

Assignment 8

```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
from sklearn.model_selection import train_test_split
from sklearn.preprocessing import StandardScaler, LabelEncoder
from sklearn.svm import SVC
from sklearn.metrics import accuracy_score, classification_report, confusion_matrix
```

```
df = pd.read_csv("pizza_sales.csv")
```

```
features = ['quantity', 'unit_price', 'total_price']
target = 'pizza_category'
df = df.dropna(subset=[target])
```

```
label_encoder = LabelEncoder()
df[target] = label_encoder.fit_transform(df[target])
```

```
X = df[features]
y = df[target]
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2, random_state=42)
```

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

```
svm_model = SVC(kernel='rbf', C=1.0, gamma='scale')
svm_model.fit(X_train, y_train)
```

```
SVC()
```

```
y_pred = svm_model.predict(X_test)
```

```
accuracy = accuracy_score(y_test, y_pred)
print("Accuracy:", accuracy)
print("Classification Report:\n", classification_report(y_test, y_pred))
```

```
Accuracy: 0.5522418757712876
Classification Report:
              precision    recall  f1-score   support

     0             0.64       0.80       0.71       2155
     1             0.53       0.63       0.57       2935
     2             0.44       0.36       0.40       2357
     3             0.59       0.41       0.49       2277

 accuracy              0.55              0.55       0.55       9724
 macro avg              0.55              0.55       0.54       9724
 weighted avg           0.55              0.55       0.54       9724
```

```
conf_matrix = confusion_matrix(y_test, y_pred)
plt.figure(figsize=(6,4))
sns.heatmap(conf_matrix, annot=True, cmap='Blues', fmt='d', xticklabels=label_encoder.classes_, yticklabels=label_encoder.classes_,
plt.xlabel("Predicted")
plt.ylabel("Actual")
plt.title("Confusion Matrix")
plt.show()
```

