

```
!pip install tensorflow opencv-python mediapipe sklearn matplotlib
```

```
Requirement already satisfied: tensorflow in c:\users\ankit\anaconda3\lib\site-packages (2.10.0)
```

```
Requirement already satisfied: opencv-python in c:\users\ankit\anaconda3\lib\site-packages (4.6.0.66)
```

```
Collecting mediapipe
```

```
  Downloading mediapipe-0.9.0-cp39-cp39-win_amd64.whl (49.8 MB)
```

```
----- 49.8/49.8 MB 3.3 MB/s
```

```
eta 0:00:00
```

```
Collecting sklearn
```

```
  Using cached sklearn-0.0.post1.tar.gz (3.6 kB)
```

```
  Preparing metadata (setup.py): started
```

```
  Preparing metadata (setup.py): finished with status 'done'
```

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Requirement already satisfied: matplotlib in c:\users\ankit\anaconda3\lib\site-packages (3.5.2)
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Requirement already satisfied: typing-extensions>=3.6.6 in c:\users\ankit\anaconda3\lib\site-packages (from tensorflow) (4.3.0)
```

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Requirement already satisfied: setuptools in c:\users\ankit\anaconda3\lib\site-packages (from tensorflow) (63.4.1)
```

```
Requirement already satisfied: wrapt>=1.11.0 in c:\users\ankit\anaconda3\lib\site-packages (from tensorflow) (1.14.1)
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Requirement already satisfied: numpy>=1.20 in c:\users\ankit\anaconda3\lib\site-packages (from tensorflow) (1.21.5)
```

```
Requirement already satisfied: google-pasta>=0.1.1 in c:\users\ankit\anaconda3\lib\site-packages (from tensorflow) (0.2.0)
```

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Requirement already satisfied: gast<=0.4.0,>=0.2.1 in c:\users\ankit\anaconda3\lib\site-packages (from tensorflow) (0.4.0)
```

```
Requirement already satisfied: flatbuffers>=2.0 in c:\users\ankit\anaconda3\lib\site-packages (from tensorflow) (22.10.26)
```

```
Requirement already satisfied: tensorflow-estimator<2.11,>=2.10.0 in c:\users\ankit\anaconda3\lib\site-packages (from tensorflow) (2.10.0)
```

```
Requirement already satisfied: keras-preprocessing>=1.1.1 in c:\users\ankit\anaconda3\lib\site-packages (from tensorflow) (1.1.2)
```

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Requirement already satisfied: packaging in c:\users\ankit\anaconda3\lib\site-packages (from tensorflow) (21.3)
```

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Requirement already satisfied: h5py>=2.9.0 in c:\users\ankit\anaconda3\lib\site-packages (from tensorflow) (3.7.0)
```

```
Requirement already satisfied: libclang>=13.0.0 in c:\users\ankit\anaconda3\lib\site-packages (from tensorflow) (14.0.6)
```

```
Requirement already satisfied: termcolor>=1.1.0 in c:\users\ankit\anaconda3\lib\site-packages (from tensorflow) (2.1.0)
```

```
Requirement already satisfied: tensorboard<2.11,>=2.10 in c:\users\ankit\anaconda3\lib\site-packages (from tensorflow) (2.10.1)
```

```
Requirement already satisfied: protobuf<3.20,>=3.9.2 in c:\users\ankit\anaconda3\lib\site-packages (from tensorflow) (3.19.6)
```

```
Requirement already satisfied: opt-einsum>=2.3.2 in c:\users\ankit\anaconda3\lib\site-packages (from tensorflow) (3.3.0)
```

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Requirement already satisfied: grpcio<2.0,>=1.24.3 in c:\users\ankit\anaconda3\lib\site-packages (from tensorflow) (1.50.0)
```

Requirement already satisfied: tensorflow-io-gcs-filesystem<=0.23.1 in c:\users\ankit\anaconda3\lib\site-packages (from tensorflow) (0.27.0)

Requirement already satisfied: six<=1.12.0 in c:\users\ankit\anaconda3\lib\site-packages (from tensorflow) (1.16.0)

Requirement already satisfied: absl-py<=1.0.0 in c:\users\ankit\anaconda3\lib\site-packages (from tensorflow) (1.3.0)

Requirement already satisfied: keras<2.11,>=2.10.0 in c:\users\ankit\anaconda3\lib\site-packages (from tensorflow) (2.10.0)

Requirement already satisfied: astunparse<=1.6.0 in c:\users\ankit\anaconda3\lib\site-packages (from tensorflow) (1.6.3)

Collecting opencv-contrib-python

Using cached opencv_contrib_python-4.6.0.66-cp36-abi3-win_amd64.whl (42.5 MB)

Requirement already satisfied: attrs<=19.1.0 in c:\users\ankit\anaconda3\lib\site-packages (from mediapipe) (21.4.0)

Requirement already satisfied: python-dateutil<=2.7 in c:\users\ankit\anaconda3\lib\site-packages (from matplotlib) (2.8.2)

Requirement already satisfied: kiwisolver<=1.0.1 in c:\users\ankit\anaconda3\lib\site-packages (from matplotlib) (1.4.2)

Requirement already satisfied: pyparsing<=2.2.1 in c:\users\ankit\anaconda3\lib\site-packages (from matplotlib) (3.0.9)

Requirement already satisfied: pillow<=6.2.0 in c:\users\ankit\anaconda3\lib\site-packages (from matplotlib) (9.2.0)

Requirement already satisfied: cycler<=0.10 in c:\users\ankit\anaconda3\lib\site-packages (from matplotlib) (0.11.0)

Requirement already satisfied: fonttools<=4.22.0 in c:\users\ankit\anaconda3\lib\site-packages (from matplotlib) (4.25.0)

Requirement already satisfied: wheel<1.0,>=0.23.0 in c:\users\ankit\anaconda3\lib\site-packages (from astunparse<=1.6.0->tensorflow) (0.37.1)

Requirement already satisfied: requests<3,>=2.21.0 in c:\users\ankit\anaconda3\lib\site-packages (from tensorboard<2.11,>=2.10->tensorflow) (2.28.1)

Requirement already satisfied: tensorboard-plugin-wit<=1.6.0 in c:\users\ankit\anaconda3\lib\site-packages (from tensorboard<2.11,>=2.10->tensorflow) (1.8.1)

Requirement already satisfied: markdown<=2.6.8 in c:\users\ankit\anaconda3\lib\site-packages (from tensorboard<2.11,>=2.10->tensorflow) (3.3.4)

Requirement already satisfied: tensorboard-data-server<0.7.0,>=0.6.0 in c:\users\ankit\anaconda3\lib\site-packages (from tensorboard<2.11,>=2.10->tensorflow) (0.6.1)

Requirement already satisfied: werkzeug<=1.0.1 in c:\users\ankit\anaconda3\lib\site-packages (from tensorboard<2.11,>=2.10->tensorflow) (2.0.3)

Requirement already satisfied: google-auth<3,>=1.6.3 in c:\users\ankit\anaconda3\lib\site-packages (from tensorboard<2.11,>=2.10->tensorflow) (2.14.1)

Requirement already satisfied: google-auth-oauthlib<0.5,>=0.4.1 in c:\users\ankit\anaconda3\lib\site-packages (from tensorboard<2.11,>=2.10->tensorflow) (0.4.6)

```

>tensorflow) (0.4.6)
Requirement already satisfied: cachetools<6.0,>=2.0.0 in c:\users\
ankit\anaconda3\lib\site-packages (from google-auth<3,>=1.6.3-
>tensorboard<2.11,>=2.10->tensorflow) (5.2.0)
Requirement already satisfied: rsa<5,>=3.1.4 in c:\users\ankit\
anaconda3\lib\site-packages (from google-auth<3,>=1.6.3-
>tensorboard<2.11,>=2.10->tensorflow) (4.9)
Requirement already satisfied: pyasn1-modules>=0.2.1 in c:\users\
ankit\anaconda3\lib\site-packages (from google-auth<3,>=1.6.3-
>tensorboard<2.11,>=2.10->tensorflow) (0.2.8)
Requirement already satisfied: requests-oauthlib>=0.7.0 in c:\users\
ankit\anaconda3\lib\site-packages (from google-auth-
oauthlib<0.5,>=0.4.1->tensorboard<2.11,>=2.10->tensorflow) (1.3.1)
Requirement already satisfied: urllib3<1.27,>=1.21.1 in c:\users\
ankit\anaconda3\lib\site-packages (from requests<3,>=2.21.0-
>tensorboard<2.11,>=2.10->tensorflow) (1.26.11)
Requirement already satisfied: charset-normalizer<3,>=2 in c:\users\
ankit\anaconda3\lib\site-packages (from requests<3,>=2.21.0-
>tensorboard<2.11,>=2.10->tensorflow) (2.0.4)
Requirement already satisfied: idna<4,>=2.5 in c:\users\ankit\
anaconda3\lib\site-packages (from requests<3,>=2.21.0-
>tensorboard<2.11,>=2.10->tensorflow) (3.3)
Requirement already satisfied: certifi>=2017.4.17 in c:\users\ankit\
anaconda3\lib\site-packages (from requests<3,>=2.21.0-
>tensorboard<2.11,>=2.10->tensorflow) (2022.9.14)
Requirement already satisfied: pyasn1<0.5.0,>=0.4.6 in c:\users\ankit\
anaconda3\lib\site-packages (from pyasn1-modules>=0.2.1->google-
auth<3,>=1.6.3->tensorboard<2.11,>=2.10->tensorflow) (0.4.8)
Requirement already satisfied: oauthlib>=3.0.0 in c:\users\ankit\
anaconda3\lib\site-packages (from requests-oauthlib>=0.7.0->google-
auth-oauthlib<0.5,>=0.4.1->tensorboard<2.11,>=2.10->tensorflow)
(3.2.2)
Building wheels for collected packages: sklearn
  Building wheel for sklearn (setup.py): started
  Building wheel for sklearn (setup.py): finished with status 'done'
  Created wheel for sklearn: filename=sklearn-0.0.post1-py3-none-
any.whl size=2936
sha256=477ea03fd7cea39b0d771ff267addaee0145b20eb526dac6720a8b8a0284cb9
9
  Stored in directory: c:\users\ankit\appdata\local\pip\cache\wheels\
f8\e0\3d\9d0c2020c44a519b9f02ab4fa6d2a4a996c98d79ab2f569fa1
Successfully built sklearn
Installing collected packages: sklearn, opencv-contrib-python,
mediapipe
Successfully installed mediapipe-0.9.0 opencv-contrib-python-4.6.0.66
sklearn-0.0.post1

import cv2
import numpy as np
import os

```

```

from matplotlib import pyplot as plt
import time
import mediapipe as mp

# Holistic model
mp_holistic = mp.solutions.holistic

# Drawing utilities
mp_drawing = mp.solutions.drawing_utils

def mediapipe_detection(image, model):
    # Color conversion BGR to RGB
    image = cv2.cvtColor(image, cv2.COLOR_BGR2RGB)

    # Image is no longer writeable
    image.flags.writeable = False

    # Make prediction
    results = model.process(image)

    # Image is now writeable
    image.flags.writeable = True

    # Color conversion RGB to BGR
    image = cv2.cvtColor(image, cv2.COLOR_RGB2BGR)

    return image, results

def draw_landmarks(image, results):
    # Draw face connections
    mp_drawing.draw_landmarks(image, results.face_landmarks,
    mp_holistic.FACEMESH_TESSELATION)

    # Draw pose connections
    mp_drawing.draw_landmarks(image, results.pose_landmarks,
    mp_holistic.POSE_CONNECTIONS)

    # Draw left hand connections
    mp_drawing.draw_landmarks(image, results.left_hand_landmarks,
    mp_holistic.HAND_CONNECTIONS)

    # Draw right hand connections
    mp_drawing.draw_landmarks(image, results.right_hand_landmarks,
    mp_holistic.HAND_CONNECTIONS)

def draw_styled_landmarks(image, results):
    # Draw face connections
    mp_drawing.draw_landmarks(image, results.face_landmarks,
    mp_holistic.FACEMESH_TESSELATION,

