**Machine Learning Lab – Part2**

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**NAÏVE BAYES**

**import** pandas **as** pd

**import** numpy **as** np

data **=** pd**.**read\_csv('covid.csv')

data

**from** sklearn **import** preprocessing

le **=** preprocessing**.**LabelEncoder()

pc\_encoded**=**le**.**fit\_transform(data['pc']**.**values)

wbc\_encoded**=**le**.**fit\_transform(data['wbc']**.**values)

mc\_encoded**=**le**.**fit\_transform(data['mc']**.**values)

ast\_encoded**=**le**.**fit\_transform(data['ast']**.**values)

bc\_encoded**=**le**.**fit\_transform(data['bc']**.**values)

ldh\_encoded**=**le**.**fit\_transform(data['ldh']**.**values)

Y**=**le**.**fit\_transform(data['diagnosis']**.**values)

X**=**np**.**array(list(zip(pc\_encoded,wbc\_encoded,mc\_encoded,ast\_encoded,bc\_encoded,ldh\_encoded)))

X

Y

**from** sklearn.naive\_bayes **import** MultinomialNB

**from** sklearn.metrics **import** accuracy\_score

**from** sklearn.metrics **import** classification\_report

model **=** MultinomialNB()

**from** sklearn.model\_selection **import** train\_test\_split

X\_train,X\_test,Y\_train,Y\_test**=**train\_test\_split(X,Y)

model**.**fit(X\_train, Y\_train)

y\_pred **=** model**.**predict(X\_test)

print("Accuracy:",accuracy\_score(Y\_test, y\_pred))

print("\nReport")

print(classification\_report(Y\_test,y\_pred))

**Random Forest**

**import** pandas **as** pd

**import** numpy **as** np

**import** matplotlib.pyplot **as** plt

**import** seaborn **as** sns

data **=** pd**.**read\_csv('pima.csv')

data**.**head()

**from** sklearn.model\_selection **import** train\_test\_split

**from** sklearn.ensemble **import** RandomForestClassifier

**from** sklearn.datasets **import** make\_classification

**from** sklearn.metrics **import** accuracy\_score

**from** sklearn.preprocessing **import** StandardScaler, MinMaxScaler

**import** pandas\_profiling

**from** matplotlib **import** rcParams

**import** warnings

data**.**columns

X**=**data**.**drop("Outcome",axis**=**1)

y**=**data["Outcome"]

scaler**=**StandardScaler()

X\_scaled**=**scaler**.**fit\_transform(X)

X\_train,X\_test,Y\_train,Y\_test**=**train\_test\_split(X\_scaled,y,stratify**=**y,test\_size**=**0.10,random\_state**=**34)

classifier **=** RandomForestClassifier(n\_estimators**=**100)

classifier**.**fit(X\_train,Y\_train)

y\_pred **=** classifier**.**predict(X\_test)

print("Accuracy:",accuracy\_score(Y\_test,y\_pred))

feature\_importances\_df **=** pd**.**DataFrame(

{"feature":list(X**.**columns),"importance":classifier**.**feature\_importances\_}

)**.**sort\_values("importance",ascending**=False**)

feature\_importances\_df

**from** sklearn.tree **import** DecisionTreeClassifier

clf**=**DecisionTreeClassifier()

clf**.**fit(X\_train,Y\_train)

Y\_pred **=** clf**.**predict(X\_test)

**from** sklearn.metrics **import** accuracy\_score

print("Accuracy-DecisionTree :",accuracy\_score(Y\_test,Y\_pred))

**SVM**

**from** sklearn.svm **import** SVC

**from** sklearn **import** svm

**import** numpy **as** np

X**=**np**.**array([[3,4],[1,4],[2,3],[6,**-**1],[7,**-**1],[5,**-**3]])

y**=**np**.**array([**-**1,**-**1,**-**1,1,1,1])

l**=**SVC(C**=**1e5,kernel**=**'linear')

l**.**fit(X,y)

print('w= ',l**.**coef\_)

print('b= ',l**.**intercept\_)

print('Indices of support vectors= ',l**.**support\_)

print('Support vectors= ',l**.**support\_vectors\_)

print('No. of support vectors from each class= ',l**.**n\_support\_)

print('coefficient of support vectors in decision function= ',np**.**abs(l**.**dual\_coef\_))

**import** pandas **as** pd

data**=**pd**.**read\_csv('glass.csv')

data**.**head()

x**=**data**.**drop('Type',axis**=**1)

y**=**data**.**Type

**from** sklearn.model\_selection **import** train\_test\_split

x\_train,x\_test,y\_train,y\_test**=**train\_test\_split(x,y,test\_size**=**0.3)

linear**=**svm**.**SVC(kernel**=**'linear')

linear**.**fit(x\_train,y\_train)

print(linear**.**support\_vectors\_)

print(linear**.**n\_support\_)

y\_pred**=**linear**.**predict(x\_test)

**from** sklearn.metrics **import** accuracy\_score

print(accuracy\_score(y\_test,y\_pred))

**from** sklearn.metrics **import** confusion\_matrix

print(confusion\_matrix(y\_test,y\_pred))

**from** sklearn.metrics **import** classification\_report

print(classification\_report(y\_test,y\_pred))

model1**=**SVC(kernel**=**'sigmoid')

model2**=**SVC(kernel**=**'poly')

model3**=**SVC(kernel**=**'rbf')

model1**.**fit(x\_train,y\_train)

model2**.**fit(x\_train,y\_train)

model3**.**fit(x\_train,y\_train)

y\_pred1**=**model1**.**predict(x\_test)

y\_pred2**=**model2**.**predict(x\_test)

y\_pred3**=**model3**.**predict(x\_test)

print("prediction by model1 ",accuracy\_score(y\_test,y\_pred1))

print("prediction by model2",accuracy\_score(y\_test,y\_pred2))

print("prediction by model3",accuracy\_score(y\_test,y\_pred1))