```
!pip install mlxtend
```

```
Looking in indexes: https://pypi.org/simple, https://us-python.pkg.dev/colab-wheels/public/simple/
Requirement already satisfied: mlxtend in /usr/local/lib/python3.10/dist-packages (0.14.0)
Requirement already satisfied: scipy>=0.17 in /usr/local/lib/python3.10/dist-packages (from mlxtend) (1.10.1)
Requirement already satisfied: numpy>=1.10.4 in /usr/local/lib/python3.10/dist-packages (from mlxtend) (1.22.4)
Requirement already satisfied: pandas>=0.17.1 in /usr/local/lib/python3.10/dist-packages (from mlxtend) (1.5.3)
Requirement already satisfied: scikit-learn>=0.18 in /usr/local/lib/python3.10/dist-packages (from mlxtend) (1.2.2)
Requirement already satisfied: matplotlib>=1.5.1 in /usr/local/lib/python3.10/dist-packages (from mlxtend) (3.7.1)
Requirement already satisfied: setuptools in /usr/local/lib/python3.10/dist-packages (from mlxtend) (67.7.2)
Requirement already satisfied: contourpy>=1.0.1 in /usr/local/lib/python3.10/dist-packages (from matplotlib>=1.5.1->mlxtend) (1.0.7)
Requirement already satisfied: cycler>=0.10 in /usr/local/lib/python3.10/dist-packages (from matplotlib>=1.5.1->mlxtend) (0.11.0)
Requirement already satisfied: fonttools>=4.22.0 in /usr/local/lib/python3.10/dist-packages (from matplotlib>=1.5.1->mlxtend) (4.39.3)
Requirement already satisfied: kiwisolver>=1.0.1 in /usr/local/lib/python3.10/dist-packages (from matplotlib>=1.5.1->mlxtend) (1.4.4)
Requirement already satisfied: packaging>=20.0 in /usr/local/lib/python3.10/dist-packages (from matplotlib>=1.5.1->mlxtend) (23.1)
Requirement already satisfied: pillow>=6.2.0 in /usr/local/lib/python3.10/dist-packages (from matplotlib>=1.5.1->mlxtend) (8.4.0)
Requirement already satisfied: pyparsing>=2.3.1 in /usr/local/lib/python3.10/dist-packages (from matplotlib>=1.5.1->mlxtend) (3.0.9)
Requirement already satisfied: python-dateutil>=2.7 in /usr/local/lib/python3.10/dist-packages (from matplotlib>=1.5.1->mlxtend) (2.8.2)
Requirement already satisfied: pytz>=2020.1 in /usr/local/lib/python3.10/dist-packages (from pandas>=0.17.1->mlxtend) (2022.7.1)
Requirement already satisfied: joblib>=1.1.1 in /usr/local/lib/python3.10/dist-packages (from scikit-learn>=0.18->mlxtend) (1.2.0)
Requirement already satisfied: threadpoolctl>=2.0.0 in /usr/local/lib/python3.10/dist-packages (from scikit-learn>=0.18->mlxtend) (3.1.0
Requirement already satisfied: six>=1.5 in /usr/local/lib/python3.10/dist-packages (from python-dateutil>=2.7->matplotlib>=1.5.1->mlxter
```

Packages Required

```
!pip install pandas_profiling
```

```
Looking in indexes: https://pypi.org/simple, https://us-python.pkg.dev/colab-wheels/public/simple/
Requirement already satisfied: pandas_profiling in /usr/local/lib/python3.10/dist-packages (3.6.6)
Requirement already satisfied: ydata-profiling in /usr/local/lib/python3.10/dist-packages (from pandas_profiling) (4.3.1)
Requirement already satisfied: scipy<1.11,>=1.4.1 in /usr/local/lib/python3.10/dist-packages (from ydata-profiling->pandas_profiling) (1
Requirement already satisfied: pandas!=1.4.0,<2.1,>1.1 in /usr/local/lib/python3.10/dist-packages (from ydata-profiling->pandas_profilir
Requirement already satisfied: matplotlib<4,>=3.2 in /usr/local/lib/python3.10/dist-packages (from ydata-profiling->pandas_profiling) (3
Requirement already satisfied: pydantic<2,>=1.8.1 in /usr/local/lib/python3.10/dist-packages (from ydata-profiling->pandas_profiling) (1
Requirement already satisfied: PyYAML<6.1,>=5.0.0 in /usr/local/lib/python3.10/dist-packages (from ydata-profiling->pandas_profiling) (6
Requirement already satisfied: jinja2<3.2,>=2.11.1 in /usr/local/lib/python3.10/dist-packages (from ydata-profiling->pandas_profiling) (
Requirement already satisfied: visions[type_image_path]==0.7.5 in /usr/local/lib/python3.10/dist-packages (from ydata-profiling->pandas_
Requirement already satisfied: numpy<1.24,>=1.16.0 in /usr/local/lib/python3.10/dist-packages (from ydata-profiling->pandas_profiling) (
Requirement already satisfied: htmlmin==0.1.12 in /usr/local/lib/python3.10/dist-packages (from ydata-profiling->pandas_profiling) (0.1.
Requirement already satisfied: phik<0.13,>=0.11.1 in /usr/local/lib/python3.10/dist-packages (from ydata-profiling->pandas_profiling) (0
Requirement already satisfied: requests<3,>=2.24.0 in /usr/local/lib/python3.10/dist-packages (from ydata-profiling->pandas_profiling) (
Requirement already satisfied: tqdm<5,>=4.48.2 in /usr/local/lib/python3.10/dist-packages (from ydata-profiling->pandas_profiling) (4.65
Requirement already satisfied: seaborn<0.13,>=0.10.1 in /usr/local/lib/python3.10/dist-packages (from ydata-profiling->pandas_profiling)
Requirement already satisfied: multimethod<2,>=1.4 in /usr/local/lib/python3.10/dist-packages (from ydata-profiling->pandas_profiling) (
Requirement already satisfied: statsmodels<1,>=0.13.2 in /usr/local/lib/python3.10/dist-packages (from ydata-profiling->pandas_profiling
Requirement already satisfied: typeguard<3,>=2.13.2 in /usr/local/lib/python3.10/dist-packages (from ydata-profiling->pandas_profiling)
Requirement already satisfied: imagehash==4.3.1 in /usr/local/lib/python3.10/dist-packages (from ydata-profiling->pandas_profiling) (4.3
Requirement already satisfied: wordcloud>=1.9.1 in /usr/local/lib/python3.10/dist-packages (from ydata-profiling->pandas_profiling) (1.9
Requirement already satisfied: dacite>=1.8 in /usr/local/lib/python3.10/dist-packages (from ydata-profiling->pandas_profiling) (1.8.1)
Requirement already satisfied: PyWavelets in /usr/local/lib/python3.10/dist-packages (from imagehash==4.3.1->ydata-profiling->pandas_pro
Requirement already satisfied: pillow in /usr/local/lib/python3.10/dist-packages (from imagehash==4.3.1->ydata-profiling->pandas_profili
Requirement already satisfied: attrs>=19.3.0 in /usr/local/lib/python3.10/dist-packages (from visions[type_image_path]==0.7.5->ydata-pro
Requirement already satisfied: networkx>=2.4 in /usr/local/lib/python3.10/dist-packages (from visions[type_image_path]==0.7.5->ydata-pro
Requirement already satisfied: tangled-up-in-unicode>=0.0.4 in /usr/local/lib/python3.10/dist-packages (from visions[type_image_path]==0
Requirement already satisfied: MarkupSafe>=2.0 in /usr/local/lib/python3.10/dist-packages (from jinja2<3.2,>=2.11.1->ydata-profiling->pa
Requirement already satisfied: contourpy>=1.0.1 in /usr/local/lib/python3.10/dist-packages (from matplotlib<4,>=3.2->ydata-profiling->pa
Requirement already satisfied: cycler>=0.10 in /usr/local/lib/python3.10/dist-packages (from matplotlib<4,>=3.2->ydata-profiling->pandas
Requirement already satisfied: fonttools>=4.22.0 in /usr/local/lib/python3.10/dist-packages (from matplotlib<4,>=3.2->ydata-profiling->p
Requirement already satisfied: kiwisolver>=1.0.1 in /usr/local/lib/python3.10/dist-packages (from matplotlib<4,>=3.2->ydata-profiling->p
Requirement already satisfied: packaging>=20.0 in /usr/local/lib/python3.10/dist-packages (from matplotlib<4,>=3.2->ydata-profiling->par
Requirement already satisfied: pyparsing>=2.3.1 in /usr/local/lib/python3.10/dist-packages (from matplotlib<4,>=3.2->ydata-profiling->pa
Requirement already satisfied: python-dateutil>=2.7 in /usr/local/lib/python3.10/dist-packages (from matplotlib<4,>=3.2->ydata-profiling
Requirement already satisfied: pytz>=2020.1 in /usr/local/lib/python3.10/dist-packages (from pandas!=1.4.0,<2.1,>1.1->ydata-profiling->p
Requirement already satisfied: joblib>=0.14.1 in /usr/local/lib/python3.10/dist-packages (from phik<0.13,>=0.11.1->ydata-profiling->panc
Requirement already satisfied: typing-extensions>=4.2.0 in /usr/local/lib/python3.10/dist-packages (from pydantic<2,>=1.8.1->ydata-profi
Requirement already satisfied: urllib3<1.27,>=1.21.1 in /usr/local/lib/python3.10/dist-packages (from requests<3,>=2.24.0->ydata-profili
Requirement already satisfied: certifi>=2017.4.17 in /usr/local/lib/python3.10/dist-packages (from requests<3,>=2.24.0->ydata-profiling-
Requirement already satisfied: charset-normalizer~=2.0.0 in /usr/local/lib/python3.10/dist-packages (from requests<3,>=2.24.0->ydata-pro
Requirement already satisfied: idna<4,>=2.5 in /usr/local/lib/python3.10/dist-packages (from requests<3,>=2.24.0->ydata-profiling->panda
Requirement already satisfied: patsy>=0.5.2 in /usr/local/lib/python3.10/dist-packages (from statsmodels<1,>=0.13.2->ydata-profiling->pa
Requirement already satisfied: six in /usr/local/lib/python3.10/dist-packages (from patsy>=0.5.2->statsmodels<1,>=0.13.2->ydata-profilir
```

```
import six
import sys
sys.modules['sklearn.externals.six'] = six
```

```
#loading dataset
import pandas as pd
import numpy as np
#visualisation
import matplotlib.pyplot as plt
%matplotlib inline
import seaborn as sns
#EDA
from collections import Counter
import pandas_profiling as pp
# data preprocessing
from sklearn.preprocessing import StandardScaler
# data splitting
from sklearn.model_selection import train_test_split
# data modeling
from sklearn.metrics import confusion_matrix,accuracy_score,roc_curve,classification_report
from sklearn.linear_model import LogisticRegression
from sklearn.naive_bayes import GaussianNB
from xgboost import XGBClassifier
from sklearn.ensemble import RandomForestClassifier
from sklearn.tree import DecisionTreeClassifier
from sklearn.neighbors import KNeighborsClassifier
from sklearn.naive_bayes import GaussianNB
from sklearn.svm import SVC
```

```
data = pd.read_csv("/content/heart.csv")
data.head()
```

