```python
import numpy as np
import tensorflow as tf
from tensorflow import keras
```

```python
(x_train, y_train), (x_test, y_test) = keras.datasets.mnist.load_data()
```

```
Downloading data from https://storage.googleapis.com/tensorflow/tf-keras-datasets/mnist.npz
11490434/11490434 [==============================] - 2s 0us/step
```

```python
x_train = x_train.astype('float32') / 255
x_test = x_test.astype('float32') / 255
x_train = np.expand_dims(x_train, axis=-1)
x_test = np.expand_dims(x_test, axis=-1)
```

```python
y_train = keras.utils.to_categorical(y_train, 10)
y_test = keras.utils.to_categorical(y_test, 10)
```

```python
model = keras.Sequential([
    keras.layers.Conv2D(32, (3, 3), activation='relu', input_shape=(28, 28, 1)),
    keras.layers.MaxPooling2D((2, 2)),
    keras.layers.Conv2D(64, (3, 3), activation='relu'),
    keras.layers.MaxPooling2D((2, 2)),
    keras.layers.Conv2D(64, (3, 3), activation='relu'),
    keras.layers.Flatten(),
    keras.layers.Dense(64, activation='relu'),
    keras.layers.Dense(10, activation='softmax')
])
```

```python
model.compile(optimizer='adam',
              loss='categorical_crossentropy',
              metrics=['accuracy'])
```

```python
model.fit(x_train, y_train, epochs=10, batch_size=32, validation_data=(x_test, y_test))
```

```
Epoch 1/10
1875/1875 [==============================] - 22s 5ms/step - loss: 0.1538 - accuracy: 0.9529 - val_loss: 0.0859 - val_accu
Epoch 2/10
1875/1875 [==============================] - 9s 5ms/step - loss: 0.0467 - accuracy: 0.9850 - val_loss: 0.0498 - val_accu
Epoch 3/10
1875/1875 [==============================] - 10s 5ms/step - loss: 0.0339 - accuracy: 0.9891 - val_loss: 0.0294 - val_accu
Epoch 4/10
1875/1875 [==============================] - 9s 5ms/step - loss: 0.0257 - accuracy: 0.9917 - val_loss: 0.0377 - val_accu
Epoch 5/10
1875/1875 [==============================] - 9s 5ms/step - loss: 0.0201 - accuracy: 0.9938 - val_loss: 0.0303 - val_accu
Epoch 6/10
1875/1875 [==============================] - 8s 4ms/step - loss: 0.0161 - accuracy: 0.9948 - val_loss: 0.0328 - val_accu
Epoch 7/10
1875/1875 [==============================] - 10s 5ms/step - loss: 0.0143 - accuracy: 0.9952 - val_loss: 0.0285 - val_accu
Epoch 8/10
1875/1875 [==============================] - 9s 5ms/step - loss: 0.0123 - accuracy: 0.9957 - val_loss: 0.0310 - val_accu
Epoch 9/10
1875/1875 [==============================] - 8s 5ms/step - loss: 0.0097 - accuracy: 0.9968 - val_loss: 0.0522 - val_accu
Epoch 10/10
1875/1875 [==============================] - 9s 5ms/step - loss: 0.0094 - accuracy: 0.9970 - val_loss: 0.0345 - val_accu
<keras.callbacks.History at 0x7f5f1c35ab20>
```