In [2]:

```
import tensorflow as tf
from tensorflow.keras.applications import EfficientNetB0
from tensorflow.keras.preprocessing.image import ImageDataGenerator
from tensorflow.keras.models import Sequential
from tensorflow.keras.layers import Dense, Dropout, BatchNormalization
from tensorflow.keras.optimizers import Adam
from tensorflow.keras.losses import CategoricalCrossentropy
from tensorflow.keras.callbacks import EarlyStopping, ReduceLROnPlateau

# Directories where your data is stored
train_dir = r'C:\Users\Abhishek\Downloads\cucumber\cucumber\train'
validation_dir = r'C:\Users\Abhishek\Downloads\cucumber\cucumber\valid'
test_dir = r'C:\Users\Abhishek\Downloads\cucumber\cucumber\test'

# Define constants
IMG_SIZE = 224
BATCH_SIZE = 32  # Reduced batch size
NUM_CLASSES = 8 # Number of classes in your dataset
EPOCHS = 100

# Generate batches of tensor image data with real-time data augmentation
datagen = ImageDataGenerator(
    rescale=1./255,
    horizontal_flip=True,
    vertical_flip=True)

train_generator = datagen.flow_from_directory(
    train_dir,
    target_size=(IMG_SIZE, IMG_SIZE),
    batch_size=BATCH_SIZE,
    class_mode='categorical')

validation_generator = datagen.flow_from_directory(
    validation_dir,
    target_size=(IMG_SIZE, IMG_SIZE),
    batch_size=BATCH_SIZE,
    class_mode='categorical')

test_generator = datagen.flow_from_directory(
    test_dir,
    target_size=(IMG_SIZE, IMG_SIZE),
    batch_size=BATCH_SIZE,
    class_mode='categorical')

# Load base model
base_model = EfficientNetB0(weights='imagenet', include_top=False, input_shape=(IMG_

# Add a new top layer
x = base_model.output
x = tf.keras.layers.GlobalAveragePooling2D()(x)
x = Dense(512, activation='relu')(x)  # Reduced the number of neurons
x = Dropout(0.2)(x)  # Add dropout layer to reduce overfitting
x = BatchNormalization()(x)
predictions = Dense(NUM_CLASSES, activation='softmax')(x)

# This is the model we will train
model = tf.keras.models.Model(inputs=base_model.input, outputs=predictions)

# Freeze the base model
for layer in base_model.layers:
    layer.trainable = False
```

```
# Compile the model
model.compile(optimizer=Adam(lr=0.001), loss=CategoricalCrossentropy(), metrics=['ac

# Define callbacks
early_stopping = EarlyStopping(monitor='val_loss', patience=10, restore_best_weights
reduce_lr = ReduceLROnPlateau(monitor='val_loss', factor=0.2, patience=5, min_lr=0.0

# Train the model
history = model.fit(
    train_generator,
    epochs=EPOCHS,
    validation_data=validation_generator,
    callbacks=[early_stopping, reduce_lr])

# Unfreeze the layers of the base model and fine-tune the entire model
for layer in base_model.layers:
    layer.trainable = True

# Recompile the model
model.compile(optimizer=Adam(lr=0.00001), loss=CategoricalCrossentropy(), metrics=['

# Continue training the model
history_fine_tuning = model.fit(
    train_generator,
    epochs=EPOCHS,
    validation_data=validation_generator,
    callbacks=[early_stopping, reduce_lr]) b

# Evaluate the model on the test data after fine-tuning
# Evaluate the model on the test data after fine-tuning
score = model.evaluate(test_generator)
print(f'Test loss: {score[0]} / Test accuracy: {score[1]}')g
```

```
Found 800 images belonging to 8 classes.
Found 240 images belonging to 8 classes.
Found 240 images belonging to 8 classes.
WARNING:absl:`lr` is deprecated, please use `learning_rate` instead, or use the lega
cy optimizer, e.g.,tf.keras.optimizers.legacy.Adam.