	age	sex	cp	trestbps	chol	fbs	restecg	thalach	exang	oldpeak	slope	ca	thal
0	52	1	0	125	212	0	1	168	0	1.0	2	2	3
1	53	1	0	140	203	1	0	155	1	3.1	0	0	3
2	70	1	0	145	174	0	1	125	1	2.6	0	0	3
3	61	1	0	148	203	0	1	161	0	0.0	2	1	3
4	62	0	0	138	294	1	1	106	0	1.9	1	3	2

```
data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 1025 entries, 0 to 1024
Data columns (total 14 columns):
 #   Column    Non-Null Count  Dtype  
---  ------    --------------  -----  
 0   age       1025 non-null   int64  
 1   sex       1025 non-null   int64  
 2   cp        1025 non-null   int64  
 3   trestbps  1025 non-null   int64  
 4   chol      1025 non-null   int64  
 5   fbs       1025 non-null   int64  
 6   restecg   1025 non-null   int64  
 7   thalach   1025 non-null   int64  
 8   exang     1025 non-null   int64  
 9   oldpeak   1025 non-null   float64
 10  slope     1025 non-null   int64  
 11  ca        1025 non-null   int64  
 12  thal      1025 non-null   int64  
 13  target    1025 non-null   int64  
dtypes: float64(1), int64(13)
memory usage: 112.2 KB
```

