# IMAGE CLASSIFICATION

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DESCRIPTION

Image classification is the process of detecting image features. This is one of the fastest-growing problems arising with modern technology. I have used several unsupervised learning algorithms such as SVM, KNN, Logistic Regression, Decision Tree, and Random Forest to classify the images. When the SVM algorithm was used, the accuracy was 93%.
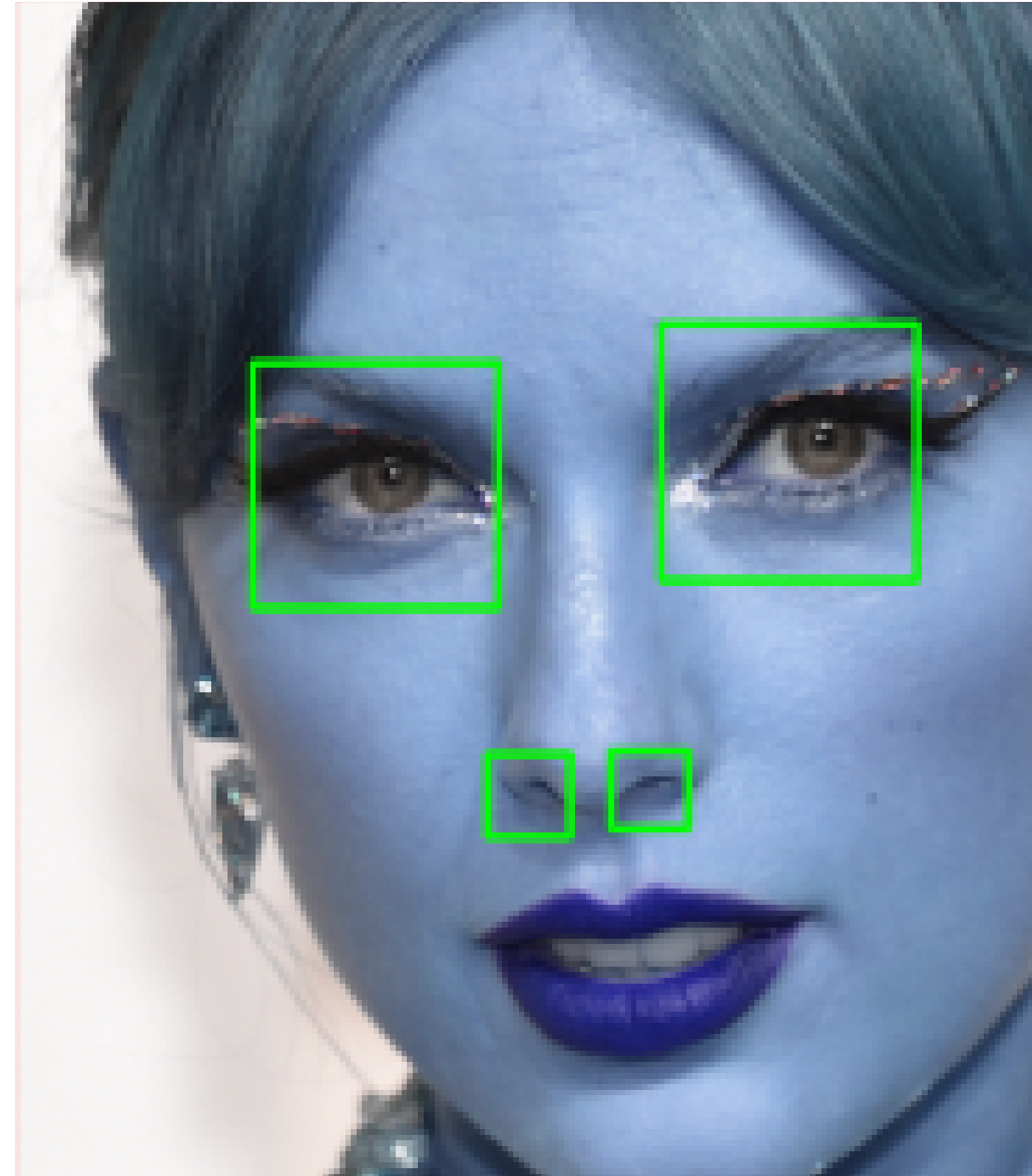
FLOW OF THE PROJECT

- Data Cleaning

- Data Preprocessing

- Algorithms

- Results

- Visualization of the results

- ROC Curve and AUC

DATA PREPROCESSING

Data Collection

The images are collected using a chrome extension named fatkun. These images are stored in a folder.

Data Cleaning and Integration

The images are initially converted to grayscale. The library used is OpenCV and the haar cascade technique to detect the features of the face. After detection, the face is cropped. Also if the eyes are detected then the image is kept for training the model.

Feature Engineering

In feature engineering, the image's important features are identified. With this, all the raw images are transformed into X and y labels. The X and y will be useful to train the model.

ALGORITHMS

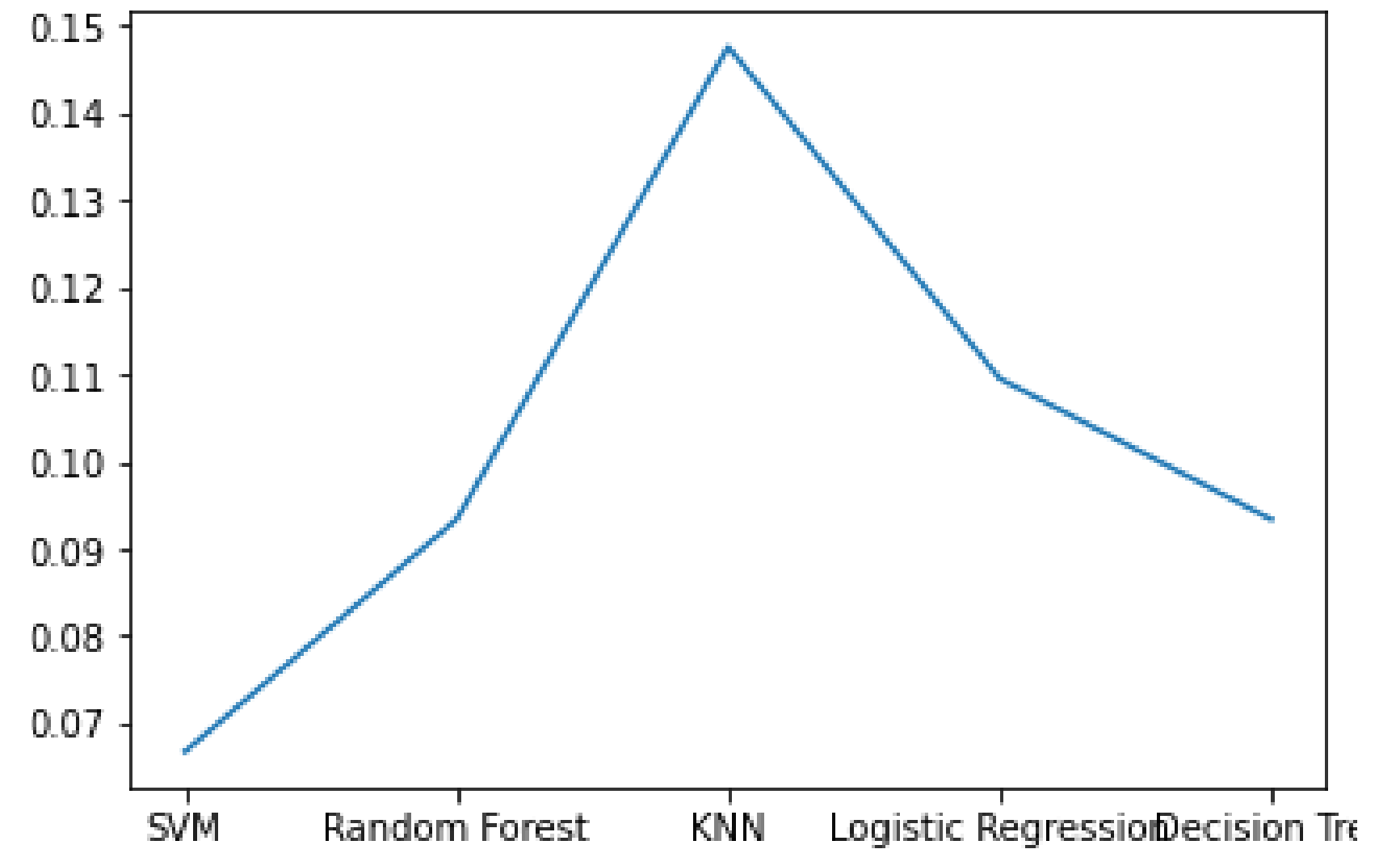| 1	2	3	4	5
Support Vector Machine	**K Nearest Neighbors**	**Logistic Regression**	**Decision Tree**	**Random Forest**

