Assignment 1: Build a spam filter using Python and the Naive Bayes algorithm.

Code =>

```
import pandas as pd

from sklearn.feature_extraction.text import CountVectorizer
from sklearn.naive_bayes import MultinomialNB
from sklearn.model_selection import train_test_split
from sklearn.metrics import accuracy_score, classification_report

# Load Dataset
file_path = r"C:\Users\Shreyash Musmade\Desktop\Practical\AICS\AICS_Prac-
1\spam.csv"
data = pd.read_csv(file_path, encoding='latin-1', usecols=[0, 1],
names=['label', 'message'], header=0)

# Data Preprocessing
data['label'] = data['label'].map({'ham': 0, 'spam': 1})
X = data['message']
y = data['label']

vectorizer = CountVectorizer()
X = vectorizer.fit_transform(X)

# Split the data into training and testing sets
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.3,
random_state=42)

# Train the Naive Bayes model
model = MultinomialNB()
model.fit(X_train, y_train)

# Predict on the test data
y_pred = model.predict(X_test)

# Evaluate the model
print("Accuracy:", accuracy_score(y_test, y_pred))
print("Classification Report:\n", classification_report(y_test, y_pred))

# Test with new messages
def predict_message(message):
    msg_transformed = vectorizer.transform([message])
    prediction = model.predict(msg_transformed)
    return 'Spam' if prediction[0] == 1 else 'Ham'

# Example
print(predict_message("Congratulations! You have won a $1,000 Walmart gift
card. Call now!"))
```

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Output =>

```
[Running] python -u "c:\Users\Shreyash
Musmade\Desktop\Practical\AICS\AICS_Prac-1\Practical.py"

Accuracy: 0.9784688995215312
Classification Report:
              precision    recall  f1-score   support

           0       0.99      0.99      0.99      1453
           1       0.92      0.92      0.92       219

    accuracy                           0.98      1672
   macro avg       0.95      0.95      0.95      1672
weighted avg       0.98      0.98      0.98      1672

Spam

[Done] exited with code=0 in 1.054 seconds
```