```

```

mp_drawing.DrawingSpec(color=(80,110,10), thickness=1,
circle_radius=1),

mp_drawing.DrawingSpec(color=(80,256,121), thickness=1,
circle_radius=1)
    )
    # Draw pose connections
    mp_drawing.draw_landmarks(image, results.pose_landmarks,
mp_holistic.POSE_CONNECTIONS,

mp_drawing.DrawingSpec(color=(80,110,10), thickness=1,
circle_radius=1),

mp_drawing.DrawingSpec(color=(80,44,121), thickness=1,
circle_radius=1)
    )

    # Draw left hand connections
    mp_drawing.draw_landmarks(image, results.left_hand_landmarks,
mp_holistic.HAND_CONNECTIONS,
        mp_drawing.DrawingSpec(color=(121,22,76),
thickness=1, circle_radius=1),

mp_drawing.DrawingSpec(color=(121,44,250), thickness=1,
circle_radius=1)
    )

    # Draw right hand connections
    mp_drawing.draw_landmarks(image, results.right_hand_landmarks,
mp_holistic.HAND_CONNECTIONS,

mp_drawing.DrawingSpec(color=(245,117,66), thickness=1,
circle_radius=1),

mp_drawing.DrawingSpec(color=(245,66,230), thickness=1,
circle_radius=1)
    )

cap = cv2.VideoCapture(0)
# Set mediapipe model
with mp_holistic.Holistic(min_detection_confidence = 0.5,
min_tracking_confidence = 0.5) as holistic:
    while cap.isOpened():

        # Read feed
        ret, frame = cap.read()

        # Make detections
        image, results = mediapipe_detection(frame, holistic)

```

```

# Draw landmarks
draw_styled_landmarks(image, results)

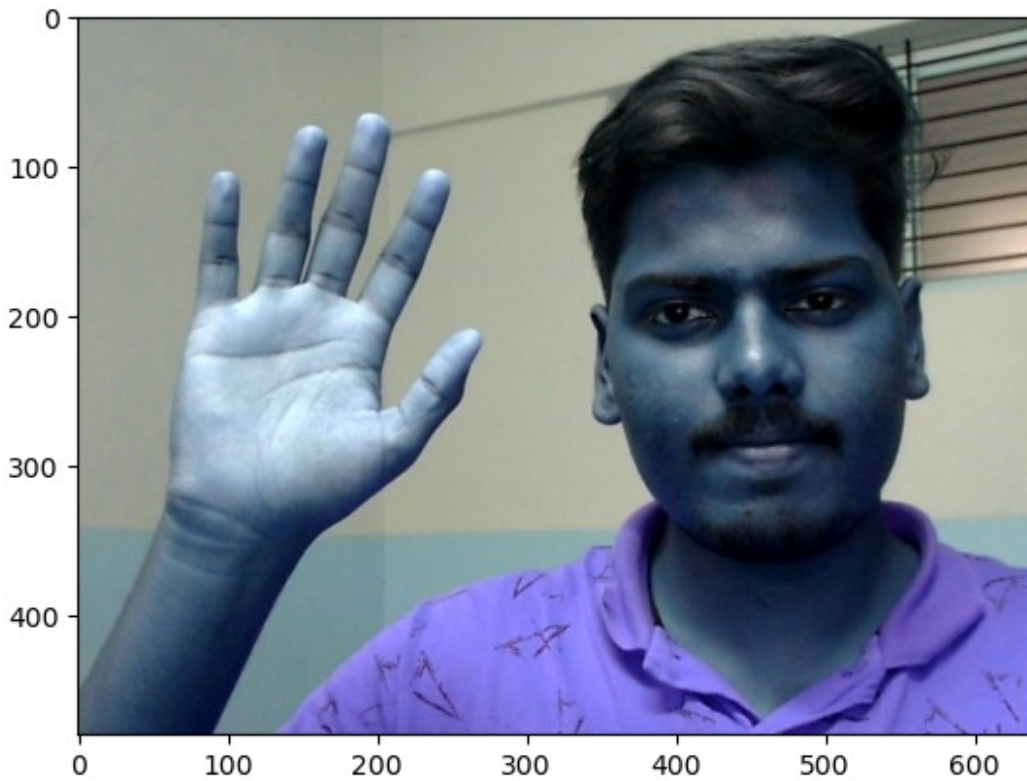
# Show to screen
cv2.imshow('OpenCV Feed', image)

# Break gracefully
if cv2.waitKey(10) & 0xFF == ord('q'):
    break
cap.release()
cv2.destroyAllWindows()

cap.release()
cv2.destroyAllWindows()

plt.imshow(frame)
<matplotlib.image.AxesImage at 0x1e814de1520>

```

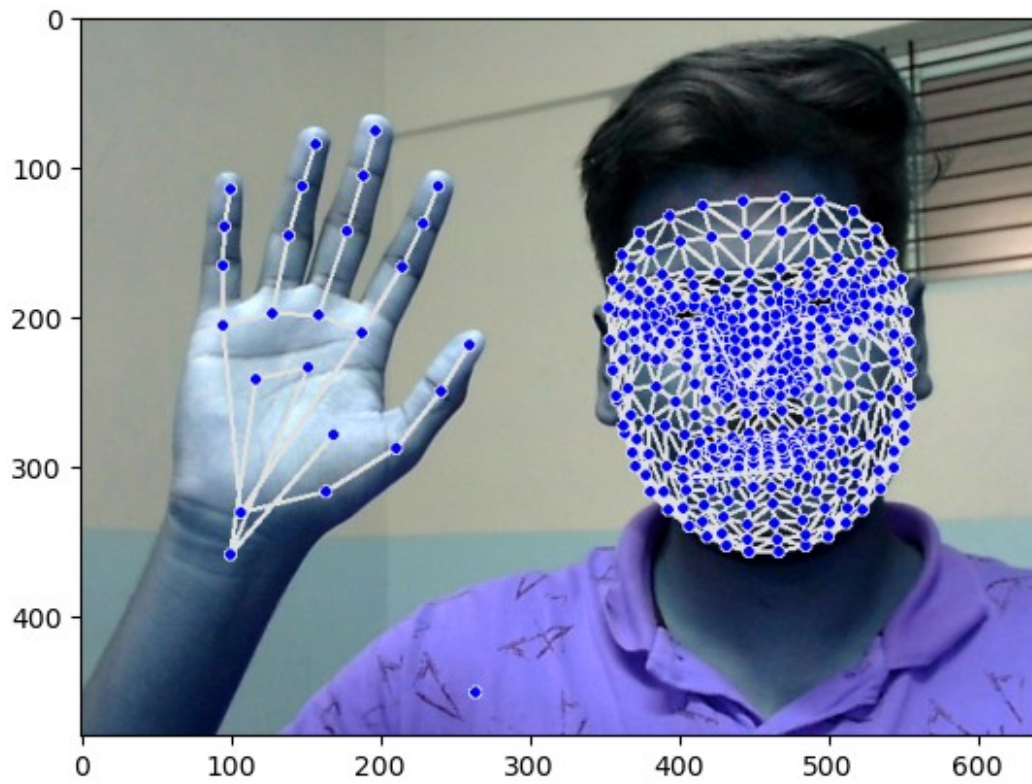


```

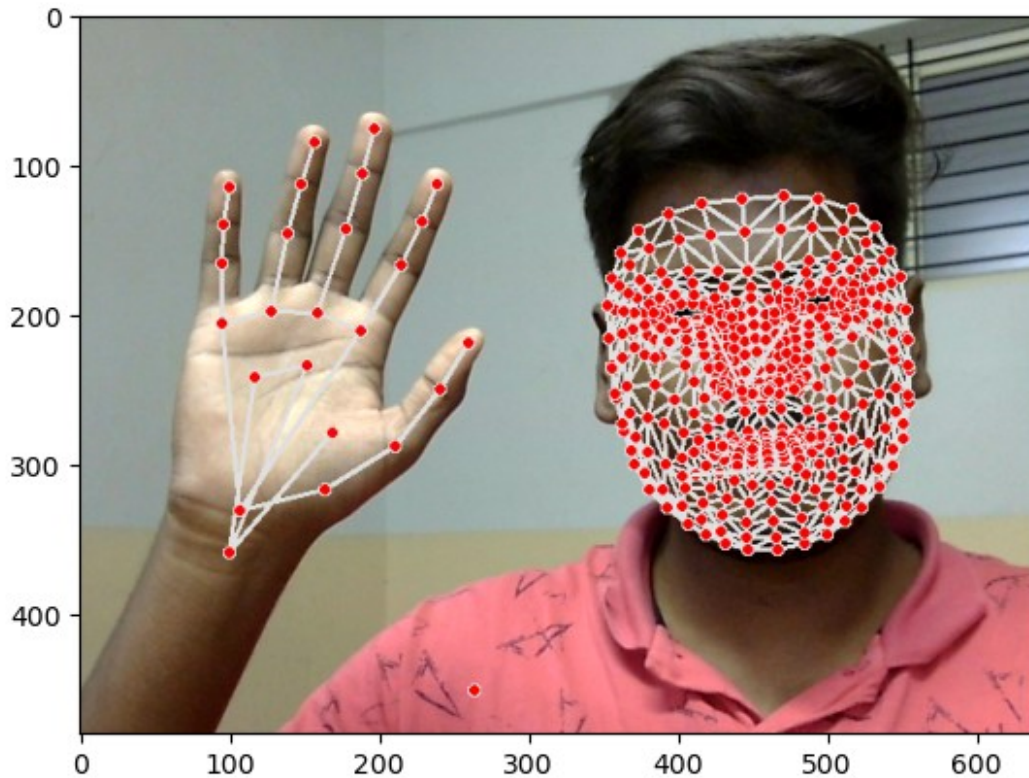
draw_landmarks(frame, results)

plt.imshow(frame)
<matplotlib.image.AxesImage at 0x1e814e34310>

```



```
plt.imshow(cv2.cvtColor(frame, cv2.COLOR_BGR2RGB))  
<matplotlib.image.AxesImage at 0x1e814e88c70>
```

results

mediapipe.python.solution_base.SolutionOutputs

```
pose = np.array([[res.x, res.y, res.z, res.visibility] for res in
results.pose_landmarks.landmark]).flatten() if results.pose_landmarks
else np.zeros(132)
face = np.array([[res.x, res.y, res.z] for res in
results.face_landmarks.landmark]).flatten() if results.face_landmarks
else np.zeros(1404)
lh = np.array([[res.x, res.y, res.z] for res in
results.left_hand_landmarks.landmark]).flatten() if
results.left_hand_landmarks else np.zeros(21*3)
rh = np.array([[res.x, res.y, res.z] for res in
results.right_hand_landmarks.landmark]).flatten() if
results.right_hand_landmarks else np.zeros(21*3)

def extract_keypoints(results):
    pose = np.array([[res.x, res.y, res.z, res.visibility] for res in
results.pose_landmarks.landmark]).flatten() if results.pose_landmarks
else np.zeros(132)
    face = np.array([[res.x, res.y, res.z] for res in
results.face_landmarks.landmark]).flatten() if results.face_landmarks
else np.zeros(1404)
    lh = np.array([[res.x, res.y, res.z] for res in
results.left_hand_landmarks.landmark]).flatten() if
```



```

results.left_hand_landmarks else np.zeros(21*3)
    rh = np.array([[res.x, res.y, res.z] for res in
results.right_hand_landmarks.landmark]).flatten() if
results.right_hand_landmarks else np.zeros(21*3)
    return np.concatenate([pose, face, lh, rh])

extract_keypoints(results).shape

(1662,)

# Path for exported data, numpy arrays
DATA_PATH = os.path.join('MP_Data')

# Actions that we try to detect
actions = np.array(['hello', 'thanks', 'iloveyou'])

# Thirty videos worth of data
no_sequences = 30

# Videos are going to be 30 frames in length
sequence_length = 30

for action in actions:
    for sequence in range(no_sequences):
        try:
            os.makedirs(os.path.join(DATA_PATH, action,
str(sequence)))
        except:
            pass

cap = cv2.VideoCapture(0)
# Set mediapipe model
with mp_holistic.Holistic(min_detection_confidence=0.5,
min_tracking_confidence=0.5) as holistic:

    # Loop through actions
    for action in actions:

        # Loop through sequences aka videos
        for sequence in range(no_sequences):

            # Loop through video length aka sequence length
            for frame_num in range(sequence_length):

                # Read feed
                ret, frame = cap.read()

                # Make detections
                image, results = mediapipe_detection(frame, holistic)
                print(results)

