Unit 3.2 Graded Assignment:
Muhammad Khan (2303.KHI.DEG.027)
Qadeer Hussain (2303.KHI.DEG.006)

Daily Assignment :

Implement a single classification model of your choice and try to achieve at least an 80% F1 score on the wine dataset provided by Sklearn.

Answer:

First of all we Imports necessary libraries and packages from scikit-learn, including the Wine dataset, the SVM classifier, the f1_score metric, and a StandardScaler object for feature scaling, then Loads the Wine dataset and splits it into training and testing sets using the train_test_split() function, where the testing set is 20% of the total data.

```
from sklearn.datasets import load_wine
from sklearn.model_selection import train_test_split
from sklearn.svm import SVC
from sklearn.metrics import f1_score
from sklearn.preprocessing import StandardScaler


wine = load_wine()
X_train, X_test, y_train, y_test = train_test_split(wine.data, wine.target, test_size=0.2)


scaler = StandardScaler()
X_train = scaler.fit_transform(X_train)
X_test = scaler.transform(X_test)


clf = SVC(kernel='linear')
clf.fit(X_train, y_train)
y_pred = clf.predict(X_test)
f1 = f1_score(y_test, y_pred, average='micro')

print(f"F1 score: {f1}")
```

```
F1 score: 0.9722222222222222
```

Standardizes the features of the data by fitting a StandardScaler() object to the training data and then transforming the test data using the same scaling parameters,then we creates an SVM classifier object with a linear kernel and trains it on the standardized training data. Predicts the classes of the test set using the trained SVM classifier and calculates the F1 score using the f1_score() function, with a micro average. Then prints the F1 Score, output is 0.97222222.