localhost:8888/notebooks/A.Machine Learning Algorithms/1.Supervised Learning/1.Classification/2.KNN-Iris.ipynb

jupyter 2.KNN-Iris Last Checkpoint: a few seconds ago (autosaved)

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Run Code

Iris Flower Species Prediction Using KNN

In [ ]:
```
#Import Libraries
import numpy as np
import pandas as pd
```

In [71]:
```
#Load Dataset
df=pd.read_csv('/home/student/Downloads/Iris.csv')
df
```

Out[71]:

	Id	SepalLengthCm	SepalWidthCm	PetalLengthCm	PetalWidthCm	Species
0	1	5.1	3.5	1.4	0.2	Iris-setosa
1	2	4.9	3.0	1.4	0.2	Iris-setosa
2	3	4.7	3.2	1.3	0.2	Iris-setosa
3	4	4.6	3.1	1.5	0.2	Iris-setosa
4	5	5.0	3.6	1.4	0.2	Iris-setosa
...	...	...	...	...	...	...
145	146	6.7	3.0	5.2	2.3	Iris-virginica
146	147	6.3	2.5	5.0	1.9	Iris-virginica
147	148	6.5	3.0	5.2	2.0	Iris-virginica
148	149	6.2	3.4	5.4	2.3	Iris-virginica
149	150	5.9	3.0	5.1	1.8	Iris-virginica

In [35]:
```
df.columns
```

Out[35]:
```
Index(['Id', 'SepalLengthCm', 'SepalWidthCm', 'PetalLengthCm', 'PetalWidthCm',
       'Species'],
      dtype='object')
```

In [36]:
```
df.head()
```

Out[36]:

	Id	SepalLengthCm	SepalWidthCm	PetalLengthCm	PetalWidthCm	Species
0	1	5.1	3.5	1.4	0.2	Iris-setosa
1	2	4.9	3.0	1.4	0.2	Iris-setosa
2	3	4.7	3.2	1.3	0.2	Iris-setosa
3	4	4.6	3.1	1.5	0.2	Iris-setosa
4	5	5.0	3.6	1.4	0.2	Iris-setosa

In [37]:
```
df.tail()
```

Out[37]:

	Id	SepalLengthCm	SepalWidthCm	PetalLengthCm	PetalWidthCm	Species
145	146	6.7	3.0	5.2	2.3	Iris-virginica
146	147	6.3	2.5	5.0	1.9	Iris-virginica
147	148	6.5	3.0	5.2	2.0	Iris-virginica
148	149	6.2	3.4	5.4	2.3	Iris-virginica
149	150	5.9	3.0	5.1	1.8	Iris-virginica

In [38]:
```
df.shape
```

Out[38]:
```
(150, 6)
```

In [39]:
```
#Checking for Null values
df.isna().sum()
```

Out[39]:
```
Id               0
SepalLengthCm    0
SepalWidthCm     0
PetalLengthCm    0
PetalWidthCm     0
Species          0
dtype: int64
```

In [40]:
```
df1=df.drop(['Id'],axis=1)
df1
```

Out[40]:

	SepalLengthCm	SepalWidthCm	PetalLengthCm	PetalWidthCm	Species
0	5.1	3.5	1.4	0.2	Iris-setosa
1	4.9	3.0	1.4	0.2	Iris-setosa
2	4.7	3.2	1.3	0.2	Iris-setosa
3	4.6	3.1	1.5	0.2	Iris-setosa
4	5.0	3.6	1.4	0.2	Iris-setosa
...	...	...	...	...	...
145	6.7	3.0	5.2	2.3	Iris-virginica
146	6.3	2.5	5.0	1.9	Iris-virginica

In [72]:
```
#Input Data
x=df1.iloc[:,:-1].values
x
```

Out[72]:
```
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 [73]:
```
#Output Data
y=df1.iloc[:,-1].values
y
```

Out[73]:
```
array(['Iris-setosa', 'Iris-setosa', 'Iris-setosa', 'Iris-setosa',
       'Iris-setosa', 'Iris-setosa', 'Iris-setosa', 'Iris-setosa',
       'Iris-setosa', 'Iris-setosa', 'Iris-setosa', 'Iris-setosa',
```

In [74]:
```
#Split Dataset into Train & Test Datasets
from sklearn.model_selection import train_test_split
x_train, x_test, y_train, y_test = train_test_split(x, y, test_size = 0.30)
```

In [75]:
```
#Feature Scaling- Standard Scaler
from sklearn.preprocessing import StandardScaler
scaler = StandardScaler()
scaler.fit(x_train)
x_train = scaler.transform(x_train)
x_test = scaler.transform(x_test)
```

In [76]:
```
#KNN model
from sklearn.neighbors import KNeighborsClassifier
classifier=KNeighborsClassifier(n_neighbors=7)
classifier.fit(x_train,y_train)
y_pred=classifier.predict(x_test)
y_pred
```

Out[76]:
```
array(['Iris-setosa', 'Iris-versicolor', 'Iris-virginica',
       'Iris-virginica', 'Iris-setosa', 'Iris-virginica',
       'Iris-versicolor', 'Iris-versicolor', 'Iris-setosa',
       'Iris-versicolor', 'Iris-setosa', 'Iris-virginica',
       'Iris-virginica', 'Iris-virginica', 'Iris-versicolor',
       'Iris-setosa', 'Iris-virginica', 'Iris-setosa', 'Iris-setosa',
       'Iris-versicolor', 'Iris-virginica', 'Iris-virginica',
       'Iris-versicolor', 'Iris-setosa', 'Iris-versicolor',
       'Iris-versicolor', 'Iris-setosa', 'Iris-setosa', 'Iris-virginica',
       'Iris-virginica', 'Iris-virginica', 'Iris-virginica',
       'Iris-virginica', 'Iris-virginica', 'Iris-setosa',
       'Iris-virginica', 'Iris-versicolor', 'Iris-virginica',
```

