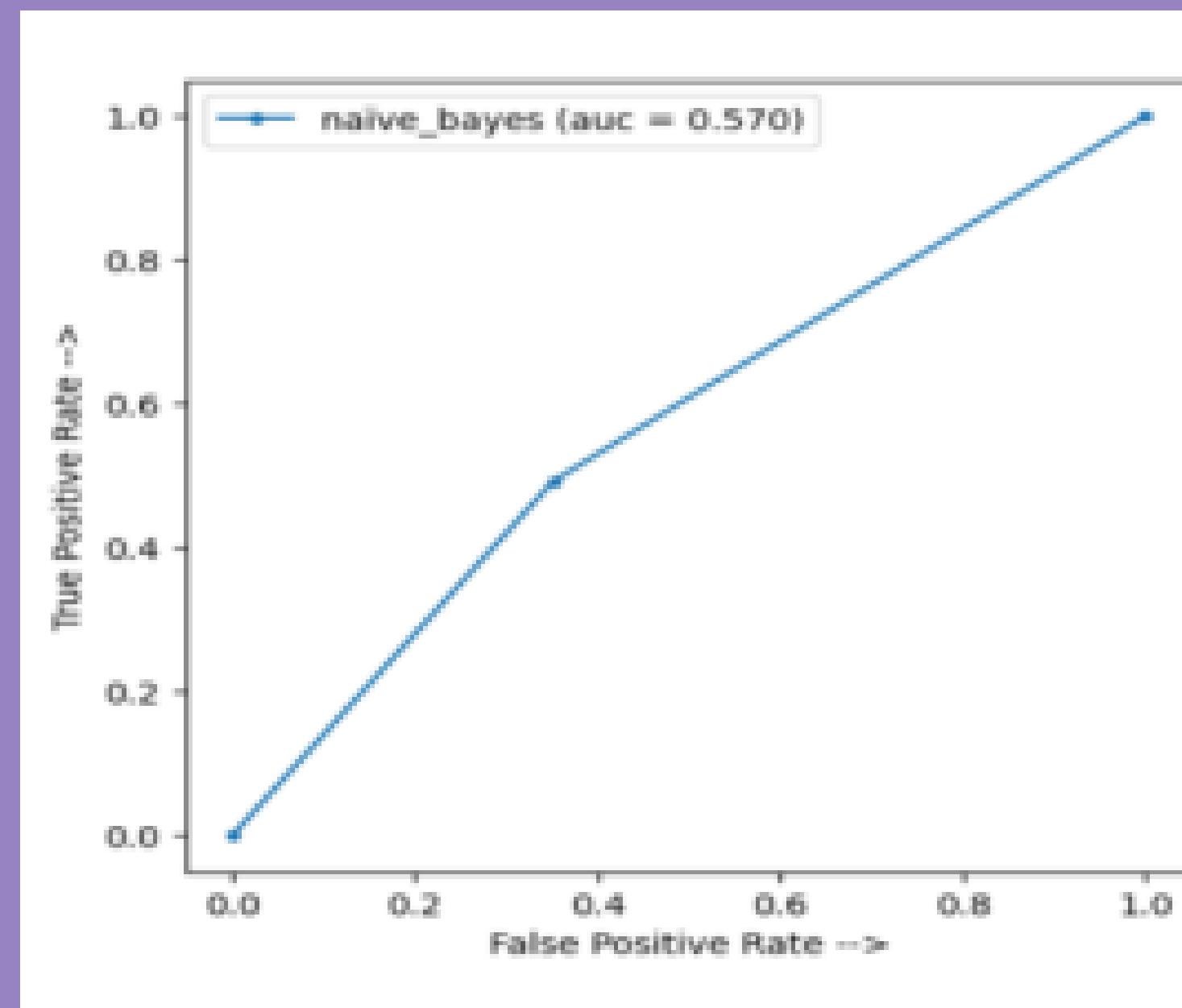
ROC curve of image in KNN



ROC curve of image in RF



ROC curve of image in LR



ROC curve of image in NB

Based on result of training models
Best accuracy of image in SVM algorithm

73%

The result is not good enough



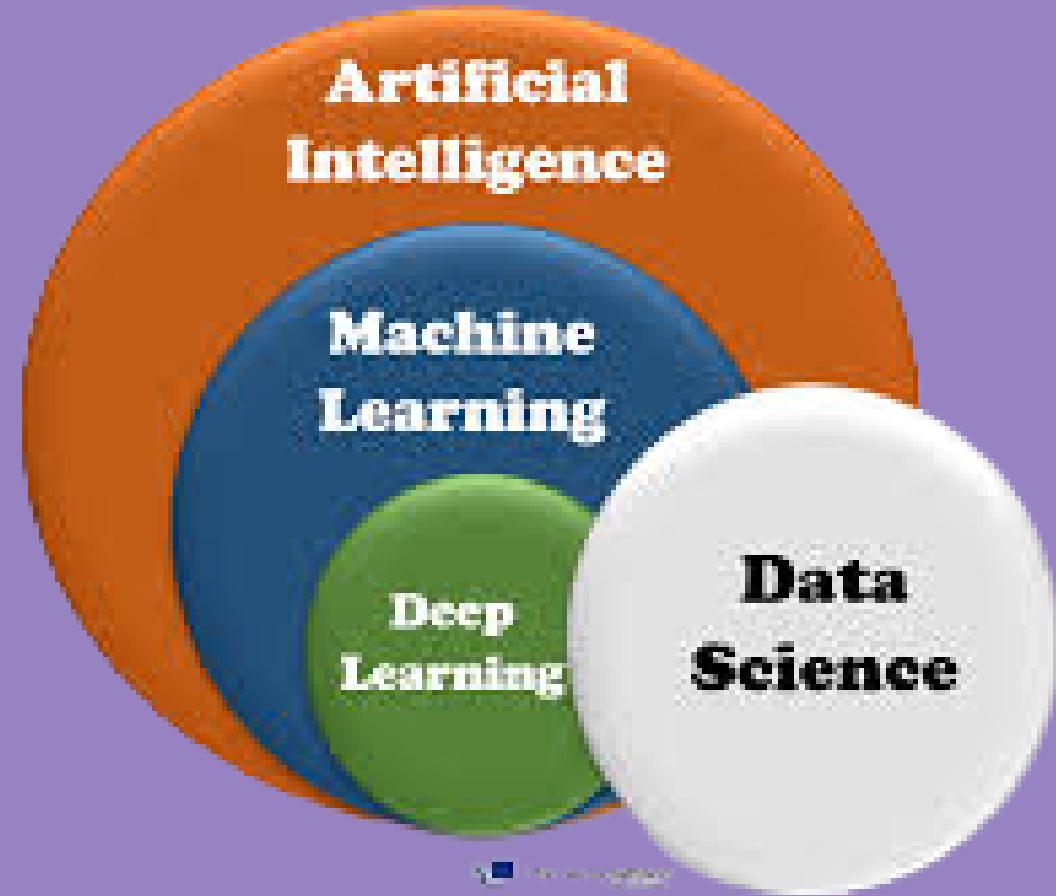


Deeb Learning in images

DL produce much better results than MI . Instead of feature extraction dl has hidden layers.

In this part we use some of deep learning techniques:-

- 1.CNN**
- 2.VGG 16**
- 3.VGG 19**



CNN

In CNN model we use some of layers
conv2d,max pooling

Layer (type)	Output Shape	Param #
conv2d (Conv2D)	(None, 126, 126, 32)	320
max_pooling2d (MaxPooling2D)	(None, 63, 63, 32)	0
conv2d_1 (Conv2D)	(None, 61, 61, 32)	9248
max_pooling2d_1 (MaxPooling2D)	(None, 30, 30, 32)	0
flatten (Flatten)	(None, 28800)	0
dense (Dense)	(None, 128)	3686528
dense_1 (Dense)	(None, 64)	8256
dense_2 (Dense)	(None, 10)	650
dense_3 (Dense)	(None, 2)	22

VGG

**VGG network is constructed with very small convolutional filters
VGG-19 is the as VGG-16 except that the number of layers.**

VGG 16

Table 23: The parameters used in VGG-16 model

Layer (type)	Output Shape	# Parameters
block1_conv1 (Conv2D)	(None, 64, 64, 64)	1729
block1_conv2 (Conv2D)	(None, 64, 64, 64)	36928
block1_pool (MaxPooling2D)	(None, 32, 32, 64)	0
block2_conv1 (Conv2D)	(None, 32, 32, 128)	73856
block2_conv2 (Conv2D)	(None, 32, 32, 128)	147584
block2_pool (MaxPooling2D)	(None, 16,16, 128)	0
conv2d (Conv2D)	(None, 16,16, 128)	147584
batch_normalization (Batch Normalization)	(None, 16,16, 128)	512
dropout (Dropout)	(None, 16,16, 128)	0
max_pooling2d (MaxPooling2D)	(None, 8, 8, 128)	0
conv2d_1 (Conv2D)	(None, 8, 8, 64)	73792
batch_normalization_1(Batch Normalization)	(None, 8, 8, 64)	256
dropout_1 (Dropout)	(None, 8, 8, 64)	0
max_pooling2d_1 (MaxPooling2D)	(None, 4,4, 64)	0
conv2d_2 (Conv2D)	(None, 4 ,4, 32)	18464

dropout_2 (Dropout)	(None, 4 ,4, 32)	0
max_pooling2d_2 (MaxPooling2D)	(None, 2, 2, 32)	0
flatten (Flatten)	(None, 128)	0
dropout_3 (Dropout)	(None128,)	0
dense (Dense)	(None, 256)	33024
Dense_1 (Dense)	(None, 2)	514