Epoch 1/100
25/25 [==============================] - 171s 6s/step - loss: 2.4104 - accuracy: 0.1
175 - val_loss: 2.3123 - val_accuracy: 0.1250 - lr: 0.0010
Epoch 2/100
25/25 [==============================] - 140s 6s/step - loss: 2.3718 - accuracy: 0.1
225 - val_loss: 2.3302 - val_accuracy: 0.1250 - lr: 0.0010
Epoch 3/100
25/25 [==============================] - 139s 6s/step - loss: 2.3358 - accuracy: 0.1
300 - val_loss: 2.2826 - val_accuracy: 0.1250 - lr: 0.0010
Epoch 4/100
25/25 [==============================] - 138s 6s/step - loss: 2.2872 - accuracy: 0.1
425 - val_loss: 2.2736 - val_accuracy: 0.1250 - lr: 0.0010
Epoch 5/100
25/25 [==============================] - 121s 5s/step - loss: 2.2767 - accuracy: 0.1
225 - val_loss: 2.2586 - val_accuracy: 0.1250 - lr: 0.0010
Epoch 6/100
25/25 [==============================] - 80s 3s/step - loss: 2.2626 - accuracy: 0.13
00 - val_loss: 2.3918 - val_accuracy: 0.1250 - lr: 0.0010
Epoch 7/100
25/25 [==============================] - 74s 3s/step - loss: 2.2442 - accuracy: 0.12
75 - val_loss: 2.3011 - val_accuracy: 0.1250 - lr: 0.0010
Epoch 8/100
25/25 [==============================] - 71s 3s/step - loss: 2.2452 - accuracy: 0.14
00 - val_loss: 2.1480 - val_accuracy: 0.1375 - lr: 0.0010
Epoch 9/100
25/25 [==============================] - 69s 3s/step - loss: 2.2503 - accuracy: 0.11
12 - val_loss: 2.1358 - val_accuracy: 0.1250 - lr: 0.0010
Epoch 10/100
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25/25 [==============================] - 163s 7s/step - loss: 2.1969 - accuracy: 0.1
262 - val_loss: 2.1200 - val_accuracy: 0.1250 - lr: 0.0010
Epoch 11/100
25/25 [==============================] - 259s 10s/step - loss: 2.1673 - accuracy: 0.
1688 - val_loss: 2.1211 - val_accuracy: 0.1292 - lr: 0.0010
Epoch 12/100
25/25 [==============================] - 275s 11s/step - loss: 2.1992 - accuracy: 0.
1350 - val_loss: 2.0963 - val_accuracy: 0.1250 - lr: 0.0010
Epoch 13/100
25/25 [==============================] - 280s 11s/step - loss: 2.1851 - accuracy: 0.
1088 - val_loss: 2.0892 - val_accuracy: 0.1250 - lr: 0.0010
Epoch 14/100
25/25 [==============================] - 282s 11s/step - loss: 2.1678 - accuracy: 0.
1163 - val_loss: 2.0961 - val_accuracy: 0.1250 - lr: 0.0010
Epoch 15/100
25/25 [==============================] - 280s 11s/step - loss: 2.1536 - accuracy: 0.
1325 - val_loss: 2.0858 - val_accuracy: 0.1250 - lr: 0.0010
Epoch 16/100
25/25 [==============================] - 338s 13s/step - loss: 2.1510 - accuracy: 0.
1325 - val_loss: 2.0963 - val_accuracy: 0.1250 - lr: 0.0010
Epoch 17/100
25/25 [==============================] - 365s 15s/step - loss: 2.1193 - accuracy: 0.
1425 - val_loss: 2.0923 - val_accuracy: 0.1250 - lr: 0.0010
Epoch 18/100
25/25 [==============================] - 380s 15s/step - loss: 2.1423 - accuracy: 0.
1275 - val_loss: 2.1216 - val_accuracy: 0.1250 - lr: 0.0010
Epoch 19/100
25/25 [==============================] - 378s 15s/step - loss: 2.1244 - accuracy: 0.
1262 - val_loss: 2.0860 - val_accuracy: 0.1750 - lr: 0.0010
Epoch 20/100
25/25 [==============================] - 377s 15s/step - loss: 2.1274 - accuracy: 0.