```


[illegible]

[illegible]

[illegible]

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```

<class 'mediapipe.python.solution_base.SolutionOutputs'>
<class 'mediapipe.python.solution_base.SolutionOutputs'>

from sklearn.model_selection import train_test_split
from tensorflow.keras.utils import to_categorical

label_map = {label:num for num, label in enumerate(actions)}

label_map

{'hello': 0, 'thanks': 1, 'iloveyou': 2}

sequences, labels = [], []
for action in actions:
    for sequence in range(no_sequences):
        window = []
        for frame_num in range(sequence_length):
            res = np.load(os.path.join(DATA_PATH, action,
str(sequence), "{}.npy".format(frame_num)))
            window.append(res)
        sequences.append(window)
        labels.append(label_map[action])

np.array(sequences).shape

(90, 30, 1662)

np.array(labels).shape

(90,)

X = np.array(sequences)

X.shape

(90, 30, 1662)

y = to_categorical(labels).astype(int)

X_train, X_test, y_train, y_test = train_test_split(X, y, test_size =
0.05)

X_train.shape

(85, 30, 1662)

X_test.shape

(5, 30, 1662)

y_train.shape

(85, 3)

y_test.shape

```

(5, 3)

```
from tensorflow.keras.models import Sequential
from tensorflow.keras.layers import LSTM, Dense
from tensorflow.keras.callbacks import TensorBoard

log_dir = os.path.join('Logs')
tb_callback = TensorBoard(log_dir = log_dir)

model = Sequential()
model.add(LSTM(64, return_sequences=True, activation='relu',
input_shape = (30, 1662)))
model.add(LSTM(128, return_sequences=True, activation='relu'))
model.add(LSTM(64, return_sequences=False, activation='relu'))
model.add(Dense(64, activation='relu'))
model.add(Dense(32, activation='relu'))
model.add(Dense(actions.shape[0], activation='softmax'))

model.compile(optimizer='Adam', loss='categorical_crossentropy',
metrics=['categorical_accuracy'])

model.fit(X_train, y_train, epochs=2000, callbacks=[tb_callback])

Epoch 1/2000
3/3 [=====] - 3s 76ms/step - loss: 7.9472 -
categorical_accuracy: 0.3882
Epoch 2/2000
3/3 [=====] - 0s 75ms/step - loss: 7.8325 -
categorical_accuracy: 0.4353
Epoch 3/2000
3/3 [=====] - 0s 76ms/step - loss: 4.4482 -
categorical_accuracy: 0.3059
Epoch 4/2000
3/3 [=====] - 0s 73ms/step - loss: 4.0829 -
categorical_accuracy: 0.2824
Epoch 5/2000
3/3 [=====] - 0s 71ms/step - loss: 3.4613 -
categorical_accuracy: 0.2941
Epoch 6/2000
3/3 [=====] - 0s 70ms/step - loss: 1.4894 -
categorical_accuracy: 0.4706
Epoch 7/2000
3/3 [=====] - 0s 69ms/step - loss: 1.7389 -
categorical_accuracy: 0.3294
Epoch 8/2000
3/3 [=====] - 0s 74ms/step - loss: 1.1202 -
categorical_accuracy: 0.3529
Epoch 9/2000
3/3 [=====] - 0s 74ms/step - loss: 1.0198 -
categorical_accuracy: 0.5176
Epoch 10/2000
```

3/3 [=====] - 0s 82ms/step - loss: 1.1872 -
categorical_accuracy: 0.4235
Epoch 11/2000
3/3 [=====] - 0s 70ms/step - loss: 1.2168 -
categorical_accuracy: 0.3529
Epoch 12/2000
3/3 [=====] - 0s 67ms/step - loss: 0.9113 -
categorical_accuracy: 0.6471
Epoch 13/2000
3/3 [=====] - 0s 60ms/step - loss: 0.9048 -
categorical_accuracy: 0.5412
Epoch 14/2000
3/3 [=====] - 0s 60ms/step - loss: 1.1959 -
categorical_accuracy: 0.4588
Epoch 15/2000
3/3 [=====] - 0s 91ms/step - loss: 1.3730 -
categorical_accuracy: 0.5176
Epoch 16/2000
3/3 [=====] - 0s 92ms/step - loss: 4.4797 -
categorical_accuracy: 0.4000
Epoch 17/2000
3/3 [=====] - 0s 94ms/step - loss: 3.3128 -
categorical_accuracy: 0.5176
Epoch 18/2000
3/3 [=====] - 0s 97ms/step - loss: 2.0548 -
categorical_accuracy: 0.3412
Epoch 19/2000
3/3 [=====] - 0s 94ms/step - loss: 2.4923 -
categorical_accuracy: 0.3176
Epoch 20/2000
3/3 [=====] - 0s 87ms/step - loss: 1.8240 -
categorical_accuracy: 0.3294
Epoch 21/2000
3/3 [=====] - 0s 83ms/step - loss: 0.8950 -
categorical_accuracy: 0.5529
Epoch 22/2000
3/3 [=====] - 0s 89ms/step - loss: 0.9873 -
categorical_accuracy: 0.4941
Epoch 23/2000
3/3 [=====] - 0s 98ms/step - loss: 1.7199 -
categorical_accuracy: 0.3529
Epoch 24/2000
3/3 [=====] - 0s 90ms/step - loss: 1.3042 -
categorical_accuracy: 0.4941
Epoch 25/2000
3/3 [=====] - 0s 98ms/step - loss: 1.5869 -
categorical_accuracy: 0.3529
Epoch 26/2000
3/3 [=====] - 0s 106ms/step - loss: 2.3484 -
categorical_accuracy: 0.2588

Epoch 27/2000
3/3 [=====] - 0s 75ms/step - loss: 16.0621 -
categorical_accuracy: 0.3647
Epoch 28/2000
3/3 [=====] - 0s 63ms/step - loss: 4.7272 -
categorical_accuracy: 0.3176
Epoch 29/2000
3/3 [=====] - 0s 63ms/step - loss: 9.5959 -
categorical_accuracy: 0.3294
Epoch 30/2000
3/3 [=====] - 0s 82ms/step - loss: 4.0085 -
categorical_accuracy: 0.4118
Epoch 31/2000
3/3 [=====] - 0s 65ms/step - loss: 5.2608 -
categorical_accuracy: 0.3176
Epoch 32/2000
3/3 [=====] - 0s 109ms/step - loss: 6.5644 -
categorical_accuracy: 0.3765
Epoch 33/2000
3/3 [=====] - 0s 95ms/step - loss: 4.1314 -
categorical_accuracy: 0.4941
Epoch 34/2000
3/3 [=====] - 0s 92ms/step - loss: 3.3821 -
categorical_accuracy: 0.5176
Epoch 35/2000
3/3 [=====] - 0s 94ms/step - loss: 2.0078 -
categorical_accuracy: 0.4941
Epoch 36/2000
3/3 [=====] - 0s 102ms/step - loss: 2.1859 -
categorical_accuracy: 0.4353
Epoch 37/2000
3/3 [=====] - 0s 99ms/step - loss: 2.4004 -
categorical_accuracy: 0.3412
Epoch 38/2000
3/3 [=====] - 0s 101ms/step - loss: 7.1442 -
categorical_accuracy: 0.3647
Epoch 39/2000
3/3 [=====] - 0s 106ms/step - loss: 12.2656 -
categorical_accuracy: 0.2941
Epoch 40/2000
3/3 [=====] - 0s 64ms/step - loss: 8.5878 -
categorical_accuracy: 0.1882
Epoch 41/2000
3/3 [=====] - 0s 60ms/step - loss: 3.0205 -
categorical_accuracy: 0.4000
Epoch 42/2000
3/3 [=====] - 0s 65ms/step - loss: 6.2420 -
categorical_accuracy: 0.3176
Epoch 43/2000
3/3 [=====] - 0s 95ms/step - loss: 6.5294 -