ACCURACY AND LOSS FUNCTION OF THE ALGORITHMS
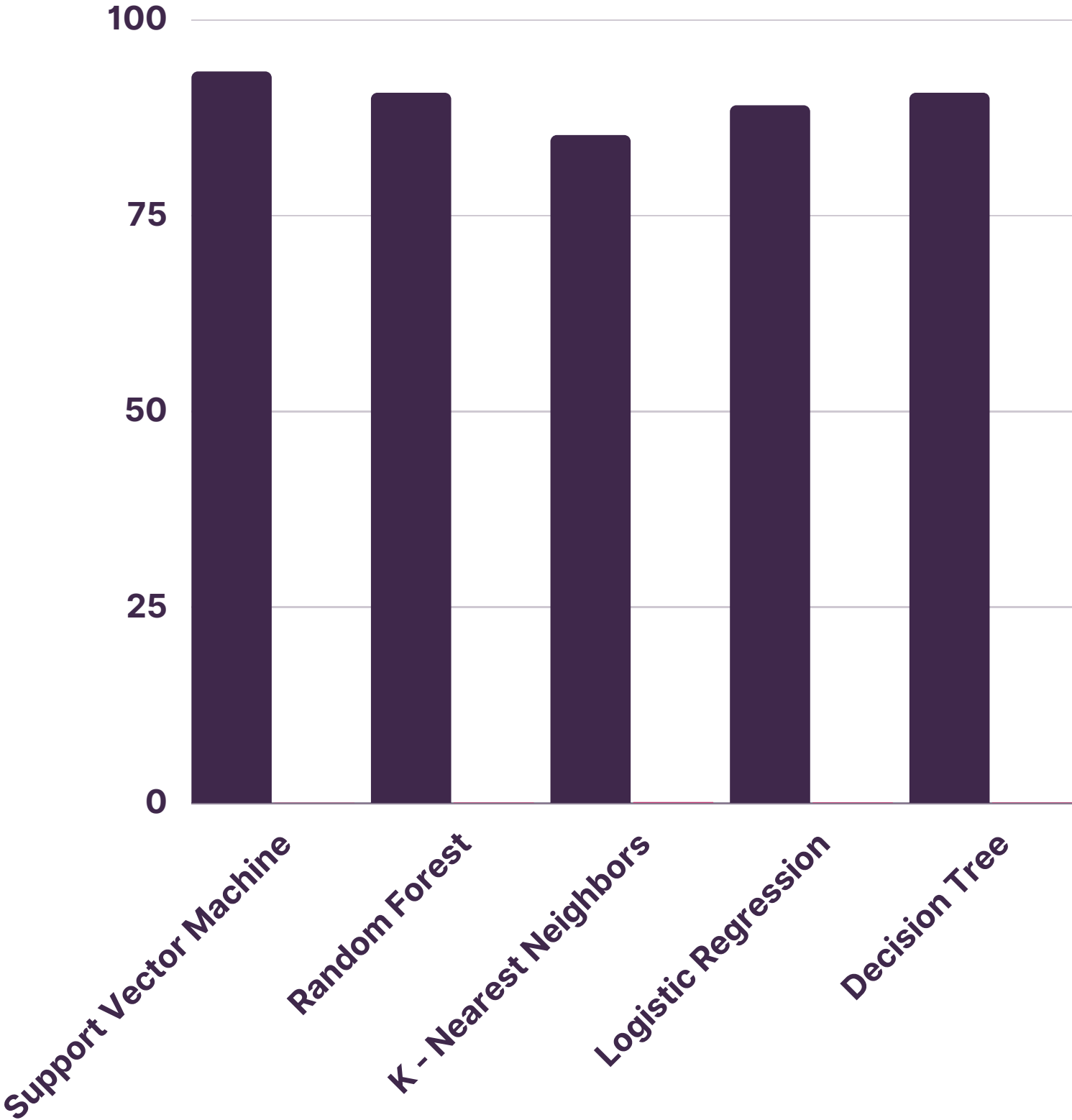
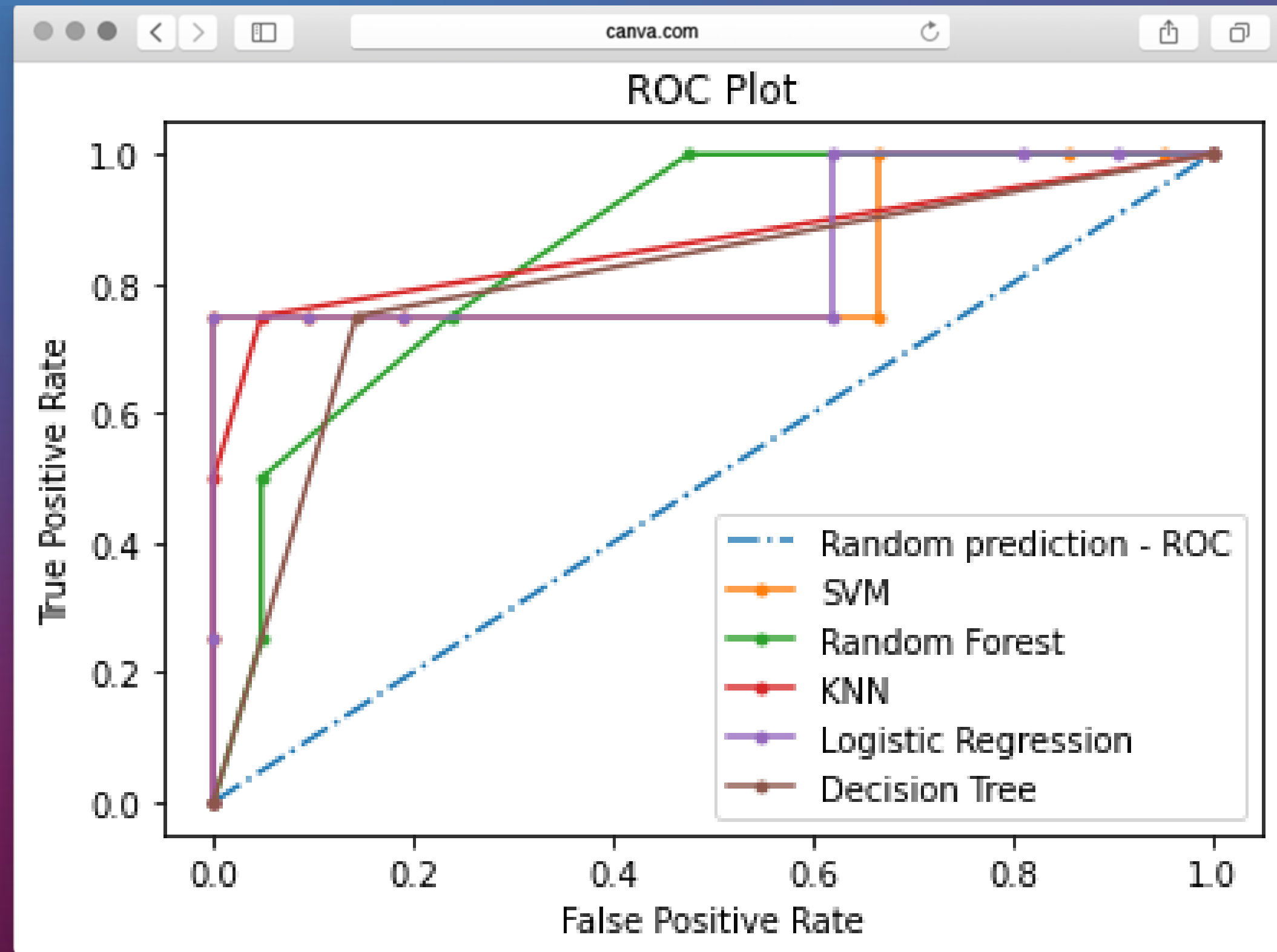| MODEL	BEST ACCURACY	ERROR RATES
SVM	0.93	0.06
RANDOM FOREST	0.90	0.09
KNN	0.85	0.15
LOGISTIC REGRESSION	0.89	0.11
DECISION TREE	0.90	0.09