VGG 19

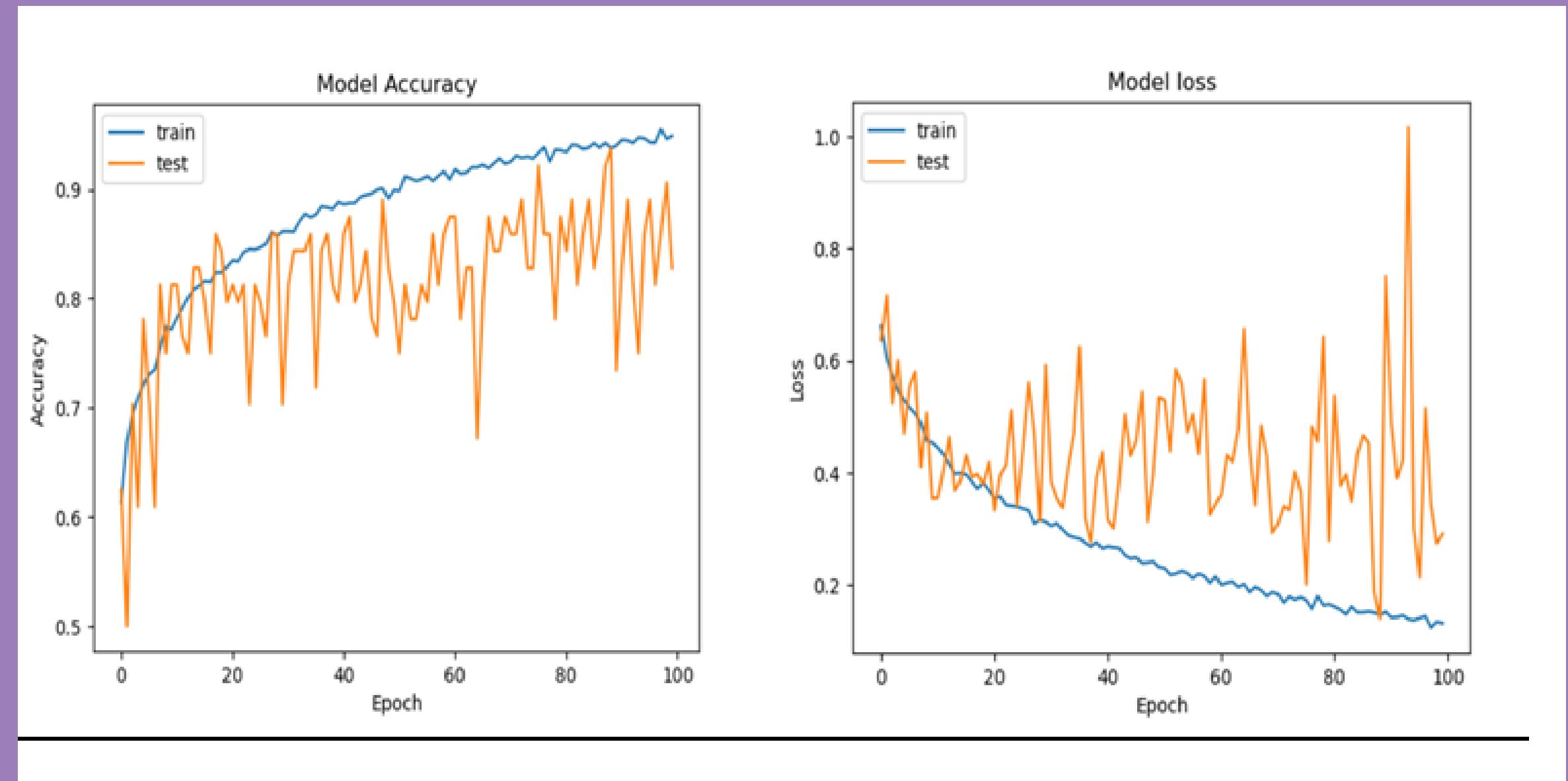
Table 26: The parameters used in VGG-19 model

Layer (type)	Output Shape	# Parameters
block1_conv1 (Conv2D)	(None, 64, 64, 64)	1729
block1_conv2 (Conv2D)	(None, 64, 64, 64)	36928
block1_pool (MaxPooling2D)	(None, 32, 32, 64)	0
block2_conv1 (Conv2D)	(None, 32, 32, 128)	73856
block2_conv2 (Conv2D)	(None, 32, 32, 128)	147584
block2_pool (MaxPooling2D)	(None, 16,16, 128)	0
conv2d (Conv2D)	(None, 16,16, 128)	147584
batch_normalization (Batch Normalization)	(None, 16,16, 128)	512
dropout (Dropout)	(None, 16,16, 128)	0
max_pooling2d (MaxPooling2D)	(None, 8, 8, 128)	0
conv2d_1 (Conv2D)	(None, 8, 8, 64)	73792
dropout_1 (Dropout)	(None, 8, 8, 64)	0
max_pooling2d_1 (MaxPooling2D)	(None, 4,4, 64)	0
conv2d_2 (Conv2D)	(None, 4 ,4, 32)	18464
dropout_2 (Dropout)	(None, 4 ,4, 32)	0
max_pooling2d_2 (MaxPooling2D)	(None, 2, 2, 32)	0

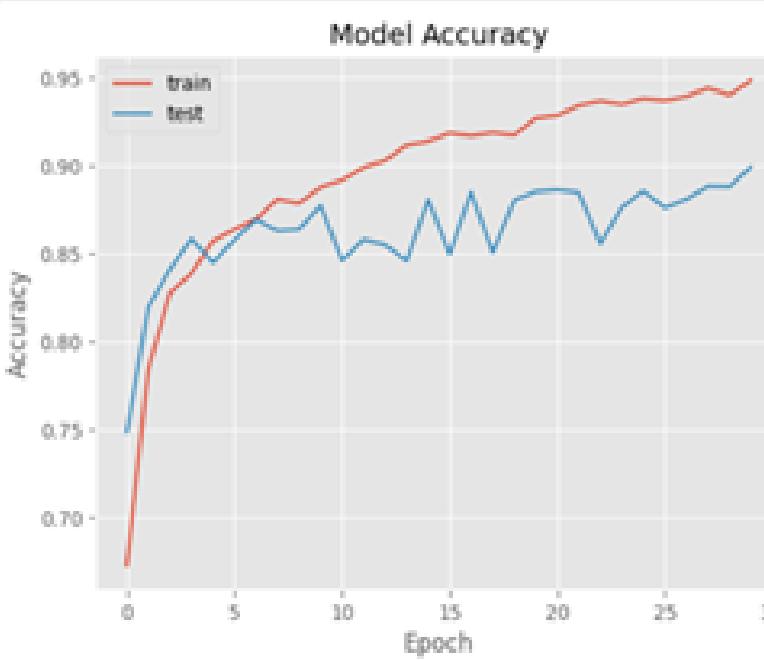
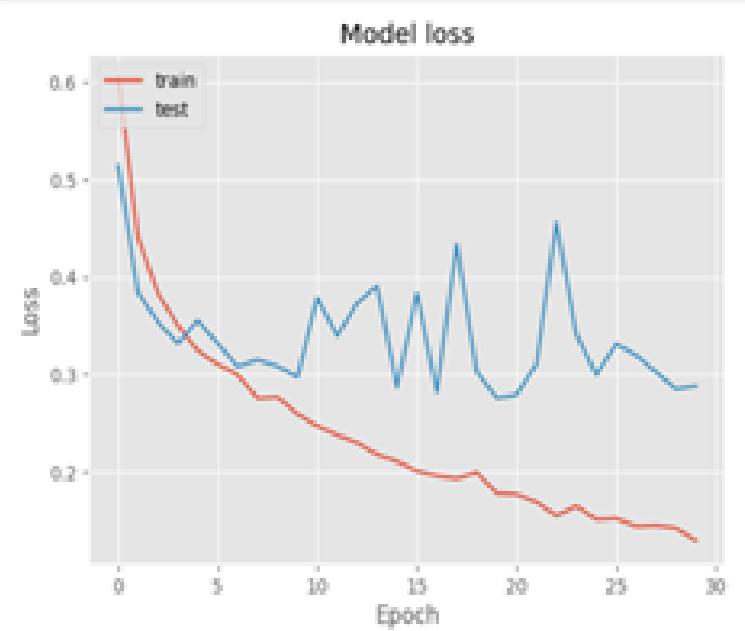
dropout_3 (Dropout)	(None, 128,)	0
dense (Dense)	(None, 256)	33024
Dense_1 (Dense)	(None, 2)	514