Missing Value Detection

```
data.isnull().sum()
```

```
age         0
sex         0
cp          0
trestbps    0
chol        0
fbs         0
restecg     0
thalach     0
```

```
exang       0
oldpeak     0
slope       0
ca          0
thal        0
target      0
dtype: int64
```

Descriptive statistics

```
data.describe()
```

	age	sex	cp	trestbps	chol	fbs	restecg	thalach	exang	c
count	1025.000000	1025.000000	1025.000000	1025.000000	1025.00000	1025.000000	1025.000000	1025.000000	1025.000000	1025.
mean	54.434146	0.695610	0.942439	131.611707	246.00000	0.149268	0.529756	149.114146	0.336585	1.
std	9.072290	0.460373	1.029641	17.516718	51.59251	0.356527	0.527878	23.005724	0.472772	1.
min	29.000000	0.000000	0.000000	94.000000	126.00000	0.000000	0.000000	71.000000	0.000000	0.
25%	48.000000	0.000000	0.000000	120.000000	211.00000	0.000000	0.000000	132.000000	0.000000	0.
50%	56.000000	1.000000	1.000000	130.000000	240.00000	0.000000	1.000000	152.000000	0.000000	0.
75%	61.000000	1.000000	2.000000	140.000000	275.00000	0.000000	1.000000	166.000000	1.000000	1.
max	77.000000	1.000000	3.000000	200.000000	564.00000	1.000000	2.000000	202.000000	1.000000	6.

EDA

```
pp.ProfileReport(data)
```

Summarize dataset: 100% 48/48 [00:08<00:00, 2.62it/s, Completed]

Generate report structure: 100% 1/1 [00:07<00:00, 7.34s/it]

Render HTML: 100% 1/1 [00:01<00:00, 1.08s/it]

Model prepration

```
y = data["target"]
X = data.drop('target',axis=1)
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.20, random_state = 0)
scaler = StandardScaler()
X_train = scaler.fit_transform(X_train)
X_test = scaler.transform(X_test)
```

Number of observations	1025	**Categorical**	9

```
print(y_test.unique())
Counter(y_train)
```

```
[1 0]
Counter({1: 419, 0: 401})
```

