

```
import numpy as np
import pandas as pd
from sklearn.datasets import load_digits
```

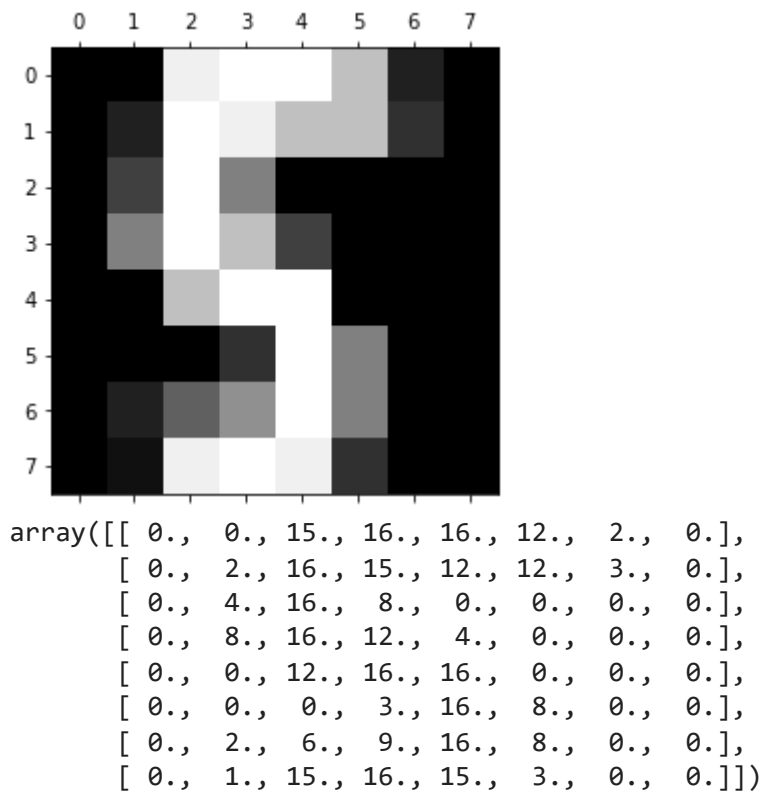
```
dataset=load_digits()
X=dataset.data
y=dataset.target
print(X.shape)
print(y.shape)
```

```
(1797, 64)
(1797,)
```

```
idx=109
import matplotlib.pyplot as plt
plt.gray()
plt.matshow(dataset.images[idx])
plt.show()
```

```
dataset.images[idx]
```

☞ <Figure size 432x288 with 0 Axes>



```
from sklearn.model_selection import train_test_split
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size = 0.2)

print(X_train.shape)
```

```
print(X_test.shape)
```

```
print(y_train.shape)
```

```
print(y_test.shape)
```

```
(1437, 64)
```

```
(360, 64)
```

```
(1437,)
```

```
(360,)
```

```
from sklearn.ensemble import RandomForestClassifier
```

```
model = RandomForestClassifier(n_estimators=20)
```

```
model.fit(X_train, y_train)
```

```
RandomForestClassifier(n_estimators=20)
```

```
model.score(X_test, y_test)
```

```
0.9722222222222222
```

```
y_pred=model.predict(X_test)
```

```
arr=np.concatenate((y_pred.reshape(len(y_pred),1),y_test.reshape(len(y_test),1)),1)
```

```
print(arr[11:440,:])
```

```
[4 4]
```

```
[7 7]
```

```
[6 6]
```

```
[3 3]
```

```
[5 5]
```

```
[9 9]
```

```
[8 9]
```

```
[4 4]
```

```
[8 8]
```

```
[9 9]
```

```
[5 5]
```

```
[0 0]
```

```
[4 4]
```

```
[6 6]
```

```
[8 8]
```

```
[0 0]
```

```
[9 9]
```

```
[7 7]
```

```
[0 0]
```

```
[9 9]
```

```
[9 9]
```

```
[1 1]
```

```
[5 5]
```

```
[4 4]
```

```
[8 8]
```

```
[9 9]
```

```
[9 9]
```

```
[6 6]
```

```
[5 5]
```

```
[5 5]
[0 0]
[6 6]
[6 6]
[8 8]
[8 8]
[6 6]
[3 3]
[6 6]
[7 7]
[0 0]
[2 2]
[8 8]
[6 6]
[5 5]
[3 3]
[8 8]
[9 9]
[6 6]
[9 9]
[0 0]
[7 7]
[1 1]
[7 7]
[0 0]
[2 2]
[2 2]
[2 2]
[9 9]
```

```
from sklearn.metrics import accuracy_score
acc=accuracy_score(y_test,y_pred)
print("Accuracy:=",acc*100)
```

```
Accuracy:= 97.22222222222221
```

```
model1 = RandomForestClassifier(n_estimators=10)
model2 = RandomForestClassifier(n_estimators=15)
model3 = RandomForestClassifier(n_estimators=20)
model4 = RandomForestClassifier(n_estimators=25)
```

```
model1.fit(X_train, y_train)
model2.fit(X_train, y_train)
model3.fit(X_train, y_train)
model4.fit(X_train, y_train)
```

```
y_pred1= model1.predict(X_test)
y_pred2= model2.predict(X_test)
y_pred3= model3.predict(X_test)
y_pred4= model4.predict(X_test)
```

```
print("Accuracy of Model 1:=", (accuracy_score(y_test,y_pred1)*100))
print("Accuracy of Model 2:=", (accuracy_score(y_test,y_pred2)*100))
```

```
print("Accuarcy of Model 3:=", (accuracy_score(y_test, y_pred3)*100))  
print("Accuarcy of Model 4:=", (accuracy_score(y_test, y_pred4)*100))
```

```
Accuarcy of Model 1:= 95.83333333333334  
Accuarcy of Model 2:= 97.5  
Accuarcy of Model 3:= 97.22222222222221  
Accuarcy of Model 4:= 96.66666666666667
```

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