CNN has accuracy 94.00%
VGG-16 has accuracy 90.0%
VGG-19 has accuracy 90.0%

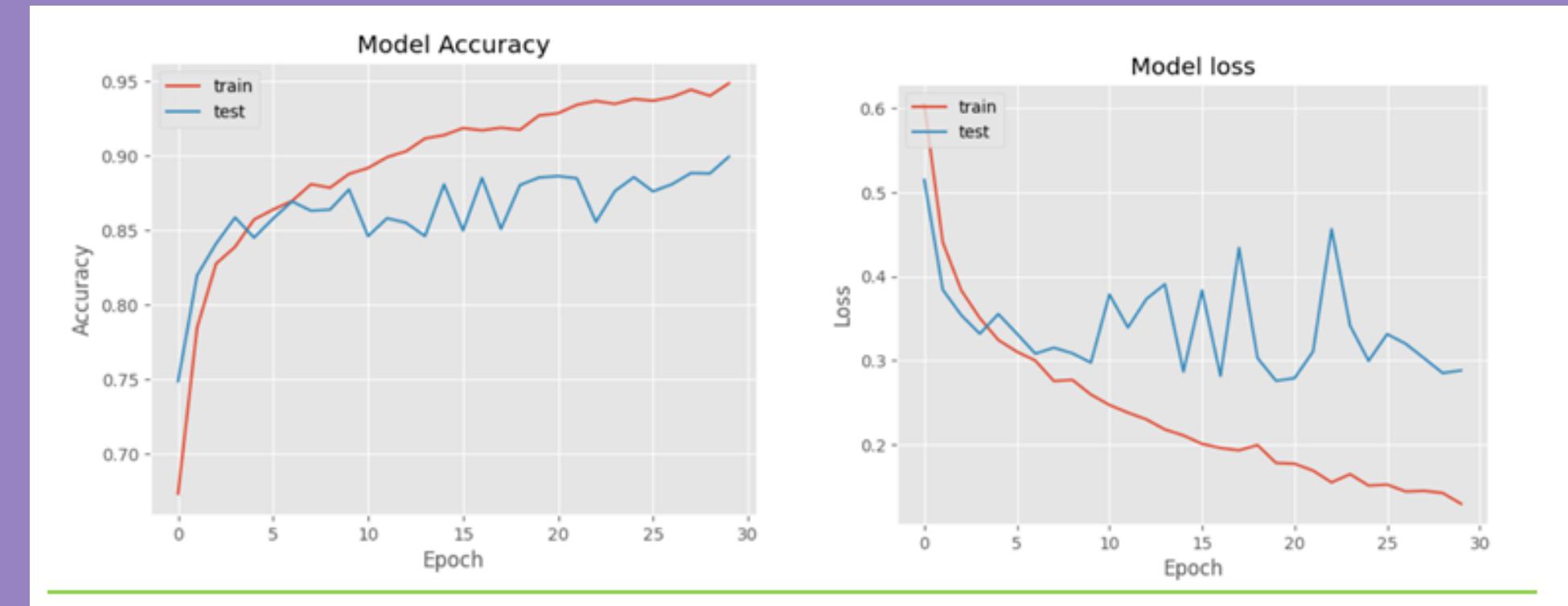




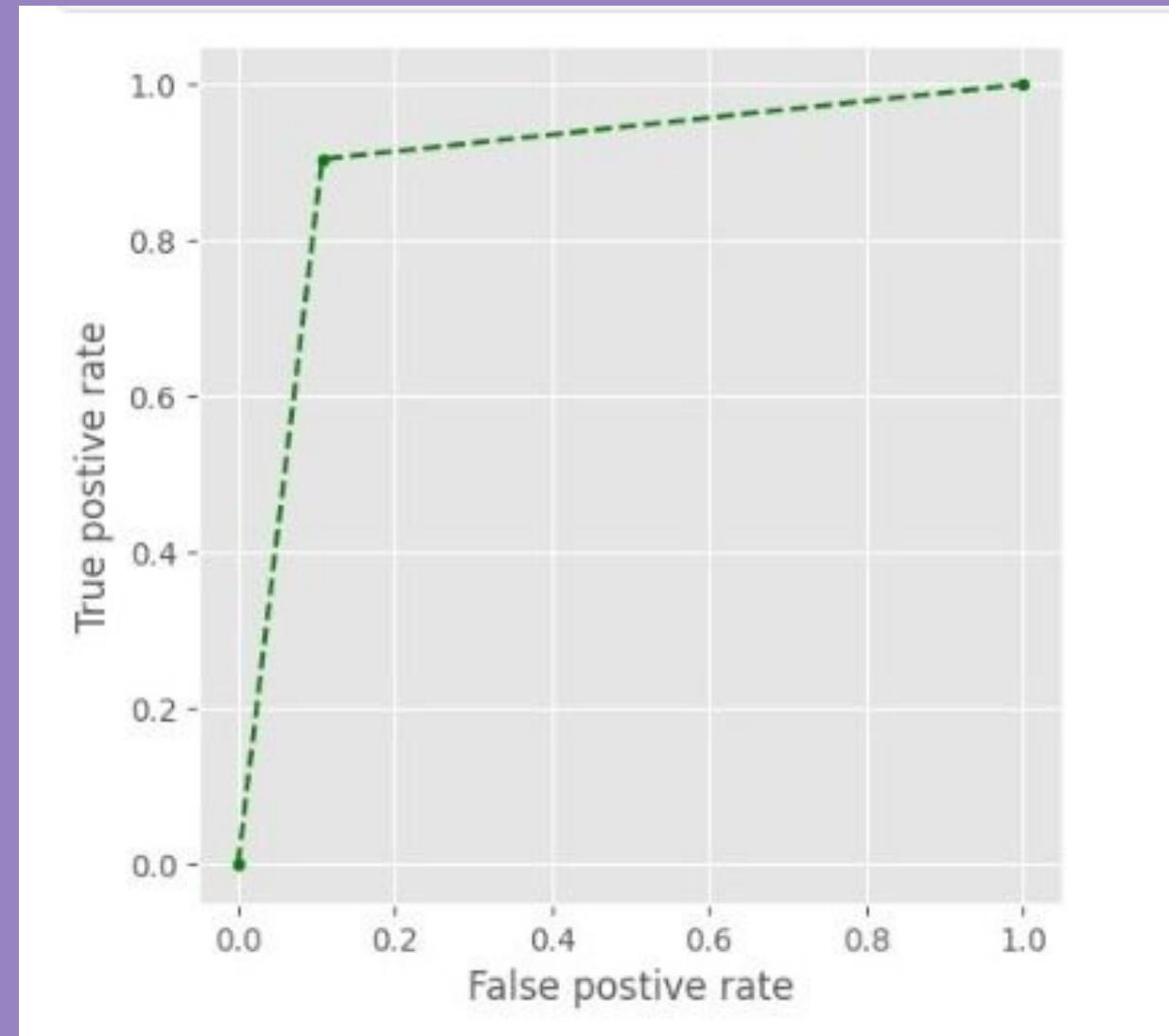
CNN accuracy and loss



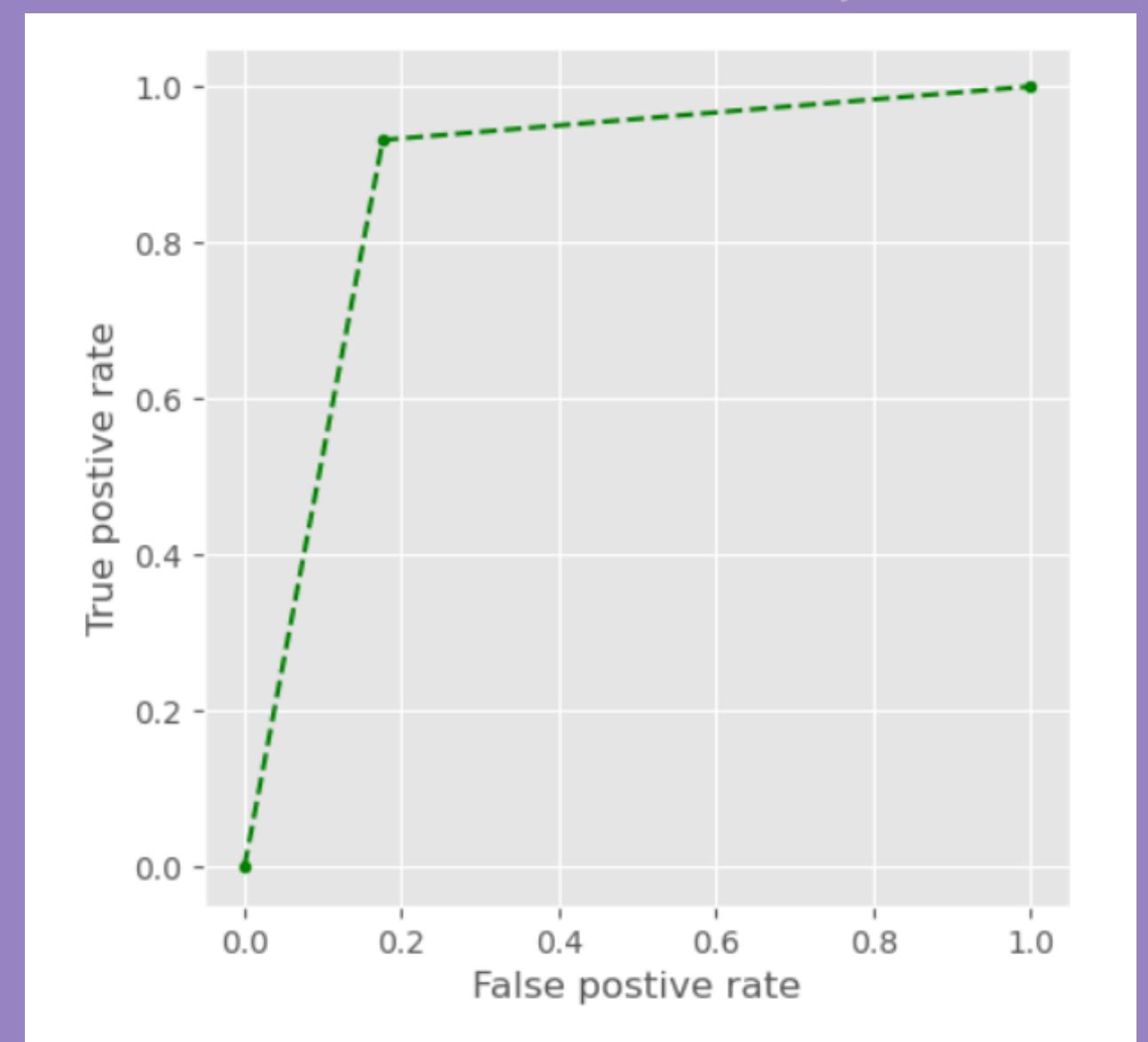
VGG-16 accuracy and loss



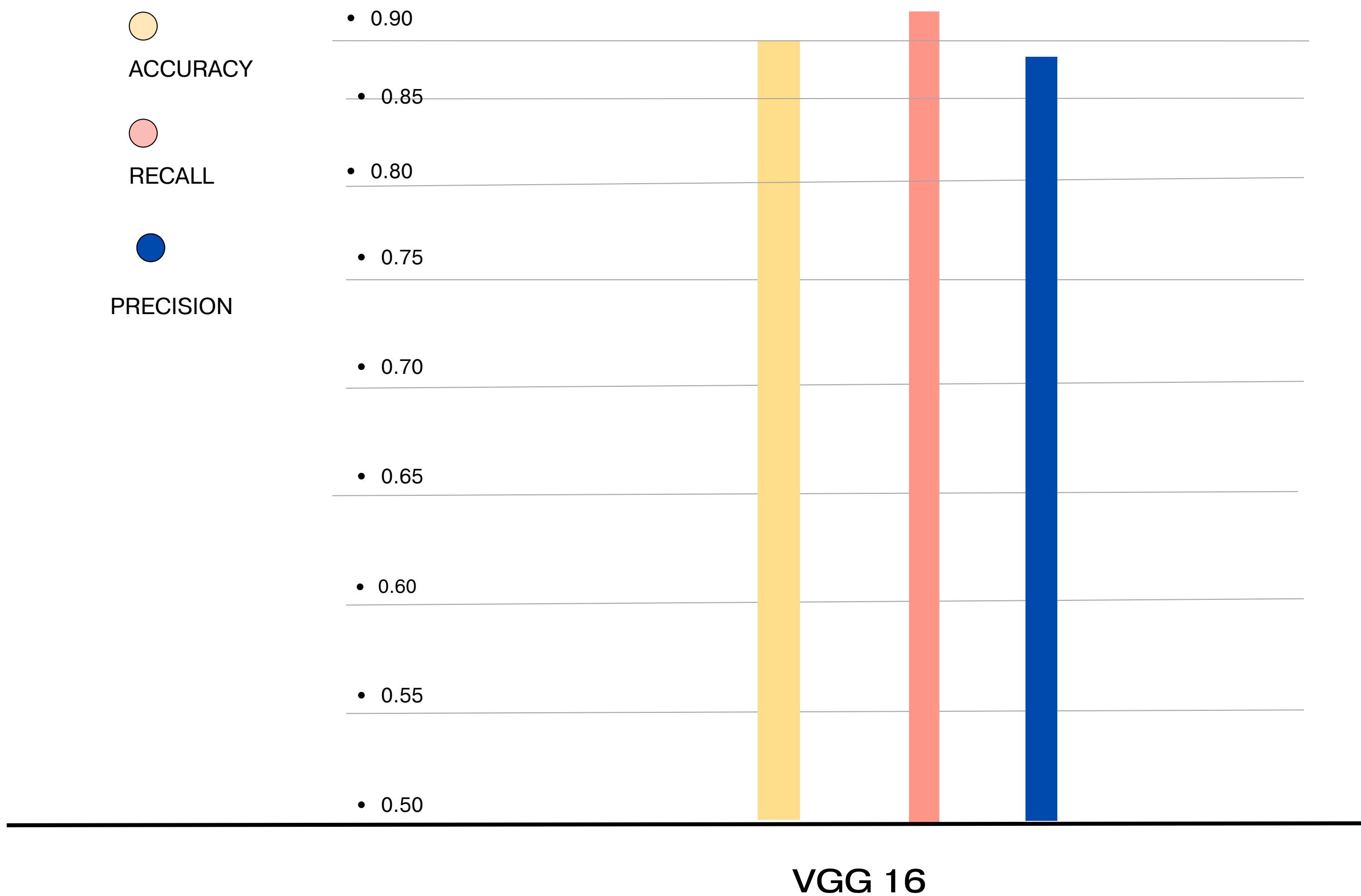