```
categorical_accuracy: 0.3412
Epoch 44/2000
3/3 [=====] - 0s 105ms/step - loss: 11.4546 -
categorical_accuracy: 0.3176
Epoch 45/2000
3/3 [=====] - 0s 76ms/step - loss: 13.7256 -
categorical_accuracy: 0.2941
Epoch 46/2000
3/3 [=====] - 0s 77ms/step - loss: 7.5133 -
categorical_accuracy: 0.3059
Epoch 47/2000
3/3 [=====] - 0s 61ms/step - loss: 8.0141 -
categorical_accuracy: 0.4118
Epoch 48/2000
3/3 [=====] - 0s 77ms/step - loss: 4.2342 -
categorical_accuracy: 0.4588
Epoch 49/2000
3/3 [=====] - 0s 64ms/step - loss: 5.6910 -
categorical_accuracy: 0.2706
Epoch 50/2000
3/3 [=====] - 0s 74ms/step - loss: 9.6302 -
categorical_accuracy: 0.2471
Epoch 51/2000
3/3 [=====] - 0s 72ms/step - loss: 7.0821 -
categorical_accuracy: 0.3059
Epoch 52/2000
3/3 [=====] - 0s 59ms/step - loss: 6.1185 -
categorical_accuracy: 0.2941
Epoch 53/2000
3/3 [=====] - 0s 63ms/step - loss: 8.2380 -
categorical_accuracy: 0.4118
Epoch 54/2000
3/3 [=====] - 0s 64ms/step - loss: 5.5221 -
categorical_accuracy: 0.2941
Epoch 55/2000
3/3 [=====] - 0s 59ms/step - loss: 16.6259 -
categorical_accuracy: 0.4118
Epoch 56/2000
3/3 [=====] - 0s 88ms/step - loss: 18.2497 -
categorical_accuracy: 0.4000
Epoch 57/2000
3/3 [=====] - 0s 62ms/step - loss: 46.7628 -
categorical_accuracy: 0.3412
Epoch 58/2000
3/3 [=====] - 0s 61ms/step - loss: 51.4211 -
categorical_accuracy: 0.2941
Epoch 59/2000
3/3 [=====] - 0s 72ms/step - loss: 43.4478 -
categorical_accuracy: 0.2588
Epoch 60/2000
```

3/3 [=====] - 0s 64ms/step - loss: 36.0262 -
categorical_accuracy: 0.3882
Epoch 61/2000
3/3 [=====] - 0s 66ms/step - loss: 24.2818 -
categorical_accuracy: 0.4235
Epoch 62/2000
3/3 [=====] - 0s 62ms/step - loss: 39.2085 -
categorical_accuracy: 0.3529
Epoch 63/2000
3/3 [=====] - 0s 60ms/step - loss: 172.5055 -
categorical_accuracy: 0.3412
Epoch 64/2000
3/3 [=====] - 0s 62ms/step - loss: 36.8957 -
categorical_accuracy: 0.3765
Epoch 65/2000
3/3 [=====] - 0s 63ms/step - loss: 31.3468 -
categorical_accuracy: 0.4235
Epoch 66/2000
3/3 [=====] - 0s 61ms/step - loss: 28.2716 -
categorical_accuracy: 0.4235
Epoch 67/2000
3/3 [=====] - 0s 63ms/step - loss: 9.3829 -
categorical_accuracy: 0.3176
Epoch 68/2000
3/3 [=====] - 0s 67ms/step - loss: 4.4927 -
categorical_accuracy: 0.2941
Epoch 69/2000
3/3 [=====] - 0s 87ms/step - loss: 4.8526 -
categorical_accuracy: 0.3882
Epoch 70/2000
3/3 [=====] - 0s 89ms/step - loss: 11.3689 -
categorical_accuracy: 0.3176
Epoch 71/2000
3/3 [=====] - 0s 71ms/step - loss: 1.9786 -
categorical_accuracy: 0.3412
Epoch 72/2000
3/3 [=====] - 0s 84ms/step - loss: 2.7097 -
categorical_accuracy: 0.3412
Epoch 73/2000
3/3 [=====] - 0s 68ms/step - loss: 1.5714 -
categorical_accuracy: 0.2824
Epoch 74/2000

3/3 [=====] - 0s 68ms/step - loss: 1.6766 -
categorical_accuracy: 0.4118
Epoch 75/2000
3/3 [=====] - 0s 67ms/step - loss: 11.8879 -
categorical_accuracy: 0.3529
Epoch 76/2000
3/3 [=====] - 0s 72ms/step - loss: 24.1846 -

categorical_accuracy: 0.3176
Epoch 77/2000
3/3 [=====] - 0s 74ms/step - loss: 5.7070 -
categorical_accuracy: 0.3412
Epoch 78/2000
3/3 [=====] - 0s 68ms/step - loss: 8.4067 -
categorical_accuracy: 0.3294
Epoch 79/2000
3/3 [=====] - 0s 70ms/step - loss: 8.4984 -
categorical_accuracy: 0.3647
Epoch 80/2000
3/3 [=====] - 0s 69ms/step - loss: 5.6048 -
categorical_accuracy: 0.3647
Epoch 81/2000
3/3 [=====] - 0s 78ms/step - loss: 6.0193 -
categorical_accuracy: 0.3412
Epoch 82/2000
3/3 [=====] - 0s 64ms/step - loss: 3.0545 -
categorical_accuracy: 0.2588
Epoch 83/2000
3/3 [=====] - 0s 70ms/step - loss: 4.5769 -
categorical_accuracy: 0.4588
Epoch 84/2000
3/3 [=====] - 0s 66ms/step - loss: 12.2050 -
categorical_accuracy: 0.4000
Epoch 85/2000
3/3 [=====] - 0s 65ms/step - loss: 12.1075 -
categorical_accuracy: 0.3176
Epoch 86/2000
3/3 [=====] - 0s 75ms/step - loss: 3.9777 -
categorical_accuracy: 0.4471
Epoch 87/2000
3/3 [=====] - 0s 64ms/step - loss: 2.1231 -
categorical_accuracy: 0.2706
Epoch 88/2000
3/3 [=====] - 0s 65ms/step - loss: 16.5721 -
categorical_accuracy: 0.3059
Epoch 89/2000
3/3 [=====] - 0s 66ms/step - loss: 2.1419 -
categorical_accuracy: 0.3294
Epoch 90/2000
3/3 [=====] - 0s 71ms/step - loss: 1.5552 -
categorical_accuracy: 0.2706
Epoch 91/2000
3/3 [=====] - 0s 67ms/step - loss: 5.7598 -
categorical_accuracy: 0.2941
Epoch 92/2000
3/3 [=====] - 0s 70ms/step - loss: 7.5348 -
categorical_accuracy: 0.3647
Epoch 93/2000

3/3 [=====] - 0s 65ms/step - loss: 4.1750 -
categorical_accuracy: 0.4824
Epoch 94/2000
3/3 [=====] - 0s 72ms/step - loss: 1.6614 -
categorical_accuracy: 0.4824
Epoch 95/2000
3/3 [=====] - 0s 68ms/step - loss: 1.6447 -
categorical_accuracy: 0.4824
Epoch 96/2000
3/3 [=====] - 0s 76ms/step - loss: 1.1331 -
categorical_accuracy: 0.3294
Epoch 97/2000
3/3 [=====] - 0s 68ms/step - loss: 1.0996 -
categorical_accuracy: 0.3176
Epoch 98/2000
3/3 [=====] - 0s 66ms/step - loss: 1.1037 -
categorical_accuracy: 0.3176
Epoch 99/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0990 -
categorical_accuracy: 0.3176
Epoch 100/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0990 -
categorical_accuracy: 0.3176
Epoch 101/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0990 -
categorical_accuracy: 0.3176
Epoch 102/2000
3/3 [=====] - 0s 70ms/step - loss: 1.0990 -
categorical_accuracy: 0.3176
Epoch 103/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0990 -
categorical_accuracy: 0.3176
Epoch 104/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0990 -
categorical_accuracy: 0.3176
Epoch 105/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0990 -
categorical_accuracy: 0.3176
Epoch 106/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0989 -
categorical_accuracy: 0.3176
Epoch 107/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0989 -
categorical_accuracy: 0.3176
Epoch 108/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0989 -
categorical_accuracy: 0.3176
Epoch 109/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0989 -
categorical_accuracy: 0.3176

Epoch 110/2000
3/3 [=====] - 0s 60ms/step - loss: 1.0989 -
categorical_accuracy: 0.3176
Epoch 111/2000
3/3 [=====] - 0s 61ms/step - loss: 1.0989 -
categorical_accuracy: 0.3176
Epoch 112/2000
3/3 [=====] - 0s 61ms/step - loss: 1.0989 -
categorical_accuracy: 0.3176
Epoch 113/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0989 -
categorical_accuracy: 0.3176
Epoch 114/2000
3/3 [=====] - 0s 61ms/step - loss: 1.0989 -
categorical_accuracy: 0.3176
Epoch 115/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0989 -
categorical_accuracy: 0.3176
Epoch 116/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0989 -
categorical_accuracy: 0.3176
Epoch 117/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0989 -
categorical_accuracy: 0.3176
Epoch 118/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0989 -
categorical_accuracy: 0.3176
Epoch 119/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0989 -
categorical_accuracy: 0.3176
Epoch 120/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0988 -
categorical_accuracy: 0.3176
Epoch 121/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0988 -
categorical_accuracy: 0.3176
Epoch 122/2000
3/3 [=====] - 0s 60ms/step - loss: 1.0988 -
categorical_accuracy: 0.3176
Epoch 123/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0988 -
categorical_accuracy: 0.3176
Epoch 124/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0988 -
categorical_accuracy: 0.3176
Epoch 125/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0988 -
categorical_accuracy: 0.3176
Epoch 126/2000
3/3 [=====] - 0s 73ms/step - loss: 1.0988 -

categorical_accuracy: 0.3176
Epoch 127/2000
3/3 [=====] - 0s 71ms/step - loss: 1.0988 -
categorical_accuracy: 0.3176
Epoch 128/2000
3/3 [=====] - 0s 69ms/step - loss: 1.0988 -
categorical_accuracy: 0.3176
Epoch 129/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0988 -
categorical_accuracy: 0.3176
Epoch 130/2000
3/3 [=====] - 0s 61ms/step - loss: 1.0988 -
categorical_accuracy: 0.3176
Epoch 131/2000
3/3 [=====] - 0s 61ms/step - loss: 1.0988 -
categorical_accuracy: 0.3176
Epoch 132/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0988 -
categorical_accuracy: 0.3176
Epoch 133/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0988 -
categorical_accuracy: 0.3176
Epoch 134/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0988 -
categorical_accuracy: 0.3176
Epoch 135/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0987 -
categorical_accuracy: 0.3176
Epoch 136/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0987 -
categorical_accuracy: 0.3176
Epoch 137/2000
3/3 [=====] - 0s 60ms/step - loss: 1.0987 -
categorical_accuracy: 0.3176
Epoch 138/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0987 -
categorical_accuracy: 0.3176
Epoch 139/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0987 -
categorical_accuracy: 0.3176
Epoch 140/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0987 -
categorical_accuracy: 0.3176
Epoch 141/2000
3/3 [=====] - 0s 69ms/step - loss: 1.0987 -
categorical_accuracy: 0.3176
Epoch 142/2000
3/3 [=====] - 0s 61ms/step - loss: 1.0987 -
categorical_accuracy: 0.3176
Epoch 143/2000

3/3 [=====] - 0s 60ms/step - loss: 1.0987 -
categorical_accuracy: 0.3176
Epoch 144/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0987 -
categorical_accuracy: 0.3176
Epoch 145/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0987 -
categorical_accuracy: 0.3176
Epoch 146/2000

3/3 [=====] - 0s 63ms/step - loss: 1.0987 -
categorical_accuracy: 0.3176
Epoch 147/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0987 -
categorical_accuracy: 0.3176
Epoch 148/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0987 -
categorical_accuracy: 0.3176
Epoch 149/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0987 -
categorical_accuracy: 0.3176
Epoch 150/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0987 -
categorical_accuracy: 0.3176
Epoch 151/2000
3/3 [=====] - 0s 60ms/step - loss: 1.0987 -
categorical_accuracy: 0.3176
Epoch 152/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0987 -
categorical_accuracy: 0.3176
Epoch 153/2000
3/3 [=====] - 0s 60ms/step - loss: 1.0987 -
categorical_accuracy: 0.3176
Epoch 154/2000
3/3 [=====] - 0s 60ms/step - loss: 1.0987 -
categorical_accuracy: 0.3176
Epoch 155/2000
3/3 [=====] - 0s 60ms/step - loss: 1.0987 -
categorical_accuracy: 0.3176
Epoch 156/2000
3/3 [=====] - 0s 61ms/step - loss: 1.0986 -
categorical_accuracy: 0.3176
Epoch 157/2000
3/3 [=====] - 0s 61ms/step - loss: 1.0986 -
categorical_accuracy: 0.3176
Epoch 158/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0986 -
categorical_accuracy: 0.3176
Epoch 159/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0986 -

categorical_accuracy: 0.3412
Epoch 160/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0986 -
categorical_accuracy: 0.3412
Epoch 161/2000
3/3 [=====] - 0s 60ms/step - loss: 1.0986 -
categorical_accuracy: 0.3412
Epoch 162/2000
3/3 [=====] - 0s 61ms/step - loss: 1.0986 -
categorical_accuracy: 0.3412
Epoch 163/2000
3/3 [=====] - 0s 59ms/step - loss: 1.0986 -
categorical_accuracy: 0.3412
Epoch 164/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0986 -
categorical_accuracy: 0.3412
Epoch 165/2000
3/3 [=====] - 0s 60ms/step - loss: 1.0986 -
categorical_accuracy: 0.3412
Epoch 166/2000
3/3 [=====] - 0s 61ms/step - loss: 1.0986 -
categorical_accuracy: 0.3412
Epoch 167/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0986 -
categorical_accuracy: 0.3412
Epoch 168/2000
3/3 [=====] - 0s 61ms/step - loss: 1.0986 -
categorical_accuracy: 0.3412
Epoch 169/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0986 -
categorical_accuracy: 0.3412
Epoch 170/2000
3/3 [=====] - 0s 69ms/step - loss: 1.0986 -
categorical_accuracy: 0.3412
Epoch 171/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0986 -
categorical_accuracy: 0.3412
Epoch 172/2000
3/3 [=====] - 0s 61ms/step - loss: 1.0985 -
categorical_accuracy: 0.3412
Epoch 173/2000
3/3 [=====] - 0s 58ms/step - loss: 1.0985 -
categorical_accuracy: 0.3412
Epoch 174/2000
3/3 [=====] - 0s 61ms/step - loss: 1.0985 -
categorical_accuracy: 0.3412
Epoch 175/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0985 -
categorical_accuracy: 0.3412
Epoch 176/2000

3/3 [=====] - 0s 60ms/step - loss: 1.0985 -
categorical_accuracy: 0.3412
Epoch 177/2000
3/3 [=====] - 0s 60ms/step - loss: 1.0985 -
categorical_accuracy: 0.3412
Epoch 178/2000
3/3 [=====] - 0s 60ms/step - loss: 1.0985 -
categorical_accuracy: 0.3412
Epoch 179/2000
3/3 [=====] - 0s 60ms/step - loss: 1.0985 -
categorical_accuracy: 0.3412
Epoch 180/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0985 -
categorical_accuracy: 0.3412
Epoch 181/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0985 -
categorical_accuracy: 0.3412
Epoch 182/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0985 -
categorical_accuracy: 0.3412
Epoch 183/2000
3/3 [=====] - 0s 61ms/step - loss: 1.0985 -
categorical_accuracy: 0.3412
Epoch 184/2000
3/3 [=====] - 0s 61ms/step - loss: 1.0985 -
categorical_accuracy: 0.3412
Epoch 185/2000
3/3 [=====] - 0s 60ms/step - loss: 1.0985 -
categorical_accuracy: 0.3412
Epoch 186/2000
3/3 [=====] - 0s 61ms/step - loss: 1.0985 -
categorical_accuracy: 0.3412
Epoch 187/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0985 -
categorical_accuracy: 0.3412
Epoch 188/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0985 -
categorical_accuracy: 0.3412
Epoch 189/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0985 -
categorical_accuracy: 0.3412
Epoch 190/2000
3/3 [=====] - 0s 60ms/step - loss: 1.0985 -
categorical_accuracy: 0.3412
Epoch 191/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0985 -
categorical_accuracy: 0.3412
Epoch 192/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0985 -
categorical_accuracy: 0.3412

Epoch 193/2000
3/3 [=====] - 0s 59ms/step - loss: 1.0985 -
categorical_accuracy: 0.3412
Epoch 194/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0985 -
categorical_accuracy: 0.3412
Epoch 195/2000
3/3 [=====] - 0s 61ms/step - loss: 1.0985 -
categorical_accuracy: 0.3412
Epoch 196/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0985 -
categorical_accuracy: 0.3412
Epoch 197/2000
3/3 [=====] - 0s 61ms/step - loss: 1.0985 -
categorical_accuracy: 0.3412
Epoch 198/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0985 -
categorical_accuracy: 0.3412
Epoch 199/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0985 -
categorical_accuracy: 0.3412
Epoch 200/2000
3/3 [=====] - 0s 61ms/step - loss: 1.0985 -
categorical_accuracy: 0.3412
Epoch 201/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0985 -
categorical_accuracy: 0.3412
Epoch 202/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0984 -
categorical_accuracy: 0.3412
Epoch 203/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0984 -
categorical_accuracy: 0.3412
Epoch 204/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0984 -
categorical_accuracy: 0.3412
Epoch 205/2000
3/3 [=====] - 0s 61ms/step - loss: 1.0984 -
categorical_accuracy: 0.3412
Epoch 206/2000
3/3 [=====] - 0s 61ms/step - loss: 1.0984 -
categorical_accuracy: 0.3412
Epoch 207/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0984 -
categorical_accuracy: 0.3412
Epoch 208/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0984 -
categorical_accuracy: 0.3412
Epoch 209/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0984 -

