Assignment 2: Classify DDoS attacks with Artificial Intelligence.

Code =>

```
import pandas as pd

from sklearn.model_selection import train_test_split

from sklearn.preprocessing import StandardScaler, LabelEncoder

from sklearn.ensemble import RandomForestClassifier

from sklearn.metrics import classification_report, accuracy_score

# Load the dataset

file_path = r"C:\Users\Shreyash Musmade\Desktop\Practical\AICS\AICS_Prac-
2\TCP-SYNC DATASET.csv"

df = pd.read_csv(file_path)

# Drop non-numeric columns except the target label

df_cleaned = df.drop(columns=["Flow ID", "Src IP", "Dst IP",
"Timestamp"]).dropna()

# Encode the target variable

label_encoder = LabelEncoder()

df_cleaned["Label"] = label_encoder.fit_transform(df_cleaned["Label"])

# Split features and target

X = df_cleaned.drop(columns=["Label"])

y = df_cleaned["Label"]

# Standardize the features

scaler = StandardScaler()

X_scaled = scaler.fit_transform(X)

# Split into training and test sets

X_train, X_test, y_train, y_test = train_test_split(X_scaled, y,
test_size=0.2, random_state=42)

# Train a Random Forest classifier

model = RandomForestClassifier(n_estimators=100, random_state=42)

model.fit(X_train, y_train)

# Make predictions

y_pred = model.predict(X_test)

# Evaluate the model

accuracy = accuracy_score(y_test, y_pred)
```

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```
report = classification_report(y_test, y_pred,
target_names=label_encoder.classes_)

print(f"Model Accuracy: {accuracy * 100:.2f}%")

print("Classification Report:\n", report)
```

Output =>

```
[Running] python -u "c:\Users\Shreyash
Musmade\Desktop\Practical\AICS\AICS_Prac-2\Practical.py"

Model Accuracy: 100.00%

Classification Report:

              precision    recall  f1-score   support

        DDOS       1.00      1.00      1.00       689
      Normal       1.00      1.00      1.00       558

    accuracy                           1.00      1247
   macro avg       1.00      1.00      1.00      1247
weighted avg       1.00      1.00      1.00      1247

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