```
import pandas as pd
df = pd.read_csv("ECom_Shiping.csv")
df.head()
```

	ID	Warehouse_block	Mode_of_Shipment	Customer_care_calls	Customer_rating	Cost_of_the_Product	Prior_purchases	Product_import
0	1	D	Flight	4	2	177	3	
1	2	F	Flight	4	5	216	2	
2	3	A	Flight	2	2	183	4	
3	4	B	Flight	3	3	176	4	me
4	5	C	Flight	2	2	184	3	me

Next steps: Generate code with df View recommended plots

```
from sklearn.naive_bayes import GaussianNB
from sklearn.model_selection import train_test_split
from sklearn.metrics import accuracy_score
from sklearn.preprocessing import LabelEncoder
from sklearn.metrics import confusion_matrix, roc_curve, auc, f1_score
import matplotlib.pyplot as plt
```

```
# Assuming you have a DataFrame called 'data' with the independent and dependent variables
X = df[['Weight_in_gms', 'Product_importance', 'Cost_of_the_Product', 'Customer_rating', 'Customer_care_calls', 'Mode_of_Shipment']]
y = df['Reached.on.Time_Y.N']
```

```
# Encode categorical variables
label_encoder = LabelEncoder()
X_encoded = X.copy()
X_encoded['Product_importance'] = label_encoder.fit_transform(X['Product_importance'])
X_encoded['Mode_of_Shipment'] = label_encoder.fit_transform(X['Mode_of_Shipment'])
```

```
# Split the data into training and testing sets
X_train, X_test, y_train, y_test = train_test_split(X_encoded, y, test_size=0.2, random_state=42)
```

```
# Create a Naive Bayes classifier
nb_clf = GaussianNB()
```

```
# Train the Naive Bayes classifier
nb_clf.fit(X_train, y_train)
```

```
▾ GaussianNB
GaussianNB()
```

```
# Make predictions on the test set
y_pred = nb_clf.predict(X_test)
```

```
# Evaluate the accuracy of the Naive Bayes classifier
accuracy = accuracy_score(y_test, y_pred)
print("Accuracy:", accuracy)
```

```
Accuracy: 0.6386363636363637
```

```
# Calculate the confusion matrix
confusion_mat = confusion_matrix(y_test, y_pred)
print("Confusion Matrix:")
print(confusion_mat)
```

```
Confusion Matrix:
[[ 345  550]
 [ 245 1060]]
```

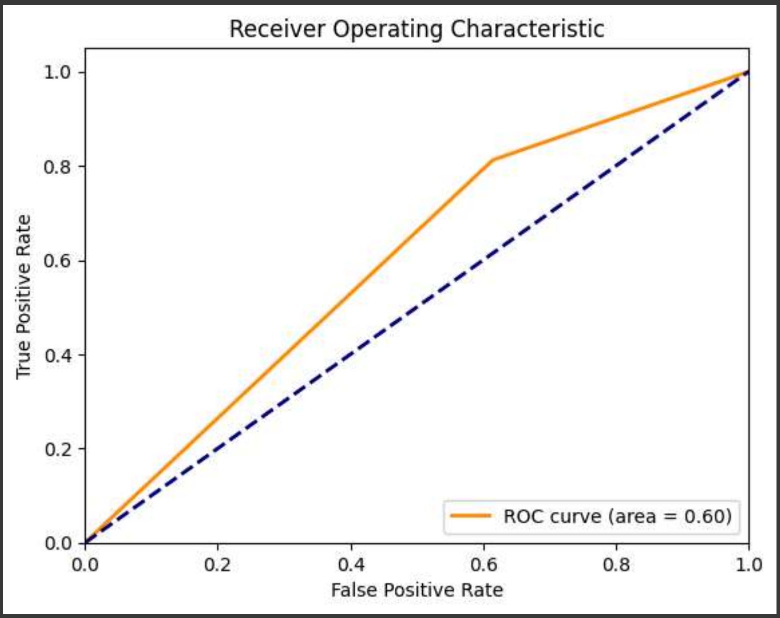
```
# Calculate the AUC (Area Under the Curve)
fpr, tpr, thresholds = roc_curve(y_test, y_pred)
roc_auc = auc(fpr, tpr)
print("AUC:", roc_auc)
```

```
AUC: 0.5988676983668315
```

```
# Calculate the F1 score
f1_score_value = f1_score(y_test, y_pred)
print("F1 Score:", f1_score_value)
```

```
F1 Score: 0.7272727272727273
```

```
# Plot the ROC curve
plt.figure()
lw = 2
plt.plot(fpr, tpr, color='darkorange',
         lw=lw, label='ROC curve (area = %0.2f)' % roc_auc)
plt.plot([0, 1], [0, 1], color='navy', lw=lw, 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.show()
```


Receiver Operating Characteristic
True Positive Rate
False Positive Rate
ROC curve (area = 0.60)