VGG-19 accuracy and loss

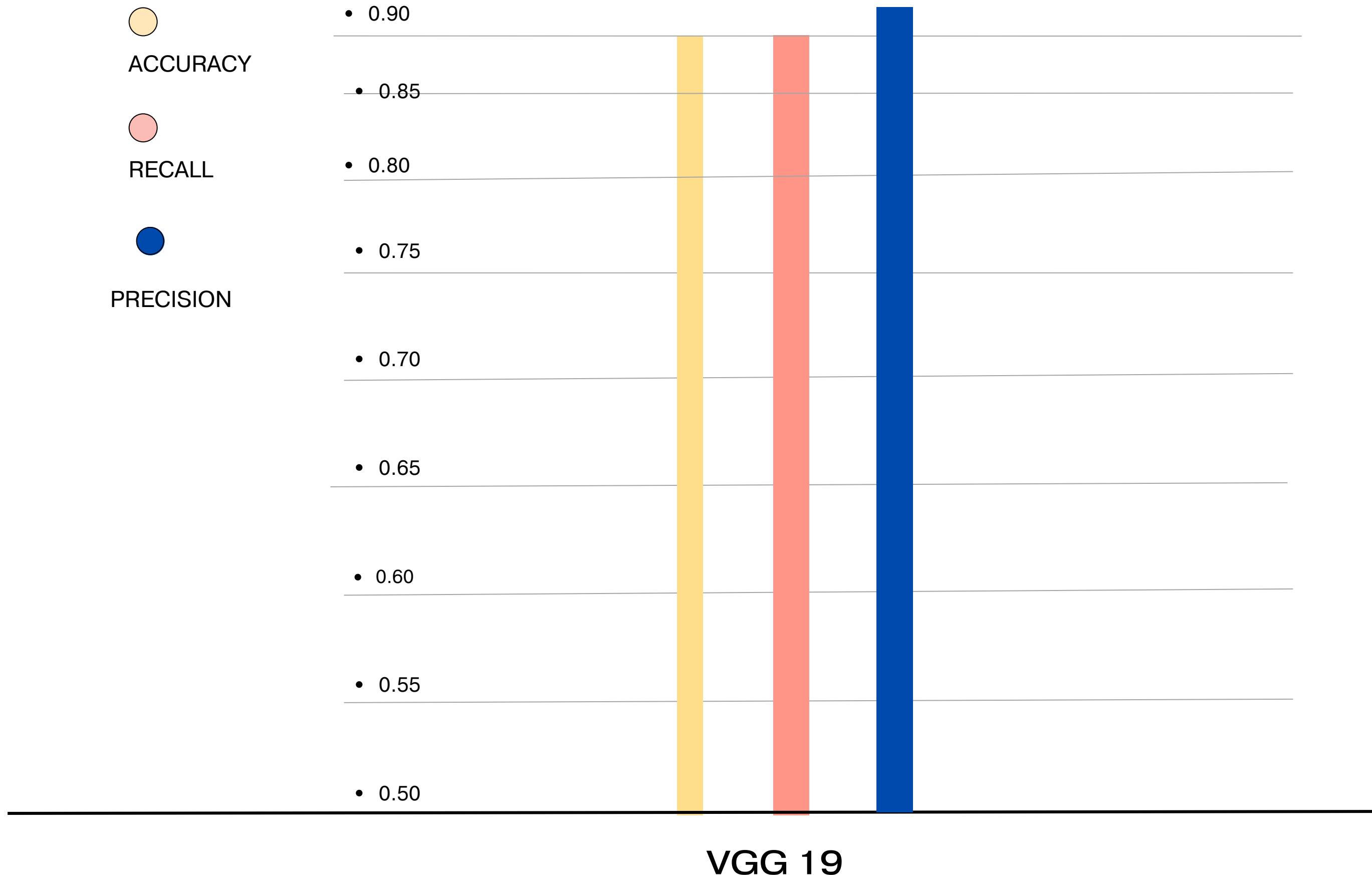


ROC Curve VGG-16



ROC Curve VGG-19





PREPROCESSING

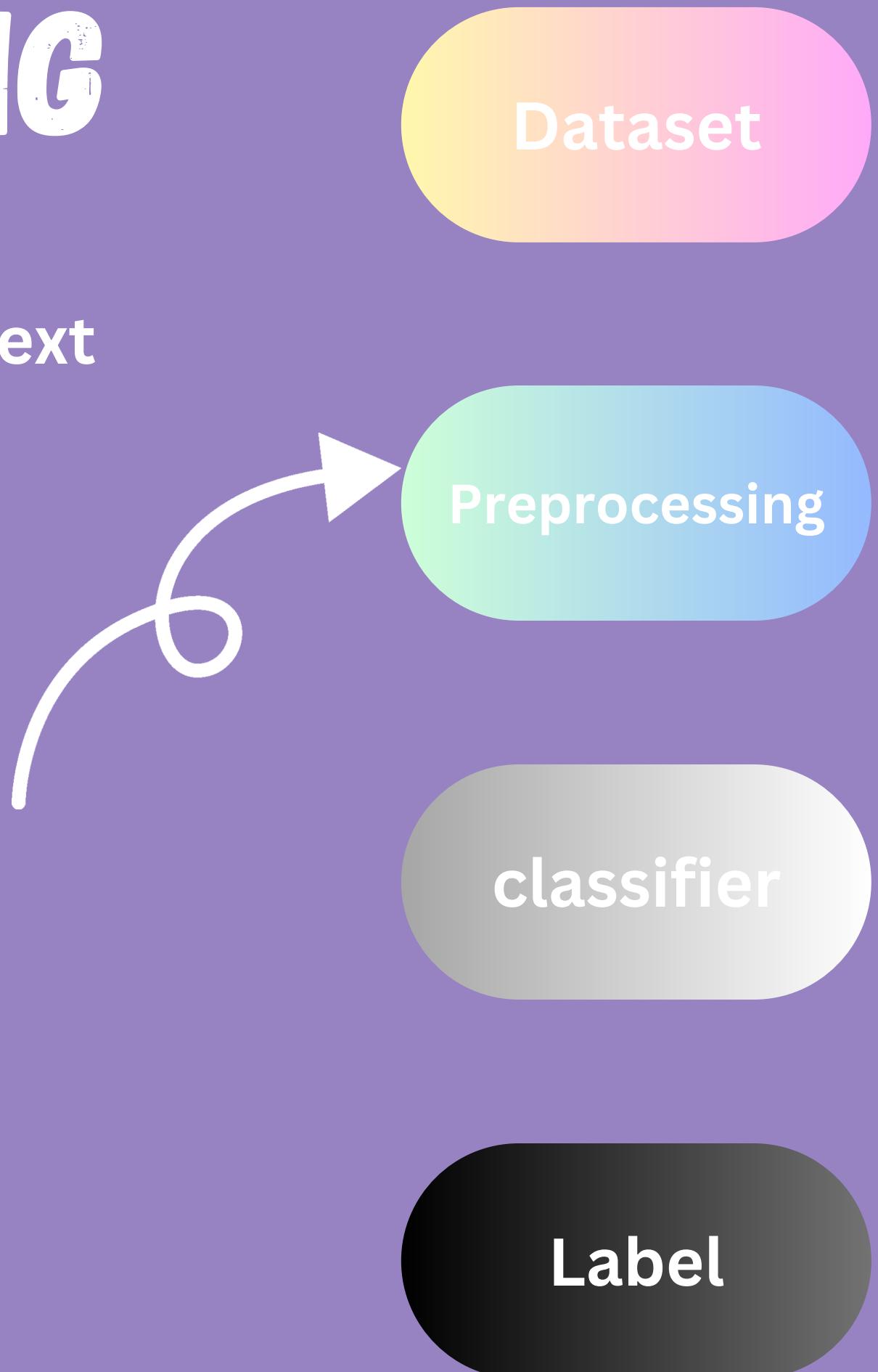
We use preprocessing to improve the quality of text so we can analyze it in better way.

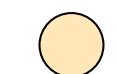
Techniques used:

Removing Stop words

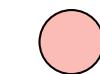
Tokenization word

Tokenizer.word_index

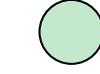




SVM



KNN



RANDOM
FOREST



LOGISTIC
REGRESSION



NAIVE BAYE

• 1.1

• 1

• 0.90

• 0.80

• 0.70

• 0.60

• 0.50

• 0.40

• 0.30

ACCURACY

>

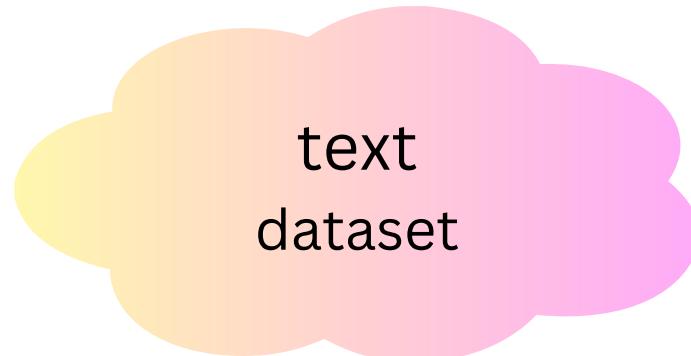
PRECISION

>

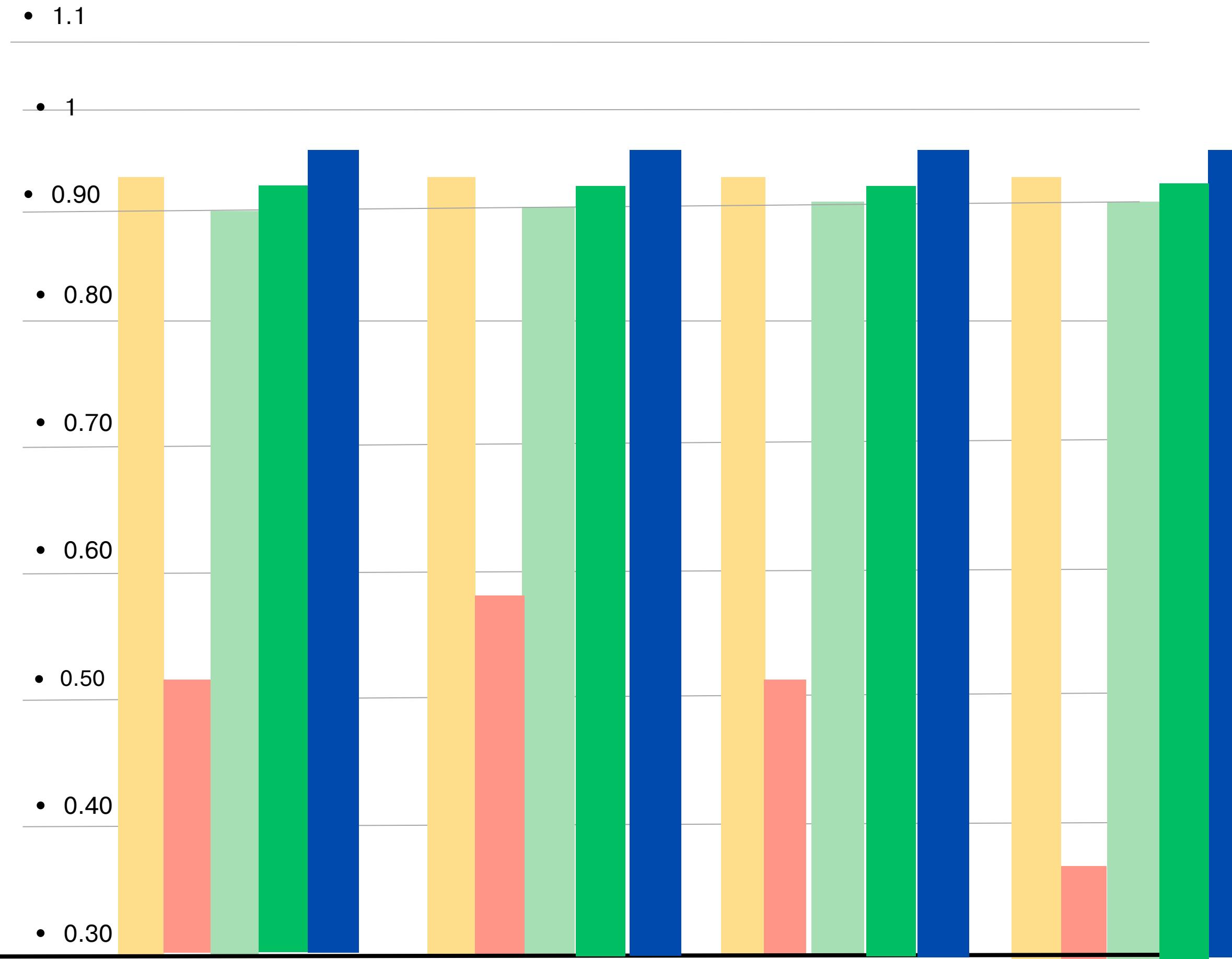
RECALL

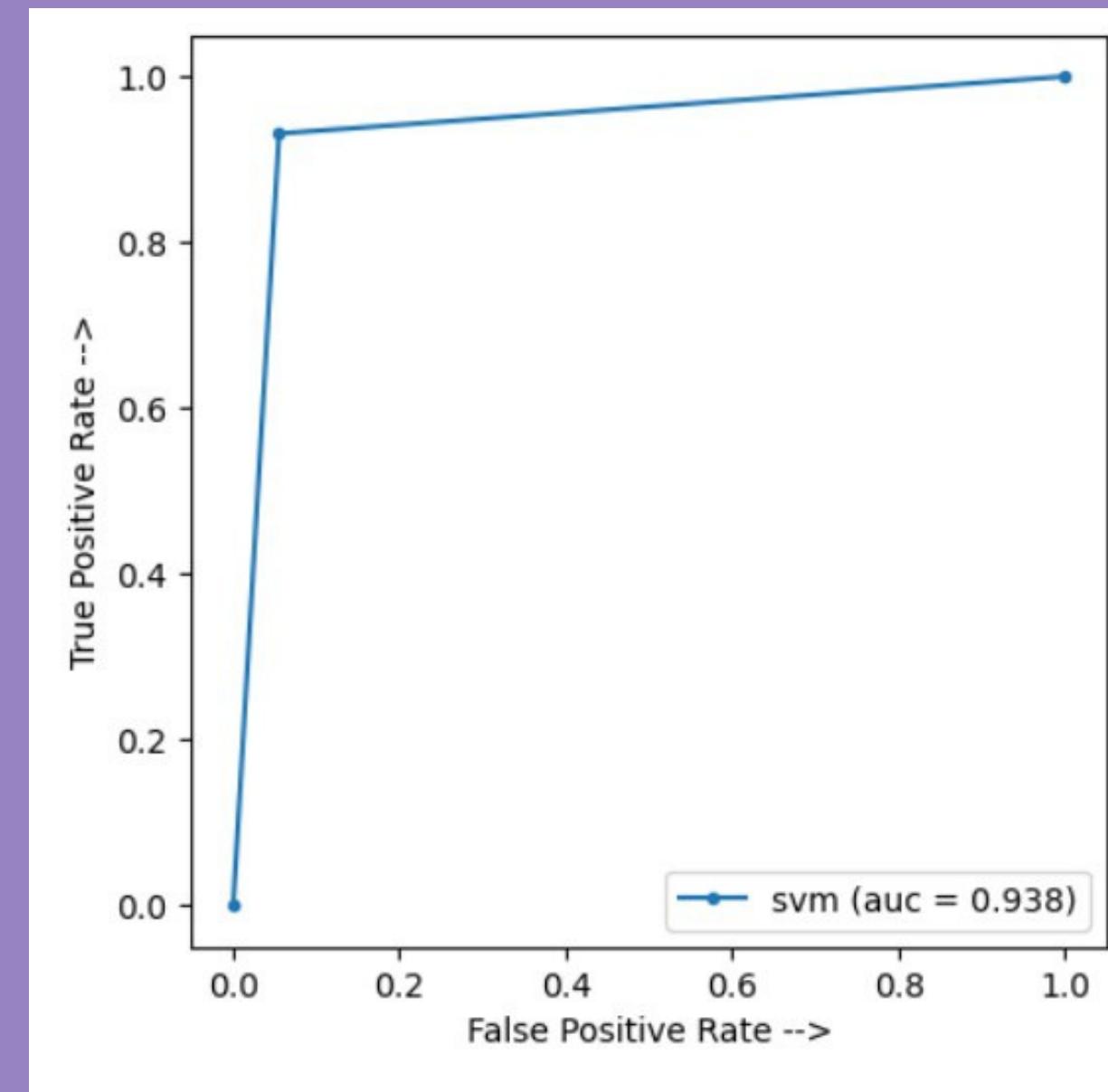
>

F1_SCORE

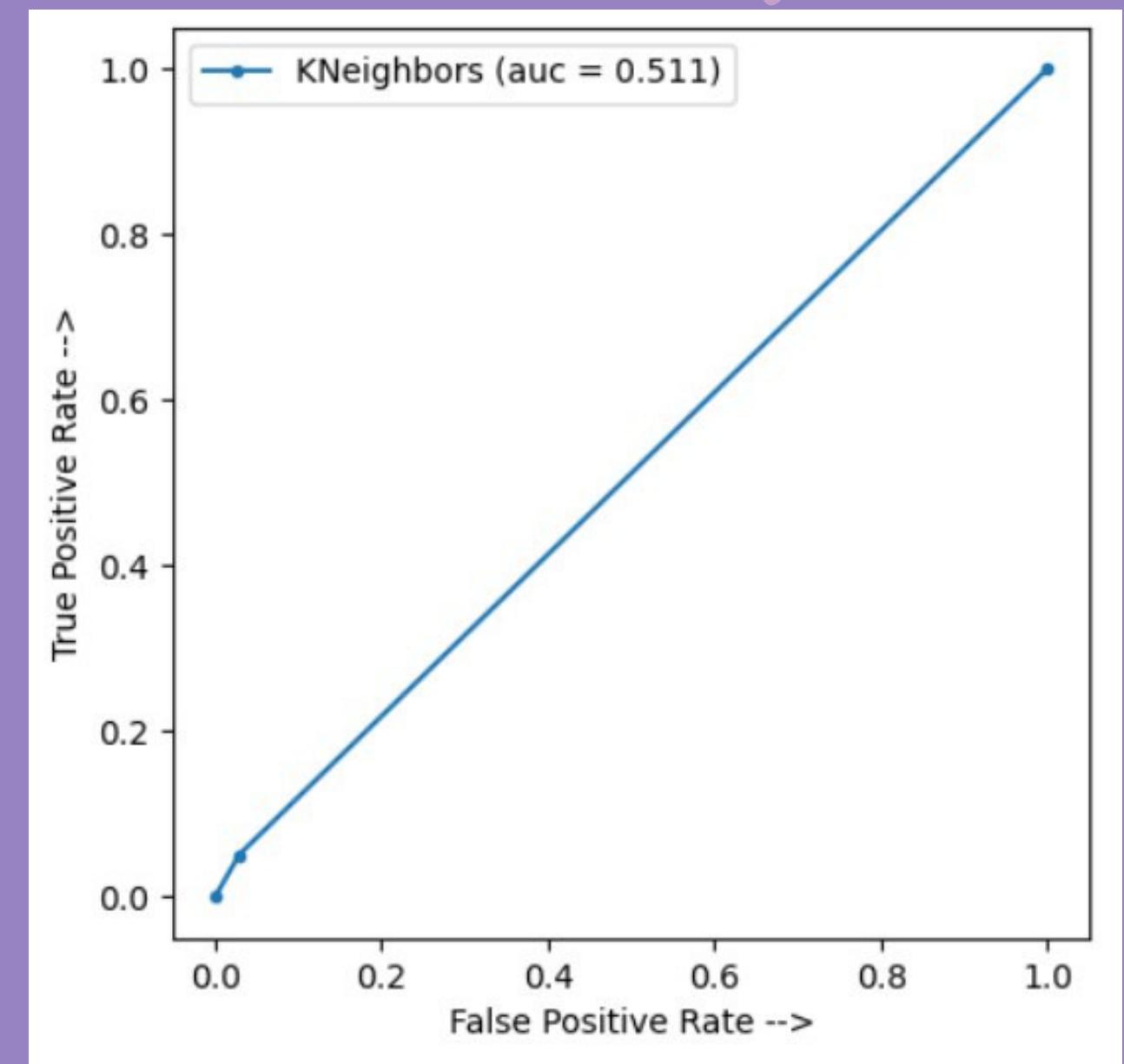


text
dataset

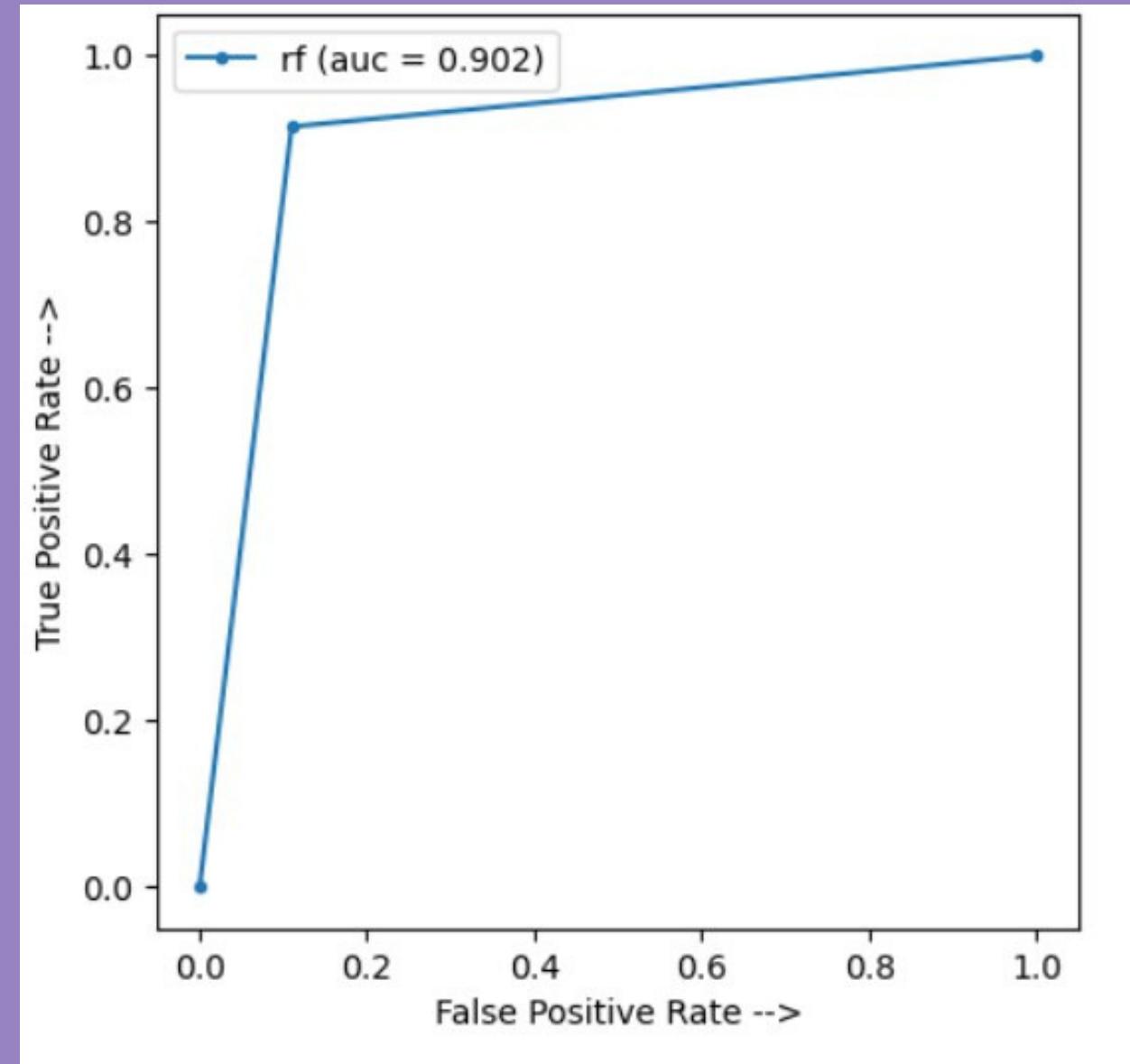




