```
#To plot diagrams or visualizations
import matplotlib.pyplot as plt
#A python library for array operations
import numpy as np
#A python library for data analysis
import pandas as pd
#importing ensemble and gradient boosting model from python library sklearn
from sklearn.ensemble import GradientBoostingRegressor
#importing XGBClassifier model from python library xgboost
from xgboost import XGBClassifier
#importing SVM from python library sklearn
from sklearn import svm
#importing logistic regression from python library sklearn
from sklearn.linear_model import LogisticRegression
#importing RandomForestClassifier from python library sklearn
from sklearn.ensemble import RandomForestClassifier
#importing GaussianMixture model from python library sklearn
from sklearn.mixture import GaussianMixture
#For splitting data
from sklearn.model_selection import train_test_split, cross_val_score, cross_val_predict, KFo
#For scaling the data
from sklearn.preprocessing import StandardScaler, PolynomialFeatures
#gives you a single interface for all transformation and resulting estimator
from sklearn.pipeline import Pipeline
```

```
!pip install -U -q PyDrive
from pydrive.auth import GoogleAuth
from pydrive.drive import GoogleDrive
from google.colab import auth
from oauth2client.client import GoogleCredentials
# Authenticate and create the PyDrive client.
auth.authenticate_user()
gauth = GoogleAuth()
gauth.credentials = GoogleCredentials.get_application_default()
drive = GoogleDrive(gauth)
```

```
link = 'https://drive.google.com/open?id=12Bl0Isr8-vUed7yWLv8z17l_2kQmz9qH' # The shareable l
```

```
fluff, id = link.split('=')
print (id) # Verify that you have everything after '='
```

```
12Bl0Isr8-vUed7yWLv8z17l_2kQmz9qH
```

```
downloaded = drive.CreateFile({'id':id})
downloaded.GetContentFile('Filename.csv')
df = pd.read_csv('Filename.csv')
# Dataset is now stored in a Pandas Dataframe
```

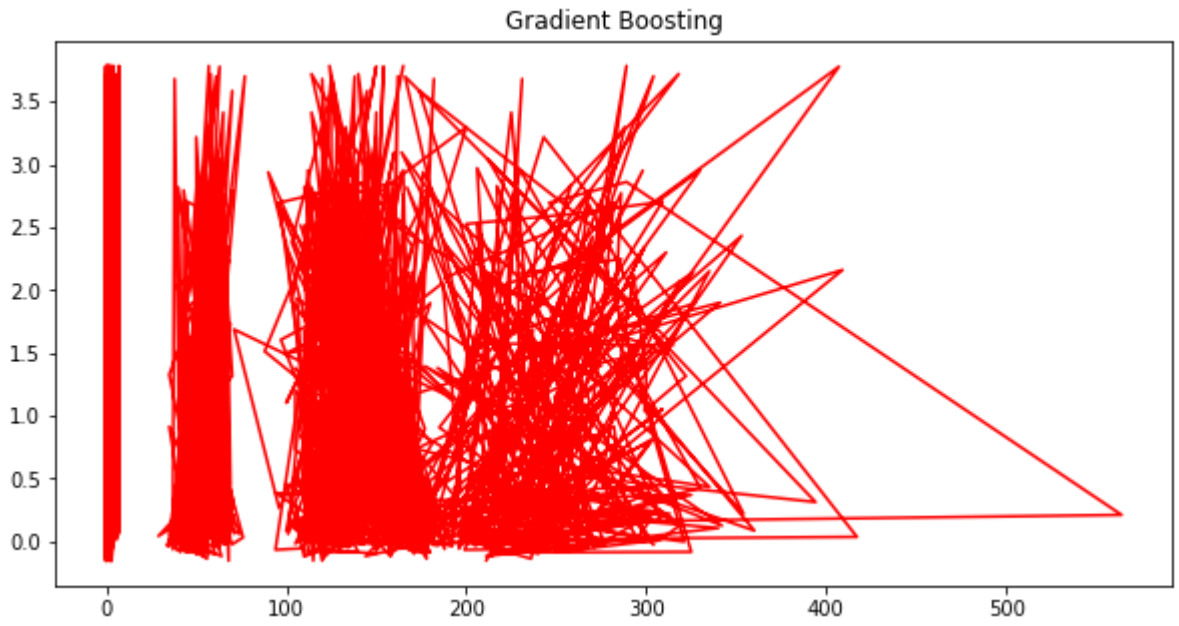
```
df.head()
```

age	sex	cp	tresp	chol	fbs	restecg	thalach	exang	oldpeak	slope	ca	thal

```
#For splitting data into dependent and independent data
X = df[['age', 'sex', 'cp', 'tresp', 'chol', 'fbs', 'restecg', 'thalach', 'exang', 'oldpeak',
y = df['num']


#For splitting data into training and testing data
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.4, random_state=101)

#Apply GradientBoosting model on the data

model=GradientBoostingRegressor()
model=model.fit(X,y)
# print(model.score(np.nan_to_num(X),Y))
print(model.score(np.nan_to_num(X_train),y_train))
print(model.score(np.nan_to_num(X_test),y_test))