1325 - val_loss: 2.1012 - val_accuracy: 0.1708 - lr: 0.0010
Epoch 21/100
25/25 [==============================] - 378s 15s/step - loss: 2.1263 - accuracy: 0.
1338 - val_loss: 2.0902 - val_accuracy: 0.1250 - lr: 2.0000e-04
Epoch 22/100
25/25 [==============================] - 280s 11s/step - loss: 2.1279 - accuracy: 0.
1375 - val_loss: 2.0874 - val_accuracy: 0.1250 - lr: 2.0000e-04
Epoch 23/100
25/25 [==============================] - 207s 8s/step - loss: 2.1040 - accuracy: 0.1
363 - val_loss: 2.0853 - val_accuracy: 0.1250 - lr: 2.0000e-04
Epoch 24/100
25/25 [==============================] - 208s 8s/step - loss: 2.1250 - accuracy: 0.1
238 - val_loss: 2.0797 - val_accuracy: 0.1958 - lr: 2.0000e-04
Epoch 25/100
25/25 [==============================] - 205s 8s/step - loss: 2.1148 - accuracy: 0.1
388 - val_loss: 2.0832 - val_accuracy: 0.1708 - lr: 2.0000e-04
Epoch 26/100
25/25 [==============================] - 206s 8s/step - loss: 2.1131 - accuracy: 0.1
200 - val_loss: 2.1433 - val_accuracy: 0.1250 - lr: 2.0000e-04
Epoch 27/100
25/25 [==============================] - 207s 8s/step - loss: 2.1331 - accuracy: 0.1
200 - val_loss: 2.1013 - val_accuracy: 0.1500 - lr: 2.0000e-04
Epoch 28/100
25/25 [==============================] - 205s 8s/step - loss: 2.1150 - accuracy: 0.1
488 - val_loss: 2.0869 - val_accuracy: 0.1375 - lr: 2.0000e-04
Epoch 29/100
25/25 [==============================] - 206s 8s/step - loss: 2.1286 - accuracy: 0.1
138 - val_loss: 2.0818 - val_accuracy: 0.1417 - lr: 2.0000e-04
Epoch 30/100
25/25 [==============================] - 210s 8s/step - loss: 2.1064 - accuracy: 0.1
462 - val_loss: 2.0788 - val_accuracy: 0.1375 - lr: 4.0000e-05
Epoch 31/100
25/25 [==============================] - 207s 8s/step - loss: 2.1014 - accuracy: 0.1
637 - val_loss: 2.0771 - val_accuracy: 0.1292 - lr: 4.0000e-05
Epoch 32/100
25/25 [==============================] - 207s 8s/step - loss: 2.1091 - accuracy: 0.1
412 - val_loss: 2.0760 - val_accuracy: 0.1250 - lr: 4.0000e-05
Epoch 33/100
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25/25 [==============================] - 208s 8s/step - loss: 2.1238 - accuracy: 0.1
338 - val_loss: 2.0752 - val_accuracy: 0.1250 - lr: 4.0000e-05
Epoch 34/100
25/25 [==============================] - 207s 8s/step - loss: 2.0951 - accuracy: 0.1
450 - val_loss: 2.0734 - val_accuracy: 0.1250 - lr: 4.0000e-05
Epoch 35/100
25/25 [==============================] - 206s 8s/step - loss: 2.1139 - accuracy: 0.1
300 - val_loss: 2.0727 - val_accuracy: 0.1250 - lr: 4.0000e-05
Epoch 36/100
25/25 [==============================] - 209s 8s/step - loss: 2.1301 - accuracy: 0.1
163 - val_loss: 2.0731 - val_accuracy: 0.1250 - lr: 4.0000e-05
Epoch 37/100
25/25 [==============================] - 205s 8s/step - loss: 2.1037 - accuracy: 0.1
