

```
import tensorflow as tf
from tensorflow import keras
```

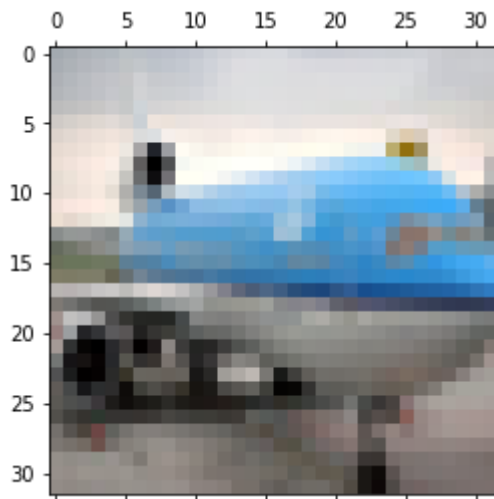
```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
%matplotlib inline
```

```
(x_train, y_train), (x_test, y_test) = tf.keras.datasets.cifar10.load_data()
```

Downloading data from <https://www.cs.toronto.edu/~kriz/cifar-10-python.tar.gz>
170498071/170498071 [=====] - 4s 0us/step

```
plt.matshow(x_train[700])
```

<matplotlib.image.AxesImage at 0x7f95351ead10>



```
y_train[700]
```

```
array([0], dtype=uint8)
```

```
classes = ["aeroplane", "bird", "cat", "deer", "dog", "frog", "horse", "ship", "truck"]
```

```
x_train.shape
```

```
(50000, 32, 32, 3)
```

```
y_train.shape
```

```
(50000, 1)
```

```
#Scaling
```

```
x_train = x_train/255
```

```
x_test = x_test/255
```

```
x_train.shape
```

```
(50000, 32, 32, 3)
```

```
y_train.shape
```

```
(50000,)
```

```
y_train[:10]
```

```
array([[6],  
       [9],  
       [9],  
       [4],  
       [1],  
       [1],  
       [2],  
       [7],  
       [8],  
       [3]], dtype=uint8)
```

```
y_train = y_train.reshape(-1)
```

```
y_train[:10]
```

```
array([6, 9, 9, 4, 1, 1, 2, 7, 8, 3], dtype=uint8)
```

```
model = keras.Sequential([  
    keras.layers.Flatten(input_shape=(32,32,3)),  
    keras.layers.Dense(1000, activation = "relu"),  
    keras.layers.Dense(10, activation = "sigmoid")  
])
```

```
model.compile(  
    optimizer = "sgd",  
    loss = "sparse_categorical_crossentropy",  
    metrics = ["accuracy"]  
)
```

```
model.fit(x_train, y_train, epochs = 5)
```

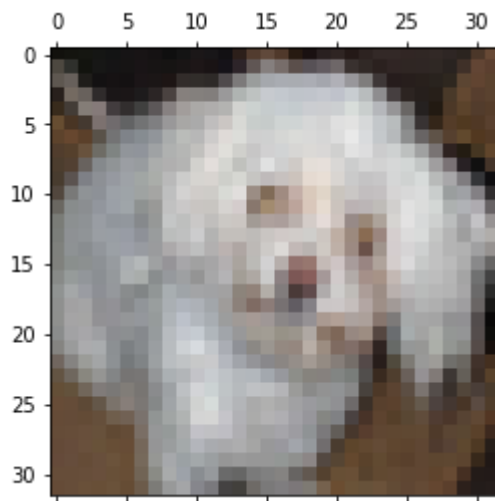
```
Epoch 1/5  
1563/1563 [=====] - 31s 20ms/step - loss: 1.4630 - accuracy  
Epoch 2/5  
1563/1563 [=====] - 31s 20ms/step - loss: 1.4309 - accuracy  
Epoch 3/5  
1563/1563 [=====] - 30s 19ms/step - loss: 1.4026 - accuracy  
Epoch 4/5  
1563/1563 [=====] - 29s 18ms/step - loss: 1.3775 - accuracy  
Epoch 5/5
```

```
1563/1563 [=====] - 30s 19ms/step - loss: 1.3547 - accuracy  
<keras.callbacks.History at 0x7f952fa4c990>
```



```
plt.matshow(x_test[1000])
```

```
<matplotlib.image.AxesImage at 0x7f952f910650>
```



```
y_test[1000]
```

```
array([5], dtype=uint8)
```

```
classes[5-1]
```

```
'dog'
```

```
model.eva
```

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