In [1]:
```
import pandas as pd
from sklearn.datasets import load_digits
```

In [2]:
```
digits=load_digits()
```

In [3]:
```
dir(digits)
```

Out[3]:
```
['DESCR', 'data', 'feature_names', 'frame', 'images', 'target', 'target_names']
```

In [4]:
```
df=pd.DataFrame(digits.data)
```

In [5]:
```
df.head()
```

Out[5]:

	0	1	2	3	4	5	6	7	8	9	...	54	55	56	57	58	59	60	61	6
0	0.0	0.0	5.0	13.0	9.0	1.0	0.0	0.0	0.0	0.0	...	0.0	0.0	0.0	0.0	6.0	13.0	10.0	0.0	0
1	0.0	0.0	0.0	12.0	13.0	5.0	0.0	0.0	0.0	0.0	...	0.0	0.0	0.0	0.0	0.0	11.0	16.0	10.0	0
2	0.0	0.0	0.0	4.0	15.0	12.0	0.0	0.0	0.0	0.0	...	5.0	0.0	0.0	0.0	0.0	3.0	11.0	16.0	9
3	0.0	0.0	7.0	15.0	13.0	1.0	0.0	0.0	0.0	8.0	...	9.0	0.0	0.0	0.0	7.0	13.0	13.0	9.0	0
4	0.0	0.0	0.0	1.0	11.0	0.0	0.0	0.0	0.0	0.0	...	0.0	0.0	0.0	0.0	0.0	2.0	16.0	4.0	0

5 rows × 64 columns

In [6]:
```
digits.target
```

Out[6]:
```
array([0, 1, 2, ..., 8, 9, 8])
```

In [7]:
```
df['target']=digits.target
```

In [8]:
```
df.head()
```

Out[8]:

	0	1	2	3	4	5	6	7	8	9	...	55	56	57	58	59	60	61	62	6
0	0.0	0.0	5.0	13.0	9.0	1.0	0.0	0.0	0.0	0.0	...	0.0	0.0	0.0	6.0	13.0	10.0	0.0	0.0	0
1	0.0	0.0	0.0	12.0	13.0	5.0	0.0	0.0	0.0	0.0	...	0.0	0.0	0.0	0.0	11.0	16.0	10.0	0.0	0
2	0.0	0.0	0.0	4.0	15.0	12.0	0.0	0.0	0.0	0.0	...	0.0	0.0	0.0	0.0	3.0	11.0	16.0	9.0	0
3	0.0	0.0	7.0	15.0	13.0	1.0	0.0	0.0	0.0	8.0	...	0.0	0.0	0.0	7.0	13.0	13.0	9.0	0.0	0
4	0.0	0.0	0.0	1.0	11.0	0.0	0.0	0.0	0.0	0.0	...	0.0	0.0	0.0	0.0	2.0	16.0	4.0	0.0	0

5 rows × 65 columns

In [13]:
```
x=df.drop('target',axis=1)
```

In [14]:
```
x.head()
```

Out[14]:

	0	1	2	3	4	5	6	7	8	9	...	54	55	56	57	58	59	60	61	6
0	0.0	0.0	5.0	13.0	9.0	1.0	0.0	0.0	0.0	0.0	...	0.0	0.0	0.0	0.0	6.0	13.0	10.0	0.0	0
1	0.0	0.0	0.0	12.0	13.0	5.0	0.0	0.0	0.0	0.0	...	0.0	0.0	0.0	0.0	0.0	11.0	16.0	10.0	0
2	0.0	0.0	0.0	4.0	15.0	12.0	0.0	0.0	0.0	0.0	...	5.0	0.0	0.0	0.0	0.0	3.0	11.0	16.0	9
3	0.0	0.0	7.0	15.0	13.0	1.0	0.0	0.0	0.0	8.0	...	9.0	0.0	0.0	0.0	7.0	13.0	13.0	9.0	0
4	0.0	0.0	0.0	1.0	11.0	0.0	0.0	0.0	0.0	0.0	...	0.0	0.0	0.0	0.0	0.0	2.0	16.0	4.0	0

5 rows × 64 columns

In [15]:
```
y=df.target
```

In [16]:
```
y.head()
```

Out[16]:
```
0    0
1    1
2    2
3    3
4    4
Name: target, dtype: int32
```

In [17]:
```
from sklearn.model_selection import train_test_split
```

In [25]:
```
x_train,x_test,y_train,y_test=train_test_split(x,y,test_size=0.2)
```

In [26]:
```
len(x)
len(x_train)
len(x_test)
```

Out[26]:
```
360
```

In [27]:
```
len(x_train)
```

Out[27]:
```
1437
```

In [28]:
```
len(x)
```

Out[28]:
```
1797
```

In [29]:
```
from sklearn.ensemble import RandomForestClassifier
```

In [66]:
```
model=RandomForestClassifier(n_estimators=150)
```

In [67]:
```
model.fit(x_train,y_train)
```

Out[67]:
```
RandomForestClassifier(n_estimators=150)
```

In [68]:
```
model.score(x_test,y_test)
```

Out[68]:
```
0.9916666666666667
```

In [70]:
```
y_predicted=model.predict(x_test)
```

In [73]:
```
from sklearn.metrics import confusion_matrix
cm=confusion_matrix(y_test,y_predicted)
```

In [74]:
```
cm
```

Out[74]:
```
array([[38,  0,  0,  0,  0,  0,  0,  0,  0,  0],
       [ 0, 33,  0,  0,  0,  0,  0,  0,  0,  0],
       [ 0,  0, 41,  0,  0,  0,  0,  0,  0,  0],
       [ 0,  0,  0, 40,  0,  0,  0,  0,  0,  0],
       [ 0,  0,  0,  0, 35,  0,  0,  0,  0,  0],
       [ 0,  0,  0,  0,  1, 35,  0,  0,  0,  0],
       [ 0,  0,  0,  0,  0,  0, 30,  0,  0,  0],
       [ 0,  0,  0,  0,  0,  0,  0, 36,  0,  0],
       [ 0,  1,  0,  0,  0,  0,  0,  0, 38,  1],
       [ 0,  0,  0,  0,  0,  0,  0,  0,  0, 31]], dtype=int64)
```

In [ ]:
```

```