```

```
0.8933000966775845
0.9046502870567227
```

```
#To show the data from trained model
plt.figure(figsize=(10, 5))
plt.title("Gradient Boosting")
plt.plot(X, model.predict(X), color='r')
plt.show()
```




```
#To find accuracy of this model
accuracy = model.score(X_test,y_test)
print(accuracy*100)
```

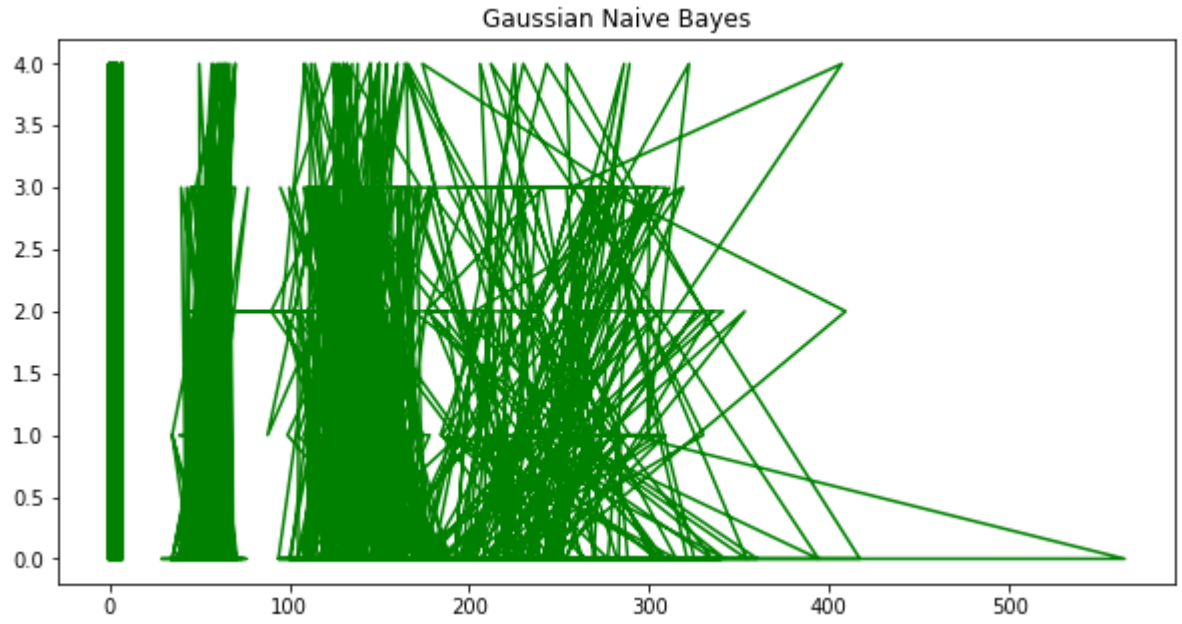
```
90.46502870567227
```

```
#Apply Gaussian Naive Bayes model on the data
XGB = XGBClassifier()
```

```
XGB.fit(X_train,y_train.values.ravel())
```

```
XGBClassifier(base_score=0.5, booster='gbtree', colsample_bylevel=1,
       colsample_bytree=1, gamma=0, learning_rate=0.1, max_delta_step=0,
       max_depth=3, min_child_weight=1, missing=None, n_estimators=100,
       n_jobs=1, nthread=None, objective='multi:softprob', random_state=0,
       reg_alpha=0, reg_lambda=1, scale_pos_weight=1, seed=None,
       silent=True, subsample=1)
```

```
#To show the data from trained model
plt.figure(figsize=(10, 5))
plt.title("Gaussian Naive Bayes")
plt.plot(X, XGB.predict(X), color='g')
plt.show()
```




```
#To find accuracy of this model
accuracy = XGB.score(X_test,y_test)
print(accuracy*100)
```

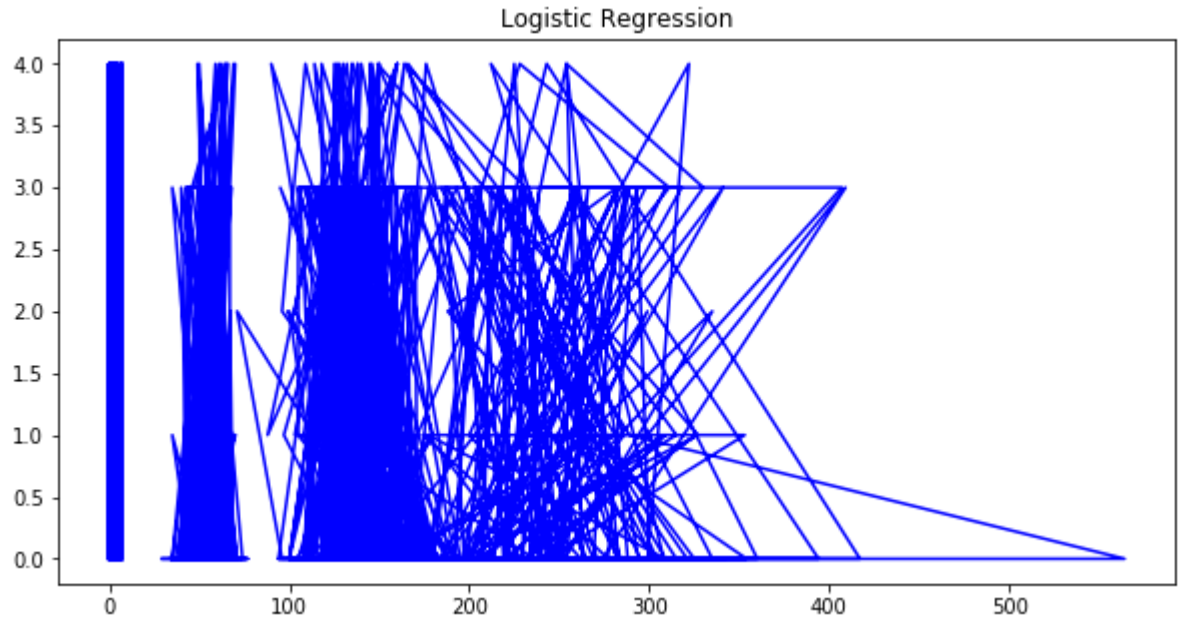
```
54.91803278688525
```

```
#Logistic Regression
