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EXP NO:9 - IMPLEMENTING ARTIFICIAL NEURAL NETWORKS FOR APPLICATION USING PYTHON - CLASSIFICATION

AIM

To implement artificial neural networks for an application in classification using python

ALGORITHM :

1) import essential libraries for data ~~data~~ generation, model training and visualization.

2) create a circular training and testing datasets with noise using make_circles

3) Plot the training data with colors indicating classes

4) Initialize an MLPClassifier and train it on circular training data

5) Print the R^2 scores of the model on both training and test datasets

6) Predict classes for test data, then plot and compare true and predicted test data.

CODE :

```
from sklearn.model_selection import train_test_split
from sklearn.datasets import make_circles
from sklearn.neural_network import MLPClassifier
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns

%matplotlib inline.
```

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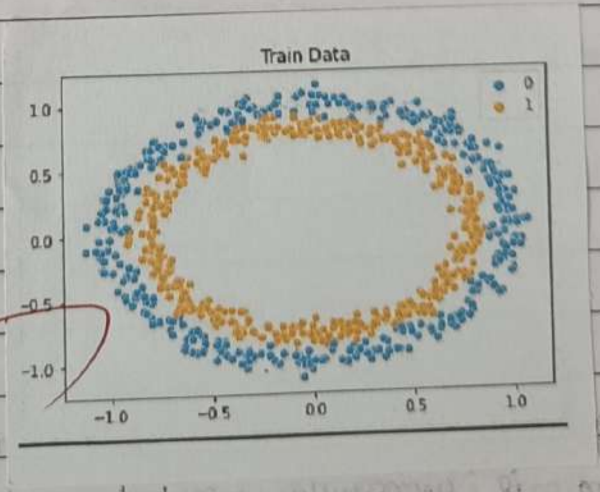
```
x_train , y-train =  make- circles (n-samples = 100, noise = 0.05)
x- test , y- test =  make- circles ( n- samples = 300, noise = 0.05)
sns. scatterplot ( x= x-train [ : , 0] , y = x-train [:, 1], hue = y-train, palette =
                                                        " viridis")

plt. title (" Train Data")
plt. show ( )

clf = MLPClassifier (max_iter = 1000 , random state=42)
clf . fit ( x-train , y- train)
print ( f" R2 score ~~#~~ for training Data = {clf . score (x-train , y-train):
                                                                .2f }")
print ( f"R2 score for Test Data = { clf . score ( x-test , y-test):.2f}")

y- pred = clf . predict (x-test)
fig , ax = plt . subplots (1, 2, figsize = (12, 5))
sns. scatterplot (x = x- test [:,0] , x- test [:, 1], hue = y-pred , ax = ax[0])
ax[0] . set - title (" predicted Data").

sns. scatterplot (x = x - test [:, 0] , y = x- test [:, 1], hue = y - test , ax= ax[1])
ax [1]. set - title (" True Test Data")
plt. show ()
```

OUTPUT :



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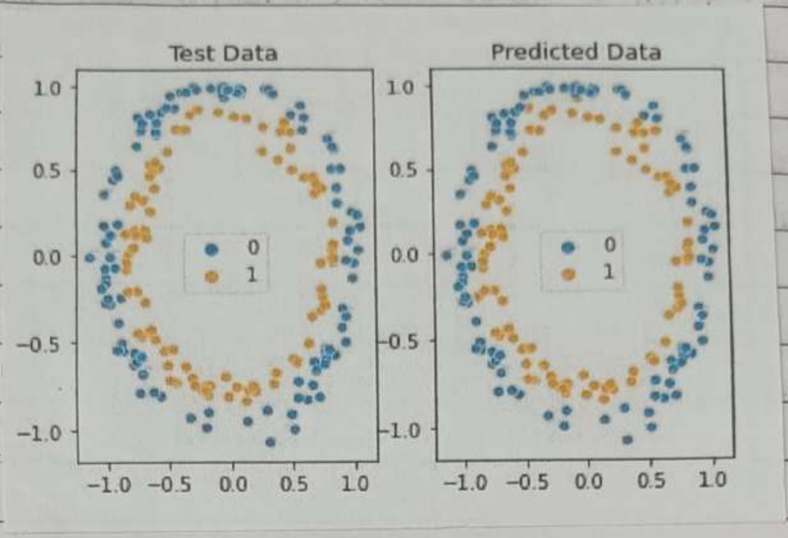

RESULT :

Thus the implementation of Artificial Neural network application in classification is successfully executed and verified