```python
import numpy as np
import keras
from keras import layers

# Model / data parameters
num_classes = 10
input_shape = (28, 28, 1)

# Load the data and split it between train and test sets
(x_train, y_train), (x_test, y_test) = keras.datasets.mnist.load_data()

# Scale images to the [0, 1] range
x_train = x_train.astype("float32") / 255
x_test = x_test.astype("float32") / 255
# Make sure images have shape (28, 28, 1)
x_train = np.expand_dims(x_train, -1)
x_test = np.expand_dims(x_test, -1)
print("x_train shape:", x_train.shape)
print(x_train.shape[0], "train samples")
print(x_test.shape[0], "test samples")

# convert class vectors to binary class matrices
y_train = keras.utils.to_categorical(y_train, num_classes)
y_test = keras.utils.to_categorical(y_test, num_classes)

# Build the model
model = keras.Sequential(
    [
        keras.Input(shape=input_shape),
        layers.Conv2D(32, kernel_size=(3, 3), activation="relu"),
        layers.MaxPooling2D(pool_size=(2, 2)),
        layers.Conv2D(64, kernel_size=(3, 3), activation="relu"),
        layers.MaxPooling2D(pool_size=(2, 2)),
        layers.Flatten(),
        layers.Dropout(0.5),
        layers.Dense(num_classes, activation="softmax"),
    ]
)

model.summary()

# Train the model
batch_size = 128
epochs = 15

model.compile(loss="categorical_crossentropy", optimizer="adam", metrics=["accuracy"])

model.fit(x_train, y_train, batch_size=batch_size, epochs=epochs, validation_split=0.1)

# Evaluate the trained model
score = model.evaluate(x_test, y_test, verbose=0)
print("Test loss:", score[0])
print("Test accuracy:", score[1])
```

Downloading data from https://storage.googleapis.com/tensorflow/tf-keras-datasets/mnist.npz
11490434/11490434 ──────────────── **1s** 0us/step
x_train shape: (60000, 28, 28, 1)
60000 train samples
10000 test samples
Model: "sequential"

Layer (type)	Output Shape	Param #
conv2d (Conv2D)	(None, 26, 26, 32)	320
max_pooling2d (MaxPooling2D)	(None, 13, 13, 32)	0
conv2d_1 (Conv2D)	(None, 11, 11, 64)	18,496
max_pooling2d_1 (MaxPooling2D)	(None, 5, 5, 64)	0
flatten (Flatten)	(None, 1600)	0
dropout (Dropout)	(None, 1600)	0
dense (Dense)	(None, 10)	16,010

 Total params: 34,826 (136.04 KB)
 Trainable params: 34,826 (136.04 KB)
 Non-trainable params: 0 (0.00 B)
Epoch 1/15
422/422 ──────────────── **59s** 134ms/step - accuracy: 0.7670 - loss: 0.7613 - val_accuracy: 0.9772 - val_loss: 0.0847
Epoch 2/15
422/422 ──────────────── **73s** 113ms/step - accuracy: 0.9633 - loss: 0.1228 - val_accuracy: 0.9848 - val_loss: 0.0586
Epoch 3/15
422/422 ──────────────── **46s** 110ms/step - accuracy: 0.9731 - loss: 0.0904 - val_accuracy: 0.9880 - val_loss: 0.0454
Epoch 4/15
422/422 ──────────────── **83s** 112ms/step - accuracy: 0.9776 - loss: 0.0706 - val_accuracy: 0.9867 - val_loss: 0.0446
Epoch 5/15
422/422 ──────────────── **81s** 111ms/step - accuracy: 0.9798 - loss: 0.0664 - val_accuracy: 0.9895 - val_loss: 0.0399
Epoch 6/15
422/422 ──────────────── **81s** 109ms/step - accuracy: 0.9827 - loss: 0.0551 - val_accuracy: 0.9892 - val_loss: 0.0378
Epoch 7/15
422/422 ──────────────── **49s** 117ms/step - accuracy: 0.9839 - loss: 0.0531 - val_accuracy: 0.9893 - val_loss: 0.0380
Epoch 8/15
422/422 ──────────────── **46s** 110ms/step - accuracy: 0.9853 - loss: 0.0480 - val_accuracy: 0.9900 - val_loss: 0.0349
Epoch 9/15
422/422 ──────────────── **82s** 111ms/step - accuracy: 0.9850 - loss: 0.0475 - val_accuracy: 0.9902 - val_loss: 0.0326
Epoch 10/15
422/422 ──────────────── **84s** 117ms/step - accuracy: 0.9865 - loss: 0.0452 - val_accuracy: 0.9912 - val_loss: 0.0333
Epoch 11/15
422/422 ──────────────── **81s** 115ms/step - accuracy: 0.9879 - loss: 0.0391 - val_accuracy: 0.9910 - val_loss: 0.0330
Epoch 12/15
422/422 ──────────────── **82s** 114ms/step - accuracy: 0.9860 - loss: 0.0429 - val_accuracy: 0.9903 - val_loss: 0.0325
Epoch 13/15
422/422 ──────────────── **47s** 112ms/step - accuracy: 0.9884 - loss: 0.0370 - val_accuracy: 0.9922 - val_loss: 0.0302
Epoch 14/15
422/422 ──────────────── **81s** 111ms/step - accuracy: 0.9893 - loss: 0.0343 - val_accuracy: 0.9922 - val_loss: 0.0286
Epoch 15/15
422/422 ──────────────── **84s** 116ms/step - accuracy: 0.9877 - loss: 0.0373 - val_accuracy: 0.9917 - val_loss: 0.0304
Test loss: 0.025226449593901634