EX.NO :

DATE :
IMPLEMENTING ARTIFICIAL NEURAL NETWORKS FOR AN APPLICATION USING PYTHON - CLASSIFICATION

AIM : To implementing artificial neural networks for an application in classification using python.

Source Code :

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

# Generate data
X_train, y_train = make_circles(n_samples=700, noise=0.05)
X_test, y_test = make_circles(n_samples=300, noise=0.05)

# Plot training data
sns.scatterplot(x=X_train[:,0], y=X_train[:,1], hue=y_train, palette="viridis")
plt.title("Train Data")
plt.show()

# Train the model
clf = MLPClassifier(max_iter=1000)
clf.fit(X_train, y_train)
print(f"R2 Score for Training Data = {clf.score(X_train, y_train)}")
print(f"R2 Score for Test Data = {clf.score(X_test, y_test)}")

# Predict and plot test data
y_pred = clf.predict(X_test)
fig, ax = plt.subplots(1, 2, figsize=(12, 5))

sns.scatterplot(x=X_test[:,0], y=X_test[:,1], hue=y_pred, ax=ax[0], palette="viridis")
ax[0].set_title("Predicted Data")

sns.scatterplot(x=X_test[:,0], y=X_test[:,1], hue=y_test, ax=ax[1], palette="viridis")
ax[1].set_title("Test Data")

plt.show()
```
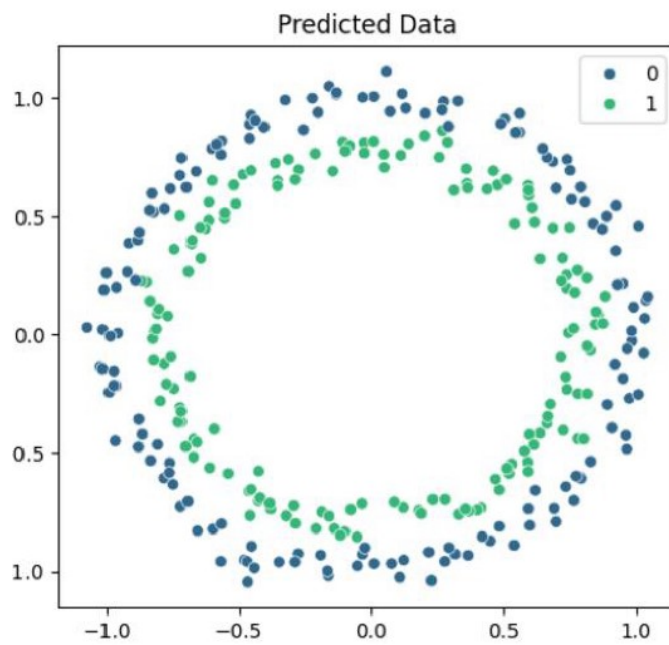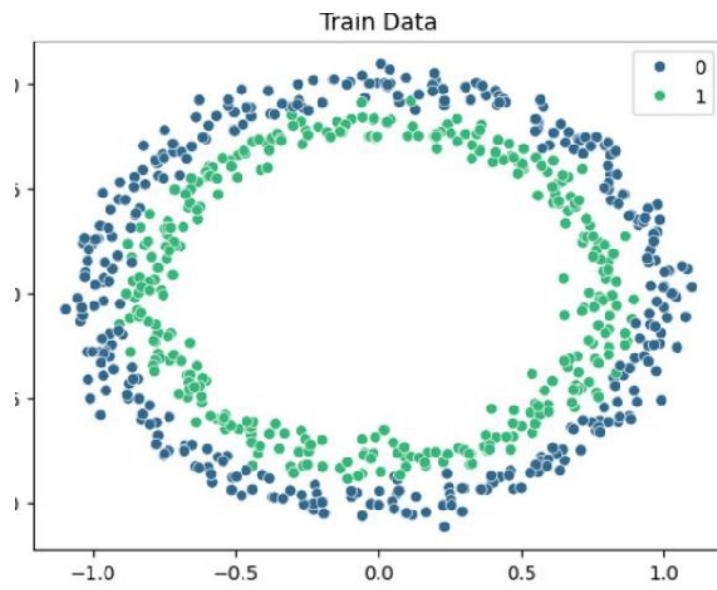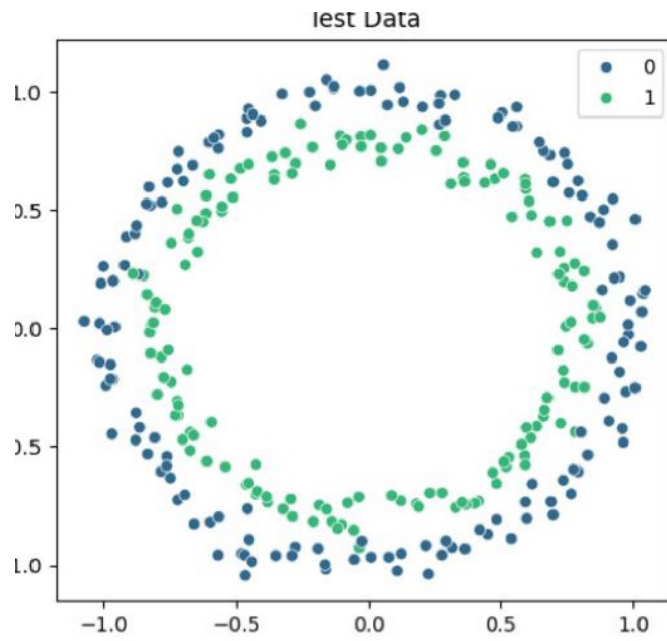
Train Data

Predicted Data

Test Data