lr = LogisticRegression(penalty = 'l1')
lr.fit(X_train , y_train.values.ravel())
#print(model.score(np.nan_to_num(X),Y))
print(lr.score(np.nan_to_num(X_train),y_train))
print(lr.score(np.nan_to_num(X_test),y_test))
```

```
0.6795580110497238
0.5901639344262295
/usr/local/lib/python3.6/dist-packages/sklearn/linear_model/logistic.py:433: FutureWar
  FutureWarning)
/usr/local/lib/python3.6/dist-packages/sklearn/linear_model/logistic.py:460: FutureWar
  "this warning.", FutureWarning)
```

```
#To show the data from trained model
```

```
plt.figure(figsize=(10, 5))
plt.title("Logistic Regression")
plt.plot(X, lr.predict(X), color='b')
plt.show()
```



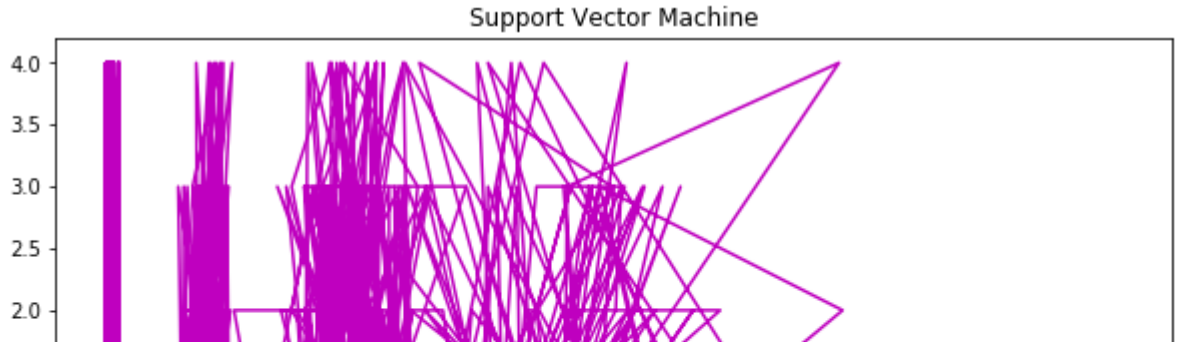

```
#To find accuracy of this model
accuracy = lr.score(X_test,y_test)
print(accuracy*100)
```

```
59.01639344262295
```

```
#SVM
sv = svm.SVC()
sv.fit(X_train , y_train.values.ravel())
print(sv.score(np.nan_to_num(X_train),y_train))
print(sv.score(np.nan_to_num(X_test),y_test))
```

```
1.0
0.5245901639344263
/usr/local/lib/python3.6/dist-packages/sklearn/svm/base.py:196: FutureWarning: The def
  "avoid this warning.", FutureWarning)
```

```
#To show the data from trained model
plt.figure(figsize=(10, 5))
plt.title("Support Vector Machine")
plt.plot(X, sv.predict(X), color='m')