```
categorical_accuracy: 0.3412
Epoch 210/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0984 -
categorical_accuracy: 0.3412
Epoch 211/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0984 -
categorical_accuracy: 0.3412
Epoch 212/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0984 -
categorical_accuracy: 0.3412
Epoch 213/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0984 -
categorical_accuracy: 0.3412
Epoch 214/2000
3/3 [=====] - 0s 60ms/step - loss: 1.0984 -
categorical_accuracy: 0.3412
Epoch 215/2000
3/3 [=====] - 0s 61ms/step - loss: 1.0984 -
categorical_accuracy: 0.3412
Epoch 216/2000
3/3 [=====] - 0s 59ms/step - loss: 1.0984 -
categorical_accuracy: 0.3412
Epoch 217/2000
3/3 [=====] - 0s 69ms/step - loss: 1.0984 -
categorical_accuracy: 0.3412
Epoch 218/2000
3/3 [=====] - 0s 87ms/step - loss: 1.0984 -
categorical_accuracy: 0.3412
Epoch 219/2000
3/3 [=====] - 0s 69ms/step - loss: 1.0984 -
categorical_accuracy: 0.3412
Epoch 220/2000
3/3 [=====] - 0s 76ms/step - loss: 1.0983 -
categorical_accuracy: 0.3412
Epoch 221/2000
3/3 [=====] - 0s 69ms/step - loss: 1.0983 -
categorical_accuracy: 0.3412
Epoch 222/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0983 -
categorical_accuracy: 0.3412
Epoch 223/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0983 -
categorical_accuracy: 0.3412
Epoch 224/2000
3/3 [=====] - 0s 61ms/step - loss: 1.0983 -
categorical_accuracy: 0.3412
Epoch 225/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0983 -
categorical_accuracy: 0.3412
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Epoch 226/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0983 -
categorical_accuracy: 0.3412
Epoch 227/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0983 -
categorical_accuracy: 0.3412
Epoch 228/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0983 -
categorical_accuracy: 0.3412
Epoch 229/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0983 -
categorical_accuracy: 0.3412
Epoch 230/2000
3/3 [=====] - 0s 61ms/step - loss: 1.0983 -
categorical_accuracy: 0.3412
Epoch 231/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0983 -
categorical_accuracy: 0.3412
Epoch 232/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0983 -
categorical_accuracy: 0.3412
Epoch 233/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0983 -
categorical_accuracy: 0.3412
Epoch 234/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0983 -
categorical_accuracy: 0.3412
Epoch 235/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0983 -
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Epoch 236/2000
3/3 [=====] - 0s 148ms/step - loss: 1.0983 -
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Epoch 237/2000
3/3 [=====] - 0s 77ms/step - loss: 1.0983 -
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Epoch 238/2000
3/3 [=====] - 0s 70ms/step - loss: 1.0983 -
categorical_accuracy: 0.3412
Epoch 239/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0983 -
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Epoch 240/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0983 -
categorical_accuracy: 0.3412
Epoch 241/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0983 -
categorical_accuracy: 0.3412
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Epoch 248/2000
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Epoch 249/2000
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Epoch 250/2000
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Epoch 254/2000
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Epoch 255/2000
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Epoch 602/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 603/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
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Epoch 604/2000
3/3 [=====] - 0s 70ms/step - loss: 1.0981 -
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Epoch 605/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
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Epoch 606/2000
3/3 [=====] - 0s 72ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 607/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0981 -

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Epoch 608/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
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Epoch 609/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0981 -
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Epoch 610/2000
3/3 [=====] - 0s 79ms/step - loss: 1.0981 -
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Epoch 611/2000
3/3 [=====] - 0s 60ms/step - loss: 1.0981 -
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Epoch 612/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0981 -
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Epoch 613/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0981 -
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Epoch 614/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
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Epoch 615/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
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Epoch 616/2000
3/3 [=====] - 0s 60ms/step - loss: 1.0981 -
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Epoch 617/2000
3/3 [=====] - 0s 61ms/step - loss: 1.0981 -
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Epoch 618/2000
3/3 [=====] - 0s 60ms/step - loss: 1.0981 -
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Epoch 619/2000
3/3 [=====] - 0s 60ms/step - loss: 1.0981 -
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Epoch 620/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0981 -
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Epoch 621/2000
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Epoch 622/2000
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Epoch 623/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
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Epoch 624/2000

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Epoch 625/2000
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Epoch 627/2000
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Epoch 629/2000
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Epoch 630/2000
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Epoch 640/2000
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Epoch 641/2000
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Epoch 642/2000
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Epoch 643/2000
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Epoch 644/2000
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Epoch 645/2000
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Epoch 646/2000
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Epoch 647/2000
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Epoch 649/2000
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Epoch 650/2000
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Epoch 653/2000
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Epoch 654/2000
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Epoch 655/2000
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Epoch 656/2000
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Epoch 657/2000

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Epoch 658/2000
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Epoch 659/2000
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Epoch 660/2000
3/3 [=====] - 0s 100ms/step - loss: 1.0981 -
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Epoch 661/2000
3/3 [=====] - 0s 102ms/step - loss: 1.0981 -
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Epoch 662/2000
3/3 [=====] - 0s 89ms/step - loss: 1.0981 -
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Epoch 663/2000
3/3 [=====] - 0s 77ms/step - loss: 1.0981 -
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Epoch 664/2000
3/3 [=====] - 0s 83ms/step - loss: 1.0981 -
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Epoch 665/2000
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Epoch 666/2000
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Epoch 667/2000
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Epoch 668/2000
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Epoch 669/2000
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Epoch 672/2000
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Epoch 673/2000
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Epoch 674/2000
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Epoch 675/2000
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Epoch 677/2000
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Epoch 678/2000
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Epoch 679/2000
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Epoch 680/2000
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Epoch 681/2000
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Epoch 682/2000
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Epoch 688/2000
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Epoch 690/2000
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Epoch 699/2000
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Epoch 700/2000
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Epoch 701/2000
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Epoch 702/2000
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Epoch 703/2000
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Epoch 704/2000
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Epoch 705/2000
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Epoch 706/2000
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Epoch 707/2000

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Epoch 722/2000

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Epoch 734/2000
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Epoch 740/2000

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Epoch 753/2000
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Epoch 755/2000
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Epoch 756/2000
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Epoch 757/2000
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Epoch 759/2000
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Epoch 760/2000
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Epoch 761/2000
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Epoch 766/2000
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Epoch 772/2000
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Epoch 773/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0981 -

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Epoch 777/2000
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Epoch 781/2000
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Epoch 782/2000
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Epoch 783/2000
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Epoch 787/2000
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categorical_accuracy: 0.3412
Epoch 788/2000
3/3 [=====] - 0s 68ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 789/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 790/2000
```

3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 791/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 792/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 793/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 794/2000

3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 795/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 796/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 797/2000
3/3 [=====] - 0s 61ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 798/2000
3/3 [=====] - 0s 61ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 799/2000
3/3 [=====] - 0s 61ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 800/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 801/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 802/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 803/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 804/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 805/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 806/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -

```
categorical_accuracy: 0.3412
Epoch 807/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 808/2000
3/3 [=====] - 0s 60ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 809/2000
3/3 [=====] - 0s 61ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 810/2000
3/3 [=====] - 0s 61ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 811/2000
3/3 [=====] - 0s 61ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 812/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 813/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 814/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 815/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 816/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 817/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 818/2000
3/3 [=====] - 0s 60ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 819/2000
3/3 [=====] - 0s 61ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 820/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 821/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 822/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 823/2000
```

3/3 [=====] - 0s 69ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 824/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 825/2000
3/3 [=====] - 0s 61ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 826/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 827/2000
3/3 [=====] - 0s 61ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 828/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 829/2000
3/3 [=====] - 0s 61ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 830/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 831/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 832/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 833/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 834/2000
3/3 [=====] - 0s 79ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 835/2000
3/3 [=====] - 0s 75ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 836/2000
3/3 [=====] - 0s 82ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 837/2000
3/3 [=====] - 0s 70ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 838/2000
3/3 [=====] - 0s 61ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 839/2000
3/3 [=====] - 0s 68ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412

Epoch 840/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 841/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 842/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 843/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 844/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 845/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 846/2000
3/3 [=====] - 0s 68ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 847/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 848/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 849/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 850/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 851/2000
3/3 [=====] - 0s 61ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 852/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 853/2000
3/3 [=====] - 0s 61ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 854/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 855/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 856/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -

```
categorical_accuracy: 0.3412
Epoch 857/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 858/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 859/2000
3/3 [=====] - 0s 69ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 860/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 861/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 862/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 863/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 864/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 865/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 866/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 867/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 868/2000
3/3 [=====] - 0s 61ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 869/2000
3/3 [=====] - 0s 61ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 870/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3294
Epoch 871/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 872/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
```

Epoch 873/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 874/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 875/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 876/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 877/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 878/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 879/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 880/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 881/2000
3/3 [=====] - 0s 60ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 882/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 883/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.2706
Epoch 884/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 885/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 886/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 887/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 888/2000
3/3 [=====] - 0s 61ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 889/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0981 -

```
categorical_accuracy: 0.3412
Epoch 890/2000
3/3 [=====] - 0s 61ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 891/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 892/2000
3/3 [=====] - 0s 60ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 893/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 894/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 895/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 896/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 897/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 898/2000
3/3 [=====] - 0s 61ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 899/2000
3/3 [=====] - 0s 61ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 900/2000
3/3 [=====] - 0s 61ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 901/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 902/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 903/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 904/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 905/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 906/2000
```

3/3 [=====] - 0s 68ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 907/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 908/2000
3/3 [=====] - 0s 61ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 909/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 910/2000
3/3 [=====] - 0s 61ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 911/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 912/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 913/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 914/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 915/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 916/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 917/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 918/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 919/2000
3/3 [=====] - 0s 61ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 920/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 921/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 922/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0981 -
categorical_accuracy: 0.3647

Epoch 923/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 924/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 925/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 926/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 927/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 928/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.2588
Epoch 929/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 930/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 931/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 932/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 933/2000
3/3 [=====] - 0s 70ms/step - loss: 1.0981 -
categorical_accuracy: 0.2941
Epoch 934/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 935/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 936/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.2824
Epoch 937/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 938/2000

3/3 [=====] - 0s 67ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 939/2000

3/3 [=====] - 0s 71ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 940/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 941/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 942/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 943/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 944/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 945/2000
3/3 [=====] - 0s 74ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 946/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 947/2000
3/3 [=====] - 0s 74ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 948/2000
3/3 [=====] - 0s 69ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 949/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 950/2000
3/3 [=====] - 0s 72ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 951/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 952/2000
3/3 [=====] - 0s 71ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 953/2000
3/3 [=====] - 0s 68ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 954/2000
3/3 [=====] - 0s 70ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 955/2000
3/3 [=====] - 0s 77ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412

Epoch 956/2000
3/3 [=====] - 0s 69ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 957/2000
3/3 [=====] - 0s 68ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 958/2000
3/3 [=====] - 0s 71ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 959/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.2824
Epoch 960/2000
3/3 [=====] - 0s 75ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 961/2000
3/3 [=====] - 0s 70ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 962/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.2824
Epoch 963/2000
3/3 [=====] - 0s 72ms/step - loss: 1.0981 -
categorical_accuracy: 0.2588
Epoch 964/2000
3/3 [=====] - 0s 73ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 965/2000
3/3 [=====] - 0s 82ms/step - loss: 1.0981 -
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Epoch 966/2000
3/3 [=====] - 0s 78ms/step - loss: 1.0981 -
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Epoch 967/2000
3/3 [=====] - 0s 69ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 968/2000
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categorical_accuracy: 0.3412
Epoch 969/2000
3/3 [=====] - 0s 71ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 970/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 971/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 972/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -

categorical_accuracy: 0.3412
Epoch 973/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 974/2000
3/3 [=====] - 0s 69ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 975/2000
3/3 [=====] - 0s 76ms/step - loss: 1.0981 -
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Epoch 976/2000
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Epoch 977/2000
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Epoch 978/2000
3/3 [=====] - 0s 68ms/step - loss: 1.0981 -
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Epoch 979/2000
3/3 [=====] - 0s 73ms/step - loss: 1.0981 -
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Epoch 980/2000
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Epoch 981/2000
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Epoch 982/2000
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Epoch 983/2000
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Epoch 984/2000
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Epoch 985/2000
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Epoch 986/2000
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Epoch 987/2000
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Epoch 988/2000
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categorical_accuracy: 0.3412
Epoch 989/2000

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Epoch 990/2000
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Epoch 991/2000
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Epoch 992/2000
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Epoch 993/2000
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Epoch 994/2000
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Epoch 995/2000
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Epoch 996/2000
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Epoch 997/2000
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Epoch 998/2000
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Epoch 1000/2000
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Epoch 1011/2000
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Epoch 1018/2000
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Epoch 1021/2000
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Epoch 1022/2000

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Epoch 1026/2000
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Epoch 1027/2000
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Epoch 1029/2000
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Epoch 1032/2000
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Epoch 1033/2000
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Epoch 1038/2000
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Epoch 1043/2000
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Epoch 1044/2000
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Epoch 1045/2000
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Epoch 1048/2000
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Epoch 1049/2000
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Epoch 1052/2000
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Epoch 1053/2000
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Epoch 1054/2000
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Epoch 1055/2000
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Epoch 1057/2000
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Epoch 1058/2000
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Epoch 1059/2000
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Epoch 1060/2000
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Epoch 1061/2000
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Epoch 1062/2000
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Epoch 1063/2000
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Epoch 1064/2000
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Epoch 1065/2000
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Epoch 1066/2000
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Epoch 1071/2000
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Epoch 1072/2000
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Epoch 1073/2000
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Epoch 1074/2000
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Epoch 1075/2000
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Epoch 1076/2000
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Epoch 1077/2000
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Epoch 1078/2000
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Epoch 1079/2000
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Epoch 1080/2000
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Epoch 1081/2000
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Epoch 1082/2000

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Epoch 1083/2000
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Epoch 1084/2000
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Epoch 1086/2000
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Epoch 1087/2000
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Epoch 1088/2000
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Epoch 1089/2000
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Epoch 1090/2000
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Epoch 1091/2000
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Epoch 1092/2000
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Epoch 1093/2000
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Epoch 1094/2000
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Epoch 1098/2000
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Epoch 1099/2000
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Epoch 1101/2000
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Epoch 1102/2000
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Epoch 1103/2000
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Epoch 1104/2000
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Epoch 1105/2000

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Epoch 1106/2000
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Epoch 1107/2000
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Epoch 1108/2000
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Epoch 1109/2000
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Epoch 1112/2000
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Epoch 1113/2000
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Epoch 1114/2000
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Epoch 1116/2000
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Epoch 1118/2000
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Epoch 1120/2000
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Epoch 1121/2000
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Epoch 1122/2000
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Epoch 1127/2000
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Epoch 1129/2000
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Epoch 1132/2000
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Epoch 1133/2000
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Epoch 1134/2000
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Epoch 1135/2000
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Epoch 1136/2000
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Epoch 1137/2000
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Epoch 1138/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -

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Epoch 1139/2000
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Epoch 1140/2000
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Epoch 1141/2000
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Epoch 1142/2000
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Epoch 1143/2000
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Epoch 1144/2000
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Epoch 1145/2000
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Epoch 1146/2000
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Epoch 1147/2000
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Epoch 1148/2000
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Epoch 1149/2000
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Epoch 1152/2000
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Epoch 1153/2000
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Epoch 1154/2000
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Epoch 1157/2000
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Epoch 1158/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1159/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1160/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1161/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1162/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1163/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1164/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1165/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1166/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1167/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1168/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1169/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1170/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1171/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -

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categorical_accuracy: 0.3412
Epoch 1172/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1173/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1174/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1175/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1176/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1177/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1178/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1179/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1180/2000
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Epoch 1181/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1182/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1183/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1184/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1185/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1186/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1187/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1188/2000
```

3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1189/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1190/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1191/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1192/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1193/2000
3/3 [=====] - 0s 68ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1194/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1195/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1196/2000
3/3 [=====] - 0s 70ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1197/2000
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Epoch 1198/2000
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categorical_accuracy: 0.3412
Epoch 1199/2000
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Epoch 1200/2000
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Epoch 1201/2000
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Epoch 1202/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1203/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1204/2000
3/3 [=====] - 0s 68ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412

Epoch 1205/2000
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categorical_accuracy: 0.3412
Epoch 1206/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
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Epoch 1207/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
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Epoch 1208/2000
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Epoch 1209/2000
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Epoch 1210/2000
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Epoch 1211/2000
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Epoch 1212/2000
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Epoch 1213/2000
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Epoch 1214/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
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Epoch 1215/2000
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Epoch 1216/2000
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Epoch 1217/2000
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categorical_accuracy: 0.3412
Epoch 1218/2000
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Epoch 1219/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1220/2000
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categorical_accuracy: 0.3412
Epoch 1221/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -

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categorical_accuracy: 0.3412
Epoch 1222/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1223/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1224/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1225/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
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Epoch 1226/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0981 -
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Epoch 1227/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1228/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1229/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1230/2000
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Epoch 1231/2000
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Epoch 1232/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
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Epoch 1233/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
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Epoch 1234/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1235/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0981 -
categorical_accuracy: 0.2941
Epoch 1236/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.3176
Epoch 1237/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3176
```


Epoch 1238/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.2941
Epoch 1239/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.2471
Epoch 1240/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.2941
Epoch 1241/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1242/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1243/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1244/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1245/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1246/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1247/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1248/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
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Epoch 1249/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0981 -
categorical_accuracy: 0.2706
Epoch 1250/2000
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categorical_accuracy: 0.2941
Epoch 1251/2000
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categorical_accuracy: 0.3412
Epoch 1252/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1253/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1254/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -

categorical_accuracy: 0.3412
Epoch 1255/2000
3/3 [=====] - 0s 68ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1256/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1257/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1258/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1259/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1260/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1261/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1262/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0981 -
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Epoch 1263/2000
3/3 [=====] - 0s 72ms/step - loss: 1.0981 -
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Epoch 1264/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
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Epoch 1265/2000
3/3 [=====] - 0s 69ms/step - loss: 1.0981 -
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Epoch 1266/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
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Epoch 1267/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
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Epoch 1268/2000
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Epoch 1269/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0981 -
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Epoch 1270/2000
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categorical_accuracy: 0.3412
Epoch 1271/2000

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categorical_accuracy: 0.3412
Epoch 1272/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1273/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1274/2000
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categorical_accuracy: 0.3412
Epoch 1275/2000
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categorical_accuracy: 0.3412
Epoch 1276/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1277/2000
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categorical_accuracy: 0.3412
Epoch 1278/2000
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Epoch 1279/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0981 -
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Epoch 1280/2000
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Epoch 1281/2000
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Epoch 1282/2000
3/3 [=====] - 0s 68ms/step - loss: 1.0981 -
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Epoch 1283/2000
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Epoch 1284/2000
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Epoch 1285/2000
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Epoch 1286/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1287/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412

Epoch 1288/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1289/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1290/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1291/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1292/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1293/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1294/2000
3/3 [=====] - 0s 69ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1295/2000
3/3 [=====] - 0s 68ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1296/2000
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categorical_accuracy: 0.3412
Epoch 1297/2000
3/3 [=====] - 0s 68ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1298/2000

3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
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Epoch 1299/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1300/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0981 -
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Epoch 1301/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1302/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1303/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1304/2000

3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1305/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1306/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1307/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1308/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
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Epoch 1309/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1310/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
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Epoch 1311/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
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Epoch 1312/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
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Epoch 1313/2000
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categorical_accuracy: 0.3412
Epoch 1314/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1315/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1316/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1317/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1318/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1319/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1320/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412

Epoch 1321/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
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Epoch 1322/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1323/2000
3/3 [=====] - 0s 61ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1324/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1325/2000
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Epoch 1326/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1327/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1328/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1329/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1330/2000
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categorical_accuracy: 0.3412
Epoch 1331/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0981 -
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Epoch 1332/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0981 -
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Epoch 1333/2000
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Epoch 1334/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1335/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1336/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1337/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0981 -

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categorical_accuracy: 0.3412
Epoch 1338/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1339/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
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Epoch 1340/2000
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Epoch 1341/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
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Epoch 1342/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1343/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1344/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1345/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1346/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1347/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1348/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1349/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1350/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1351/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1352/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1353/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1354/2000
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3/3 [=====] - 0s 67ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1355/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1356/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1357/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1358/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
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Epoch 1359/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
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Epoch 1360/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
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Epoch 1361/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0981 -
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Epoch 1362/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0981 -
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Epoch 1363/2000
3/3 [=====] - 0s 69ms/step - loss: 1.0981 -
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Epoch 1364/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
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Epoch 1365/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
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Epoch 1366/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
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Epoch 1367/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
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Epoch 1368/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
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Epoch 1369/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1370/2000

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Epoch 1371/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
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Epoch 1372/2000
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Epoch 1373/2000
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Epoch 1374/2000
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Epoch 1375/2000
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Epoch 1376/2000
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Epoch 1377/2000
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Epoch 1378/2000
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Epoch 1379/2000
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Epoch 1380/2000
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Epoch 1381/2000
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Epoch 1382/2000
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Epoch 1383/2000
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Epoch 1384/2000
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Epoch 1385/2000
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Epoch 1386/2000
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Epoch 1387/2000
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Epoch 1388/2000
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Epoch 1389/2000
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Epoch 1390/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
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Epoch 1391/2000
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Epoch 1392/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
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Epoch 1393/2000
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Epoch 1394/2000
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Epoch 1395/2000
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Epoch 1396/2000
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Epoch 1398/2000
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Epoch 1399/2000
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Epoch 1400/2000
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Epoch 1401/2000
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Epoch 1402/2000
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Epoch 1403/2000
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Epoch 1404/2000
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Epoch 1405/2000
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Epoch 1406/2000
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Epoch 1407/2000
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Epoch 1408/2000
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Epoch 1409/2000
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Epoch 1410/2000
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Epoch 1411/2000
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Epoch 1412/2000
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Epoch 1413/2000
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Epoch 1414/2000
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Epoch 1415/2000
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Epoch 1416/2000
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Epoch 1417/2000
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Epoch 1418/2000
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Epoch 1419/2000
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Epoch 1420/2000

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Epoch 1421/2000
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Epoch 1422/2000
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Epoch 1423/2000
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Epoch 1424/2000
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Epoch 1425/2000
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Epoch 1426/2000
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Epoch 1427/2000
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Epoch 1428/2000
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Epoch 1429/2000
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Epoch 1430/2000
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Epoch 1431/2000
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Epoch 1432/2000
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Epoch 1433/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
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Epoch 1434/2000
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Epoch 1435/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
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Epoch 1436/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
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Epoch 1437/2000
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Epoch 1438/2000
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Epoch 1439/2000
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Epoch 1440/2000
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Epoch 1441/2000
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Epoch 1442/2000
3/3 [=====] - 0s 72ms/step - loss: 1.0981 -
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Epoch 1443/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
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Epoch 1444/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
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Epoch 1445/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0981 -
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Epoch 1446/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
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Epoch 1447/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
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Epoch 1448/2000
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Epoch 1449/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
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Epoch 1450/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
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Epoch 1451/2000
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Epoch 1452/2000
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Epoch 1453/2000

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Epoch 1454/2000
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Epoch 1455/2000
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Epoch 1456/2000
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Epoch 1457/2000
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Epoch 1458/2000
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Epoch 1459/2000
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Epoch 1460/2000
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Epoch 1461/2000
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Epoch 1462/2000
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Epoch 1463/2000
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Epoch 1464/2000
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Epoch 1465/2000
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Epoch 1466/2000
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Epoch 1467/2000
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Epoch 1468/2000
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Epoch 1469/2000
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Epoch 1470/2000
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Epoch 1471/2000
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Epoch 1472/2000
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Epoch 1473/2000
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Epoch 1474/2000
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Epoch 1475/2000
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Epoch 1476/2000
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Epoch 1477/2000
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Epoch 1478/2000
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Epoch 1479/2000
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Epoch 1480/2000
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Epoch 1481/2000
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Epoch 1482/2000
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Epoch 1483/2000
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Epoch 1484/2000
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Epoch 1485/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
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Epoch 1486/2000
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Epoch 1487/2000
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Epoch 1488/2000
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Epoch 1489/2000
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Epoch 1490/2000
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Epoch 1491/2000
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Epoch 1492/2000
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Epoch 1493/2000
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Epoch 1494/2000
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Epoch 1495/2000
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Epoch 1496/2000
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Epoch 1497/2000
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Epoch 1498/2000
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Epoch 1499/2000
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Epoch 1500/2000
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Epoch 1501/2000
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Epoch 1502/2000
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Epoch 1503/2000

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Epoch 1504/2000
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Epoch 1505/2000
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Epoch 1506/2000
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Epoch 1507/2000
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Epoch 1508/2000
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Epoch 1509/2000
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Epoch 1510/2000
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Epoch 1511/2000
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Epoch 1512/2000
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Epoch 1513/2000
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Epoch 1514/2000

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Epoch 1515/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
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Epoch 1516/2000
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Epoch 1517/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
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Epoch 1518/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
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Epoch 1519/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -

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Epoch 1520/2000
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Epoch 1521/2000
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Epoch 1522/2000
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Epoch 1523/2000
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Epoch 1524/2000
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Epoch 1525/2000
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Epoch 1526/2000
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Epoch 1527/2000
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Epoch 1528/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1529/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1530/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1531/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1532/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1533/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1534/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1535/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1536/2000

3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1537/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1538/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1539/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1540/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1541/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1542/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1543/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1544/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1545/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1546/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1547/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1548/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1549/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1550/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.2824
Epoch 1551/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.2471
Epoch 1552/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412

Epoch 1553/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3176
Epoch 1554/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1555/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1556/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1557/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1558/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
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Epoch 1559/2000
3/3 [=====] - 0s 69ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1560/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1561/2000
3/3 [=====] - 0s 78ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1562/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1563/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1564/2000
3/3 [=====] - 0s 68ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1565/2000
3/3 [=====] - 0s 61ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1566/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.2471
Epoch 1567/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.3529
Epoch 1568/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1569/2000
3/3 [=====] - 0s 68ms/step - loss: 1.0981 -

categorical_accuracy: 0.3412
Epoch 1570/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1571/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1572/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1573/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1574/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1575/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1576/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.2824
Epoch 1577/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0981 -
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Epoch 1578/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0981 -
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Epoch 1579/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0981 -
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Epoch 1580/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
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Epoch 1581/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
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Epoch 1582/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1583/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1584/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.2471
Epoch 1585/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
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Epoch 1586/2000

3/3 [=====] - 0s 67ms/step - loss: 1.0981 -
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Epoch 1587/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
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Epoch 1588/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1589/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1590/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1591/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1592/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
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Epoch 1593/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
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Epoch 1594/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
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Epoch 1595/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0981 -
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Epoch 1596/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
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Epoch 1597/2000
3/3 [=====] - 0s 69ms/step - loss: 1.0981 -
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Epoch 1598/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
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Epoch 1599/2000
3/3 [=====] - 0s 68ms/step - loss: 1.0981 -
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Epoch 1600/2000
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Epoch 1601/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0981 -
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Epoch 1602/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412

Epoch 1603/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
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Epoch 1604/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
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Epoch 1605/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
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Epoch 1606/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
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Epoch 1607/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
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Epoch 1608/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0981 -
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Epoch 1609/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
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Epoch 1610/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
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Epoch 1611/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
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Epoch 1612/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0981 -
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Epoch 1613/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
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Epoch 1614/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
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Epoch 1615/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
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Epoch 1616/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
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Epoch 1617/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
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Epoch 1618/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
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Epoch 1619/2000
3/3 [=====] - 0s 68ms/step - loss: 1.0981 -

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Epoch 1620/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
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Epoch 1621/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
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Epoch 1622/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
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Epoch 1623/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0981 -
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Epoch 1624/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
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Epoch 1625/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
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Epoch 1626/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
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Epoch 1627/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0981 -
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Epoch 1628/2000
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Epoch 1629/2000
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Epoch 1630/2000
3/3 [=====] - 0s 69ms/step - loss: 1.0981 -
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Epoch 1631/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
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Epoch 1632/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
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Epoch 1633/2000
3/3 [=====] - 0s 73ms/step - loss: 1.0981 -
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Epoch 1634/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
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Epoch 1635/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1636/2000

3/3 [=====] - 0s 67ms/step - loss: 1.0981 -
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Epoch 1637/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
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Epoch 1638/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
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Epoch 1639/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
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Epoch 1640/2000
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Epoch 1641/2000
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Epoch 1642/2000
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Epoch 1643/2000
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Epoch 1644/2000
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Epoch 1645/2000
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Epoch 1646/2000
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Epoch 1647/2000
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Epoch 1648/2000
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Epoch 1649/2000
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Epoch 1650/2000
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Epoch 1651/2000
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Epoch 1652/2000
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Epoch 1653/2000
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Epoch 1654/2000
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Epoch 1655/2000
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Epoch 1656/2000
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Epoch 1657/2000
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Epoch 1658/2000
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Epoch 1659/2000
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Epoch 1660/2000
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Epoch 1661/2000
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Epoch 1662/2000
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Epoch 1663/2000
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Epoch 1664/2000
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Epoch 1665/2000
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Epoch 1666/2000
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Epoch 1667/2000
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Epoch 1668/2000
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Epoch 1669/2000

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Epoch 1670/2000
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Epoch 1671/2000
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Epoch 1672/2000
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Epoch 1673/2000
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Epoch 1674/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
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Epoch 1675/2000
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Epoch 1676/2000
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Epoch 1677/2000
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Epoch 1678/2000
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Epoch 1679/2000
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Epoch 1680/2000
3/3 [=====] - 0s 69ms/step - loss: 1.0981 -
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Epoch 1681/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
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Epoch 1682/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
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Epoch 1683/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
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Epoch 1684/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
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Epoch 1685/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
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Epoch 1686/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
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Epoch 1687/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
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Epoch 1688/2000
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Epoch 1689/2000
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Epoch 1690/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
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Epoch 1691/2000
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Epoch 1692/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
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Epoch 1693/2000
3/3 [=====] - 0s 61ms/step - loss: 1.0981 -
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Epoch 1694/2000
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Epoch 1695/2000
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Epoch 1696/2000
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Epoch 1697/2000
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Epoch 1698/2000
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Epoch 1699/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
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Epoch 1700/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
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Epoch 1701/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
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Epoch 1702/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -

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Epoch 1703/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0981 -
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Epoch 1704/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0981 -
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Epoch 1705/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
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Epoch 1706/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
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Epoch 1707/2000
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Epoch 1708/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
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Epoch 1709/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
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Epoch 1710/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
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Epoch 1711/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
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Epoch 1712/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0981 -
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Epoch 1713/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1714/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1715/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1716/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1717/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1718/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1719/2000

3/3 [=====] - 0s 66ms/step - loss: 1.0980 -
categorical_accuracy: 0.3412
Epoch 1720/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1721/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1722/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1723/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1724/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1725/2000
3/3 [=====] - 0s 68ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1726/2000
3/3 [=====] - 0s 69ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1727/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1728/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1729/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1730/2000

3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1731/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1732/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1733/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1734/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1735/2000
3/3 [=====] - 0s 70ms/step - loss: 1.0981 -

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categorical_accuracy: 0.3412
Epoch 1736/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1737/2000
3/3 [=====] - 0s 68ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1738/2000
3/3 [=====] - 0s 70ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1739/2000
3/3 [=====] - 0s 69ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1740/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1741/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1742/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1743/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1744/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1745/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1746/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1747/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1748/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3294
Epoch 1749/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0981 -
categorical_accuracy: 0.2706
Epoch 1750/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1751/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1752/2000
```

3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1753/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1754/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1755/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1756/2000
3/3 [=====] - 0s 61ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1757/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1758/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1759/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1760/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1761/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1762/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1763/2000
3/3 [=====] - 0s 70ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1764/2000
3/3 [=====] - 0s 69ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1765/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1766/2000
3/3 [=====] - 0s 68ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1767/2000
3/3 [=====] - 0s 69ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1768/2000
3/3 [=====] - 0s 73ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412