```
'Iris-versicolor', 'Iris-virginica', 'Iris-virginica',
'Iris-versicolor', 'Iris-setosa', 'Iris-versicolor',
'Iris-versicolor', 'Iris-setosa', 'Iris-setosa', 'Iris-virginica',
'Iris-virginica', 'Iris-virginica', 'Iris-virginica',
'Iris-virginica', 'Iris-virginica', 'Iris-setosa',
'Iris-virginica', 'Iris-versicolor', 'Iris-virginica',
'Iris-versicolor', 'Iris-virginica', 'Iris-setosa',
'Iris-versicolor', 'Iris-versicolor', 'Iris-versicolor',
'Iris-virginica'], dtype=object)
```

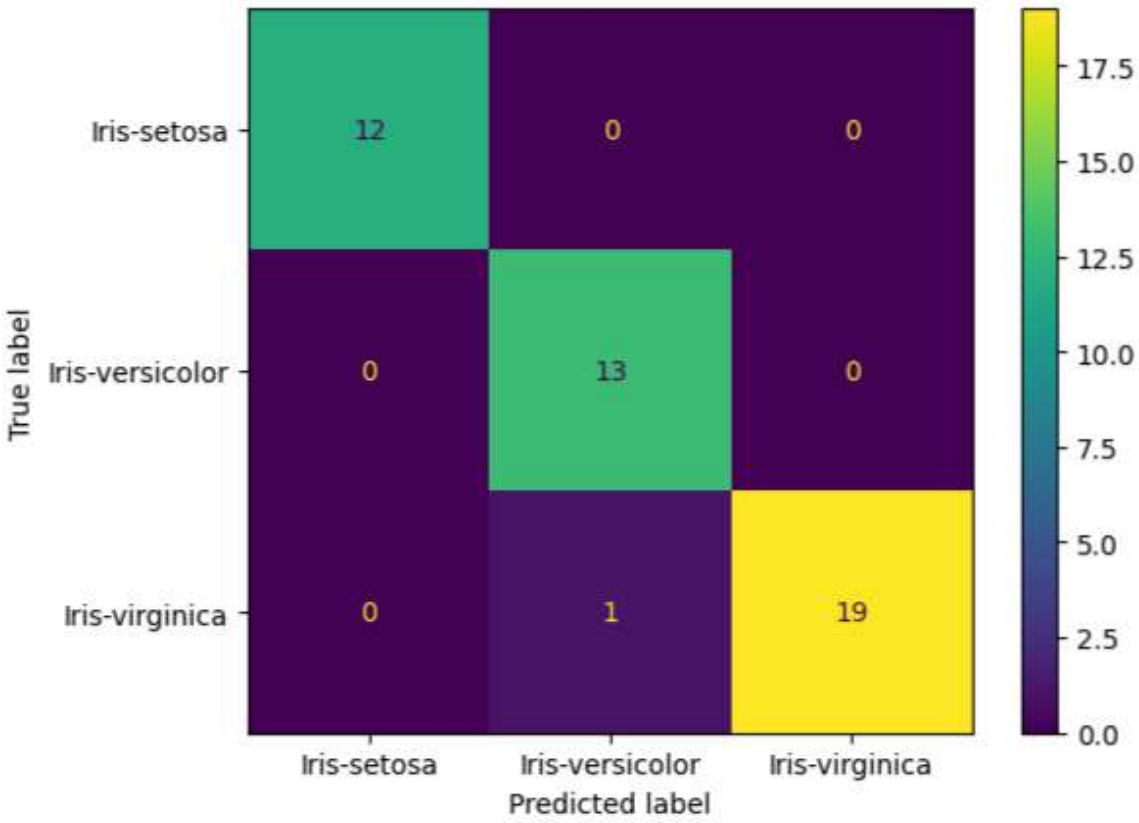
In [69]:
```
print(classifier.predict([[5.7,4.4,1.5,0.4]]))
```

```
['Iris-virginica']
```

In [79]:
```
#Evaluating Model -Accuracy Score,Confusion Matrix and ConfusionMatrixDisplay
from sklearn.metrics._plot.confusion_matrix import confusion_matrix
from sklearn.metrics import classification_report,accuracy_score,ConfusionMatrixDisplay
labels=[ 'Iris-setosa','Iris-versicolor', 'Iris-virginica']

result=confusion_matrix(y_test,y_pred)
cm=ConfusionMatrixDisplay(result,display_labels=labels)
cm.plot()
score=accuracy_score(y_test,y_pred)
print(result)
print(score)
```

```
[[12  0  0]
 [ 0 13  0]
 [ 0  1 19]]
0.9777777777777777
```


Iris-setosa
Iris-versicolor
Iris-virginica
True label
12
0
0
0
13
0
0
1
19
Iris-setosa
Iris-versicolor
Iris-virginica
Predicted label
17.5
15.0
12.5
10.0
7.5
5.0
2.5
0.0