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In [8]: import numpy as np
import matplotlib.pyplot as plt
from sklearn.metrics import roc_curve, auc, classification_report, confusion_matrix
from sklearn.model_selection import train_test_split
from sklearn.svm import SVC
from sklearn.impute import SimpleImputer
import pandas as pd

data = pd.read_csv('/Users/mehtap/Downloads/PCOS_data.csv')

X = data.iloc[:, 3:-1]
y = data['PCOS (Y/N)']

imputer = SimpleImputer(strategy='mean')
X_imputed = imputer.fit_transform(X)

X_train, X_test, y_train, y_test = train_test_split(X_imputed, y, test_size=0.2)

svm_classifier = SVC(kernel='linear', random_state=42)

svm_classifier.fit(X_train, y_train)

y_pred = svm_classifier.predict(X_test)

accuracy = np.mean(y_test == y_pred)

report = classification_report(y_test, y_pred, output_dict=True)
precision = report['weighted avg']['precision']
recall = report['weighted avg']['recall']
f1_score = report['weighted avg']['f1-score']

y_scores = svm_classifier.decision_function(X_test)

fpr, tpr, _ = roc_curve(y_test, y_scores)
roc_auc = auc(fpr, tpr)

plt.figure(figsize=(8, 6))
plt.plot(fpr, tpr, color='darkorange', lw=2, label='ROC curve (area = %0.2f)' % roc_auc)
plt.plot([0, 1], [0, 1], color='navy', lw=2, linestyle='--')
plt.xlim([0.0, 1.0])
plt.ylim([0.0, 1.05])
plt.xlabel('False Positive Rate')
plt.ylabel('True Positive Rate')
plt.title('Receiver Operating Characteristic')
plt.legend(loc="lower right")

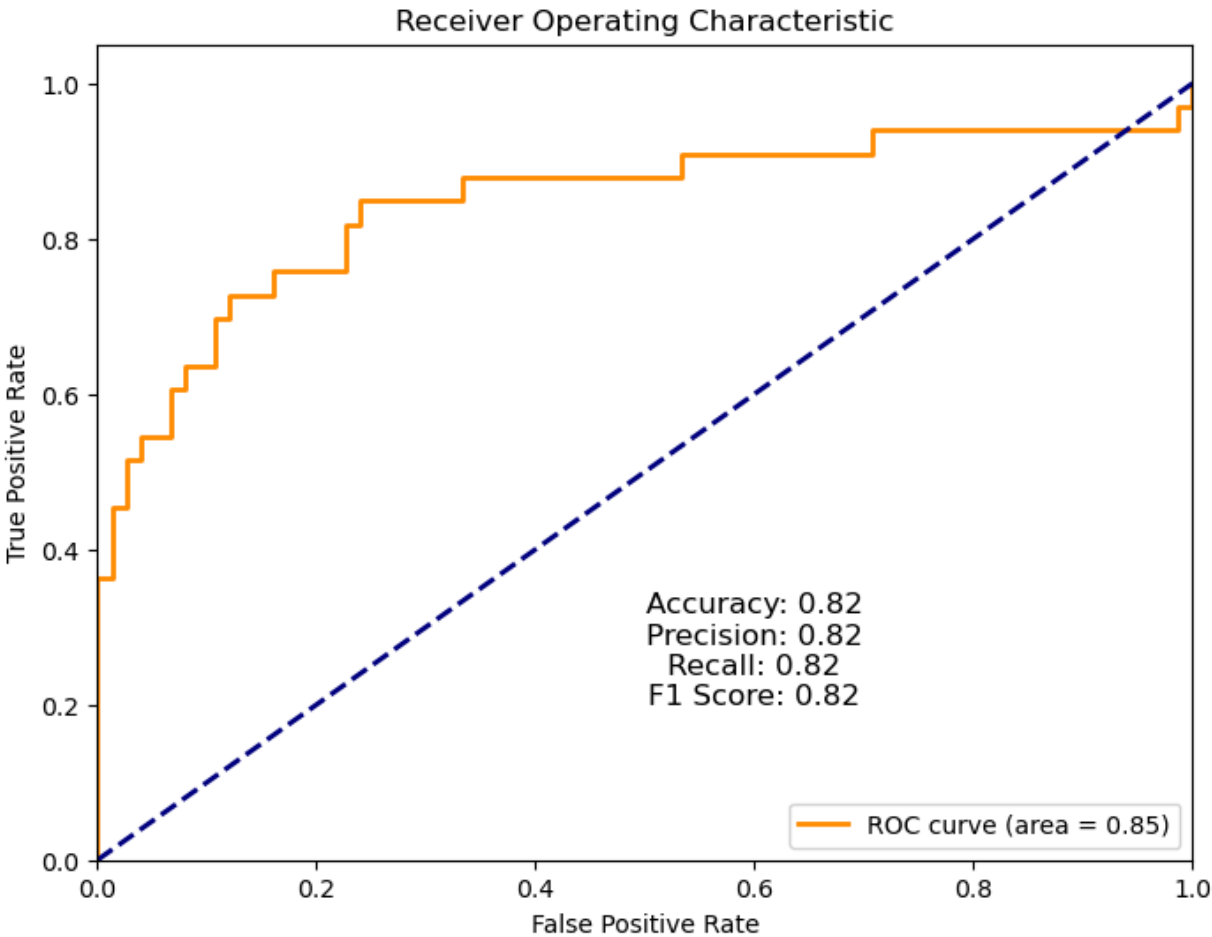
plt.text(0.6, 0.2, 'Accuracy: {:.2f}\nPrecision: {:.2f}\nRecall: {:.2f}\nF1 Score: {:.2f}'.format(accuracy, precision, recall, f1_score),
        fontsize=12, ha='center')

plt.show()

print("Classification Report:")
print(classification_report(y_test, y_pred))

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print("Confusion Matrix:")
print(confusion_matrix(y_test, y_pred))
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Classification Report:

	precision	recall	f1-score	support
0	0.84	0.92	0.88	75
1	0.77	0.61	0.68	33
accuracy			0.82	108
macro avg	0.81	0.76	0.78	108
weighted avg	0.82	0.82	0.82	108

Confusion Matrix:
[[69 6]
 [13 20]]

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In [ ]:
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