

## CE066-ML-LAB3

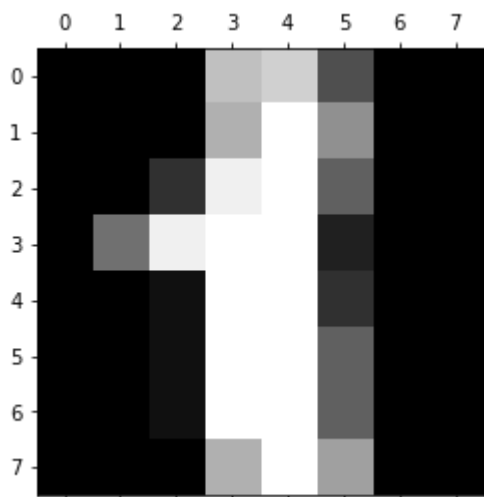
### ▼ import dataset

```
from sklearn.datasets import load_digits
digits = load_digits()
```

### ▼ display image

```
import matplotlib.pyplot as plt
plt.gray()
plt.matshow(digits.images[1])
plt.show()
```

☐ <Figure size 432x288 with 0 Axes>



```
print(digits.data.shape)
print(digits.target.shape)
```

☐ (1797, 64)  
(1797,)

### ▼ split data in train and test

```
from sklearn.model_selection import train_test_split
x_train ,x_test ,y_train ,y_test = train_test_split(digits.data ,digits.target, test_size=
```

### ▼ import library and fit model find accuracy

```

from sklearn.naive_bayes import GaussianNB
from sklearn import metrics
model = GaussianNB()
model.fit(x_train,y_train)
y_pred = model.predict(x_test)
print("Accuracy : ",metrics.accuracy_score(y_test,y_pred))

```

↳ Accuracy : 0.8251192368839427

## ▼ create confusion matrix

```

from sklearn.metrics import confusion_matrix
confusion_matrix(y_test, y_pred)

```

↳ array([[64, 0, 0, 0, 1, 1, 0, 0, 0, 0],  
[ 0, 45, 1, 0, 0, 0, 2, 1, 9, 7],  
[ 0, 2, 28, 0, 0, 0, 1, 0, 26, 0],  
[ 0, 0, 1, 39, 0, 3, 1, 4, 3, 1],  
[ 0, 1, 0, 0, 63, 0, 5, 5, 0, 0],  
[ 0, 0, 0, 0, 0, 62, 0, 4, 0, 0],  
[ 0, 0, 0, 0, 0, 1, 63, 0, 1, 0],  
[ 0, 0, 0, 0, 0, 0, 0, 50, 1, 0],  
[ 0, 3, 1, 0, 0, 0, 0, 1, 51, 0],  
[ 0, 1, 1, 3, 2, 0, 0, 7, 9, 54]])

## ▼ checked on random data

```

y_pred_sample = model.predict([digits.data[100]])
print("predicted : " , y_pred_sample)
print("Actual : ",digits.target[100])

```

↳ predicted : [4]  
Actual : 4

```

from sklearn.metrics import precision_score
from sklearn.metrics import recall_score
precision = precision_score(y_test,y_pred,average='micro')
recall = recall_score(y_test,y_pred,average='micro')
print('precision:-- {}'.format(precision))
print('recall:-- {}'.format(recall))

```

↳ precision:-- 0.8251192368839427  
recall:-- 0.8251192368839427

