In [1]:
```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
from sklearn import datasets
from sklearn.linear_model import LogisticRegression
from sklearn.model_selection import train_test_split
from sklearn.metrics import accuracy_score,confusion_matrix
import seaborn as sns
```

In [2]:
```
d=datasets.load_iris()
d
```

Out[2]:
```
{'data': array([[5.1, 3.5, 1.4, 0.2],
        [4.9, 3. , 1.4, 0.2],
        [4.7, 3.2, 1.3, 0.2],
        [4.6, 3.1, 1.5, 0.2],
        [5. , 3.6, 1.4, 0.2],
        [5.4, 3.9, 1.7, 0.4],
        [4.6, 3.4, 1.4, 0.3],
        [5. , 3.4, 1.5, 0.2],
        [4.4, 2.9, 1.4, 0.2],
        [4.9, 3.1, 1.5, 0.1],
        [5.4, 3.7, 1.5, 0.2],
        [4.8, 3.4, 1.6, 0.2],
        [4.8, 3. , 1.4, 0.1],
        [4.3, 3. , 1.1, 0.1],
        [5.8, 4. , 1.2, 0.2],
        [5.7, 4.4, 1.5, 0.4],
        [5.4, 3.9, 1.3, 0.4],
        [5.1, 3.5, 1.4, 0.3],
        [5.7, 3.8, 1.7, 0.3],
```

In [3]:
```
x=d.data
y=d.target
x_train,x_test,y_train,y_test=train_test_split(x,y,random_state=0)
print("x_train\n",x_train)
```

```
x_train
 [[5.9 3.  4.2 1.5]
 [5.8 2.6 4.  1.2]
 [6.8 3.  5.5 2.1]
 [4.7 3.2 1.3 0.2]
 [6.9 3.1 5.1 2.3]
 [5.  3.5 1.6 0.6]
 [5.4 3.7 1.5 0.2]
 [5.  2.  3.5 1. ]
 [6.5 3.  5.5 1.8]
 [6.7 3.3 5.7 2.5]
 [6.  2.2 5.  1.5]
 [6.7 2.5 5.8 1.8]
 [5.6 2.5 3.9 1.1]
 [7.7 3.  6.1 2.3]
 [6.3 3.3 4.7 1.6]
 [5.5 2.4 3.8 1.1]
 [6.3 2.7 4.9 1.8]
 [6.3 2.8 5.1 1.5]
```

In [4]:
```
regressor=LogisticRegression()
regressor.fit(x_train,y_train)
```

```
C:\ProgramData\Anaconda3\lib\site-packages\sklearn\linear_model\_logistic.py:
814: ConvergenceWarning: lbfgs failed to converge (status=1):
STOP: TOTAL NO. of ITERATIONS REACHED LIMIT.

Increase the number of iterations (max_iter) or scale the data as shown in:
    https://scikit-learn.org/stable/modules/preprocessing.html (https://sciki
t-learn.org/stable/modules/preprocessing.html)
Please also refer to the documentation for alternative solver options:
    https://scikit-learn.org/stable/modules/linear_model.html#logistic-regres
sion (https://scikit-learn.org/stable/modules/linear_model.html#logistic-regr
ession)
  n_iter_i = _check_optimize_result(
```

Out[4]:
```
LogisticRegression()
```

In [5]:
```
y_pred=regressor.predict(x_test)
print("Predicted values of x_test\n",y_pred)
```

```
Predicted values of x_test
 [2 1 0 2 0 2 0 1 1 1 2 1 1 1 1 0 1 1 0 0 2 1 0 0 2 0 0 1 1 0 2 1 0 2 2 1 0
 2]
```

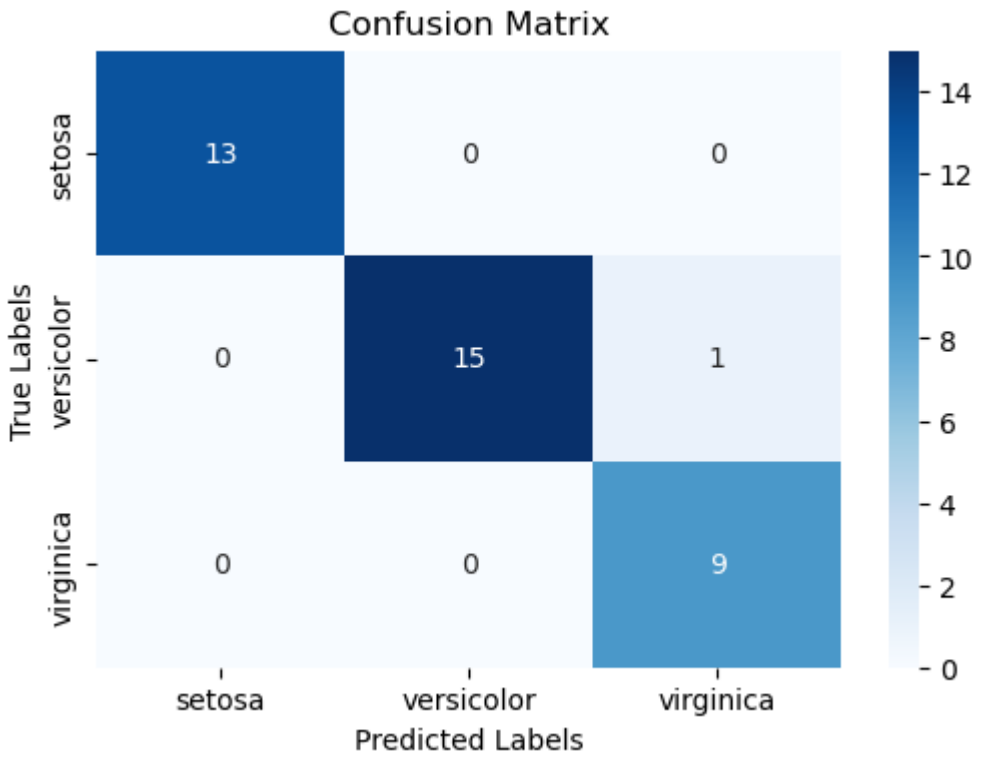
In [6]:
```
accuracy=accuracy_score(y_pred,y_test)
print("Accuracy: ",accuracy)
```

```
Accuracy:  0.9736842105263158
```

In [12]:
```
#conf=confusion_matrix(y_pred,y_test)
#print("Confusion matrix :",conf)
conf_matrix=confusion_matrix(y_test,y_pred)
print(conf_matrix)

plt.figure(figsize=(6, 4))
sns.heatmap(conf_matrix, annot=True, cmap='Blues', fmt='d', xticklabels=d.targ
plt.xlabel('Predicted Labels')
plt.ylabel('True Labels')
plt.title('Confusion Matrix')
plt.show()
```

```
[[13  0  0]
 [ 0 15  1]
 [ 0  0  9]]
```



In [13]:
```
new_data=np.array([[5.1,3.5,3.2,1.2],[2.3,5.3,3.1,1.2],[3.7,4.2,5.7,1.2]])
prediction=regressor.predict(new_data)
print("0-setosa\n1-virginica\n2-versicolor\n",prediction)
```

```
0-setosa
1-virginica
2-versicolor
 [1 0 2]
```

In [ ]: