In [1]:
```
# import libraries
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
```

In [2]:
```
# reading dataset
read = pd.read_csv("titanic_data.csv")
```

In [3]:
```
read.head(10)
```

Out[3]:

	PassengerId	Survived	Pclass	Name	Sex	Age	SibSp	Parch	Ticket	Fare	Cabi
0	1	0	3	Braund, Mr. Owen Harris	male	22.0	1	0	A/5 21171	7.2500	Na
1	2	1	1	Cumings, Mrs. John Bradley (Florence Briggs Th...	female	38.0	1	0	PC 17599	71.2833	C8
2	3	1	3	Heikkinen, Miss. Laina	female	26.0	0	0	STON/O2. 3101282	7.9250	Na
3	4	1	1	Futrelle, Mrs. Jacques Heath (Lily May Peel)	female	35.0	1	0	113803	53.1000	C12
4	5	0	3	Allen, Mr. William Henry	male	35.0	0	0	373450	8.0500	Na
5	6	0	3	Moran, Mr. James	male	NaN	0	0	330877	8.4583	Na
6	7	0	1	McCarthy, Mr. Timothy J	male	54.0	0	0	17463	51.8625	E4
7	8	0	3	Palsson, Master. Gosta Leonard	male	2.0	3	1	349909	21.0750	Na
8	9	1	3	Johnson, Mrs. Oscar W (Elisabeth Vilhelmina Berg)	female	27.0	0	2	347742	11.1333	Na
9	10	1	2	Nasser, Mrs. Nicholas (Adele Achem)	female	14.0	1	0	237736	30.0708	Na

In [4]:
```
# selecting the columns what are needed.
df=read[['Survived','Pclass','Sex','Age','Fare']]
```

In [5]:
```
# replacing male with 1 and females with 0.
df["Sex"] = df["Sex"].apply(lambda sex:1 if sex=="male" else  0)
```

```
<ipython-input-5-038c01d3b808>:2: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/sta
ble/user_guide/indexing.html#returning-a-view-versus-a-copy (https://pandas.pyd
ata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-c
opy)
  df["Sex"] = df["Sex"].apply(lambda sex:1 if sex=="male" else  0)
```

In [6]:
```
# Handling missing values - Data Imputation
print(df.isnull().sum())
```

```
Survived      0
Pclass        0
Sex           0
Age         177
Fare          0
dtype: int64
```

In [7]:
```
df["Age"] = df["Age"].fillna(df["Age"].median())
```

```
<ipython-input-7-0f86aa1fb408>:1: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/sta
ble/user_guide/indexing.html#returning-a-view-versus-a-copy (https://pandas.pyd
ata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-c
opy)
  df["Age"] = df["Age"].fillna(df["Age"].median())
```

In [8]:
```
# taking a look at a dataframe
df.head()
```

Out[8]:

	Survived	Pclass	Sex	Age	Fare
0	0	3	1	22.0	7.2500
1	1	1	0	38.0	71.2833
2	1	3	0	26.0	7.9250
3	1	1	0	35.0	53.1000
4	0	3	1	35.0	8.0500

In [9]:
```
# Set the predictor (x) and response (y) variables
x = df.drop("Survived",axis=1)
y = df["Survived"]
```

In [10]:
```
# splitting the dataset
from sklearn.model_selection import train_test_split
xtrain,xtest,ytrain,ytest = train_test_split(x,y,test_size = 0.3,random_state = 0
```

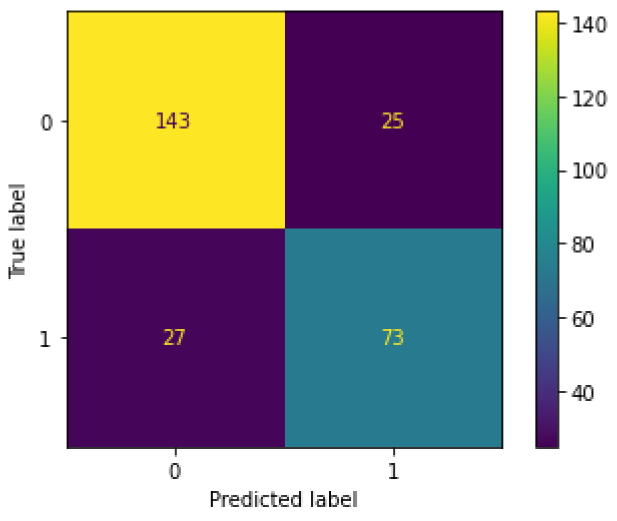
In [11]:
```
# import logistic regression
from sklearn.linear_model import LogisticRegression
lr = LogisticRegression()
lr.fit(xtrain,ytrain)
ypredict = lr.predict(xtest)
```

In [12]:
```
ypredict
```

Out[12]:
```
array([0, 0, 0, 1, 1, 0, 1, 1, 1, 1, 0, 1, 0, 1, 1, 1, 0, 0, 0, 0, 0, 1,
       0, 0, 1, 1, 0, 1, 1, 1, 0, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
       1, 0, 0, 1, 0, 0, 0, 1, 1, 0, 0, 0, 0, 1, 0, 0, 0, 1, 1, 0, 1, 0,
       1, 0, 1, 1, 1, 0, 0, 0, 0, 1, 1, 0, 0, 0, 0, 0, 1, 0, 0, 1, 1, 0,
       1, 1, 0, 0, 0, 1, 1, 0, 1, 0, 0, 1, 0, 0, 0, 0, 1, 1, 1, 0, 0, 1,
       0, 1, 0, 1, 0, 1, 1, 1, 0, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0,
       0, 1, 0, 0, 0, 0, 0, 0, 0, 1, 0, 1, 1, 1, 0, 1, 1, 0, 0, 1, 0, 0,
       1, 0, 0, 0, 1, 1, 0, 0, 1, 1, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 1, 0,
       1, 0, 0, 1, 0, 0, 0, 0, 0, 0, 1, 0, 0, 1, 1, 0, 1, 1, 0, 0, 0, 1,
       0, 0, 0, 1, 0, 1, 0, 0, 1, 0, 1, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 1,
       0, 1, 1, 0, 1, 0, 0, 1, 0, 0, 0, 1, 1, 1, 0, 0, 1, 1, 1, 0, 0, 1,
       0, 0, 1, 0, 1, 0, 0, 1, 0, 0, 0, 0, 1, 1, 1, 0, 0, 0, 0, 0, 0, 0,
       0, 0, 1, 0], dtype=int64)
```

In [13]:
```
#  Confusion Matrix
from sklearn.metrics import confusion_matrix,plot_confusion_matrix,accuracy_score
print(confusion_matrix(ytest,ypredict))
plot_confusion_matrix(lr,xtest,ytest)
plt.show()
```

```
[[143  25]
 [ 27  73]]
```



In [14]:
```
print("Accuracy Score :- ",accuracy_score(ytest,ypredict))
```

```
Accuracy Score :-  0.8059701492537313
```

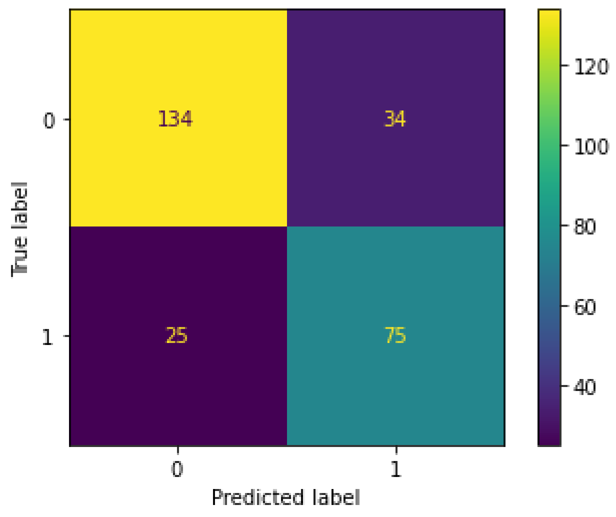
In [15]:
```
print(classification_report(ytest,ypredict))
```

```
              precision    recall  f1-score   support

           0       0.84      0.85      0.85       168
           1       0.74      0.73      0.74       100

    accuracy                           0.81       268
   macro avg       0.79      0.79      0.79       268
weighted avg       0.81      0.81      0.81       268
```

In [16]:
```
from sklearn.naive_bayes import  GaussianNB
gb = GaussianNB()
gb.fit(xtrain,ytrain)
ypredict = gb.predict(xtest)
```

In [17]:
```
print(confusion_matrix(ytest,ypredict))
plot_confusion_matrix(gb,xtest,ytest)
plt.show()
```

```
[[134  34]
 [ 25  75]]
```



In [18]:
```
print("Accuracy Score :- ",accuracy_score(ytest,ypredict))
```

```
Accuracy Score :-  0.7798507462686567
```

In [19]:
```
print(classification_report(ytest,ypredict))
```

```
              precision    recall  f1-score   support

           0       0.84      0.80      0.82       168
           1       0.69      0.75      0.72       100

    accuracy                           0.78       268
   macro avg       0.77      0.77      0.77       268
weighted avg       0.79      0.78      0.78       268
```

Conclusion :- Logistic Regression is much better than Naive Bayes