plt.show()
```



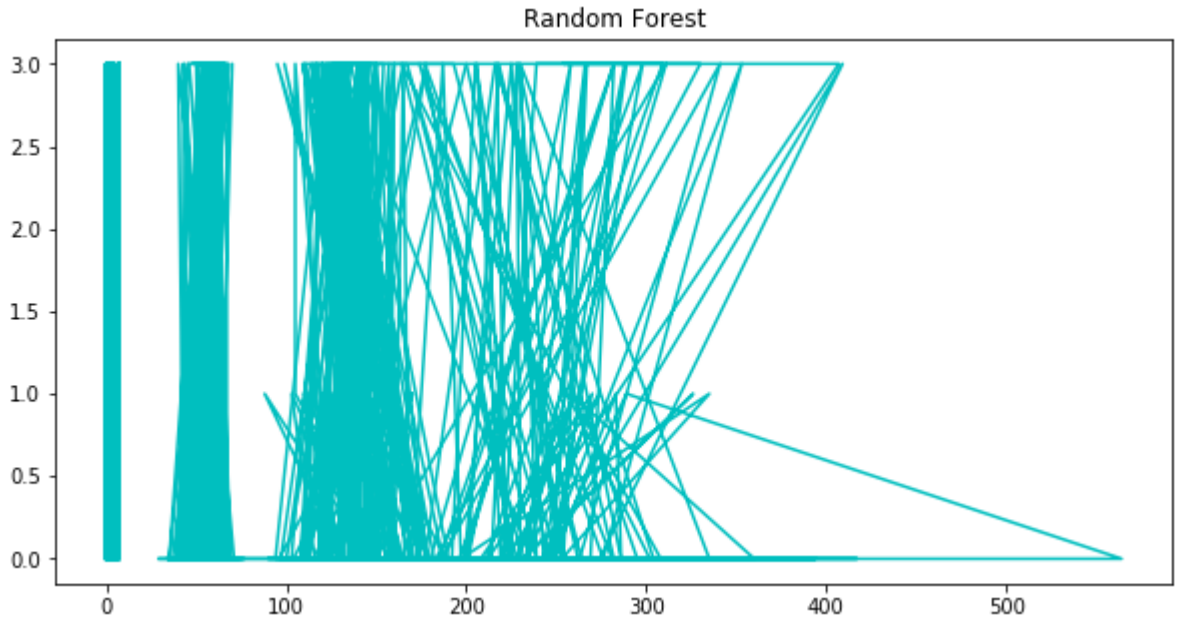

```
#To find accuracy of this model
accuracy = sv.score(X_test,y_test)
print(accuracy*100)
```

```
52.459016393442624
```

```
#Random Forest
rf = RandomForestClassifier(n_estimators=100, max_depth=2, random_state=0)
rf.fit(X_train , y_train.values.ravel())
print(rf.score(np.nan_to_num(X_train),y_train))
print(rf.score(np.nan_to_num(X_test),y_test))
```

```
0.6353591160220995
0.5737704918032787
```

```
#To show the data from trained model
plt.figure(figsize=(10, 5))
plt.title("Random Forest")
plt.plot(X, rf.predict(X), color='c')
plt.show()
```

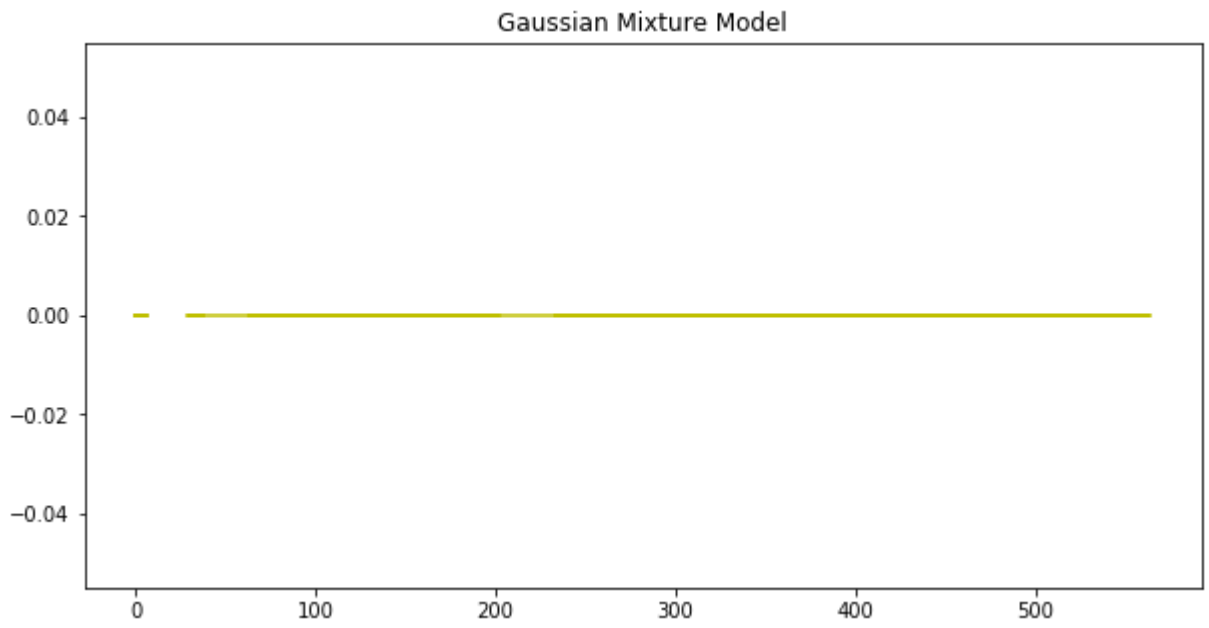



```
#To find accuracy of this model
accuracy = rf.score(X_test,y_test)
print(accuracy*100)
```

```
#Gaussian Mixture model
gmm = GaussianMixture()
gmm.fit(X_train,y_train.values.ravel())
print(gmm.score(np.nan_to_num(X_train),y_train))
print(gmm.score(np.nan_to_num(X_test),y_test))
```

```
-27.093420563987006
-27.372984576501256
```

```
#To show the data from trained model
plt.figure(figsize=(10, 5))
plt.title("Gaussian Mixture Model")
plt.plot(X, gmm.predict(X), color='y')
plt.show()
```




```
#To find accuracy of this model
accuracy = gmm.score(X_test,y_test)
print(accuracy*100)
```

```
-2737.298457650126
```