2306aml133-kritika-assignment12

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[1]:
```
import numpy as np
import tensorflow as tf
from tensorflow.keras.datasets import cifar10
from tensorflow.keras.models import Sequential
from tensorflow.keras.layers import Dense, Flatten, Conv2D, MaxPooling2D
from tensorflow.keras.utils import to_categorical

(train_images, train_labels), (test_images, test_labels) = cifar10.load_data()

train_images = train_images.astype('float32') / 255.0
test_images = test_images.astype('float32') / 255.0

train_labels = to_categorical(train_labels, num_classes=10)
test_labels = to_categorical(test_labels, num_classes=10)

model = Sequential()

model.add(Conv2D(32, (3, 3), activation='relu', input_shape=(32, 32, 3)))
model.add(MaxPooling2D((2, 2)))

model.add(Conv2D(64, (3, 3), activation='relu'))
model.add(MaxPooling2D((2, 2)))

model.add(Conv2D(128, (3, 3), activation='relu'))
model.add(Flatten())

model.add(Dense(128, activation='relu'))
model.add(Dense(10, activation='softmax'))

model.compile(optimizer='adam', loss='categorical_crossentropy',␣
 ↪metrics=['accuracy'])
model.fit(train_images, train_labels, epochs=10, batch_size=64,␣
 ↪validation_split=0.1)

test_loss, test_acc = model.evaluate(test_images, test_labels)
print("Test accuracy:", test_acc)
```

```
Downloading data from https://www.cs.toronto.edu/~kriz/cifar-10-python.tar.gz
```

```
170498071/170498071 [==============================] - 3s 0us/step
Epoch 1/10
704/704 [==============================] - 79s 110ms/step - loss: 1.5315 -
accuracy: 0.4399 - val_loss: 1.3702 - val_accuracy: 0.5016
Epoch 2/10
704/704 [==============================] - 76s 107ms/step - loss: 1.1657 -
accuracy: 0.5853 - val_loss: 1.0445 - val_accuracy: 0.6376
Epoch 3/10
704/704 [==============================] - 74s 105ms/step - loss: 1.0088 -
accuracy: 0.6442 - val_loss: 1.0007 - val_accuracy: 0.6428
Epoch 4/10
704/704 [==============================] - 75s 106ms/step - loss: 0.8931 -
accuracy: 0.6874 - val_loss: 0.8731 - val_accuracy: 0.7010
Epoch 5/10
704/704 [==============================] - 77s 110ms/step - loss: 0.8103 -
accuracy: 0.7160 - val_loss: 0.8703 - val_accuracy: 0.7054
Epoch 6/10
704/704 [==============================] - 73s 104ms/step - loss: 0.7343 -
accuracy: 0.7434 - val_loss: 0.9011 - val_accuracy: 0.6946
Epoch 7/10
704/704 [==============================] - 75s 107ms/step - loss: 0.6671 -
accuracy: 0.7658 - val_loss: 0.8086 - val_accuracy: 0.7278
Epoch 8/10
704/704 [==============================] - 76s 109ms/step - loss: 0.6031 -
accuracy: 0.7894 - val_loss: 0.7759 - val_accuracy: 0.7362
Epoch 9/10
704/704 [==============================] - 73s 103ms/step - loss: 0.5544 -
accuracy: 0.8064 - val_loss: 0.8013 - val_accuracy: 0.7282
Epoch 10/10
704/704 [==============================] - 75s 107ms/step - loss: 0.4953 -
accuracy: 0.8268 - val_loss: 0.7847 - val_accuracy: 0.7442
313/313 [==============================] - 5s 15ms/step - loss: 0.8372 -
accuracy: 0.7243
Test accuracy: 0.7243000268936157
```