388 - val_loss: 2.0730 - val_accuracy: 0.1250 - lr: 4.0000e-05
Epoch 38/100
25/25 [==============================] - 207s 8s/step - loss: 2.0848 - accuracy: 0.1
475 - val_loss: 2.0707 - val_accuracy: 0.1250 - lr: 4.0000e-05
Epoch 39/100
25/25 [==============================] - 207s 8s/step - loss: 2.1155 - accuracy: 0.1
312 - val_loss: 2.0697 - val_accuracy: 0.1250 - lr: 4.0000e-05
Epoch 40/100
25/25 [==============================] - 208s 8s/step - loss: 2.0956 - accuracy: 0.1
538 - val_loss: 2.0686 - val_accuracy: 0.1375 - lr: 4.0000e-05
Epoch 41/100
25/25 [==============================] - 209s 8s/step - loss: 2.1011 - accuracy: 0.1
213 - val_loss: 2.0677 - val_accuracy: 0.2417 - lr: 4.0000e-05
Epoch 42/100
25/25 [==============================] - 205s 8s/step - loss: 2.0948 - accuracy: 0.1
388 - val_loss: 2.0675 - val_accuracy: 0.1375 - lr: 4.0000e-05
Epoch 43/100
25/25 [==============================] - 205s 8s/step - loss: 2.1099 - accuracy: 0.1
262 - val_loss: 2.0674 - val_accuracy: 0.1750 - lr: 4.0000e-05
Epoch 44/100
25/25 [==============================] - 206s 8s/step - loss: 2.1145 - accuracy: 0.1
213 - val_loss: 2.0676 - val_accuracy: 0.1250 - lr: 4.0000e-05
Epoch 45/100
25/25 [==============================] - 209s 8s/step - loss: 2.1162 - accuracy: 0.1
150 - val_loss: 2.0664 - val_accuracy: 0.1500 - lr: 4.0000e-05
Epoch 46/100
25/25 [==============================] - 204s 8s/step - loss: 2.1235 - accuracy: 0.1
325 - val_loss: 2.0647 - val_accuracy: 0.1917 - lr: 4.0000e-05
Epoch 47/100
25/25 [==============================] - 156s 6s/step - loss: 2.0972 - accuracy: 0.1
338 - val_loss: 2.0654 - val_accuracy: 0.1333 - lr: 4.0000e-05
Epoch 48/100
25/25 [==============================] - 166s 7s/step - loss: 2.1005 - accuracy: 0.1
275 - val_loss: 2.0654 - val_accuracy: 0.1250 - lr: 4.0000e-05
Epoch 49/100
25/25 [==============================] - 228s 9s/step - loss: 2.0891 - accuracy: 0.1
513 - val_loss: 2.0641 - val_accuracy: 0.1625 - lr: 4.0000e-05
Epoch 50/100
25/25 [==============================] - 227s 9s/step - loss: 2.0988 - accuracy: 0.1
300 - val_loss: 2.0642 - val_accuracy: 0.2667 - lr: 4.0000e-05
Epoch 51/100
25/25 [==============================] - 220s 9s/step - loss: 2.1056 - accuracy: 0.1
475 - val_loss: 2.0645 - val_accuracy: 0.1708 - lr: 4.0000e-05
Epoch 52/100
25/25 [==============================] - 227s 9s/step - loss: 2.1176 - accuracy: 0.1
275 - val_loss: 2.0639 - val_accuracy: 0.2000 - lr: 4.0000e-05
Epoch 53/100
25/25 [==============================] - 220s 9s/step - loss: 2.1019 - accuracy: 0.1
350 - val_loss: 2.0618 - val_accuracy: 0.2250 - lr: 4.0000e-05
Epoch 54/100
25/25 [==============================] - 251s 10s/step - loss: 2.0967 - accuracy: 0.