Accuracy Graph
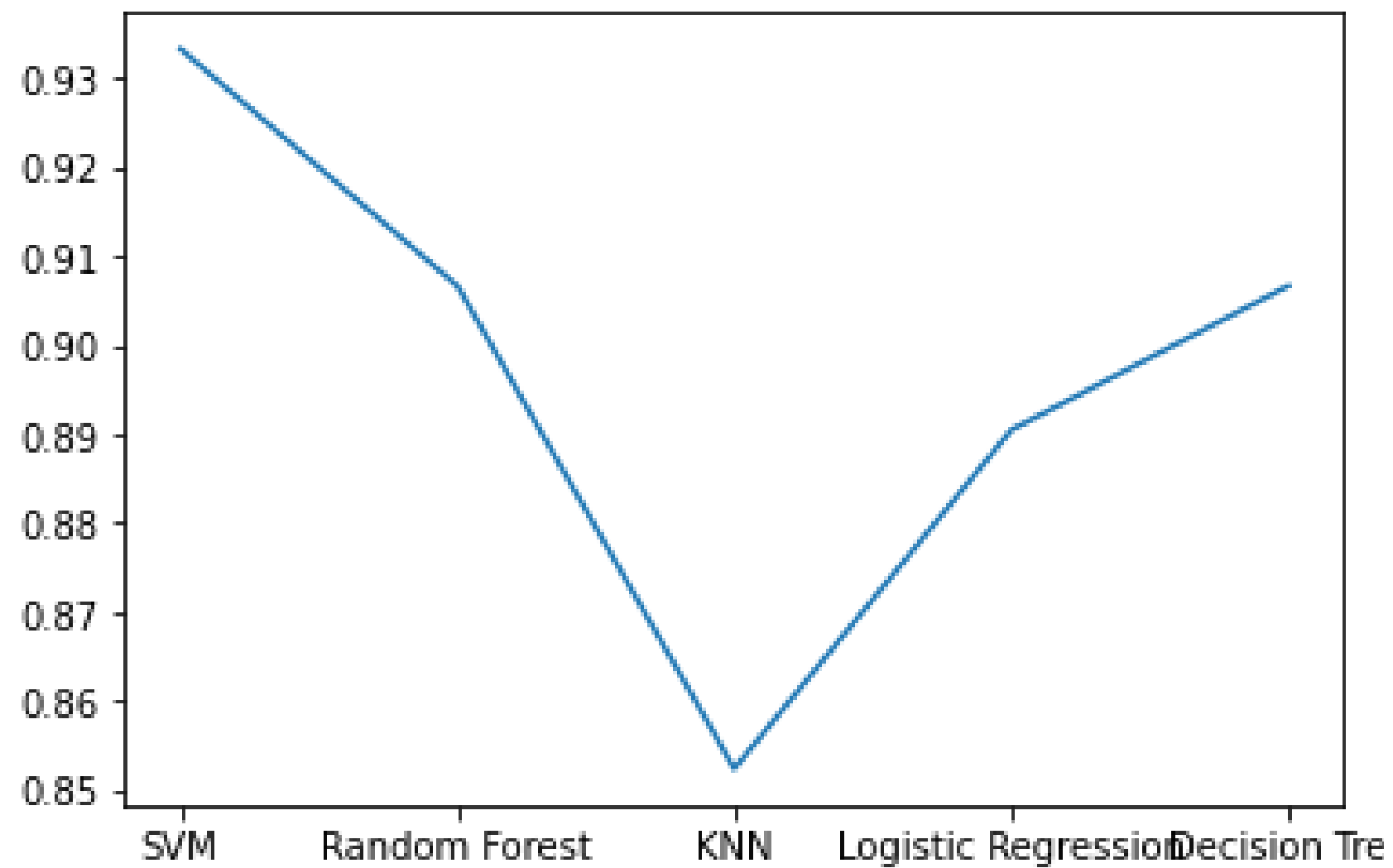
Loss function Graph

ROC Graph

This graph is generally used for binary classification problems. This graph calculates the TPR and FPR i.e. the performance of the algorithms at all possible thresholds from 0 to 1. This plot is constructed for all the algorithms. The AUC curve measures the area under ROC curve. If the area is greater then the model will perform well.

THANK YOU