EXPERIMENT 5

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A PYTHON PROGRAM TO IMPLEMENT MUTILAYER PERCEPTION WITH BACK PROPAGATION

AIM:

TO IMPLEMENT A PYTHON PROGRAM WITH MUTILAYER PERCEPTION WITH BACK PROPAGATION

CODE:

```
import pandas as pd
import numpy as np
bnotes = pd.read_csv('/content/BankNote_Authentication.csv')
bnotes.head(10)

x = bnotes.drop('class',axis=1)
y = bnotes['class']
print(x.head(2))
print(y.head(2))

from sklearn.model_selection import train_test_split
#train_test ratio = 0.2
x_train,x_test,y_train,y_test = train_test_split(x,y,test_size=0.2)
from sklearn.neural_network import MLPClassifier
# activation function : relu
mlp = MLPClassifier(max_iter=500,activation='relu')
mlp.fit(x_train,y_train)
MLPClassifier(max_iter=500)
pred = mlp.predict(x_test)
print(pred)
```

```
from sklearn.metrics import classification_report, confusion_matrix
confusion_matrix(y_test,pred)
print(classification_report(y_test,pred))

# activation function : logistic
mlp = MLPClassifier(max_iter=500,activation='logistic')
mlp.fit(x_train,y_train)

MLPClassifier(activation='logistic', max_iter=500)
pred = mlp.predict(x_test)
print(pred)

from sklearn.metrics import classification_report, confusion_matrix
confusion_matrix(y_test,pred)

print(classification_report(y_test,pred))

mlp = MLPClassifier(max_iter=500,activation='tanh')
mlp.fit(x_train,y_train)
pred = mlp.predict(x_test)
print(pred)

from sklearn.metrics import classification_report, confusion_matrix
confusion_matrix(y_test,pred)


print(classification_report(y_test,pred))

# activation function : identity
mlp = MLPClassifier(max_iter=500,activation='identity')
mlp.fit(x_train,y_train)
MLPClassifier(activation='identity', max_iter=500)
pred = mlp.predict(x_test)
print(pred)

from sklearn.metrics import classification_report,confusion_matrix
confusion_matrix(y_test,pred)
```

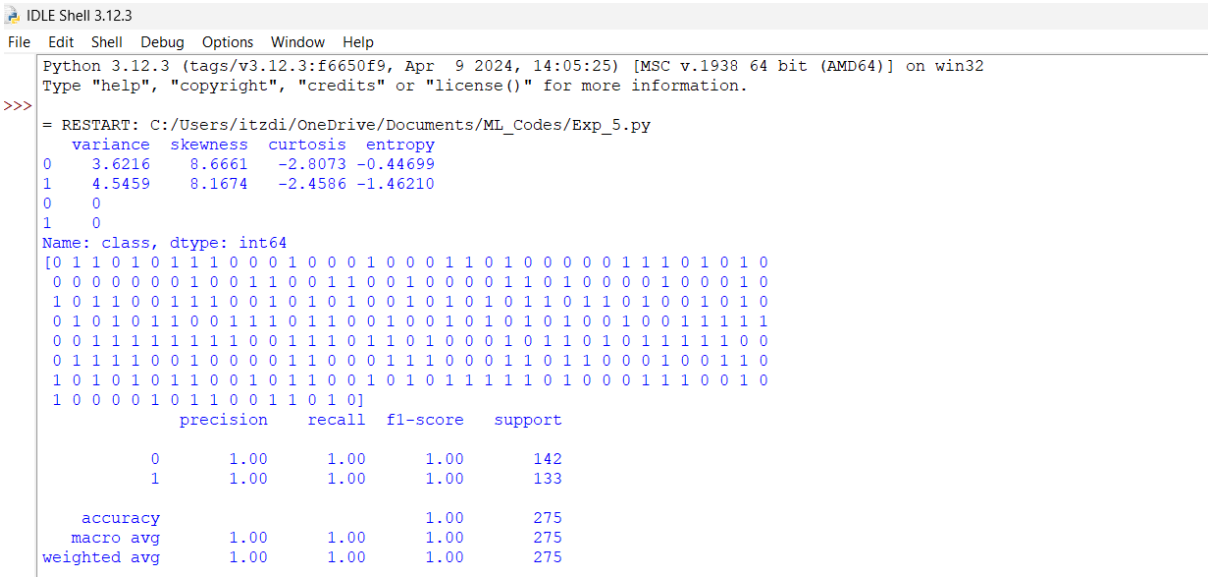
```
print(classification_report(y_test,pred))

#train_test ratio = 0.3
x_train,x_test,y_train,y_test = train_test_split(x,y,test_size=0.3)
from sklearn.neural_network import MLPClassifier
# activation function : relu
mlp = MLPClassifier(max_iter=500,activation='relu')
mlp.fit(x_train,y_train)
MLPClassifier(max_iter=500)
pred = mlp.predict(x_test)
print(pred)


from sklearn.metrics import classification_report,confusion_matrix
confusion_matrix(y_test,pred)

print(classification_report(y_test,pred))

# activation function : logistic
mlp = MLPClassifier(max_iter=500,activation='logistic')
mlp.fit(x_train,y_train)
MLPClassifier(max_iter=500,activation='logistic')
pred = mlp.predict(x_test)
print(pred)
MLPClassifier(max_iter=500,activation='tanh')

# activation function : tanh
mlp = MLPClassifier(max_iter=500,activation='tanh')
mlp.fit(x_train,y_train)
pred = mlp.predict(x_test)
print(pred)

from sklearn.metrics import classification_report,confusion_matrix
confusion_matrix(y_test,pred)

print(classification_report(y_test,pred))
```

 # activation function : identity
mlp = MLPClassifier(max_iter=500,activation='identity')
mlp.fit(x_train,y_train)
MLPClassifier(max_iter=500,activation='identity')
pred = mlp.predict(x_test)
print(pred)

from sklearn.metrics import classification_report,confusion_matrix
confusion_matrix(y_test,pred)

print(classification_report(y_test,pred))

OUTPUT:



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              precision    recall  f1-score   support

           0       1.00      1.00      1.00       142
           1       1.00      1.00      1.00       133

    accuracy                           1.00       275
   macro avg       1.00      1.00      1.00       275
weighted avg       1.00      1.00      1.00       275

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    accuracy                           0.99       275
   macro avg       0.99      0.99      0.99       275
weighted avg       0.99      0.99      0.99       275
```

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 1 1 1 0 0]
              precision    recall  f1-score   support

           0       1.00      1.00      1.00       221
           1       1.00      0.99      1.00       191

    accuracy                           1.00       412
   macro avg       1.00      1.00      1.00       412
weighted avg       1.00      1.00      1.00       412
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[0 1 0 1 0 1 1 1 1 0 0 1 0 0 0 1 0 1 0 0 0 0 0 0 1 1 1 0 0 1 0 0 1 1 0 1 0
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 1 1 1 0 0]
              precision    recall  f1-score   support

           0       0.99      0.99      0.99       221
           1       0.98      0.98      0.98       191

    accuracy                           0.99       412
   macro avg       0.99      0.99      0.99       412
weighted avg       0.99      0.99      0.99       412
```

RESULT:

A PYTHON PROGRAM TO IMPLEMENT MUTILAYER PERCEPTION WITH BACK PROPAGATION AS BEEN ANALYSED AND VERIFIED