Epoch 1769/2000
3/3 [=====] - 0s 74ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1770/2000
3/3 [=====] - 0s 72ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1771/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1772/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1773/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1774/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1775/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1776/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1777/2000
3/3 [=====] - 0s 68ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1778/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1779/2000
3/3 [=====] - 0s 68ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1780/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1781/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1782/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1783/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
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Epoch 1784/2000
3/3 [=====] - 0s 68ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1785/2000
3/3 [=====] - 0s 70ms/step - loss: 1.0981 -

categorical_accuracy: 0.3412
Epoch 1786/2000
3/3 [=====] - 0s 70ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1787/2000
3/3 [=====] - 0s 74ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1788/2000
3/3 [=====] - 0s 75ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1789/2000
3/3 [=====] - 0s 75ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1790/2000
3/3 [=====] - 0s 68ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1791/2000
3/3 [=====] - 0s 75ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1792/2000
3/3 [=====] - 0s 78ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1793/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1794/2000
3/3 [=====] - 0s 68ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1795/2000
3/3 [=====] - 0s 72ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1796/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1797/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1798/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1799/2000
3/3 [=====] - 0s 69ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1800/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1801/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1802/2000

3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1803/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1804/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.2706
Epoch 1805/2000
3/3 [=====] - 0s 69ms/step - loss: 1.0981 -
categorical_accuracy: 0.3529
Epoch 1806/2000
3/3 [=====] - 0s 69ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1807/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1808/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1809/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1810/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1811/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1812/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1813/2000
3/3 [=====] - 0s 68ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1814/2000
3/3 [=====] - 0s 69ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1815/2000
3/3 [=====] - 0s 70ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1816/2000
3/3 [=====] - 0s 68ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1817/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0981 -
categorical_accuracy: 0.3059
Epoch 1818/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412

Epoch 1819/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1820/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1821/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1822/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1823/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1824/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1825/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1826/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1827/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1828/2000
3/3 [=====] - 0s 68ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1829/2000
3/3 [=====] - 0s 68ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1830/2000
3/3 [=====] - 0s 69ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1831/2000
3/3 [=====] - 0s 68ms/step - loss: 1.0981 -
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Epoch 1832/2000
3/3 [=====] - 0s 69ms/step - loss: 1.0981 -
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Epoch 1833/2000
3/3 [=====] - 0s 69ms/step - loss: 1.0981 -
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Epoch 1834/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1835/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -

categorical_accuracy: 0.3412
Epoch 1836/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1837/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1838/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1839/2000
3/3 [=====] - 0s 70ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1840/2000
3/3 [=====] - 0s 85ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1841/2000
3/3 [=====] - 0s 77ms/step - loss: 1.0981 -
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Epoch 1842/2000
3/3 [=====] - 0s 75ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1843/2000
3/3 [=====] - 0s 78ms/step - loss: 1.0981 -
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Epoch 1844/2000
3/3 [=====] - 0s 71ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1845/2000
3/3 [=====] - 0s 69ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1846/2000
3/3 [=====] - 0s 68ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1847/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
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Epoch 1848/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
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Epoch 1849/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
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Epoch 1850/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1851/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1852/2000

3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1853/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1854/2000
3/3 [=====] - 0s 69ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1855/2000
3/3 [=====] - 0s 73ms/step - loss: 1.0981 -
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Epoch 1856/2000
3/3 [=====] - 0s 81ms/step - loss: 1.0981 -
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Epoch 1857/2000
3/3 [=====] - 0s 76ms/step - loss: 1.0981 -
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Epoch 1858/2000
3/3 [=====] - 0s 74ms/step - loss: 1.0981 -
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Epoch 1859/2000
3/3 [=====] - 0s 74ms/step - loss: 1.0981 -
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Epoch 1860/2000
3/3 [=====] - 0s 91ms/step - loss: 1.0981 -
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Epoch 1861/2000
3/3 [=====] - 0s 86ms/step - loss: 1.0981 -
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Epoch 1862/2000
3/3 [=====] - 0s 70ms/step - loss: 1.0981 -
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Epoch 1863/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1864/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1865/2000
3/3 [=====] - 0s 68ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1866/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1867/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1868/2000
3/3 [=====] - 0s 68ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412

Epoch 1869/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1870/2000
3/3 [=====] - 0s 69ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1871/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1872/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1873/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1874/2000

3/3 [=====] - 0s 68ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1875/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1876/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1877/2000
3/3 [=====] - 0s 69ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1878/2000
3/3 [=====] - 0s 68ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1879/2000
3/3 [=====] - 0s 69ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1880/2000
3/3 [=====] - 0s 73ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1881/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1882/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1883/2000
3/3 [=====] - 0s 96ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1884/2000
3/3 [=====] - 0s 68ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1885/2000

3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1886/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1887/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1888/2000
3/3 [=====] - 0s 69ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1889/2000
3/3 [=====] - 0s 71ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1890/2000
3/3 [=====] - 0s 69ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1891/2000
3/3 [=====] - 0s 71ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1892/2000
3/3 [=====] - 0s 68ms/step - loss: 1.0981 -
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Epoch 1893/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
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Epoch 1894/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1895/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
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Epoch 1896/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
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Epoch 1897/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
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Epoch 1898/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
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Epoch 1899/2000
3/3 [=====] - 0s 68ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1900/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1901/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412

Epoch 1902/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1903/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1904/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1905/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1906/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1907/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1908/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1909/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1910/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1911/2000
3/3 [=====] - 0s 68ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1912/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1913/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1914/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1915/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1916/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1917/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1918/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -

categorical_accuracy: 0.3412
Epoch 1919/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1920/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1921/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1922/2000
3/3 [=====] - 0s 68ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1923/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1924/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1925/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1926/2000
3/3 [=====] - 0s 69ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1927/2000
3/3 [=====] - 0s 68ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1928/2000
3/3 [=====] - 0s 69ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1929/2000
3/3 [=====] - 0s 69ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1930/2000
3/3 [=====] - 0s 68ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1931/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1932/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1933/2000
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categorical_accuracy: 0.3412
Epoch 1934/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1935/2000

3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
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Epoch 1936/2000
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categorical_accuracy: 0.3412
Epoch 1937/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1938/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0981 -
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Epoch 1939/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1940/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1941/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1942/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1943/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1944/2000
3/3 [=====] - 0s 68ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1945/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1946/2000

3/3 [=====] - 0s 62ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1947/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1948/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1949/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1950/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1951/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -

categorical_accuracy: 0.3412
Epoch 1952/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1953/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1954/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
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categorical_accuracy: 0.3412
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3/3 [=====] - 0s 62ms/step - loss: 1.0981 -
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Epoch 1957/2000
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categorical_accuracy: 0.3412
Epoch 1959/2000
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categorical_accuracy: 0.3412
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Epoch 1967/2000
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Epoch 1968/2000

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Epoch 1969/2000
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categorical_accuracy: 0.3412
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Epoch 1972/2000
3/3 [=====] - 0s 64ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1973/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1974/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1975/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1976/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
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3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1978/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1979/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1980/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
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3/3 [=====] - 0s 73ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1982/2000
3/3 [=====] - 0s 71ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1983/2000
3/3 [=====] - 0s 67ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1984/2000
3/3 [=====] - 0s 65ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412

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categorical_accuracy: 0.3412
Epoch 1986/2000
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Epoch 1987/2000
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Epoch 1996/2000
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categorical_accuracy: 0.3412
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categorical_accuracy: 0.3412
Epoch 1998/2000
3/3 [=====] - 0s 62ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 1999/2000
3/3 [=====] - 0s 66ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412
Epoch 2000/2000
3/3 [=====] - 0s 63ms/step - loss: 1.0981 -
categorical_accuracy: 0.3412

<keras.callbacks.History at 0x1e818123730>

```
model.summary()
```

```
Model: "sequential"
```

Layer (type)	Output Shape	Param #
lstm (LSTM)	(None, 30, 64)	442112
lstm_1 (LSTM)	(None, 30, 128)	98816
lstm_2 (LSTM)	(None, 64)	49408
dense (Dense)	(None, 64)	4160
dense_1 (Dense)	(None, 32)	2080
dense_2 (Dense)	(None, 3)	99

Total params: 596,675
Trainable params: 596,675
Non-trainable params: 0

```
res = model.predict(X_test)
```

```
1/1 [=====] - 0s 350ms/step
```

```
actions[np.argmax(res[0])]
```

```
'iloveyou'
```

```
actions[np.argmax(y_test[0])]
```

```
'iloveyou'
```

```
model.save('action.h5')
```

```
model.load_weights('action.h5')
```

```
from sklearn.metrics import multilabel_confusion_matrix,  
accuracy_score
```

```
yhat = model.predict(X_train)
```

```
3/3 [=====] - 0s 18ms/step
```

```
y_true = np.argmax(y_train, axis=1).tolist()
```

```
yhat = np.argmax(yhat, axis=1).tolist()
```

```
yhat
```

[illegible]

[illegible]

y_true

$$\begin{bmatrix} 2, \\ 1, \\ 0, \\ 1, \\ 2, \\ 1, \\ 0, \\ 0, \\ 0, \\ 2, \\ 1, \\ 1, \\ 0, \end{bmatrix}$$

2,
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multilabel_confusion_matrix(y_true, yhat)

array([[[56,  0],
        [29,  0]],

       [[58,  0],
        [27,  0]],

       [[ 0, 56],
        [ 0, 29]]], dtype=int64)

accuracy_score(y_true,yhat)

0.3411764705882353

colors = [(245, 117, 16), (117, 245, 16), (16, 117, 245)]
def prob_viz(res, actions, input_frame, colors):
    output_frame = input_frame.copy()
    for num, prob in enumerate(res):
        cv2.rectangle(output_frame, (0,60+num*40), (int(prob*100),
90+num*40), colors[num], -1)
        cv2.putText(output_frame, actions[num], (0, 85+num*40),
cv2.FONT_HERSHEY_SIMPLEX, 1, (255, 255, 255), 2, cv2.LINE_AA)

    return output_frame

# 1. New detection variables
sequence = []

```

```

sentence = []
predictions = []
threshold = 0.7

cap = cv2.VideoCapture(0)
# Set mediapipe model
with mp_holistic.Holistic(min_detection_confidence = 0.5,
min_tracking_confidence = 0.5) as holistic:
    while cap.isOpened():

        # Read feed
        ret, frame = cap.read()

        # Make detections
        image, results = mediapipe_detection(frame, holistic)

        # Draw landmarks
        draw_styled_landmarks(image, results)

        # 2. Prediction Logic
        keypoints = extract_keypoints(results)
        sequence.append(keypoints)
        sequence = sequence[-30:]

        if len(sequence) == 30:
            res = model.predict(np.expand_dims(sequence, axis=0))[0]
            print(actions[np.argmax(res)])
            predictions.append(np.argmax(res))

        # 3. Visualisation logic
        if np.unique(predictions[-10:])[0]==np.argmax(res):
            if res[np.argmax(res)] > threshold:
                if len(sentence) > 0:
                    if actions[np.argmax(res)] != sentence[-1]:
                        sentence.append(actions[np.argmax(res)])
                else:
                    sentence.append(actions[np.argmax(res)])

            if len(sentence) > 5:
                sentence = sentence[-5:]

        # Visualisation probabilities
        image = prob_viz(res, actions, image, colors)

        cv2.rectangle(image, (0,0), (640, 40), (245, 117, 16), -1)
        cv2.putText(image, ' '.join(sentence), (3,30),
                    cv2.FONT_HERSHEY_SIMPLEX, 1, (255, 255, 255), 2,
cv2.LINE_AA)

```

```

    # Show to screen
    cv2.imshow('OpenCV Feed', image)

    # Break gracefully
    if cv2.waitKey(10) & 0xFF == ord('q'):
        break
cap.release()
cv2.destroyAllWindows()

```

```

1/1 [=====] - 0s 23ms/step
iloveyou
1/1 [=====] - 0s 19ms/step
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```
cap.release()  
cv2.destroyAllWindows()
```