Importing Modules

```
import numpy as np
import matplotlib.pyplot as plt
from sklearn.metrics import confusion_matrix
import seaborn as sns
```

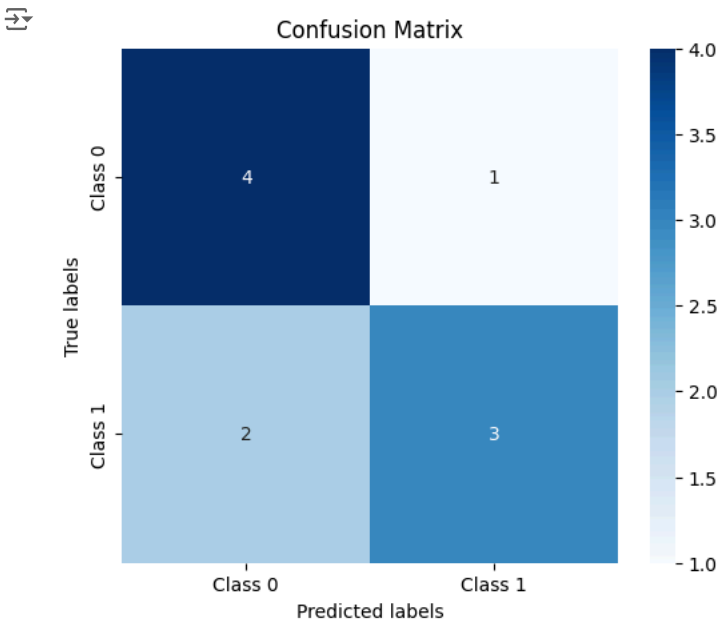
Defining Dataset

```
true_labels = [0, 1, 0, 1, 1, 0, 1, 0, 1, 0]
predicted_labels = [0, 0, 0, 1, 1, 0, 0, 0, 1, 1]
```

Generating and Visualizing the Confusion Matrix

```
cm = confusion_matrix(true_labels, predicted_labels)

plt.figure(figsize=(6, 5))
sns.heatmap(cm, annot=True, fmt="d", cmap="Blues", xticklabels=["Class 0", "Class 1"], yticklabels=["Class 0", "Class 1"])
plt.xlabel('Predicted labels')
plt.ylabel('True labels')
plt.title('Confusion Matrix')
plt.show()
```



Understanding the Confusion matrix

```
TN, FP, FN, TP = cm.ravel()
print(f"True Negative (TN): {TN}")
print(f"False Positive (FP): {FP}")
print(f"False Negative (FN): {FN}")
print(f"True Positive (TP): {TP}")
```

```
True Negative (TN): 4
False Positive (FP): 1
False Negative (FN): 2
True Positive (TP): 3
```

Understanding the Metrics

```
accuracy = (TN + TP) / (TN + FP + FN + TP)
precision = TP / (TP + FP) if (TP + FP) != 0 else 0
recall = TP / (TP + FN) if (TP + FN) != 0 else 0
f1_score = 2 * (precision * recall) / (precision + recall) if (precision + recall) != 0 else 0

print(f"Accuracy: {accuracy:.2f}")
print(f"Precision: {precision:.2f}")
print(f"Recall: {recall:.2f}")
print(f"F1 Score: {f1_score:.2f}")
```

```
Accuracy: 0.70
Precision: 0.75
Recall: 0.60
F1 Score: 0.67
```