```
import tensorflow as tf
from tensorflow.keras.models import Sequential
from tensorflow.keras.layers import Conv2D, MaxPooling2D, Flatten, Dense, Dropout
from tensorflow.keras.datasets import cifar10
from tensorflow.keras.utils import to_categorical


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

```
Downloading data from https://www.cs.toronto.edu/~kriz/cifar-10-python.tar.gz
170498071/170498071 [==============================] - 2s 0us/step
```

```
x_train = x_train.astype('float32') / 255.0
x_test = x_test.astype('float32') / 255.0


train_images.shape
```

```
(60000, 28, 28)
```

```
num_classes = 10
y_train = to_categorical(y_train, num_classes)
y_test = to_categorical(y_test, num_classes)


model = Sequential([
    Conv2D(32, (3, 3), activation='relu', input_shape=(32, 32, 3)),
    MaxPooling2D((2, 2)),
    Conv2D(64, (3, 3), activation='relu'),
    MaxPooling2D((2, 2)),
    Conv2D(64, (3, 3), activation='relu'),
    Flatten(),
    Dense(64, activation='relu'),
    Dropout(0.5),
    Dense(num_classes, activation='softmax')
])


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


epochs = 10
batch_size = 64
```

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

```
Epoch 1/10
782/782 [==============================] - 70s 87ms/step - loss: 1.7774 - accuracy: 0.3398 - val_loss: 1.4625 - val_accuracy: 0.4803
Epoch 2/10
782/782 [==============================] - 70s 90ms/step - loss: 1.4705 - accuracy: 0.4724 - val_loss: 1.2593 - val_accuracy: 0.5586
Epoch 3/10
782/782 [==============================] - 70s 89ms/step - loss: 1.3352 - accuracy: 0.5263 - val_loss: 1.1765 - val_accuracy: 0.5756
Epoch 4/10
782/782 [==============================] - 69s 89ms/step - loss: 1.2454 - accuracy: 0.5610 - val_loss: 1.0672 - val_accuracy: 0.6255
Epoch 5/10
782/782 [==============================] - 68s 87ms/step - loss: 1.1601 - accuracy: 0.5920 - val_loss: 1.0814 - val_accuracy: 0.6172
Epoch 6/10
782/782 [==============================] - 68s 86ms/step - loss: 1.0968 - accuracy: 0.6154 - val_loss: 1.0161 - val_accuracy: 0.6409
Epoch 7/10
782/782 [==============================] - 70s 89ms/step - loss: 1.0530 - accuracy: 0.6313 - val_loss: 0.9828 - val_accuracy: 0.6585
Epoch 8/10
782/782 [==============================] - 68s 87ms/step - loss: 1.0078 - accuracy: 0.6463 - val_loss: 0.9264 - val_accuracy: 0.6762
Epoch 9/10
782/782 [==============================] - 68s 87ms/step - loss: 0.9669 - accuracy: 0.6618 - val_loss: 0.9348 - val_accuracy: 0.6754
Epoch 10/10
782/782 [==============================] - 70s 89ms/step - loss: 0.9408 - accuracy: 0.6718 - val_loss: 0.8805 - val_accuracy: 0.6948
<keras.src.callbacks.History at 0x7a383bdc2500>
```

```
# Evaluate the model
loss, accuracy = model.evaluate(x_test, y_test)
print(f'Test loss: {loss:.4f}')
print(f'Test accuracy: {accuracy:.4f}')
```

```
313/313 [==============================] - 4s 12ms/step - loss: 0.8805 - accuracy: 0.6948
Test loss: 0.8805
Test accuracy: 0.6948
```