1450 - val_loss: 2.0651 - val_accuracy: 0.1250 - lr: 4.0000e-05
Epoch 55/100
25/25 [==============================] - 221s 9s/step - loss: 2.0901 - accuracy: 0.1
425 - val_loss: 2.0605 - val_accuracy: 0.2500 - lr: 4.0000e-05
Epoch 56/100
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25/25 [==============================] - 228s 9s/step - loss: 2.1020 - accuracy: 0.1
550 - val_loss: 2.0621 - val_accuracy: 0.1833 - lr: 4.0000e-05
Epoch 57/100
25/25 [==============================] - 228s 9s/step - loss: 2.0763 - accuracy: 0.1
575 - val_loss: 2.0612 - val_accuracy: 0.2000 - lr: 4.0000e-05
Epoch 58/100
25/25 [==============================] - 221s 9s/step - loss: 2.0916 - accuracy: 0.1
538 - val_loss: 2.0608 - val_accuracy: 0.1708 - lr: 4.0000e-05
Epoch 59/100
25/25 [==============================] - 226s 9s/step - loss: 2.1090 - accuracy: 0.1
425 - val_loss: 2.0602 - val_accuracy: 0.1417 - lr: 4.0000e-05
Epoch 60/100
25/25 [==============================] - 223s 9s/step - loss: 2.0979 - accuracy: 0.1
538 - val_loss: 2.0602 - val_accuracy: 0.2000 - lr: 4.0000e-05
Epoch 61/100
25/25 [==============================] - 229s 9s/step - loss: 2.0912 - accuracy: 0.1
475 - val_loss: 2.0582 - val_accuracy: 0.2042 - lr: 4.0000e-05
Epoch 62/100
25/25 [==============================] - 219s 9s/step - loss: 2.0945 - accuracy: 0.1
363 - val_loss: 2.0592 - val_accuracy: 0.1625 - lr: 4.0000e-05
Epoch 63/100
25/25 [==============================] - 226s 9s/step - loss: 2.1041 - accuracy: 0.1
475 - val_loss: 2.0603 - val_accuracy: 0.1333 - lr: 4.0000e-05
Epoch 64/100
25/25 [==============================] - 230s 9s/step - loss: 2.0876 - accuracy: 0.1
513 - val_loss: 2.0637 - val_accuracy: 0.1250 - lr: 4.0000e-05
Epoch 65/100
25/25 [==============================] - 222s 9s/step - loss: 2.0820 - accuracy: 0.1
538 - val_loss: 2.0608 - val_accuracy: 0.1417 - lr: 4.0000e-05
Epoch 66/100
25/25 [==============================] - 229s 9s/step - loss: 2.1091 - accuracy: 0.1
450 - val_loss: 2.0600 - val_accuracy: 0.1792 - lr: 4.0000e-05
Epoch 67/100
25/25 [==============================] - 217s 9s/step - loss: 2.1046 - accuracy: 0.1
312 - val_loss: 2.0589 - val_accuracy: 0.1417 - lr: 1.0000e-05
Epoch 68/100
25/25 [==============================] - 225s 9s/step - loss: 2.1021 - accuracy: 0.1
412 - val_loss: 2.0579 - val_accuracy: 0.1417 - lr: 1.0000e-05
Epoch 69/100
25/25 [==============================] - 224s 9s/step - loss: 2.0883 - accuracy: 0.1
612 - val_loss: 2.0570 - val_accuracy: 0.1667 - lr: 1.0000e-05
Epoch 70/100
25/25 [==============================] - 226s 9s/step - loss: 2.0886 - accuracy: 0.1
462 - val_loss: 2.0573 - val_accuracy: 0.1792 - lr: 1.0000e-05
Epoch 71/100
25/25 [==============================] - 224s 9s/step - loss: 2.0779 - accuracy: 0.1
450 - val_loss: 2.0575 - val_accuracy: 0.1333 - lr: 1.0000e-05
Epoch 72/100
25/25 [==============================] - 222s 9s/step - loss: 2.0887 - accuracy: 0.1
525 - val_loss: 2.0562 - val_accuracy: 0.1708 - lr: 1.0000e-05
Epoch 73/100
25/25 [==============================] - 227s 9s/step - loss: 2.0952 - accuracy: 0.1
488 - val_loss: 2.0556 - val_accuracy: 0.1500 - lr: 1.0000e-05
Epoch 74/100