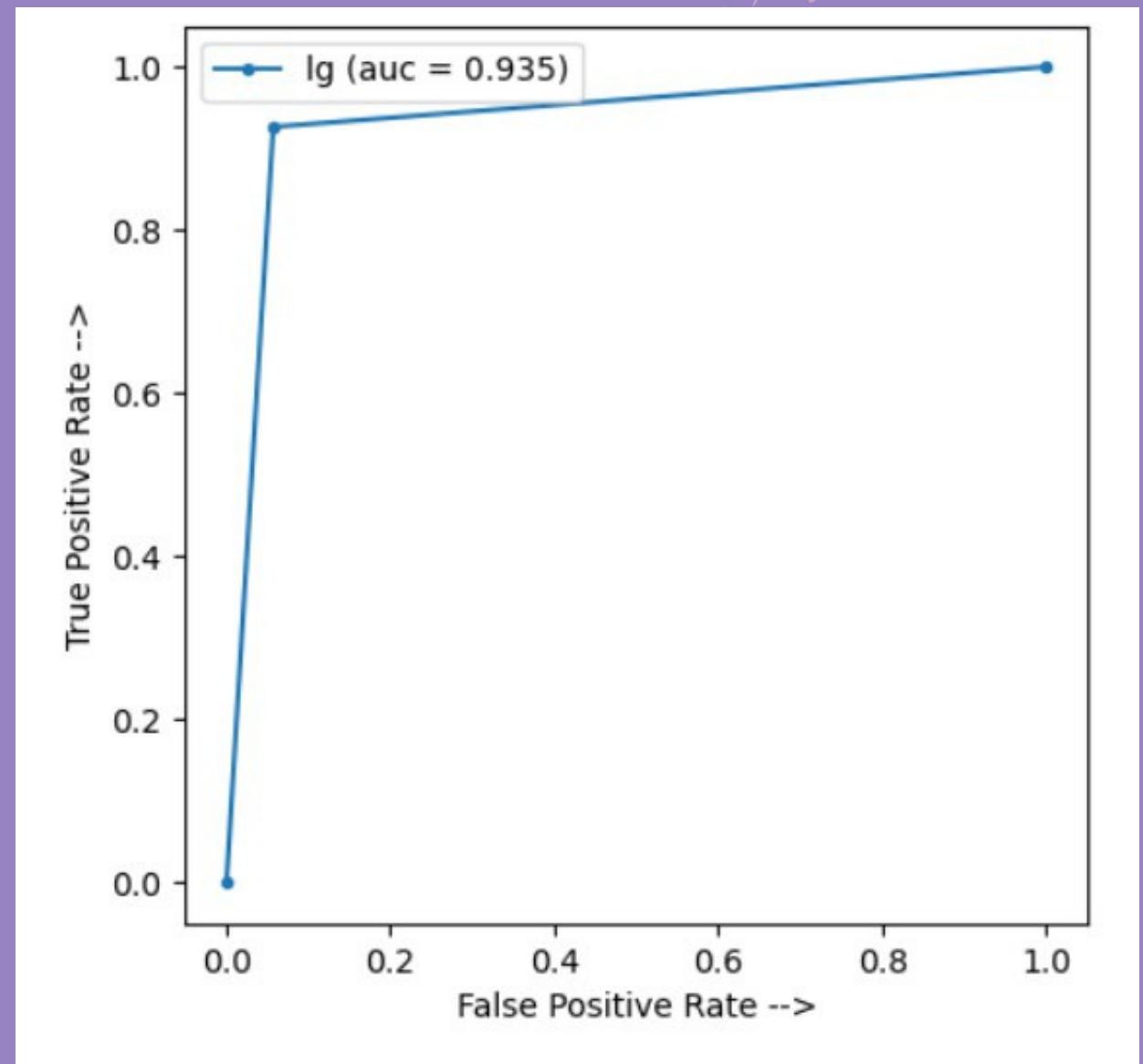
ROC curve of text in SVM



ROC curve of text in KNN

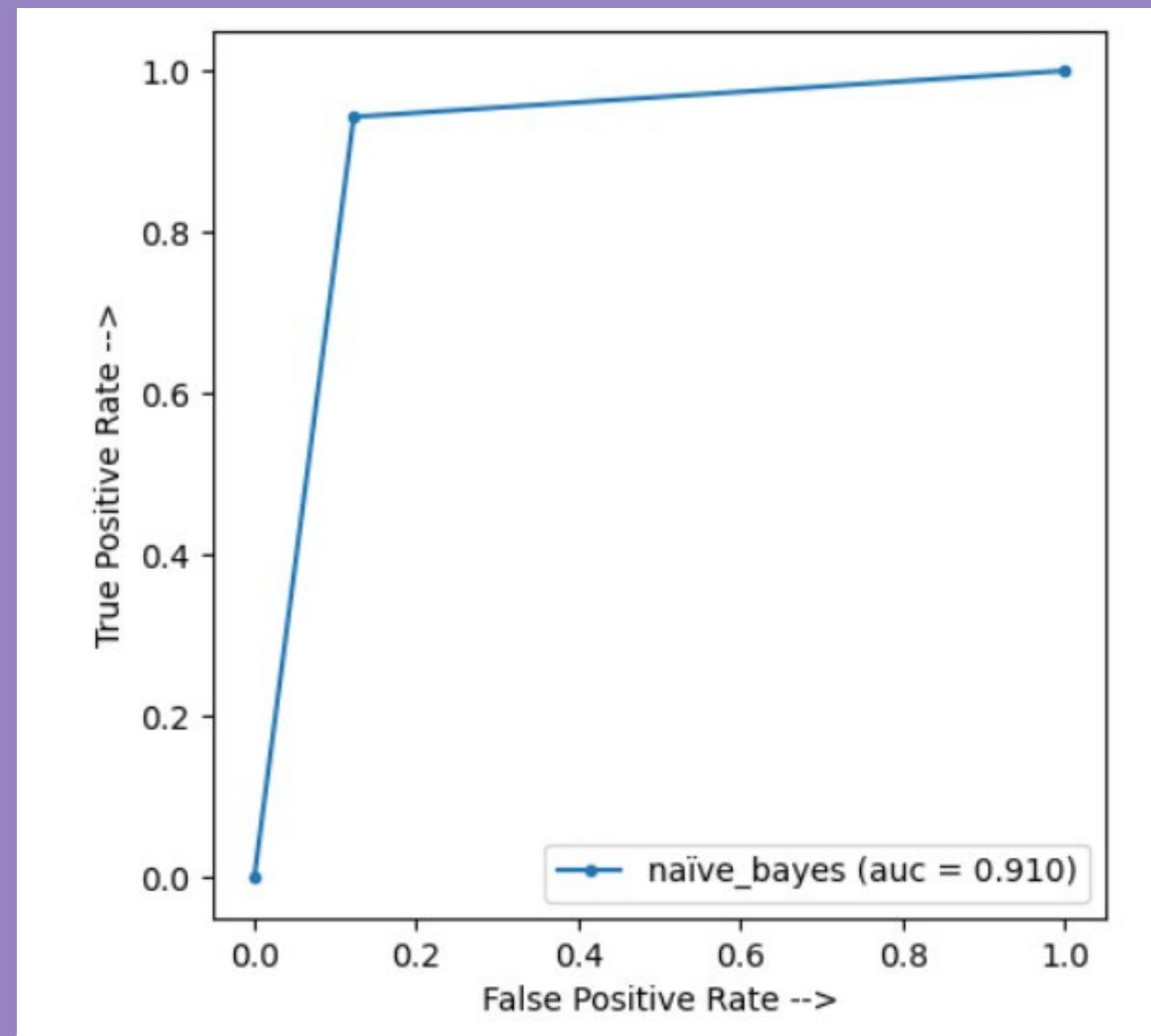


ROC curve of text in RF



ROC curve of text in LR

ROC curve of text in NB



**Based on result of training models
Best accuracy of text in LR algorithm**

96%



Deeb Learning in text

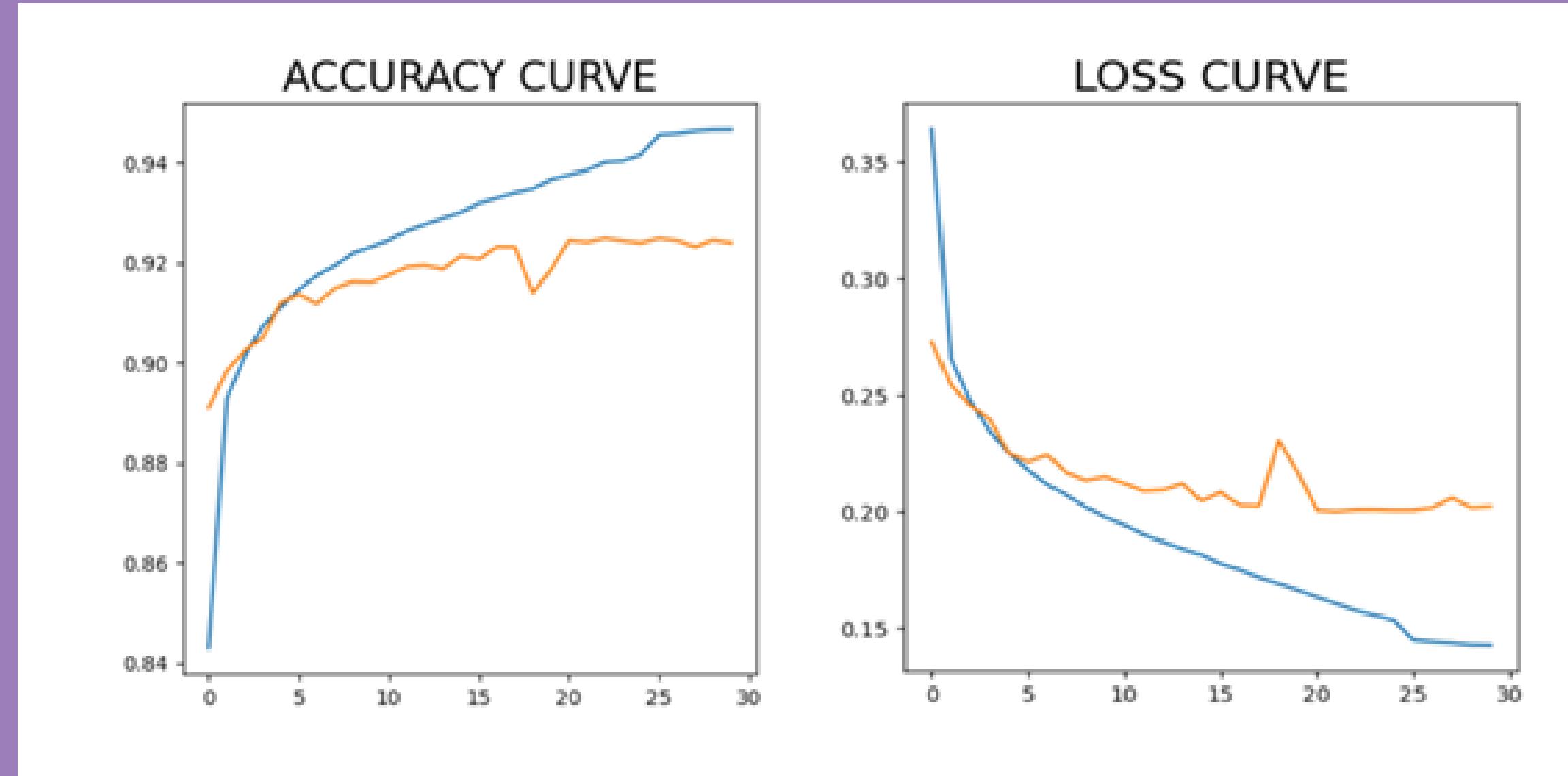
CNN

In CNN model we use some of layers Embedding,max pooling , LSTM

Table 16: The parameters used in CNN model

Layer (type)	Output Shape	# Parameters
embedding_2 (Embedding)	(None, 50, 300)	74289900
lstm_2 (LSTM)	(None, 50, 20)	25680
global_max_pooling1d_2 (GlobalMaxPooling1D)	(None, 20)	0
dense_4 (Dense)	(None, 256)	5376
dense_5 (Dense)	(None, 1)	257

CNN accuracy and loss

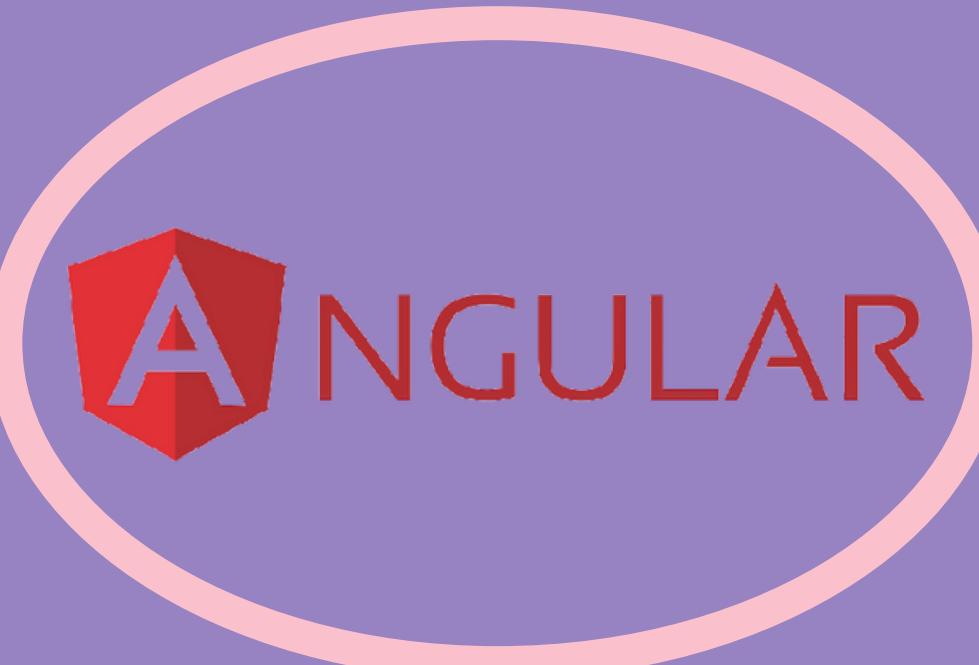


CNN has accuracy 92.39%



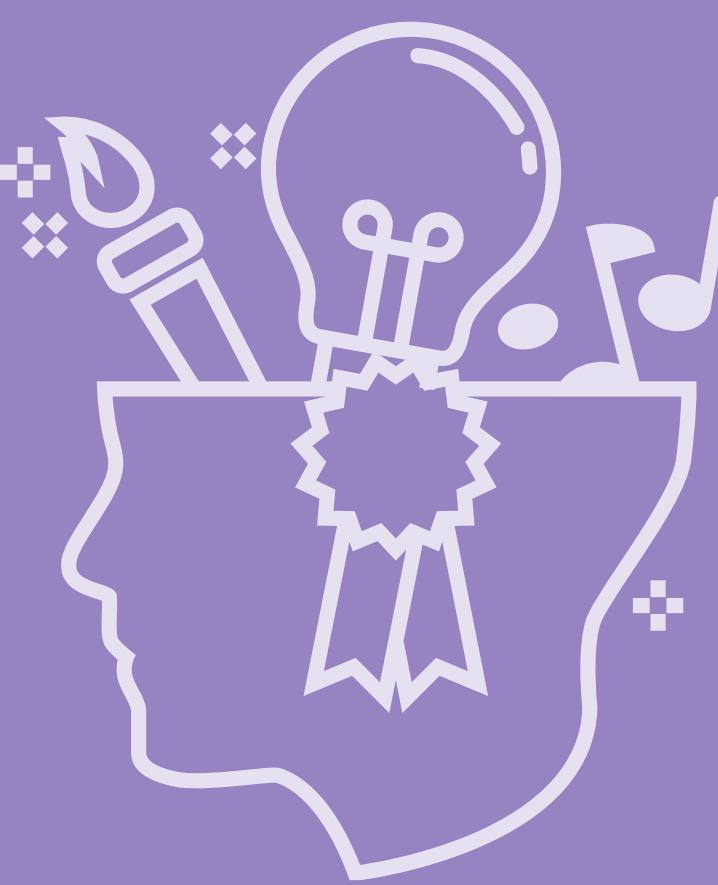
Our APPLICATION

Front End

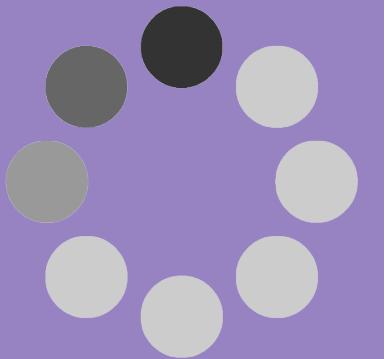


Back End





OUR FuTURE PLANNING features



OUR FUTURE PLANNING FEATURES

FEATURE 1

Mobile Application

FEATURE 2

Chat with doctors

FEATURE 3

Chat bot



ANY QUESTIONS?

A

شَكْرًا لِكُلّ دَكْتُورٍ مَنْحَنَا الْعِلْمَ ، وَلَمْ يَرِدْ مِنْ أَبْنَائِهِ الطَّلَابُ سُوَى النَّجَاحِ.

شَكْرًا دَاهِيَامُ مُوسَى

أَهِيْ وَأَبِي أَشْكَرُكُمْ عَلَى دَعْمَكُمْ وَجَبَكُمْ طَوَالَ سَنَوَاتِ دراسَتِيْ، لَقَدْ كُنْتُمْ دَائِمًا مَعِيْ، وَعَلَى اسْتَعْدَادِ لِمَا عَدَتِيْ كُلَّمَا احْتَجَتْ إِلَى ذَلِكَ، وَنَتْيَاجَةً لِتَوْجِيهِمَا تَكَمَّلَتِيْ، تَخْرِجَتِيْ الْيَوْمَ مَمْتَنًا إِلَى الأَبْدِ لِجَهُودِكُمْ لَا ثَمَنَ لِمَا فَعَلْتُهُ حَتَّى الْآنَ، فَأَنْتُمْ دَائِمًا فِي قَلْبِيْ

Thank You

THANK YOU