Duplicate rows (%)	29.5%

```
m1 = 'Logistic Regression'
lr = LogisticRegression()
model = lr.fit(X_train, y_train)
lr_predict = lr.predict(X_test)
lr_conf_matrix = confusion_matrix(y_test, lr_predict)
lr_acc_score = accuracy_score(y_test, lr_predict)
print("confussion matrix")
print(lr_conf_matrix)
print("\n")
print("Accuracy of Logistic Regression:",lr_acc_score*100,'\n')
print(classification_report(y_test,lr_predict))
```

```
confussion matrix
[[ 77  21]
 [  7 100]]


Accuracy of Logistic Regression: 86.34146341463415

              precision    recall  f1-score   support

           0       0.92      0.79      0.85        98
           1       0.83      0.93      0.88       107

    accuracy                           0.86       205
   macro avg       0.87      0.86      0.86       205
weighted avg       0.87      0.86      0.86       205
```

```
m2 = 'Naive Bayes'
nb = GaussianNB()
nb.fit(X_train,y_train)
nbpred = nb.predict(X_test)
nb_conf_matrix = confusion_matrix(y_test, nbpred)
nb_acc_score = accuracy_score(y_test, nbpred)
print("confussion matrix")
print(nb_conf_matrix)
print("\n")
print("Accuracy of Naive Bayes model:",nb_acc_score*100,'\n')
print(classification_report(y_test,nbpred))
```

```
confussion matrix
[[79 19]
 [11 96]]


Accuracy of Naive Bayes model: 85.36585365853658
```

```
                  precision    recall  f1-score   support

               0       0.88      0.81      0.84        98
               1       0.83      0.90      0.86       107

        accuracy                           0.85       205
       macro avg       0.86      0.85      0.85       205
    weighted avg       0.86      0.85      0.85       205
```

```
m3 = 'Random Forest Classfier'
rf = RandomForestClassifier(n_estimators=20, random_state=2,max_depth=5)
rf.fit(X_train,y_train)
rf_predicted = rf.predict(X_test)
rf_conf_matrix = confusion_matrix(y_test, rf_predicted)
rf_acc_score = accuracy_score(y_test, rf_predicted)
print("confussion matrix")
print(rf_conf_matrix)
print("\n")
print("Accuracy of Random Forest:",rf_acc_score*100,'\n')
print(classification_report(y_test,rf_predicted))
```

```
confussion matrix
[[ 89   9]
 [  2 105]]


Accuracy of Random Forest: 94.6341463414634

              precision    recall  f1-score   support

           0       0.98      0.91      0.94        98
           1       0.92      0.98      0.95       107

    accuracy                           0.95       205
   macro avg       0.95      0.94      0.95       205
weighted avg       0.95      0.95      0.95       205
```

```
m4 = 'Extreme Gradient Boost'
xgb = XGBClassifier(learning_rate=0.01, n_estimators=25, max_depth=15,gamma=0.6, subsample=0.52,colsample_bytree=0.6,seed=27,
                    reg_lambda=2, booster='dart', colsample_bylevel=0.6, colsample_bynode=0.5)
xgb.fit(X_train, y_train)
xgb_predicted = xgb.predict(X_test)
xgb_conf_matrix = confusion_matrix(y_test, xgb_predicted)
xgb_acc_score = accuracy_score(y_test, xgb_predicted)
print("confussion matrix")
print(xgb_conf_matrix)
print("\n")
print("Accuracy of Extreme Gradient Boost:",xgb_acc_score*100,'\n')
print(classification_report(y_test,xgb_predicted))
```

```
confussion matrix
[[ 87  11]
 [  5 102]]


Accuracy of Extreme Gradient Boost: 92.19512195121952

              precision    recall  f1-score   support

           0       0.95      0.89      0.92        98
           1       0.90      0.95      0.93       107

    accuracy                           0.92       205
   macro avg       0.92      0.92      0.92       205
weighted avg       0.92      0.92      0.92       205
```

```
m5 = 'K-NeighborsClassifier'
knn = KNeighborsClassifier(n_neighbors=10)
knn.fit(X_train, y_train)
knn_predicted = knn.predict(X_test)
knn_conf_matrix = confusion_matrix(y_test, knn_predicted)
knn_acc_score = accuracy_score(y_test, knn_predicted)
print("confussion matrix")
print(knn_conf_matrix)
print("\n")
```

```
print("Accuracy of K-NeighborsClassifier:",knn_acc_score*100,'\n')
print(classification_report(y_test,knn_predicted))
```

```
confussion matrix
[[84 14]
 [11 96]]


Accuracy of K-NeighborsClassifier: 87.8048780487805

              precision    recall  f1-score   support

           0       0.88      0.86      0.87        98
           1       0.87      0.90      0.88       107

    accuracy                           0.88       205
   macro avg       0.88      0.88      0.88       205
weighted avg       0.88      0.88      0.88       205
```

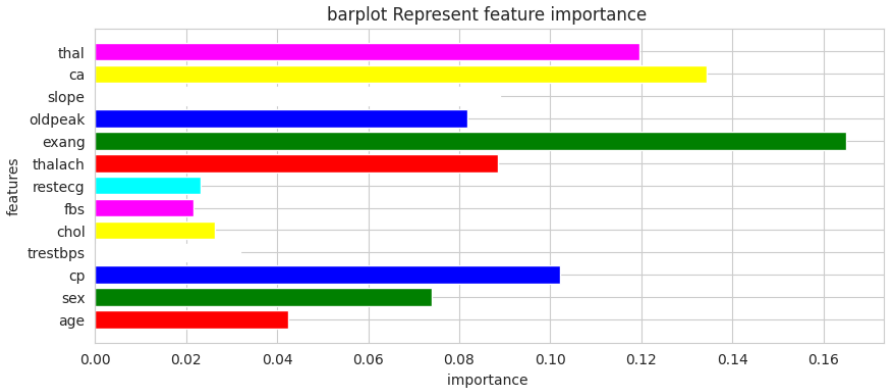
```
m6 = 'DecisionTreeClassifier'
dt = DecisionTreeClassifier(criterion = 'entropy',random_state=0,max_depth = 6)
dt.fit(X_train, y_train)
dt_predicted = dt.predict(X_test)
dt_conf_matrix = confusion_matrix(y_test, dt_predicted)
dt_acc_score = accuracy_score(y_test, dt_predicted)
print("confussion matrix")
print(dt_conf_matrix)
print("\n")
print("Accuracy of DecisionTreeClassifier:",dt_acc_score*100,'\n')
print(classification_report(y_test,dt_predicted))
```

```
confussion matrix
[[95  3]
 [ 8 99]]


Accuracy of DecisionTreeClassifier: 94.6341463414634

              precision    recall  f1-score   support

           0       0.92      0.97      0.95        98
           1       0.97      0.93      0.95       107

    accuracy                           0.95       205
   macro avg       0.95      0.95      0.95       205
weighted avg       0.95      0.95      0.95       205
```

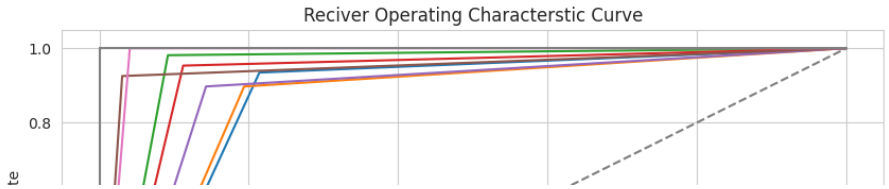
```
m7 = 'Support Vector Classifier'
svc =  SVC(kernel='rbf', C=2)
svc.fit(X_train, y_train)
svc_predicted = svc.predict(X_test)
svc_conf_matrix = confusion_matrix(y_test, svc_predicted)
svc_acc_score = accuracy_score(y_test, svc_predicted)
print("confussion matrix")
print(svc_conf_matrix)
print("\n")
print("Accuracy of Support Vector Classifier:",svc_acc_score*100,'\n')
print(classification_report(y_test,svc_predicted))
```

```
confussion matrix
[[ 94   4]
 [  0 107]]


Accuracy of Support Vector Classifier: 98.04878048780488

              precision    recall  f1-score   support

           0       1.00      0.96      0.98        98
           1       0.96      1.00      0.98       107

    accuracy                           0.98       205
   macro avg       0.98      0.98      0.98       205
weighted avg       0.98      0.98      0.98       205
```

```
imp_feature = pd.DataFrame({'Feature': ['age', 'sex', 'cp', 'trestbps', 'chol', 'fbs', 'restecg', 'thalach',
       'exang', 'oldpeak', 'slope', 'ca', 'thal'], 'Importance': xgb.feature_importances_})
plt.figure(figsize=(10,4))
plt.title("barplot Represent feature importance ")
plt.xlabel("importance ")
plt.ylabel("features")
colors = ["red","green","blue","white","yellow","magenta","cyan"]
plt.barh(imp_feature['Feature'],imp_feature['Importance'],color = colors)
plt.show()
```




```
lr_false_positive_rate,lr_true_positive_rate,lr_threshold = roc_curve(y_test,lr_predict)
nb_false_positive_rate,nb_true_positive_rate,nb_threshold = roc_curve(y_test,nbpred)
rf_false_positive_rate,rf_true_positive_rate,rf_threshold = roc_curve(y_test,rf_predicted)
xgb_false_positive_rate,xgb_true_positive_rate,xgb_threshold = roc_curve(y_test,xgb_predicted)
knn_false_positive_rate,knn_true_positive_rate,knn_threshold = roc_curve(y_test,knn_predicted)
dt_false_positive_rate,dt_true_positive_rate,dt_threshold = roc_curve(y_test,dt_predicted)
svc_false_positive_rate,svc_true_positive_rate,svc_threshold = roc_curve(y_test,svc_predicted)


sns.set_style('whitegrid')
plt.figure(figsize=(10,5))
plt.title('Reciver Operating Characterstic Curve')
plt.plot(lr_false_positive_rate,lr_true_positive_rate,label='Logistic Regression')
plt.plot(nb_false_positive_rate,nb_true_positive_rate,label='Naive Bayes')
plt.plot(rf_false_positive_rate,rf_true_positive_rate,label='Random Forest')
plt.plot(xgb_false_positive_rate,xgb_true_positive_rate,label='Extreme Gradient Boost')
plt.plot(knn_false_positive_rate,knn_true_positive_rate,label='K-Nearest Neighbor')
plt.plot(dt_false_positive_rate,dt_true_positive_rate,label='Desion Tree')
plt.plot(svc_false_positive_rate,svc_true_positive_rate,label='Support Vector Classifier')
plt.plot([0,1],ls='--')
plt.plot([0,0],[1,0],c='.5')
plt.plot([1,1],c='.5')
plt.ylabel('True positive rate')
plt.xlabel('False positive rate')
plt.legend()
plt.show()
```

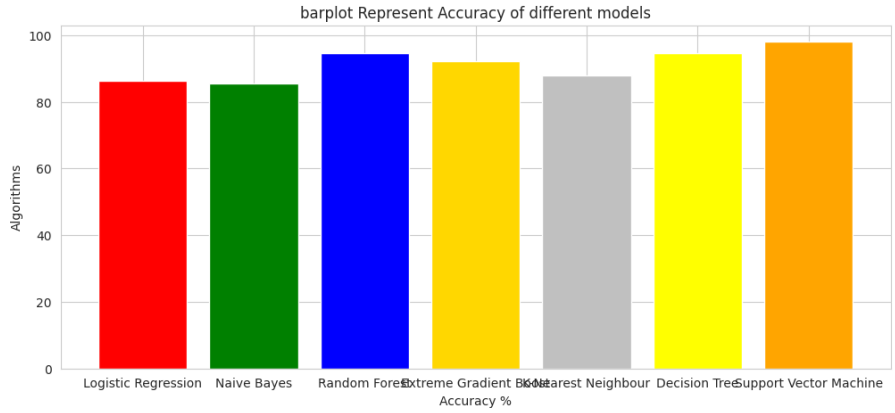


Model Evaluation

```
model_ev = pd.DataFrame({'Model': ['Logistic Regression','Naive Bayes','Random Forest','Extreme Gradient Boost',
                   'K-Nearest Neighbour','Decision Tree','Support Vector Machine'], 'Accuracy': [lr_acc_score*100,
                   nb_acc_score*100,rf_acc_score*100,xgb_acc_score*100,knn_acc_score*100,dt_acc_score*100,svc_acc_score*100]})
model_ev
```

	Model	Accuracy
0	Logistic Regression	86.341463
1	Naive Bayes	85.365854
2	Random Forest	94.634146
3	Extreme Gradient Boost	92.195122
4	K-Nearest Neighbour	87.804878
5	Decision Tree	94.634146
6	Support Vector Machine	98.048780

```
colors = ['red','green','blue','gold','silver','yellow','orange',]
plt.figure(figsize=(12,5))
plt.title("barplot Represent Accuracy of different models")
plt.xlabel("Accuracy %")
plt.ylabel("Algorithms")
plt.bar(model_ev['Model'],model_ev['Accuracy'],color = colors)
plt.show()
```



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