25/25 [==============================] - 221s 9s/step - loss: 2.0830 - accuracy: 0.1
462 - val_loss: 2.0541 - val_accuracy: 0.2042 - lr: 1.0000e-05
Epoch 75/100
25/25 [==============================] - 225s 9s/step - loss: 2.0901 - accuracy: 0.1
500 - val_loss: 2.0536 - val_accuracy: 0.1833 - lr: 1.0000e-05
Epoch 76/100
25/25 [==============================] - 220s 9s/step - loss: 2.0932 - accuracy: 0.1
450 - val_loss: 2.0540 - val_accuracy: 0.1792 - lr: 1.0000e-05
Epoch 77/100
25/25 [==============================] - 229s 9s/step - loss: 2.0686 - accuracy: 0.1
688 - val_loss: 2.0551 - val_accuracy: 0.1625 - lr: 1.0000e-05
Epoch 78/100
25/25 [==============================] - 220s 9s/step - loss: 2.0838 - accuracy: 0.1
575 - val_loss: 2.0546 - val_accuracy: 0.1750 - lr: 1.0000e-05
Epoch 79/100
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25/25 [==============================] - 224s 9s/step - loss: 2.0845 - accuracy: 0.1
538 - val_loss: 2.0528 - val_accuracy: 0.1750 - lr: 1.0000e-05
Epoch 80/100
25/25 [==============================] - 226s 9s/step - loss: 2.0849 - accuracy: 0.1
450 - val_loss: 2.0533 - val_accuracy: 0.1792 - lr: 1.0000e-05
Epoch 81/100
25/25 [==============================] - 224s 9s/step - loss: 2.0958 - accuracy: 0.1
375 - val_loss: 2.0545 - val_accuracy: 0.1375 - lr: 1.0000e-05
Epoch 82/100
25/25 [==============================] - 228s 9s/step - loss: 2.0753 - accuracy: 0.1
713 - val_loss: 2.0530 - val_accuracy: 0.1417 - lr: 1.0000e-05
Epoch 83/100
25/25 [==============================] - 220s 9s/step - loss: 2.0852 - accuracy: 0.1
462 - val_loss: 2.0514 - val_accuracy: 0.1708 - lr: 1.0000e-05
Epoch 84/100
25/25 [==============================] - 225s 9s/step - loss: 2.0723 - accuracy: 0.1
538 - val_loss: 2.0526 - val_accuracy: 0.1417 - lr: 1.0000e-05
Epoch 85/100
25/25 [==============================] - 222s 9s/step - loss: 2.1032 - accuracy: 0.1
388 - val_loss: 2.0528 - val_accuracy: 0.1542 - lr: 1.0000e-05
Epoch 86/100
25/25 [==============================] - 226s 9s/step - loss: 2.0837 - accuracy: 0.1
725 - val_loss: 2.0529 - val_accuracy: 0.1417 - lr: 1.0000e-05
Epoch 87/100
25/25 [==============================] - 224s 9s/step - loss: 2.0702 - accuracy: 0.1
775 - val_loss: 2.0526 - val_accuracy: 0.1708 - lr: 1.0000e-05
Epoch 88/100
25/25 [==============================] - 224s 9s/step - loss: 2.0827 - accuracy: 0.1
488 - val_loss: 2.0510 - val_accuracy: 0.1750 - lr: 1.0000e-05
Epoch 89/100
25/25 [==============================] - 228s 9s/step - loss: 2.0749 - accuracy: 0.1
625 - val_loss: 2.0486 - val_accuracy: 0.1792 - lr: 1.0000e-05
Epoch 90/100
25/25 [==============================] - 221s 9s/step - loss: 2.0822 - accuracy: 0.1
450 - val_loss: 2.0502 - val_accuracy: 0.1750 - lr: 1.0000e-05
Epoch 91/100
25/25 [==============================] - 225s 9s/step - loss: 2.0850 - accuracy: 0.1
513 - val_loss: 2.0495 - val_accuracy: 0.2042 - lr: 1.0000e-05
Epoch 92/100
25/25 [==============================] - 219s 9s/step - loss: 2.0935 - accuracy: 0.1
338 - val_loss: 2.0482 - val_accuracy: 0.2167 - lr: 1.0000e-05
Epoch 93/100
25/25 [==============================] - 228s 9s/step - loss: 2.0618 - accuracy: 0.1
800 - val_loss: 2.0485 - val_accuracy: 0.2042 - lr: 1.0000e-05
Epoch 94/100
25/25 [==============================] - 222s 9s/step - loss: 2.0773 - accuracy: 0.1
575 - val_loss: 2.0509 - val_accuracy: 0.1917 - lr: 1.0000e-05
Epoch 95/100
25/25 [==============================] - 227s 9s/step - loss: 2.0903 - accuracy: 0.1
462 - val_loss: 2.0483 - val_accuracy: 0.1875 - lr: 1.0000e-05
Epoch 96/100
25/25 [==============================] - 227s 9s/step - loss: 2.0691 - accuracy: 0.1
675 - val_loss: 2.0490 - val_accuracy: 0.1750 - lr: 1.0000e-05
Epoch 97/100
25/25 [==============================] - 224s 9s/step - loss: 2.0720 - accuracy: 0.1
437 - val_loss: 2.0471 - val_accuracy: 0.2000 - lr: 1.0000e-05
Epoch 98/100
25/25 [==============================] - 228s 9s/step - loss: 2.0813 - accuracy: 0.1
513 - val_loss: 2.0469 - val_accuracy: 0.2042 - lr: 1.0000e-05
Epoch 99/100
25/25 [==============================] - 219s 9s/step - loss: 2.0630 - accuracy: 0.1
800 - val_loss: 2.0485 - val_accuracy: 0.2000 - lr: 1.0000e-05
Epoch 100/100
25/25 [==============================] - 226s 9s/step - loss: 2.0777 - accuracy: 0.1
587 - val_loss: 2.0498 - val_accuracy: 0.2083 - lr: 1.0000e-05
WARNING:absl:`lr` is deprecated, please use `learning_rate` instead, or use the lega
cy optimizer, e.g.,tf.keras.optimizers.legacy.Adam.
Epoch 1/100
25/25 [==============================] - 405s 13s/step - loss: 0.7465 - accuracy: 0.
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7300 - val_loss: 2.4014 - val_accuracy: 0.1250 - lr: 0.0010
Epoch 2/100
25/25 [==============================] - 330s 13s/step - loss: 0.2580 - accuracy: 0.
9212 - val_loss: 2.4741 - val_accuracy: 0.1250 - lr: 0.0010
Epoch 3/100
25/25 [==============================] - 342s 14s/step - loss: 0.1920 - accuracy: 0.
9287 - val_loss: 3.0748 - val_accuracy: 0.1250 - lr: 0.0010
Epoch 4/100
25/25 [==============================] - 359s 14s/step - loss: 0.2363 - accuracy: 0.
9287 - val_loss: 50.9114 - val_accuracy: 0.1000 - lr: 0.0010
Epoch 5/100
25/25 [==============================] - 330s 13s/step - loss: 0.1445 - accuracy: 0.
9600 - val_loss: 66.9357 - val_accuracy: 0.1792 - lr: 0.0010
Epoch 6/100
25/25 [==============================] - 332s 13s/step - loss: 0.1097 - accuracy: 0.
9625 - val_loss: 13.8884 - val_accuracy: 0.1417 - lr: 0.0010
Epoch 7/100
25/25 [==============================] - 329s 13s/step - loss: 0.0627 - accuracy: 0.
9762 - val_loss: 11.0382 - val_accuracy: 0.1417 - lr: 2.0000e-04
Epoch 8/100
25/25 [==============================] - 327s 13s/step - loss: 0.0459 - accuracy: 0.
9862 - val_loss: 7.5471 - val_accuracy: 0.1708 - lr: 2.0000e-04
Epoch 9/100
25/25 [==============================] - 336s 13s/step - loss: 0.0157 - accuracy: 0.
9975 - val_loss: 7.7141 - val_accuracy: 0.1208 - lr: 2.0000e-04
Epoch 10/100
25/25 [==============================] - 325s 13s/step - loss: 0.0357 - accuracy: 0.
9912 - val_loss: 17.1959 - val_accuracy: 0.0917 - lr: 2.0000e-04
Epoch 11/100
25/25 [==============================] - 329s 13s/step - loss: 0.0266 - accuracy: 0.
9937 - val_loss: 18.3053 - val_accuracy: 0.1083 - lr: 2.0000e-04
8/8 [==============================] - 59s 7s/step - loss: 2.4016 - accuracy: 0.1250
Test loss: 2.4016289710998535 / Test accuracy: 0.125
```

In [ ]: