

```

# import tensorflow as tf
# import keras as k
# import numpy as np
import warnings
warnings.filterwarnings('ignore')
from keras.preprocessing.image import ImageDataGenerator

train_gen = ImageDataGenerator(rescale = 1./255,
                               horizontal_flip = True,
                               shear_range = 0.2,
                               zoom_range = 0.2, rotation_range = 35,
                               width_shift_range=0.2,
                               height_shift_range=0.2,
                               fill_mode='nearest',
                               validation_split = 0.2)

test_gen = ImageDataGenerator(rescale=1./255)

train_set = train_gen.flow_from_directory(directory =
'F:/simplilearn/projects/DL projects/cat dog classification/train',
target_size = (128,128),
batch_size= 16,
class_mode = 'binary',
color_mode = 'rgb',
shuffle=True,
subset = 'training'
)

valid_set = train_gen.flow_from_directory(directory =
'F:/simplilearn/projects/DL projects/cat dog classification/train',
target_size = (128,128),
batch_size= 4,
class_mode = 'binary',
color_mode = 'rgb',
shuffle=True,
subset = 'validation')

test_set = test_gen.flow_from_directory(directory =
'F:/simplilearn/projects/DL projects/cat dog classification/test',
target_size = (128,128),
batch_size=1,
color_mode='rgb',
class_mode='binary', shuffle = True
)

```

Found 32 images belonging to 2 classes.
Found 8 images belonging to 2 classes.
Found 20 images belonging to 2 classes.

```
from keras.models import Sequential
from keras.layers import Conv2D , MaxPooling2D , Dropout ,
BatchNormalization, Flatten , Dense
```

with 100 epochs

```
model = Sequential([
    Conv2D(32,(5,5),input_shape = (128,128,3),activation = 'relu'),
    MaxPooling2D((2,2),strides = 2),
    Conv2D(64,(5,5),activation='relu'),
    MaxPooling2D((2,2),strides = 2),
    Flatten(),
    Dense(128,activation='relu'),
    Dropout(0.4),
    Dense(1,activation='softmax')
])

# from keras.utils import plot_model
# plot_model(model,show_shapes=True)

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

model.fit_generator(train_set , steps_per_epoch = train_set.n//16,
epochs = 100 , validation_data =test_set ,validation_steps =
valid_set.n//4 )

Epoch 1/100
2/2 [=====] - 4s 1s/step - loss: 1.0566 -
accuracy: 0.5000 - val_loss: 1.3777 - val_accuracy: 0.5000
Epoch 2/100
2/2 [=====] - 2s 756ms/step - loss: 0.8323 -
accuracy: 0.5000 - val_loss: 0.4460 - val_accuracy: 0.0000e+00
Epoch 3/100
2/2 [=====] - 2s 996ms/step - loss: 0.7457 -
accuracy: 0.5000 - val_loss: 0.6893 - val_accuracy: 0.5000
Epoch 4/100
2/2 [=====] - 2s 931ms/step - loss: 0.6913 -
accuracy: 0.5000 - val_loss: 0.6844 - val_accuracy: 1.0000
Epoch 5/100
2/2 [=====] - 2s 897ms/step - loss: 0.6928 -
accuracy: 0.5000 - val_loss: 0.6958 - val_accuracy: 0.5000
Epoch 6/100
2/2 [=====] - 2s 722ms/step - loss: 0.6915 -
accuracy: 0.5000 - val_loss: 0.6947 - val_accuracy: 0.5000
Epoch 7/100
2/2 [=====] - 2s 739ms/step - loss: 0.6854 -
accuracy: 0.5000 - val_loss: 0.6813 - val_accuracy: 1.0000
Epoch 8/100
```

2/2 [=====] - 2s 810ms/step - loss: 0.6861 -
accuracy: 0.5000 - val_loss: 0.6173 - val_accuracy: 0.5000
Epoch 9/100
2/2 [=====] - 2s 817ms/step - loss: 0.6757 -
accuracy: 0.5000 - val_loss: 0.6368 - val_accuracy: 0.0000e+00
Epoch 10/100
2/2 [=====] - 2s 751ms/step - loss: 0.6628 -
accuracy: 0.5000 - val_loss: 0.7254 - val_accuracy: 0.5000
Epoch 11/100
2/2 [=====] - 2s 790ms/step - loss: 0.7456 -
accuracy: 0.5000 - val_loss: 0.8109 - val_accuracy: 0.5000
Epoch 12/100
2/2 [=====] - 2s 969ms/step - loss: 0.7112 -
accuracy: 0.5000 - val_loss: 0.4339 - val_accuracy: 0.0000e+00
Epoch 13/100
2/2 [=====] - 2s 792ms/step - loss: 0.6561 -
accuracy: 0.5000 - val_loss: 0.6546 - val_accuracy: 0.0000e+00
Epoch 14/100
2/2 [=====] - 2s 735ms/step - loss: 0.6695 -
accuracy: 0.5000 - val_loss: 0.6805 - val_accuracy: 0.5000
Epoch 15/100
2/2 [=====] - 2s 782ms/step - loss: 0.8188 -
accuracy: 0.5000 - val_loss: 0.7077 - val_accuracy: 0.5000
Epoch 16/100
2/2 [=====] - 2s 818ms/step - loss: 0.6790 -
accuracy: 0.5000 - val_loss: 0.7214 - val_accuracy: 0.5000
Epoch 17/100
2/2 [=====] - 2s 757ms/step - loss: 0.6934 -
accuracy: 0.5000 - val_loss: 0.6854 - val_accuracy: 0.5000
Epoch 18/100
2/2 [=====] - 2s 1s/step - loss: 0.6903 -
accuracy: 0.5000 - val_loss: 0.7223 - val_accuracy: 0.0000e+00
Epoch 19/100
2/2 [=====] - 2s 782ms/step - loss: 0.6879 -
accuracy: 0.5000 - val_loss: 0.6983 - val_accuracy: 0.5000
Epoch 20/100
2/2 [=====] - 2s 754ms/step - loss: 0.6774 -
accuracy: 0.5000 - val_loss: 0.6996 - val_accuracy: 0.5000
Epoch 21/100
2/2 [=====] - 2s 743ms/step - loss: 0.6924 -
accuracy: 0.5000 - val_loss: 0.6781 - val_accuracy: 1.0000
Epoch 22/100
2/2 [=====] - 2s 763ms/step - loss: 0.6875 -
accuracy: 0.5000 - val_loss: 0.7061 - val_accuracy: 0.0000e+00
Epoch 23/100
2/2 [=====] - 2s 724ms/step - loss: 0.6777 -
accuracy: 0.5000 - val_loss: 0.6922 - val_accuracy: 0.5000
Epoch 24/100
2/2 [=====] - 2s 738ms/step - loss: 0.6715 -
accuracy: 0.5000 - val_loss: 0.6368 - val_accuracy: 0.0000e+00

Epoch 25/100
2/2 [=====] - 2s 757ms/step - loss: 0.6702 - accuracy: 0.5000 - val_loss: 0.6595 - val_accuracy: 1.0000
Epoch 26/100
2/2 [=====] - 2s 1s/step - loss: 0.6675 - accuracy: 0.5000 - val_loss: 0.7061 - val_accuracy: 1.0000
Epoch 27/100
2/2 [=====] - 2s 903ms/step - loss: 0.6747 - accuracy: 0.5000 - val_loss: 0.6448 - val_accuracy: 0.5000
Epoch 28/100
2/2 [=====] - 2s 731ms/step - loss: 0.6662 - accuracy: 0.5000 - val_loss: 0.6407 - val_accuracy: 1.0000
Epoch 29/100
2/2 [=====] - 2s 974ms/step - loss: 0.6369 - accuracy: 0.5000 - val_loss: 0.6555 - val_accuracy: 1.0000
Epoch 30/100
2/2 [=====] - 2s 772ms/step - loss: 0.6749 - accuracy: 0.5000 - val_loss: 0.3357 - val_accuracy: 1.0000
Epoch 31/100
2/2 [=====] - 2s 742ms/step - loss: 0.6948 - accuracy: 0.5000 - val_loss: 0.8873 - val_accuracy: 1.0000
Epoch 32/100
2/2 [=====] - 2s 795ms/step - loss: 0.6455 - accuracy: 0.5000 - val_loss: 0.6671 - val_accuracy: 0.5000
Epoch 33/100
2/2 [=====] - 2s 940ms/step - loss: 0.6226 - accuracy: 0.5000 - val_loss: 0.6274 - val_accuracy: 0.5000
Epoch 34/100
2/2 [=====] - 2s 871ms/step - loss: 0.6407 - accuracy: 0.5000 - val_loss: 0.6334 - val_accuracy: 0.0000e+00
Epoch 35/100
2/2 [=====] - 2s 761ms/step - loss: 0.6361 - accuracy: 0.5000 - val_loss: 0.6626 - val_accuracy: 0.5000
Epoch 36/100
2/2 [=====] - 2s 845ms/step - loss: 0.6394 - accuracy: 0.5000 - val_loss: 0.7152 - val_accuracy: 1.0000
Epoch 37/100
2/2 [=====] - 2s 808ms/step - loss: 0.6307 - accuracy: 0.5000 - val_loss: 0.6927 - val_accuracy: 0.5000
Epoch 38/100
2/2 [=====] - 2s 844ms/step - loss: 0.6338 - accuracy: 0.5000 - val_loss: 0.4655 - val_accuracy: 0.0000e+00
Epoch 39/100
2/2 [=====] - 2s 712ms/step - loss: 0.6374 - accuracy: 0.5000 - val_loss: 0.6933 - val_accuracy: 1.0000
Epoch 40/100
2/2 [=====] - 2s 819ms/step - loss: 0.6245 - accuracy: 0.5000 - val_loss: 0.3816 - val_accuracy: 0.0000e+00
Epoch 41/100
2/2 [=====] - 2s 833ms/step - loss: 0.6218 -

accuracy: 0.5000 - val_loss: 0.5552 - val_accuracy: 1.0000
Epoch 42/100
2/2 [=====] - 2s 817ms/step - loss: 0.5841 -
accuracy: 0.5000 - val_loss: 0.7870 - val_accuracy: 0.5000
Epoch 43/100
2/2 [=====] - 2s 761ms/step - loss: 0.5199 -
accuracy: 0.5000 - val_loss: 0.8355 - val_accuracy: 1.0000
Epoch 44/100
2/2 [=====] - 2s 815ms/step - loss: 0.7387 -
accuracy: 0.5000 - val_loss: 0.3686 - val_accuracy: 0.0000e+00
Epoch 45/100
2/2 [=====] - 2s 748ms/step - loss: 0.5800 -
accuracy: 0.5000 - val_loss: 0.7160 - val_accuracy: 0.0000e+00
Epoch 46/100
2/2 [=====] - 2s 828ms/step - loss: 0.6081 -
accuracy: 0.5000 - val_loss: 0.5121 - val_accuracy: 0.0000e+00
Epoch 47/100
2/2 [=====] - 2s 826ms/step - loss: 0.6079 -
accuracy: 0.5000 - val_loss: 0.7657 - val_accuracy: 0.0000e+00
Epoch 48/100
2/2 [=====] - 2s 783ms/step - loss: 0.6007 -
accuracy: 0.5000 - val_loss: 0.3617 - val_accuracy: 0.0000e+00
Epoch 49/100
2/2 [=====] - 2s 756ms/step - loss: 0.5895 -
accuracy: 0.5000 - val_loss: 0.5948 - val_accuracy: 0.5000
Epoch 50/100
2/2 [=====] - 2s 768ms/step - loss: 0.6099 -
accuracy: 0.5000 - val_loss: 0.7147 - val_accuracy: 0.0000e+00
Epoch 51/100
2/2 [=====] - 2s 778ms/step - loss: 0.6213 -
accuracy: 0.5000 - val_loss: 1.6243 - val_accuracy: 0.5000
Epoch 52/100
2/2 [=====] - 2s 783ms/step - loss: 0.5543 -
accuracy: 0.5000 - val_loss: 0.2703 - val_accuracy: 1.0000
Epoch 53/100
2/2 [=====] - 2s 772ms/step - loss: 0.5449 -
accuracy: 0.5000 - val_loss: 0.4726 - val_accuracy: 0.5000
Epoch 54/100
2/2 [=====] - 2s 955ms/step - loss: 0.5312 -
accuracy: 0.5000 - val_loss: 0.0950 - val_accuracy: 0.0000e+00
Epoch 55/100
2/2 [=====] - 2s 810ms/step - loss: 0.7129 -
accuracy: 0.5000 - val_loss: 0.6176 - val_accuracy: 0.0000e+00
Epoch 56/100
2/2 [=====] - 2s 782ms/step - loss: 0.5019 -
accuracy: 0.5000 - val_loss: 0.4093 - val_accuracy: 0.5000
Epoch 57/100
2/2 [=====] - 2s 769ms/step - loss: 0.6097 -
accuracy: 0.5000 - val_loss: 0.4742 - val_accuracy: 1.0000
Epoch 58/100

2/2 [=====] - 2s 738ms/step - loss: 0.5610 -
accuracy: 0.5000 - val_loss: 0.8445 - val_accuracy: 1.0000
Epoch 59/100
2/2 [=====] - 2s 766ms/step - loss: 0.6118 -
accuracy: 0.5000 - val_loss: 0.7962 - val_accuracy: 0.5000
Epoch 60/100
2/2 [=====] - 2s 854ms/step - loss: 0.5444 -
accuracy: 0.5000 - val_loss: 2.1016 - val_accuracy: 0.0000e+00
Epoch 61/100
2/2 [=====] - 2s 846ms/step - loss: 0.6226 -
accuracy: 0.5000 - val_loss: 0.8149 - val_accuracy: 0.5000
Epoch 62/100
2/2 [=====] - 2s 780ms/step - loss: 0.5333 -
accuracy: 0.5000 - val_loss: 1.3786 - val_accuracy: 1.0000
Epoch 63/100
2/2 [=====] - 2s 763ms/step - loss: 0.5642 -
accuracy: 0.5000 - val_loss: 0.5535 - val_accuracy: 1.0000
Epoch 64/100
2/2 [=====] - 2s 815ms/step - loss: 0.8518 -
accuracy: 0.5000 - val_loss: 0.7488 - val_accuracy: 0.5000
Epoch 65/100
2/2 [=====] - 2s 925ms/step - loss: 0.5571 -
accuracy: 0.5000 - val_loss: 0.5813 - val_accuracy: 0.5000
Epoch 66/100
2/2 [=====] - 2s 827ms/step - loss: 0.6142 -
accuracy: 0.5000 - val_loss: 0.4905 - val_accuracy: 1.0000
Epoch 67/100
2/2 [=====] - 2s 789ms/step - loss: 0.5859 -
accuracy: 0.5000 - val_loss: 0.6501 - val_accuracy: 0.5000
Epoch 68/100
2/2 [=====] - 2s 754ms/step - loss: 0.6152 -
accuracy: 0.5000 - val_loss: 0.9904 - val_accuracy: 0.0000e+00
Epoch 69/100
2/2 [=====] - 2s 745ms/step - loss: 0.6121 -
accuracy: 0.5000 - val_loss: 0.7167 - val_accuracy: 1.0000
Epoch 70/100
2/2 [=====] - 2s 751ms/step - loss: 0.6243 -
accuracy: 0.5000 - val_loss: 0.6186 - val_accuracy: 0.5000
Epoch 71/100
2/2 [=====] - 2s 768ms/step - loss: 0.6143 -
accuracy: 0.5000 - val_loss: 0.7682 - val_accuracy: 0.0000e+00
Epoch 72/100
2/2 [=====] - 2s 795ms/step - loss: 0.5842 -
accuracy: 0.5000 - val_loss: 0.7764 - val_accuracy: 0.0000e+00
Epoch 73/100
2/2 [=====] - 2s 767ms/step - loss: 0.5809 -
accuracy: 0.5000 - val_loss: 0.1589 - val_accuracy: 1.0000
Epoch 74/100
2/2 [=====] - 2s 756ms/step - loss: 0.5835 -
accuracy: 0.5000 - val_loss: 0.4977 - val_accuracy: 1.0000

Epoch 75/100
2/2 [=====] - 2s 750ms/step - loss: 0.5842 -
accuracy: 0.5000 - val_loss: 0.5679 - val_accuracy: 0.5000
Epoch 76/100
2/2 [=====] - 2s 737ms/step - loss: 0.5748 -
accuracy: 0.5000 - val_loss: 0.2710 - val_accuracy: 1.0000
Epoch 77/100
2/2 [=====] - 2s 756ms/step - loss: 0.5754 -
accuracy: 0.5000 - val_loss: 0.5833 - val_accuracy: 0.5000
Epoch 78/100
2/2 [=====] - 2s 744ms/step - loss: 0.5825 -
accuracy: 0.5000 - val_loss: 0.6813 - val_accuracy: 0.5000
Epoch 79/100
2/2 [=====] - 2s 744ms/step - loss: 0.5278 -
accuracy: 0.5000 - val_loss: 0.2616 - val_accuracy: 0.5000
Epoch 80/100
2/2 [=====] - 2s 744ms/step - loss: 0.5394 -
accuracy: 0.5000 - val_loss: 0.6956 - val_accuracy: 1.0000
Epoch 81/100
2/2 [=====] - 2s 761ms/step - loss: 0.5710 -
accuracy: 0.5000 - val_loss: 0.7971 - val_accuracy: 0.5000
Epoch 82/100
2/2 [=====] - 2s 774ms/step - loss: 0.5428 -
accuracy: 0.5000 - val_loss: 0.7654 - val_accuracy: 0.5000
Epoch 83/100
2/2 [=====] - 2s 736ms/step - loss: 0.5823 -
accuracy: 0.5000 - val_loss: 1.1500 - val_accuracy: 0.5000
Epoch 84/100
2/2 [=====] - 2s 773ms/step - loss: 0.5868 -
accuracy: 0.5000 - val_loss: 0.4033 - val_accuracy: 0.0000e+00
Epoch 85/100
2/2 [=====] - 2s 890ms/step - loss: 0.5970 -
accuracy: 0.5000 - val_loss: 0.3179 - val_accuracy: 0.5000
Epoch 86/100
2/2 [=====] - 2s 795ms/step - loss: 0.4410 -
accuracy: 0.5000 - val_loss: 1.2414 - val_accuracy: 0.5000
Epoch 87/100
2/2 [=====] - 2s 761ms/step - loss: 0.5021 -
accuracy: 0.5000 - val_loss: 0.7861 - val_accuracy: 1.0000
Epoch 88/100
2/2 [=====] - 2s 813ms/step - loss: 0.4945 -
accuracy: 0.5000 - val_loss: 0.6705 - val_accuracy: 1.0000
Epoch 89/100
2/2 [=====] - 2s 760ms/step - loss: 0.4579 -
accuracy: 0.5000 - val_loss: 0.8066 - val_accuracy: 1.0000
Epoch 90/100
2/2 [=====] - 2s 769ms/step - loss: 0.4766 -
accuracy: 0.5000 - val_loss: 3.5634e-04 - val_accuracy: 0.5000
Epoch 91/100
2/2 [=====] - 2s 767ms/step - loss: 0.4392 -

```
accuracy: 0.5000 - val_loss: 0.3507 - val_accuracy: 1.0000
Epoch 92/100
2/2 [=====] - 2s 735ms/step - loss: 0.5248 -
accuracy: 0.5000 - val_loss: 1.8544 - val_accuracy: 1.0000
Epoch 93/100
2/2 [=====] - 2s 760ms/step - loss: 0.4683 -
accuracy: 0.5000 - val_loss: 0.2513 - val_accuracy: 1.0000
Epoch 94/100
2/2 [=====] - 2s 745ms/step - loss: 0.4530 -
accuracy: 0.5000 - val_loss: 0.1927 - val_accuracy: 0.5000
Epoch 95/100
2/2 [=====] - 2s 733ms/step - loss: 0.5014 -
accuracy: 0.5000 - val_loss: 0.9050 - val_accuracy: 0.5000
Epoch 96/100
2/2 [=====] - 2s 728ms/step - loss: 0.4666 -
accuracy: 0.5000 - val_loss: 0.3307 - val_accuracy: 0.5000
Epoch 97/100
2/2 [=====] - 2s 736ms/step - loss: 0.4371 -
accuracy: 0.5000 - val_loss: 0.6860 - val_accuracy: 0.0000e+00
Epoch 98/100
2/2 [=====] - 2s 749ms/step - loss: 0.4496 -
accuracy: 0.5000 - val_loss: 0.5092 - val_accuracy: 1.0000
Epoch 99/100
2/2 [=====] - 2s 743ms/step - loss: 0.4676 -
accuracy: 0.5000 - val_loss: 1.6114 - val_accuracy: 0.5000
Epoch 100/100
2/2 [=====] - 2s 752ms/step - loss: 0.3593 -
accuracy: 0.5000 - val_loss: 5.2766 - val_accuracy: 0.5000
```

<keras.callbacks.History at 0x2948a8434c0>

```
import matplotlib.pyplot as plt
```

```
pred = model.predict_generator(test_set)
```

```
plt.subplots(4,5,figsize=(20,10))
plt.subplots_adjust(hspace=0.5)
for i in range(20):
    plt.subplot(4,5,i+1)
    img = np.squeeze(test_set[i][0])
    plt.imshow(img)
    if pred[i]==0:
        plt.title('predicted as CAT',loc='center')
    else:
        plt.title('predicted as DOG',loc='center')
    plt.axis('off')
plt.show()
```

<IPython.core.display.Javascript object>

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<IPython.core.display.Javascript object>

predicted as DOG



predicted as DOG



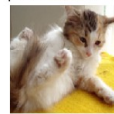
predicted as DOG



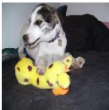
predicted as DOG



predicted as DOG



predicted as DOG



predicted as DOG



predicted as DOG



predicted as DOG



predicted as DOG



predicted as DOG



predicted as DOG



predicted as DOG



predicted as DOG



predicted as DOG



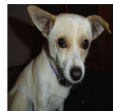
predicted as DOG



predicted as DOG



predicted as DOG



predicted as DOG



predicted as DOG



#we can see that all the images are predicted as 'DOG'

now lets do the same with 200 epochs

```
model = Sequential([
    Conv2D(32,(5,5),input_shape = (128,128,3),activation = 'relu'),
    MaxPooling2D((2,2),strides = 2),
    Conv2D(64,(5,5),activation='relu'),
    MaxPooling2D((2,2),strides = 2),
    Flatten(),
    Dense(128,activation='relu'),
    Dropout(0.4),
    Dense(1,activation='softmax')
])

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

model.fit_generator(train_set , steps_per_epoch = train_set.n//16,
epochs = 200 , validation_data =test_set ,validation_steps =
valid_set.n//4 )

Epoch 1/200
2/2 [=====] - 4s 1s/step - loss: 1.0331 -
accuracy: 0.5000 - val_loss: 6.9691 - val_accuracy: 1.0000
Epoch 2/200
2/2 [=====] - 2s 772ms/step - loss: 2.9104 -
accuracy: 0.5000 - val_loss: 0.7107 - val_accuracy: 0.5000
Epoch 3/200
2/2 [=====] - 2s 807ms/step - loss: 0.7510 -
accuracy: 0.5000 - val_loss: 0.6320 - val_accuracy: 1.0000
Epoch 4/200
2/2 [=====] - 2s 792ms/step - loss: 0.6899 -
accuracy: 0.5000 - val_loss: 0.6868 - val_accuracy: 1.0000
Epoch 5/200
2/2 [=====] - 2s 790ms/step - loss: 0.6884 -
accuracy: 0.5000 - val_loss: 0.7147 - val_accuracy: 0.5000
Epoch 6/200
2/2 [=====] - 2s 763ms/step - loss: 0.6870 -
accuracy: 0.5000 - val_loss: 0.6608 - val_accuracy: 0.0000e+00
Epoch 7/200
2/2 [=====] - 2s 757ms/step - loss: 0.6774 -
accuracy: 0.5000 - val_loss: 0.4746 - val_accuracy: 0.5000
Epoch 8/200
2/2 [=====] - 2s 828ms/step - loss: 0.6655 -
accuracy: 0.5000 - val_loss: 0.7110 - val_accuracy: 0.5000
Epoch 9/200
2/2 [=====] - 2s 743ms/step - loss: 0.6756 -
```

accuracy: 0.5000 - val_loss: 0.4259 - val_accuracy: 0.5000
Epoch 10/200
2/2 [=====] - 2s 747ms/step - loss: 0.6709 -
accuracy: 0.5000 - val_loss: 0.7514 - val_accuracy: 0.5000
Epoch 11/200
2/2 [=====] - 2s 727ms/step - loss: 0.6675 -
accuracy: 0.5000 - val_loss: 0.7862 - val_accuracy: 0.5000
Epoch 12/200
2/2 [=====] - 2s 788ms/step - loss: 0.6778 -
accuracy: 0.5000 - val_loss: 0.6305 - val_accuracy: 0.5000
Epoch 13/200
2/2 [=====] - 2s 797ms/step - loss: 0.6571 -
accuracy: 0.5000 - val_loss: 0.6963 - val_accuracy: 0.0000e+00
Epoch 14/200
2/2 [=====] - 2s 751ms/step - loss: 0.6464 -
accuracy: 0.5000 - val_loss: 0.3834 - val_accuracy: 0.0000e+00
Epoch 15/200
2/2 [=====] - 2s 745ms/step - loss: 0.6641 -
accuracy: 0.5000 - val_loss: 0.6481 - val_accuracy: 0.5000
Epoch 16/200
2/2 [=====] - 2s 751ms/step - loss: 0.6277 -
accuracy: 0.5000 - val_loss: 1.1466 - val_accuracy: 0.5000
Epoch 17/200
2/2 [=====] - 2s 809ms/step - loss: 0.6734 -
accuracy: 0.5000 - val_loss: 0.7255 - val_accuracy: 0.5000
Epoch 18/200
2/2 [=====] - 2s 834ms/step - loss: 0.6344 -
accuracy: 0.5000 - val_loss: 0.5600 - val_accuracy: 1.0000
Epoch 19/200
2/2 [=====] - 2s 754ms/step - loss: 0.6439 -
accuracy: 0.5000 - val_loss: 0.9762 - val_accuracy: 0.0000e+00
Epoch 20/200
2/2 [=====] - 2s 792ms/step - loss: 0.6805 -
accuracy: 0.5000 - val_loss: 0.7611 - val_accuracy: 0.0000e+00
Epoch 21/200
2/2 [=====] - 2s 798ms/step - loss: 0.6530 -
accuracy: 0.5000 - val_loss: 0.8256 - val_accuracy: 0.0000e+00
Epoch 22/200
2/2 [=====] - 2s 748ms/step - loss: 0.6307 -
accuracy: 0.5000 - val_loss: 0.7446 - val_accuracy: 0.5000
Epoch 23/200
2/2 [=====] - 2s 779ms/step - loss: 0.6283 -
accuracy: 0.5000 - val_loss: 0.5486 - val_accuracy: 0.5000
Epoch 24/200
2/2 [=====] - 2s 774ms/step - loss: 0.6130 -
accuracy: 0.5000 - val_loss: 0.7046 - val_accuracy: 0.0000e+00
Epoch 25/200
2/2 [=====] - 2s 786ms/step - loss: 0.6301 -
accuracy: 0.5000 - val_loss: 0.3431 - val_accuracy: 1.0000
Epoch 26/200

2/2 [=====] - 2s 813ms/step - loss: 0.6183 -
accuracy: 0.5000 - val_loss: 0.5713 - val_accuracy: 0.5000
Epoch 27/200
2/2 [=====] - 2s 743ms/step - loss: 0.5911 -
accuracy: 0.5000 - val_loss: 0.4881 - val_accuracy: 1.0000
Epoch 28/200
2/2 [=====] - 2s 757ms/step - loss: 0.6093 -
accuracy: 0.5000 - val_loss: 0.4742 - val_accuracy: 1.0000
Epoch 29/200
2/2 [=====] - 2s 775ms/step - loss: 0.7220 -
accuracy: 0.5000 - val_loss: 0.5244 - val_accuracy: 1.0000
Epoch 30/200
2/2 [=====] - 2s 790ms/step - loss: 0.5750 -
accuracy: 0.5000 - val_loss: 0.9390 - val_accuracy: 1.0000
Epoch 31/200
2/2 [=====] - 2s 763ms/step - loss: 0.6097 -
accuracy: 0.5000 - val_loss: 1.1070 - val_accuracy: 0.5000
Epoch 32/200
2/2 [=====] - 2s 785ms/step - loss: 0.5987 -
accuracy: 0.5000 - val_loss: 0.3864 - val_accuracy: 0.5000
Epoch 33/200
2/2 [=====] - 2s 929ms/step - loss: 0.7672 -
accuracy: 0.5000 - val_loss: 0.3549 - val_accuracy: 0.5000
Epoch 34/200
2/2 [=====] - 2s 789ms/step - loss: 0.5468 -
accuracy: 0.5000 - val_loss: 0.3613 - val_accuracy: 0.5000
Epoch 35/200
2/2 [=====] - 2s 830ms/step - loss: 0.5379 -
accuracy: 0.5000 - val_loss: 0.8364 - val_accuracy: 1.0000
Epoch 36/200
2/2 [=====] - 2s 771ms/step - loss: 0.6705 -
accuracy: 0.5000 - val_loss: 0.5162 - val_accuracy: 0.5000
Epoch 37/200
2/2 [=====] - 2s 730ms/step - loss: 0.6245 -
accuracy: 0.5000 - val_loss: 0.7143 - val_accuracy: 0.5000
Epoch 38/200
2/2 [=====] - 2s 731ms/step - loss: 0.6243 -
accuracy: 0.5000 - val_loss: 0.7698 - val_accuracy: 1.0000
Epoch 39/200
2/2 [=====] - 2s 783ms/step - loss: 0.5931 -
accuracy: 0.5000 - val_loss: 0.6579 - val_accuracy: 1.0000
Epoch 40/200
2/2 [=====] - 2s 874ms/step - loss: 0.6006 -
accuracy: 0.5000 - val_loss: 0.7699 - val_accuracy: 0.5000
Epoch 41/200
2/2 [=====] - 2s 857ms/step - loss: 0.6335 -
accuracy: 0.5000 - val_loss: 1.1119 - val_accuracy: 1.0000
Epoch 42/200
2/2 [=====] - 2s 825ms/step - loss: 0.5960 -
accuracy: 0.5000 - val_loss: 1.0232 - val_accuracy: 0.5000

Epoch 43/200
2/2 [=====] - 2s 868ms/step - loss: 0.6069 -
accuracy: 0.5000 - val_loss: 0.5712 - val_accuracy: 0.5000
Epoch 44/200
2/2 [=====] - 2s 1s/step - loss: 0.5627 -
accuracy: 0.5000 - val_loss: 0.6333 - val_accuracy: 1.0000
Epoch 45/200
2/2 [=====] - 2s 795ms/step - loss: 0.6021 -
accuracy: 0.5000 - val_loss: 1.0656 - val_accuracy: 0.5000
Epoch 46/200
2/2 [=====] - 2s 881ms/step - loss: 0.5777 -
accuracy: 0.5000 - val_loss: 0.4676 - val_accuracy: 0.5000
Epoch 47/200
2/2 [=====] - 2s 915ms/step - loss: 0.6029 -
accuracy: 0.5000 - val_loss: 0.8845 - val_accuracy: 0.0000e+00
Epoch 48/200
2/2 [=====] - 2s 1s/step - loss: 0.6113 -
accuracy: 0.5000 - val_loss: 0.6596 - val_accuracy: 1.0000
Epoch 49/200
2/2 [=====] - 2s 988ms/step - loss: 0.5972 -
accuracy: 0.5000 - val_loss: 0.9973 - val_accuracy: 1.0000
Epoch 50/200
2/2 [=====] - 2s 746ms/step - loss: 0.5163 -
accuracy: 0.5000 - val_loss: 0.9166 - val_accuracy: 0.0000e+00
Epoch 51/200
2/2 [=====] - 2s 929ms/step - loss: 0.5749 -
accuracy: 0.5000 - val_loss: 0.6419 - val_accuracy: 1.0000
Epoch 52/200
2/2 [=====] - 2s 798ms/step - loss: 0.5145 -
accuracy: 0.5000 - val_loss: 0.3422 - val_accuracy: 0.0000e+00
Epoch 53/200
2/2 [=====] - 2s 794ms/step - loss: 0.6926 -
accuracy: 0.5000 - val_loss: 1.2399 - val_accuracy: 0.5000
Epoch 54/200
2/2 [=====] - 2s 853ms/step - loss: 0.5202 -
accuracy: 0.5000 - val_loss: 1.7689 - val_accuracy: 0.0000e+00
Epoch 55/200
2/2 [=====] - 2s 786ms/step - loss: 0.5269 -
accuracy: 0.5000 - val_loss: 0.3598 - val_accuracy: 0.5000
Epoch 56/200
2/2 [=====] - 2s 736ms/step - loss: 0.4814 -
accuracy: 0.5000 - val_loss: 0.2552 - val_accuracy: 0.5000
Epoch 57/200
2/2 [=====] - 2s 910ms/step - loss: 0.5160 -
accuracy: 0.5000 - val_loss: 0.6226 - val_accuracy: 1.0000
Epoch 58/200

2/2 [=====] - 2s 1s/step - loss: 0.5333 -
accuracy: 0.5000 - val_loss: 0.6452 - val_accuracy: 0.0000e+00
Epoch 59/200

2/2 [=====] - 2s 1s/step - loss: 0.5179 -
accuracy: 0.5000 - val_loss: 0.3944 - val_accuracy: 1.0000
Epoch 60/200
2/2 [=====] - 2s 1s/step - loss: 0.4281 -
accuracy: 0.5000 - val_loss: 1.3721 - val_accuracy: 1.0000
Epoch 61/200
2/2 [=====] - 2s 900ms/step - loss: 0.4693 -
accuracy: 0.5000 - val_loss: 0.0256 - val_accuracy: 0.5000
Epoch 62/200
2/2 [=====] - 2s 822ms/step - loss: 0.3922 -
accuracy: 0.5000 - val_loss: 0.0443 - val_accuracy: 1.0000
Epoch 63/200
2/2 [=====] - 2s 808ms/step - loss: 0.5637 -
accuracy: 0.5000 - val_loss: 0.3196 - val_accuracy: 1.0000
Epoch 64/200
2/2 [=====] - 2s 775ms/step - loss: 0.4836 -
accuracy: 0.5000 - val_loss: 0.7202 - val_accuracy: 0.5000
Epoch 65/200
2/2 [=====] - 2s 875ms/step - loss: 0.6890 -
accuracy: 0.5000 - val_loss: 0.6767 - val_accuracy: 0.0000e+00
Epoch 66/200
2/2 [=====] - 2s 792ms/step - loss: 0.5112 -
accuracy: 0.5000 - val_loss: 0.6388 - val_accuracy: 0.5000
Epoch 67/200
2/2 [=====] - 2s 808ms/step - loss: 0.5290 -
accuracy: 0.5000 - val_loss: 0.7401 - val_accuracy: 0.5000
Epoch 68/200
2/2 [=====] - 2s 783ms/step - loss: 0.5874 -
accuracy: 0.5000 - val_loss: 0.4840 - val_accuracy: 1.0000
Epoch 69/200
2/2 [=====] - 2s 829ms/step - loss: 0.5794 -
accuracy: 0.5000 - val_loss: 0.4960 - val_accuracy: 0.5000
Epoch 70/200
2/2 [=====] - 2s 932ms/step - loss: 0.5251 -
accuracy: 0.5000 - val_loss: 0.8601 - val_accuracy: 0.5000
Epoch 71/200
2/2 [=====] - 2s 817ms/step - loss: 0.5006 -
accuracy: 0.5000 - val_loss: 0.1857 - val_accuracy: 0.5000
Epoch 72/200
2/2 [=====] - 2s 743ms/step - loss: 0.5298 -
accuracy: 0.5000 - val_loss: 0.5382 - val_accuracy: 0.0000e+00
Epoch 73/200
2/2 [=====] - 2s 725ms/step - loss: 0.4690 -
accuracy: 0.5000 - val_loss: 0.8971 - val_accuracy: 0.0000e+00
Epoch 74/200
2/2 [=====] - 2s 721ms/step - loss: 0.5393 -
accuracy: 0.5000 - val_loss: 0.4227 - val_accuracy: 0.0000e+00
Epoch 75/200
2/2 [=====] - 2s 735ms/step - loss: 0.4725 -
accuracy: 0.5000 - val_loss: 0.9110 - val_accuracy: 0.0000e+00

Epoch 76/200
2/2 [=====] - 2s 770ms/step - loss: 0.4157 -
accuracy: 0.5000 - val_loss: 1.2013 - val_accuracy: 1.0000
Epoch 77/200
2/2 [=====] - 2s 759ms/step - loss: 0.4508 -
accuracy: 0.5000 - val_loss: 0.1922 - val_accuracy: 0.5000
Epoch 78/200
2/2 [=====] - 2s 746ms/step - loss: 0.4487 -
accuracy: 0.5000 - val_loss: 0.4967 - val_accuracy: 0.5000
Epoch 79/200
2/2 [=====] - 2s 729ms/step - loss: 0.7475 -
accuracy: 0.5000 - val_loss: 0.4409 - val_accuracy: 0.0000e+00
Epoch 80/200
2/2 [=====] - 2s 735ms/step - loss: 0.3997 -
accuracy: 0.5000 - val_loss: 0.2914 - val_accuracy: 0.0000e+00
Epoch 81/200
2/2 [=====] - 2s 736ms/step - loss: 0.4684 -
accuracy: 0.5000 - val_loss: 0.5898 - val_accuracy: 0.5000
Epoch 82/200
2/2 [=====] - 2s 732ms/step - loss: 0.4414 -
accuracy: 0.5000 - val_loss: 0.1219 - val_accuracy: 0.5000
Epoch 83/200
2/2 [=====] - 2s 752ms/step - loss: 0.4231 -
accuracy: 0.5000 - val_loss: 0.4207 - val_accuracy: 0.0000e+00
Epoch 84/200
2/2 [=====] - 2s 735ms/step - loss: 0.3946 -
accuracy: 0.5000 - val_loss: 1.1206 - val_accuracy: 0.0000e+00
Epoch 85/200
2/2 [=====] - 2s 782ms/step - loss: 0.3461 -
accuracy: 0.5000 - val_loss: 0.2688 - val_accuracy: 0.5000
Epoch 86/200
2/2 [=====] - 2s 730ms/step - loss: 0.4878 -
accuracy: 0.5000 - val_loss: 2.0770 - val_accuracy: 0.5000
Epoch 87/200
2/2 [=====] - 2s 753ms/step - loss: 0.4518 -
accuracy: 0.5000 - val_loss: 0.6067 - val_accuracy: 0.5000
Epoch 88/200
2/2 [=====] - 2s 738ms/step - loss: 0.4388 -
accuracy: 0.5000 - val_loss: 0.1759 - val_accuracy: 0.5000
Epoch 89/200
2/2 [=====] - 2s 704ms/step - loss: 0.3925 -
accuracy: 0.5000 - val_loss: 0.8724 - val_accuracy: 1.0000
Epoch 90/200
2/2 [=====] - 2s 739ms/step - loss: 0.5074 -
accuracy: 0.5000 - val_loss: 1.4369 - val_accuracy: 0.5000
Epoch 91/200
2/2 [=====] - 2s 737ms/step - loss: 0.4660 -
accuracy: 0.5000 - val_loss: 1.8336 - val_accuracy: 0.5000
Epoch 92/200
2/2 [=====] - 2s 754ms/step - loss: 0.4295 -

accuracy: 0.5000 - val_loss: 0.2892 - val_accuracy: 1.0000
Epoch 93/200
2/2 [=====] - 2s 750ms/step - loss: 0.3612 -
accuracy: 0.5000 - val_loss: 1.3742 - val_accuracy: 0.5000
Epoch 94/200
2/2 [=====] - 2s 722ms/step - loss: 0.5616 -
accuracy: 0.5000 - val_loss: 0.3222 - val_accuracy: 1.0000
Epoch 95/200
2/2 [=====] - 2s 750ms/step - loss: 0.3948 -
accuracy: 0.5000 - val_loss: 1.6713 - val_accuracy: 0.0000e+00
Epoch 96/200
2/2 [=====] - 2s 754ms/step - loss: 0.4765 -
accuracy: 0.5000 - val_loss: 0.7952 - val_accuracy: 0.5000
Epoch 97/200
2/2 [=====] - 2s 740ms/step - loss: 0.5442 -
accuracy: 0.5000 - val_loss: 0.4904 - val_accuracy: 0.5000
Epoch 98/200
2/2 [=====] - 2s 751ms/step - loss: 0.5306 -
accuracy: 0.5000 - val_loss: 0.0342 - val_accuracy: 1.0000
Epoch 99/200
2/2 [=====] - 2s 745ms/step - loss: 0.4060 -
accuracy: 0.5000 - val_loss: 0.8338 - val_accuracy: 1.0000
Epoch 100/200
2/2 [=====] - 2s 736ms/step - loss: 0.4662 -
accuracy: 0.5000 - val_loss: 2.0711 - val_accuracy: 0.5000
Epoch 101/200
2/2 [=====] - 2s 736ms/step - loss: 0.3635 -
accuracy: 0.5000 - val_loss: 0.7573 - val_accuracy: 1.0000
Epoch 102/200
2/2 [=====] - 2s 749ms/step - loss: 0.4341 -
accuracy: 0.5000 - val_loss: 0.1123 - val_accuracy: 1.0000
Epoch 103/200
2/2 [=====] - 2s 752ms/step - loss: 0.4203 -
accuracy: 0.5000 - val_loss: 1.1350 - val_accuracy: 1.0000
Epoch 104/200
2/2 [=====] - 2s 737ms/step - loss: 0.4184 -
accuracy: 0.5000 - val_loss: 0.8396 - val_accuracy: 1.0000
Epoch 105/200
2/2 [=====] - 2s 739ms/step - loss: 0.3987 -
accuracy: 0.5000 - val_loss: 5.7212e-05 - val_accuracy: 0.5000
Epoch 106/200
2/2 [=====] - 2s 827ms/step - loss: 0.2932 -
accuracy: 0.5000 - val_loss: 0.8951 - val_accuracy: 0.5000
Epoch 107/200
2/2 [=====] - 2s 722ms/step - loss: 0.4077 -
accuracy: 0.5000 - val_loss: 0.1371 - val_accuracy: 0.0000e+00
Epoch 108/200
2/2 [=====] - 2s 758ms/step - loss: 0.3917 -
accuracy: 0.5000 - val_loss: 0.6696 - val_accuracy: 0.0000e+00
Epoch 109/200

2/2 [=====] - 2s 737ms/step - loss: 0.2981 -
accuracy: 0.5000 - val_loss: 0.7057 - val_accuracy: 0.5000
Epoch 110/200
2/2 [=====] - 2s 719ms/step - loss: 0.3261 -
accuracy: 0.5000 - val_loss: 0.6753 - val_accuracy: 1.0000
Epoch 111/200
2/2 [=====] - 2s 753ms/step - loss: 0.5134 -
accuracy: 0.5000 - val_loss: 1.8543 - val_accuracy: 0.5000
Epoch 112/200
2/2 [=====] - 2s 736ms/step - loss: 0.3432 -
accuracy: 0.5000 - val_loss: 0.4613 - val_accuracy: 1.0000
Epoch 113/200
2/2 [=====] - 2s 737ms/step - loss: 0.3737 -
accuracy: 0.5000 - val_loss: 1.1759 - val_accuracy: 0.0000e+00
Epoch 114/200
2/2 [=====] - 2s 737ms/step - loss: 0.2622 -
accuracy: 0.5000 - val_loss: 0.8268 - val_accuracy: 1.0000
Epoch 115/200

2/2 [=====] - 2s 752ms/step - loss: 0.3100 -
accuracy: 0.5000 - val_loss: 4.1323 - val_accuracy: 0.0000e+00
Epoch 116/200
2/2 [=====] - 2s 740ms/step - loss: 0.4413 -
accuracy: 0.5000 - val_loss: 1.5247 - val_accuracy: 0.5000
Epoch 117/200
2/2 [=====] - 2s 769ms/step - loss: 0.3647 -
accuracy: 0.5000 - val_loss: 0.4013 - val_accuracy: 0.0000e+00
Epoch 118/200
2/2 [=====] - 2s 740ms/step - loss: 0.3163 -
accuracy: 0.5000 - val_loss: 0.1268 - val_accuracy: 0.5000
Epoch 119/200
2/2 [=====] - 2s 736ms/step - loss: 0.3223 -
accuracy: 0.5000 - val_loss: 1.7064 - val_accuracy: 0.5000
Epoch 120/200
2/2 [=====] - 2s 753ms/step - loss: 0.2346 -
accuracy: 0.5000 - val_loss: 0.4969 - val_accuracy: 0.5000
Epoch 121/200
2/2 [=====] - 2s 719ms/step - loss: 0.5336 -
accuracy: 0.5000 - val_loss: 0.2764 - val_accuracy: 0.5000
Epoch 122/200
2/2 [=====] - 2s 751ms/step - loss: 0.1880 -
accuracy: 0.5000 - val_loss: 0.5574 - val_accuracy: 1.0000
Epoch 123/200
2/2 [=====] - 2s 720ms/step - loss: 0.2872 -
accuracy: 0.5000 - val_loss: 0.0997 - val_accuracy: 0.0000e+00
Epoch 124/200
2/2 [=====] - 2s 736ms/step - loss: 0.3210 -
accuracy: 0.5000 - val_loss: 0.0126 - val_accuracy: 1.0000
Epoch 125/200
2/2 [=====] - 2s 751ms/step - loss: 0.5166 -

accuracy: 0.5000 - val_loss: 0.5229 - val_accuracy: 0.5000
Epoch 126/200
2/2 [=====] - 2s 720ms/step - loss: 0.3655 -
accuracy: 0.5000 - val_loss: 0.2434 - val_accuracy: 0.5000
Epoch 127/200
2/2 [=====] - 2s 753ms/step - loss: 0.4354 -
accuracy: 0.5000 - val_loss: 0.4168 - val_accuracy: 0.5000
Epoch 128/200
2/2 [=====] - 2s 721ms/step - loss: 0.3554 -
accuracy: 0.5000 - val_loss: 0.2995 - val_accuracy: 0.5000
Epoch 129/200
2/2 [=====] - 2s 761ms/step - loss: 0.2818 -
accuracy: 0.5000 - val_loss: 0.1250 - val_accuracy: 0.5000
Epoch 130/200
2/2 [=====] - 2s 730ms/step - loss: 0.3141 -
accuracy: 0.5000 - val_loss: 2.4288 - val_accuracy: 0.0000e+00
Epoch 131/200
2/2 [=====] - 2s 721ms/step - loss: 0.3053 -
accuracy: 0.5000 - val_loss: 1.1814 - val_accuracy: 0.5000
Epoch 132/200
2/2 [=====] - 2s 737ms/step - loss: 0.4752 -
accuracy: 0.5000 - val_loss: 0.9083 - val_accuracy: 1.0000
Epoch 133/200
2/2 [=====] - 2s 721ms/step - loss: 0.1884 -
accuracy: 0.5000 - val_loss: 0.6642 - val_accuracy: 1.0000
Epoch 134/200
2/2 [=====] - 2s 743ms/step - loss: 0.3598 -
accuracy: 0.5000 - val_loss: 0.5339 - val_accuracy: 0.5000
Epoch 135/200
2/2 [=====] - 2s 727ms/step - loss: 0.2597 -
accuracy: 0.5000 - val_loss: 0.7522 - val_accuracy: 1.0000
Epoch 136/200
2/2 [=====] - 2s 741ms/step - loss: 0.3817 -
accuracy: 0.5000 - val_loss: 0.4438 - val_accuracy: 1.0000
Epoch 137/200
2/2 [=====] - 2s 749ms/step - loss: 0.5058 -
accuracy: 0.5000 - val_loss: 2.3167 - val_accuracy: 1.0000
Epoch 138/200
2/2 [=====] - 2s 735ms/step - loss: 0.2130 -
accuracy: 0.5000 - val_loss: 0.5914 - val_accuracy: 1.0000
Epoch 139/200
2/2 [=====] - 2s 734ms/step - loss: 0.2335 -
accuracy: 0.5000 - val_loss: 0.9019 - val_accuracy: 1.0000
Epoch 140/200
2/2 [=====] - 2s 751ms/step - loss: 0.3717 -
accuracy: 0.5000 - val_loss: 1.8796 - val_accuracy: 0.5000
Epoch 141/200
2/2 [=====] - 2s 783ms/step - loss: 0.2913 -
accuracy: 0.5000 - val_loss: 0.8722 - val_accuracy: 0.0000e+00
Epoch 142/200

2/2 [=====] - 2s 777ms/step - loss: 0.1824 -
accuracy: 0.5000 - val_loss: 0.0237 - val_accuracy: 0.0000e+00
Epoch 143/200
2/2 [=====] - 2s 741ms/step - loss: 0.2682 -
accuracy: 0.5000 - val_loss: 12.1879 - val_accuracy: 0.0000e+00
Epoch 144/200
2/2 [=====] - 2s 735ms/step - loss: 0.4749 -
accuracy: 0.5000 - val_loss: 8.7366 - val_accuracy: 0.5000
Epoch 145/200
2/2 [=====] - 2s 751ms/step - loss: 0.2975 -
accuracy: 0.5000 - val_loss: 0.1629 - val_accuracy: 0.5000
Epoch 146/200
2/2 [=====] - 2s 735ms/step - loss: 0.3411 -
accuracy: 0.5000 - val_loss: 0.2202 - val_accuracy: 0.5000
Epoch 147/200
2/2 [=====] - 2s 751ms/step - loss: 0.2316 -
accuracy: 0.5000 - val_loss: 1.6089 - val_accuracy: 1.0000
Epoch 148/200
2/2 [=====] - 2s 736ms/step - loss: 0.3227 -
accuracy: 0.5000 - val_loss: 0.0285 - val_accuracy: 1.0000
Epoch 149/200
2/2 [=====] - 2s 736ms/step - loss: 0.2564 -
accuracy: 0.5000 - val_loss: 2.9079 - val_accuracy: 0.5000
Epoch 150/200
2/2 [=====] - 2s 735ms/step - loss: 0.1779 -
accuracy: 0.5000 - val_loss: 0.3709 - val_accuracy: 0.0000e+00
Epoch 151/200
2/2 [=====] - 2s 736ms/step - loss: 0.2950 -
accuracy: 0.5000 - val_loss: 2.5966 - val_accuracy: 0.0000e+00
Epoch 152/200
2/2 [=====] - 2s 740ms/step - loss: 0.2172 -
accuracy: 0.5000 - val_loss: 0.1310 - val_accuracy: 0.0000e+00
Epoch 153/200
2/2 [=====] - 2s 750ms/step - loss: 0.3409 -
accuracy: 0.5000 - val_loss: 0.4359 - val_accuracy: 0.5000
Epoch 154/200
2/2 [=====] - 2s 735ms/step - loss: 0.2041 -
accuracy: 0.5000 - val_loss: 0.7894 - val_accuracy: 0.5000
Epoch 155/200
2/2 [=====] - 2s 751ms/step - loss: 0.2049 -
accuracy: 0.5000 - val_loss: 0.6472 - val_accuracy: 1.0000
Epoch 156/200
2/2 [=====] - 2s 767ms/step - loss: 0.5462 -
accuracy: 0.5000 - val_loss: 1.0895 - val_accuracy: 0.0000e+00
Epoch 157/200
2/2 [=====] - 2s 752ms/step - loss: 0.3277 -
accuracy: 0.5000 - val_loss: 7.5659 - val_accuracy: 0.5000
Epoch 158/200
2/2 [=====] - 2s 737ms/step - loss: 0.3064 -
accuracy: 0.5000 - val_loss: 0.1443 - val_accuracy: 1.0000

Epoch 159/200
2/2 [=====] - 2s 753ms/step - loss: 0.3796 - accuracy: 0.5000 - val_loss: 1.5480 - val_accuracy: 0.5000
Epoch 160/200
2/2 [=====] - 2s 753ms/step - loss: 0.2419 - accuracy: 0.5000 - val_loss: 0.2274 - val_accuracy: 0.5000
Epoch 161/200
2/2 [=====] - 2s 736ms/step - loss: 0.3147 - accuracy: 0.5000 - val_loss: 0.0455 - val_accuracy: 0.0000e+00
Epoch 162/200
2/2 [=====] - 2s 736ms/step - loss: 0.2074 - accuracy: 0.5000 - val_loss: 1.0667 - val_accuracy: 0.5000
Epoch 163/200
2/2 [=====] - 2s 734ms/step - loss: 0.2260 - accuracy: 0.5000 - val_loss: 1.1541 - val_accuracy: 0.5000
Epoch 164/200
2/2 [=====] - 2s 755ms/step - loss: 0.3033 - accuracy: 0.5000 - val_loss: 0.7748 - val_accuracy: 0.5000
Epoch 165/200
2/2 [=====] - 2s 751ms/step - loss: 0.1730 - accuracy: 0.5000 - val_loss: 0.4486 - val_accuracy: 1.0000
Epoch 166/200
2/2 [=====] - 2s 768ms/step - loss: 0.5335 - accuracy: 0.5000 - val_loss: 0.5264 - val_accuracy: 0.5000
Epoch 167/200
2/2 [=====] - 2s 733ms/step - loss: 0.2784 - accuracy: 0.5000 - val_loss: 0.2229 - val_accuracy: 1.0000
Epoch 168/200
2/2 [=====] - 2s 753ms/step - loss: 0.3696 - accuracy: 0.5000 - val_loss: 9.8505 - val_accuracy: 0.5000
Epoch 169/200
2/2 [=====] - 2s 737ms/step - loss: 0.1148 - accuracy: 0.5000 - val_loss: 11.3584 - val_accuracy: 0.5000
Epoch 170/200
2/2 [=====] - 2s 721ms/step - loss: 0.3857 - accuracy: 0.5000 - val_loss: 0.2601 - val_accuracy: 0.5000
Epoch 171/200
2/2 [=====] - 2s 736ms/step - loss: 1.4165 - accuracy: 0.5000 - val_loss: 0.3089 - val_accuracy: 0.5000
Epoch 172/200
2/2 [=====] - 2s 734ms/step - loss: 0.2845 - accuracy: 0.5000 - val_loss: 0.8431 - val_accuracy: 0.5000
Epoch 173/200
2/2 [=====] - 2s 753ms/step - loss: 0.5114 - accuracy: 0.5000 - val_loss: 0.1308 - val_accuracy: 0.0000e+00
Epoch 174/200
2/2 [=====] - 2s 722ms/step - loss: 0.5086 - accuracy: 0.5000 - val_loss: 0.6276 - val_accuracy: 0.5000
Epoch 175/200

2/2 [=====] - 2s 737ms/step - loss: 0.4797 -
accuracy: 0.5000 - val_loss: 1.1247 - val_accuracy: 0.5000
Epoch 176/200
2/2 [=====] - 2s 752ms/step - loss: 0.2532 -
accuracy: 0.5000 - val_loss: 1.2631 - val_accuracy: 0.5000
Epoch 177/200
2/2 [=====] - 2s 732ms/step - loss: 0.3538 -
accuracy: 0.5000 - val_loss: 1.7328 - val_accuracy: 1.0000
Epoch 178/200
2/2 [=====] - 2s 850ms/step - loss: 0.4574 -
accuracy: 0.5000 - val_loss: 0.4449 - val_accuracy: 1.0000
Epoch 179/200
2/2 [=====] - 2s 745ms/step - loss: 0.4595 -
accuracy: 0.5000 - val_loss: 1.0093 - val_accuracy: 0.5000
Epoch 180/200
2/2 [=====] - 2s 723ms/step - loss: 0.4629 -
accuracy: 0.5000 - val_loss: 0.4669 - val_accuracy: 0.5000
Epoch 181/200
2/2 [=====] - 2s 824ms/step - loss: 0.3193 -
accuracy: 0.5000 - val_loss: 0.6289 - val_accuracy: 1.0000
Epoch 182/200
2/2 [=====] - 2s 871ms/step - loss: 0.4152 -
accuracy: 0.5000 - val_loss: 2.0152 - val_accuracy: 0.5000
Epoch 183/200
2/2 [=====] - 2s 857ms/step - loss: 0.6858 -
accuracy: 0.5000 - val_loss: 0.3911 - val_accuracy: 0.5000
Epoch 184/200
2/2 [=====] - 2s 839ms/step - loss: 0.3943 -
accuracy: 0.5000 - val_loss: 4.7383 - val_accuracy: 0.0000e+00
Epoch 185/200
2/2 [=====] - 2s 890ms/step - loss: 0.2466 -
accuracy: 0.5000 - val_loss: 0.0301 - val_accuracy: 1.0000
Epoch 186/200
2/2 [=====] - 2s 819ms/step - loss: 0.3717 -
accuracy: 0.5000 - val_loss: 0.3116 - val_accuracy: 0.5000
Epoch 187/200
2/2 [=====] - 2s 878ms/step - loss: 0.5276 -
accuracy: 0.5000 - val_loss: 0.0409 - val_accuracy: 0.5000
Epoch 188/200
2/2 [=====] - 2s 887ms/step - loss: 0.4445 -
accuracy: 0.5000 - val_loss: 0.3012 - val_accuracy: 1.0000
Epoch 189/200
2/2 [=====] - 2s 857ms/step - loss: 0.2480 -
accuracy: 0.5000 - val_loss: 1.1456 - val_accuracy: 0.5000
Epoch 190/200
2/2 [=====] - 2s 841ms/step - loss: 0.3862 -
accuracy: 0.5000 - val_loss: 1.4909 - val_accuracy: 0.0000e+00
Epoch 191/200
2/2 [=====] - 2s 804ms/step - loss: 0.3776 -
accuracy: 0.5000 - val_loss: 0.9064 - val_accuracy: 0.5000

```
Epoch 192/200
2/2 [=====] - 2s 799ms/step - loss: 0.3961 -
accuracy: 0.5000 - val_loss: 0.3965 - val_accuracy: 0.0000e+00
Epoch 193/200
2/2 [=====] - 2s 718ms/step - loss: 0.3257 -
accuracy: 0.5000 - val_loss: 0.3074 - val_accuracy: 1.0000
Epoch 194/200
2/2 [=====] - 2s 736ms/step - loss: 0.3142 -
accuracy: 0.5000 - val_loss: 0.5316 - val_accuracy: 0.5000
Epoch 195/200
2/2 [=====] - 2s 735ms/step - loss: 0.2814 -
accuracy: 0.5000 - val_loss: 0.4094 - val_accuracy: 0.5000
Epoch 196/200
2/2 [=====] - 2s 723ms/step - loss: 0.2738 -
accuracy: 0.5000 - val_loss: 3.1360 - val_accuracy: 0.0000e+00
Epoch 197/200
2/2 [=====] - 2s 735ms/step - loss: 0.2106 -
accuracy: 0.5000 - val_loss: 0.2294 - val_accuracy: 1.0000
Epoch 198/200
2/2 [=====] - 2s 754ms/step - loss: 0.3202 -
accuracy: 0.5000 - val_loss: 0.3592 - val_accuracy: 1.0000
Epoch 199/200
2/2 [=====] - 2s 726ms/step - loss: 0.1909 -
accuracy: 0.5000 - val_loss: 13.3379 - val_accuracy: 0.5000
Epoch 200/200
2/2 [=====] - 2s 722ms/step - loss: 0.1321 -
accuracy: 0.5000 - val_loss: 0.0204 - val_accuracy: 0.5000
```

<keras.callbacks.History at 0x294938813a0>

```
pred = model.predict_generator(test_set)
```

```
plt.subplots(4,5,figsize=(20,10))
plt.subplots_adjust(hspace=0.5)
for i in range(20):
    plt.subplot(4,5,i+1)
    img = np.squeeze(test_set[i][0])
    plt.imshow(img)
    if pred[i]==0:
        plt.title('predicted as CAT',loc='center')
    else:
        plt.title('predicted as DOG',loc='center')
    plt.axis('off')
plt.show()
```

<IPython.core.display.Javascript object>

<IPython.core.display.Javascript object>

<IPython.core.display.Javascript object>

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<IPython.core.display.Javascript object>

predicted as DOG



predicted as DOG



predicted as DOG



predicted as DOG



predicted as DOG



predicted as DOG



predicted as DOG



predicted as DOG



predicted as DOG



predicted as DOG



predicted as DOG



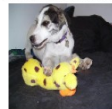
predicted as DOG



predicted as DOG



predicted as DOG



predicted as DOG



predicted as DOG



predicted as DOG



predicted as DOG



predicted as DOG



predicted as DOG



#we can see that all the images are predicted as 'DOG'

now with 300 iterations

```
model = Sequential([
    Conv2D(32,(5,5),input_shape = (128,128,3),activation = 'relu'),
    MaxPooling2D((2,2),strides = 2),
    Conv2D(64,(5,5),activation='relu'),
    MaxPooling2D((2,2),strides = 2),
    Flatten(),
    Dense(128,activation='relu'),
    Dropout(0.4),
    Dense(1,activation='softmax')
])

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

model.fit_generator(train_set , steps_per_epoch = train_set.n//16,
epochs = 300 , validation_data =test_set ,validation_steps =
valid_set.n//4 )

Epoch 1/300
2/2 [=====] - 4s 995ms/step - loss: 1.7291 -
accuracy: 0.5000 - val_loss: 0.3581 - val_accuracy: 1.0000
Epoch 2/300
2/2 [=====] - 2s 739ms/step - loss: 0.8083 -
accuracy: 0.5000 - val_loss: 0.7246 - val_accuracy: 0.5000
Epoch 3/300
2/2 [=====] - 2s 722ms/step - loss: 0.7114 -
accuracy: 0.5000 - val_loss: 0.6937 - val_accuracy: 0.5000
Epoch 4/300
2/2 [=====] - 2s 741ms/step - loss: 0.6936 -
accuracy: 0.5000 - val_loss: 0.6720 - val_accuracy: 0.0000e+00
Epoch 5/300
2/2 [=====] - 2s 736ms/step - loss: 0.6906 -
accuracy: 0.5000 - val_loss: 0.6929 - val_accuracy: 0.5000
Epoch 6/300
2/2 [=====] - 2s 735ms/step - loss: 0.6861 -
accuracy: 0.5000 - val_loss: 0.6967 - val_accuracy: 0.5000
Epoch 7/300
2/2 [=====] - 2s 753ms/step - loss: 0.6828 -
accuracy: 0.5000 - val_loss: 0.6945 - val_accuracy: 0.0000e+00
Epoch 8/300
2/2 [=====] - 2s 726ms/step - loss: 0.6868 -
accuracy: 0.5000 - val_loss: 0.5974 - val_accuracy: 0.5000
Epoch 9/300
2/2 [=====] - 2s 735ms/step - loss: 0.6861 -
accuracy: 0.5000 - val_loss: 0.6925 - val_accuracy: 0.5000
Epoch 10/300
```


2/2 [=====] - 2s 720ms/step - loss: 0.6827 -
accuracy: 0.5000 - val_loss: 0.6938 - val_accuracy: 0.5000
Epoch 11/300
2/2 [=====] - 2s 764ms/step - loss: 0.6815 -
accuracy: 0.5000 - val_loss: 0.6927 - val_accuracy: 1.0000
Epoch 12/300
2/2 [=====] - 2s 761ms/step - loss: 0.6787 -
accuracy: 0.5000 - val_loss: 0.6942 - val_accuracy: 1.0000
Epoch 13/300
2/2 [=====] - 2s 768ms/step - loss: 0.6668 -
accuracy: 0.5000 - val_loss: 0.6725 - val_accuracy: 1.0000
Epoch 14/300
2/2 [=====] - 2s 829ms/step - loss: 0.6594 -
accuracy: 0.5000 - val_loss: 0.4088 - val_accuracy: 0.0000e+00
Epoch 15/300
2/2 [=====] - 2s 712ms/step - loss: 0.6985 -
accuracy: 0.5000 - val_loss: 0.3854 - val_accuracy: 0.0000e+00
Epoch 16/300
2/2 [=====] - 2s 738ms/step - loss: 0.7300 -
accuracy: 0.5000 - val_loss: 0.6831 - val_accuracy: 0.5000
Epoch 17/300
2/2 [=====] - 2s 736ms/step - loss: 0.6945 -
accuracy: 0.5000 - val_loss: 0.6867 - val_accuracy: 0.5000
Epoch 18/300
2/2 [=====] - 2s 737ms/step - loss: 0.6683 -
accuracy: 0.5000 - val_loss: 0.7571 - val_accuracy: 1.0000
Epoch 19/300
2/2 [=====] - 2s 729ms/step - loss: 0.6670 -
accuracy: 0.5000 - val_loss: 0.5870 - val_accuracy: 0.0000e+00
Epoch 20/300
2/2 [=====] - 2s 721ms/step - loss: 0.6871 -
accuracy: 0.5000 - val_loss: 0.6793 - val_accuracy: 0.5000
Epoch 21/300
2/2 [=====] - 2s 737ms/step - loss: 0.6758 -
accuracy: 0.5000 - val_loss: 0.6735 - val_accuracy: 0.0000e+00
Epoch 22/300
2/2 [=====] - 2s 748ms/step - loss: 0.6942 -
accuracy: 0.5000 - val_loss: 0.6696 - val_accuracy: 0.5000
Epoch 23/300
2/2 [=====] - 2s 767ms/step - loss: 0.6711 -
accuracy: 0.5000 - val_loss: 0.7683 - val_accuracy: 0.5000
Epoch 24/300
2/2 [=====] - 2s 723ms/step - loss: 0.6631 -
accuracy: 0.5000 - val_loss: 0.7690 - val_accuracy: 0.0000e+00
Epoch 25/300
2/2 [=====] - 2s 769ms/step - loss: 0.6537 -
accuracy: 0.5000 - val_loss: 0.6830 - val_accuracy: 0.5000
Epoch 26/300
2/2 [=====] - 2s 755ms/step - loss: 0.6476 -
accuracy: 0.5000 - val_loss: 0.6298 - val_accuracy: 0.5000

Epoch 27/300
2/2 [=====] - 2s 755ms/step - loss: 0.6454 -
accuracy: 0.5000 - val_loss: 0.7055 - val_accuracy: 0.5000
Epoch 28/300
2/2 [=====] - 2s 954ms/step - loss: 0.6674 -
accuracy: 0.5000 - val_loss: 0.9013 - val_accuracy: 0.5000
Epoch 29/300
2/2 [=====] - 2s 754ms/step - loss: 0.6881 -
accuracy: 0.5000 - val_loss: 0.6661 - val_accuracy: 1.0000
Epoch 30/300
2/2 [=====] - 2s 839ms/step - loss: 0.6614 -
accuracy: 0.5000 - val_loss: 0.7396 - val_accuracy: 0.5000
Epoch 31/300
2/2 [=====] - 2s 762ms/step - loss: 0.6573 -
accuracy: 0.5000 - val_loss: 0.5843 - val_accuracy: 1.0000
Epoch 32/300
2/2 [=====] - 2s 738ms/step - loss: 0.6432 -
accuracy: 0.5000 - val_loss: 0.9227 - val_accuracy: 0.5000
Epoch 33/300
2/2 [=====] - 2s 770ms/step - loss: 0.6337 -
accuracy: 0.5000 - val_loss: 0.7262 - val_accuracy: 0.0000e+00
Epoch 34/300
2/2 [=====] - 2s 750ms/step - loss: 0.6370 -
accuracy: 0.5000 - val_loss: 0.6504 - val_accuracy: 0.5000
Epoch 35/300
2/2 [=====] - 2s 751ms/step - loss: 0.6118 -
accuracy: 0.5000 - val_loss: 0.5561 - val_accuracy: 1.0000
Epoch 36/300
2/2 [=====] - 2s 754ms/step - loss: 0.6020 -
accuracy: 0.5000 - val_loss: 0.5889 - val_accuracy: 0.5000
Epoch 37/300
2/2 [=====] - 2s 766ms/step - loss: 0.5917 -
accuracy: 0.5000 - val_loss: 0.6574 - val_accuracy: 0.5000
Epoch 38/300
2/2 [=====] - 2s 774ms/step - loss: 0.5931 -
accuracy: 0.5000 - val_loss: 0.6682 - val_accuracy: 1.0000
Epoch 39/300
2/2 [=====] - 2s 740ms/step - loss: 0.5700 -
accuracy: 0.5000 - val_loss: 0.9838 - val_accuracy: 0.5000
Epoch 40/300
2/2 [=====] - 2s 749ms/step - loss: 0.5995 -
accuracy: 0.5000 - val_loss: 0.4876 - val_accuracy: 0.5000
Epoch 41/300
2/2 [=====] - 2s 817ms/step - loss: 0.6346 -
accuracy: 0.5000 - val_loss: 0.7025 - val_accuracy: 0.0000e+00
Epoch 42/300
2/2 [=====] - 2s 757ms/step - loss: 0.5980 -
accuracy: 0.5000 - val_loss: 0.5051 - val_accuracy: 0.0000e+00
Epoch 43/300
2/2 [=====] - 2s 754ms/step - loss: 0.6087 -

accuracy: 0.5000 - val_loss: 0.8283 - val_accuracy: 0.0000e+00
Epoch 44/300
2/2 [=====] - 2s 768ms/step - loss: 0.6563 -
accuracy: 0.5000 - val_loss: 0.9115 - val_accuracy: 0.5000
Epoch 45/300
2/2 [=====] - 2s 748ms/step - loss: 0.6337 -
accuracy: 0.5000 - val_loss: 0.6898 - val_accuracy: 0.5000
Epoch 46/300
2/2 [=====] - 2s 765ms/step - loss: 0.6004 -
accuracy: 0.5000 - val_loss: 0.7139 - val_accuracy: 0.0000e+00
Epoch 47/300
2/2 [=====] - 2s 723ms/step - loss: 0.6194 -
accuracy: 0.5000 - val_loss: 0.1557 - val_accuracy: 0.5000
Epoch 48/300
2/2 [=====] - 2s 720ms/step - loss: 0.6343 -
accuracy: 0.5000 - val_loss: 1.4137 - val_accuracy: 0.0000e+00
Epoch 49/300
2/2 [=====] - 2s 752ms/step - loss: 0.5643 -
accuracy: 0.5000 - val_loss: 0.4101 - val_accuracy: 0.5000
Epoch 50/300
2/2 [=====] - 2s 728ms/step - loss: 0.6629 -
accuracy: 0.5000 - val_loss: 0.7035 - val_accuracy: 0.5000
Epoch 51/300
2/2 [=====] - 2s 770ms/step - loss: 0.5844 -
accuracy: 0.5000 - val_loss: 0.9554 - val_accuracy: 0.5000
Epoch 52/300
2/2 [=====] - 2s 782ms/step - loss: 0.6170 -
accuracy: 0.5000 - val_loss: 0.6202 - val_accuracy: 1.0000
Epoch 53/300
2/2 [=====] - 2s 751ms/step - loss: 0.5688 -
accuracy: 0.5000 - val_loss: 0.5786 - val_accuracy: 0.5000
Epoch 54/300
2/2 [=====] - 2s 738ms/step - loss: 0.5921 -
accuracy: 0.5000 - val_loss: 0.6559 - val_accuracy: 0.0000e+00
Epoch 55/300
2/2 [=====] - 2s 736ms/step - loss: 0.5589 -
accuracy: 0.5000 - val_loss: 0.3266 - val_accuracy: 1.0000
Epoch 56/300
2/2 [=====] - 2s 736ms/step - loss: 0.5659 -
accuracy: 0.5000 - val_loss: 0.1657 - val_accuracy: 1.0000
Epoch 57/300
2/2 [=====] - 2s 736ms/step - loss: 0.5543 -
accuracy: 0.5000 - val_loss: 0.5053 - val_accuracy: 0.5000
Epoch 58/300
2/2 [=====] - 2s 735ms/step - loss: 0.5659 -
accuracy: 0.5000 - val_loss: 0.3599 - val_accuracy: 0.5000
Epoch 59/300
2/2 [=====] - 2s 906ms/step - loss: 0.5865 -
accuracy: 0.5000 - val_loss: 0.8487 - val_accuracy: 0.0000e+00

Epoch 60/300
2/2 [=====] - 2s 728ms/step - loss: 0.5663 -
accuracy: 0.5000 - val_loss: 0.7269 - val_accuracy: 1.0000
Epoch 61/300
2/2 [=====] - 2s 719ms/step - loss: 0.6254 -
accuracy: 0.5000 - val_loss: 0.5331 - val_accuracy: 0.5000
Epoch 62/300
2/2 [=====] - 2s 720ms/step - loss: 0.5527 -
accuracy: 0.5000 - val_loss: 0.4433 - val_accuracy: 0.5000
Epoch 63/300
2/2 [=====] - 2s 734ms/step - loss: 0.5162 -
accuracy: 0.5000 - val_loss: 0.0383 - val_accuracy: 0.5000
Epoch 64/300
2/2 [=====] - 2s 735ms/step - loss: 0.5184 -
accuracy: 0.5000 - val_loss: 1.3437 - val_accuracy: 0.0000e+00
Epoch 65/300
2/2 [=====] - 2s 735ms/step - loss: 0.6626 -
accuracy: 0.5000 - val_loss: 0.9144 - val_accuracy: 0.0000e+00
Epoch 66/300
2/2 [=====] - 2s 720ms/step - loss: 0.6115 -
accuracy: 0.5000 - val_loss: 0.7216 - val_accuracy: 0.0000e+00
Epoch 67/300
2/2 [=====] - 2s 718ms/step - loss: 0.5479 -
accuracy: 0.5000 - val_loss: 0.6948 - val_accuracy: 0.5000
Epoch 68/300
2/2 [=====] - 2s 720ms/step - loss: 0.5618 -
accuracy: 0.5000 - val_loss: 0.6703 - val_accuracy: 0.0000e+00
Epoch 69/300
2/2 [=====] - 2s 754ms/step - loss: 0.5914 -
accuracy: 0.5000 - val_loss: 0.6697 - val_accuracy: 0.0000e+00
Epoch 70/300
2/2 [=====] - 2s 720ms/step - loss: 0.5709 -
accuracy: 0.5000 - val_loss: 2.8251 - val_accuracy: 0.5000
Epoch 71/300
2/2 [=====] - 2s 735ms/step - loss: 0.5710 -
accuracy: 0.5000 - val_loss: 0.9050 - val_accuracy: 1.0000
Epoch 72/300
2/2 [=====] - 2s 735ms/step - loss: 0.5749 -
accuracy: 0.5000 - val_loss: 0.7176 - val_accuracy: 0.0000e+00
Epoch 73/300
2/2 [=====] - 2s 737ms/step - loss: 0.5576 -
accuracy: 0.5000 - val_loss: 0.3451 - val_accuracy: 1.0000
Epoch 74/300
2/2 [=====] - 2s 736ms/step - loss: 0.5296 -
accuracy: 0.5000 - val_loss: 0.3537 - val_accuracy: 0.5000
Epoch 75/300
2/2 [=====] - 2s 719ms/step - loss: 0.5090 -
accuracy: 0.5000 - val_loss: 0.3799 - val_accuracy: 0.0000e+00
Epoch 76/300
2/2 [=====] - 2s 723ms/step - loss: 0.5658 -

accuracy: 0.5000 - val_loss: 0.3298 - val_accuracy: 0.5000
Epoch 77/300
2/2 [=====] - 2s 734ms/step - loss: 0.4885 -
accuracy: 0.5000 - val_loss: 0.7946 - val_accuracy: 0.5000
Epoch 78/300
2/2 [=====] - 2s 747ms/step - loss: 0.4339 -
accuracy: 0.5000 - val_loss: 0.3185 - val_accuracy: 0.5000
Epoch 79/300
2/2 [=====] - 2s 753ms/step - loss: 0.5078 -
accuracy: 0.5000 - val_loss: 0.2209 - val_accuracy: 0.0000e+00
Epoch 80/300
2/2 [=====] - 2s 735ms/step - loss: 0.4179 -
accuracy: 0.5000 - val_loss: 0.6304 - val_accuracy: 0.5000
Epoch 81/300
2/2 [=====] - 2s 734ms/step - loss: 0.5129 -
accuracy: 0.5000 - val_loss: 0.3940 - val_accuracy: 0.5000
Epoch 82/300
2/2 [=====] - 2s 753ms/step - loss: 0.4638 -
accuracy: 0.5000 - val_loss: 0.0816 - val_accuracy: 1.0000
Epoch 83/300
2/2 [=====] - 2s 736ms/step - loss: 0.5081 -
accuracy: 0.5000 - val_loss: 0.4208 - val_accuracy: 0.5000
Epoch 84/300
2/2 [=====] - 2s 751ms/step - loss: 0.6434 -
accuracy: 0.5000 - val_loss: 0.6470 - val_accuracy: 0.5000
Epoch 85/300
2/2 [=====] - 2s 734ms/step - loss: 0.5963 -
accuracy: 0.5000 - val_loss: 0.9445 - val_accuracy: 1.0000
Epoch 86/300
2/2 [=====] - 2s 721ms/step - loss: 0.6534 -
accuracy: 0.5000 - val_loss: 0.3235 - val_accuracy: 0.0000e+00
Epoch 87/300
2/2 [=====] - 2s 717ms/step - loss: 0.5310 -
accuracy: 0.5000 - val_loss: 1.0097 - val_accuracy: 0.5000
Epoch 88/300
2/2 [=====] - 2s 736ms/step - loss: 0.5628 -
accuracy: 0.5000 - val_loss: 0.6391 - val_accuracy: 0.0000e+00
Epoch 89/300
2/2 [=====] - 2s 718ms/step - loss: 0.5280 -
accuracy: 0.5000 - val_loss: 0.7604 - val_accuracy: 0.0000e+00
Epoch 90/300
2/2 [=====] - 2s 750ms/step - loss: 0.5870 -
accuracy: 0.5000 - val_loss: 0.6793 - val_accuracy: 0.5000
Epoch 91/300
2/2 [=====] - 2s 760ms/step - loss: 0.4918 -
accuracy: 0.5000 - val_loss: 0.4095 - val_accuracy: 1.0000
Epoch 92/300
2/2 [=====] - 2s 748ms/step - loss: 0.4764 -
accuracy: 0.5000 - val_loss: 0.6649 - val_accuracy: 0.5000
Epoch 93/300

2/2 [=====] - 2s 751ms/step - loss: 0.4885 -
accuracy: 0.5000 - val_loss: 0.3390 - val_accuracy: 0.5000
Epoch 94/300
2/2 [=====] - 2s 752ms/step - loss: 0.4342 -
accuracy: 0.5000 - val_loss: 0.5366 - val_accuracy: 0.5000
Epoch 95/300
2/2 [=====] - 2s 732ms/step - loss: 0.5183 -
accuracy: 0.5000 - val_loss: 0.4208 - val_accuracy: 0.5000
Epoch 96/300
2/2 [=====] - 2s 750ms/step - loss: 0.4301 -
accuracy: 0.5000 - val_loss: 0.4148 - val_accuracy: 0.5000
Epoch 97/300
2/2 [=====] - 2s 735ms/step - loss: 0.4648 -
accuracy: 0.5000 - val_loss: 0.6729 - val_accuracy: 0.5000
Epoch 98/300
2/2 [=====] - 2s 752ms/step - loss: 0.5462 -
accuracy: 0.5000 - val_loss: 0.0145 - val_accuracy: 1.0000
Epoch 99/300
2/2 [=====] - 2s 748ms/step - loss: 0.5091 -
accuracy: 0.5000 - val_loss: 0.4399 - val_accuracy: 0.0000e+00
Epoch 100/300
2/2 [=====] - 2s 752ms/step - loss: 0.5158 -
accuracy: 0.5000 - val_loss: 0.4712 - val_accuracy: 0.5000
Epoch 101/300
2/2 [=====] - 2s 736ms/step - loss: 0.5310 -
accuracy: 0.5000 - val_loss: 0.2899 - val_accuracy: 0.5000
Epoch 102/300
2/2 [=====] - 2s 801ms/step - loss: 0.5474 -
accuracy: 0.5000 - val_loss: 0.6836 - val_accuracy: 0.5000
Epoch 103/300
2/2 [=====] - 2s 750ms/step - loss: 0.4688 -
accuracy: 0.5000 - val_loss: 0.3115 - val_accuracy: 0.0000e+00
Epoch 104/300
2/2 [=====] - 2s 733ms/step - loss: 0.4680 -
accuracy: 0.5000 - val_loss: 3.2768 - val_accuracy: 1.0000
Epoch 105/300
2/2 [=====] - 2s 760ms/step - loss: 0.4842 -
accuracy: 0.5000 - val_loss: 0.5236 - val_accuracy: 0.0000e+00
Epoch 106/300
2/2 [=====] - 2s 738ms/step - loss: 0.4945 -
accuracy: 0.5000 - val_loss: 0.6547 - val_accuracy: 0.5000
Epoch 107/300
2/2 [=====] - 2s 736ms/step - loss: 0.4227 -
accuracy: 0.5000 - val_loss: 0.2037 - val_accuracy: 0.0000e+00
Epoch 108/300
2/2 [=====] - 2s 751ms/step - loss: 0.4470 -
accuracy: 0.5000 - val_loss: 1.3067 - val_accuracy: 0.0000e+00
Epoch 109/300
2/2 [=====] - 2s 745ms/step - loss: 0.5338 -
accuracy: 0.5000 - val_loss: 3.8221 - val_accuracy: 1.0000

Epoch 110/300
2/2 [=====] - 2s 761ms/step - loss: 0.3792 - accuracy: 0.5000 - val_loss: 0.6140 - val_accuracy: 0.0000e+00
Epoch 111/300
2/2 [=====] - 2s 786ms/step - loss: 0.5681 - accuracy: 0.5000 - val_loss: 0.6494 - val_accuracy: 0.5000
Epoch 112/300
2/2 [=====] - 2s 1s/step - loss: 0.4688 - accuracy: 0.5000 - val_loss: 0.3006 - val_accuracy: 0.5000
Epoch 113/300
2/2 [=====] - 2s 968ms/step - loss: 0.4599 - accuracy: 0.5000 - val_loss: 0.2305 - val_accuracy: 0.5000
Epoch 114/300
2/2 [=====] - 2s 926ms/step - loss: 0.4799 - accuracy: 0.5000 - val_loss: 0.1568 - val_accuracy: 0.0000e+00
Epoch 115/300
2/2 [=====] - 2s 845ms/step - loss: 0.4594 - accuracy: 0.5000 - val_loss: 0.7033 - val_accuracy: 0.5000
Epoch 116/300
2/2 [=====] - 2s 935ms/step - loss: 0.5704 - accuracy: 0.5000 - val_loss: 0.8025 - val_accuracy: 1.0000
Epoch 117/300
2/2 [=====] - 2s 867ms/step - loss: 0.5628 - accuracy: 0.5000 - val_loss: 0.7225 - val_accuracy: 0.5000
Epoch 118/300
2/2 [=====] - 2s 768ms/step - loss: 0.6300 - accuracy: 0.5000 - val_loss: 0.7057 - val_accuracy: 0.5000
Epoch 119/300
2/2 [=====] - 2s 772ms/step - loss: 0.5591 - accuracy: 0.5000 - val_loss: 0.7039 - val_accuracy: 0.5000
Epoch 120/300
2/2 [=====] - 2s 859ms/step - loss: 0.5721 - accuracy: 0.5000 - val_loss: 0.8570 - val_accuracy: 1.0000
Epoch 121/300
2/2 [=====] - 2s 823ms/step - loss: 0.5681 - accuracy: 0.5000 - val_loss: 0.7160 - val_accuracy: 0.5000
Epoch 122/300
2/2 [=====] - 2s 753ms/step - loss: 0.5550 - accuracy: 0.5000 - val_loss: 1.4510 - val_accuracy: 0.5000
Epoch 123/300
2/2 [=====] - 2s 768ms/step - loss: 0.5792 - accuracy: 0.5000 - val_loss: 0.5607 - val_accuracy: 0.5000
Epoch 124/300
2/2 [=====] - 2s 734ms/step - loss: 0.5031 - accuracy: 0.5000 - val_loss: 0.9527 - val_accuracy: 1.0000
Epoch 125/300
2/2 [=====] - 2s 785ms/step - loss: 0.5032 - accuracy: 0.5000 - val_loss: 2.0341 - val_accuracy: 1.0000
Epoch 126/300

2/2 [=====] - 2s 757ms/step - loss: 0.4750 -
accuracy: 0.5000 - val_loss: 2.4804 - val_accuracy: 1.0000
Epoch 127/300
2/2 [=====] - 2s 722ms/step - loss: 0.5146 -
accuracy: 0.5000 - val_loss: 0.5031 - val_accuracy: 0.0000e+00
Epoch 128/300
2/2 [=====] - 2s 720ms/step - loss: 0.6134 -
accuracy: 0.5000 - val_loss: 4.8143 - val_accuracy: 1.0000
Epoch 129/300
2/2 [=====] - 2s 720ms/step - loss: 0.4626 -
accuracy: 0.5000 - val_loss: 6.8393 - val_accuracy: 0.5000
Epoch 130/300
2/2 [=====] - 2s 735ms/step - loss: 0.6038 -
accuracy: 0.5000 - val_loss: 0.8055 - val_accuracy: 0.5000
Epoch 131/300
2/2 [=====] - 2s 734ms/step - loss: 0.5530 -
accuracy: 0.5000 - val_loss: 0.8590 - val_accuracy: 0.5000
Epoch 132/300
2/2 [=====] - 2s 735ms/step - loss: 0.5262 -
accuracy: 0.5000 - val_loss: 0.0034 - val_accuracy: 0.5000
Epoch 133/300
2/2 [=====] - 2s 736ms/step - loss: 0.5596 -
accuracy: 0.5000 - val_loss: 0.9493 - val_accuracy: 0.5000
Epoch 134/300
2/2 [=====] - 2s 768ms/step - loss: 0.5248 -
accuracy: 0.5000 - val_loss: 0.5076 - val_accuracy: 0.5000
Epoch 135/300
2/2 [=====] - 2s 777ms/step - loss: 0.4941 -
accuracy: 0.5000 - val_loss: 0.3715 - val_accuracy: 0.5000
Epoch 136/300
2/2 [=====] - 2s 763ms/step - loss: 0.5334 -
accuracy: 0.5000 - val_loss: 0.4013 - val_accuracy: 0.5000
Epoch 137/300
2/2 [=====] - 2s 737ms/step - loss: 0.6476 -
accuracy: 0.5000 - val_loss: 0.3063 - val_accuracy: 1.0000
Epoch 138/300
2/2 [=====] - 2s 722ms/step - loss: 0.5130 -
accuracy: 0.5000 - val_loss: 0.5915 - val_accuracy: 0.0000e+00
Epoch 139/300
2/2 [=====] - 2s 721ms/step - loss: 0.4664 -
accuracy: 0.5000 - val_loss: 0.8988 - val_accuracy: 1.0000
Epoch 140/300
2/2 [=====] - 2s 726ms/step - loss: 0.5021 -
accuracy: 0.5000 - val_loss: 7.1043 - val_accuracy: 0.0000e+00
Epoch 141/300
2/2 [=====] - 2s 735ms/step - loss: 0.4759 -
accuracy: 0.5000 - val_loss: 0.4198 - val_accuracy: 1.0000
Epoch 142/300
2/2 [=====] - 2s 735ms/step - loss: 0.5515 -
accuracy: 0.5000 - val_loss: 10.0731 - val_accuracy: 0.0000e+00

Epoch 143/300
2/2 [=====] - 2s 735ms/step - loss: 0.4721 - accuracy: 0.5000 - val_loss: 1.0877 - val_accuracy: 0.5000
Epoch 144/300
2/2 [=====] - 2s 735ms/step - loss: 0.4893 - accuracy: 0.5000 - val_loss: 0.5810 - val_accuracy: 0.0000e+00
Epoch 145/300
2/2 [=====] - 2s 719ms/step - loss: 0.4651 - accuracy: 0.5000 - val_loss: 2.2797 - val_accuracy: 0.5000
Epoch 146/300
2/2 [=====] - 2s 752ms/step - loss: 0.5183 - accuracy: 0.5000 - val_loss: 1.1249 - val_accuracy: 0.5000
Epoch 147/300
2/2 [=====] - 2s 720ms/step - loss: 0.4918 - accuracy: 0.5000 - val_loss: 12.4625 - val_accuracy: 0.5000
Epoch 148/300
2/2 [=====] - 2s 735ms/step - loss: 0.5602 - accuracy: 0.5000 - val_loss: 0.3547 - val_accuracy: 0.0000e+00
Epoch 149/300
2/2 [=====] - 2s 733ms/step - loss: 0.4259 - accuracy: 0.5000 - val_loss: 0.3737 - val_accuracy: 1.0000
Epoch 150/300
2/2 [=====] - 2s 736ms/step - loss: 0.5383 - accuracy: 0.5000 - val_loss: 0.0709 - val_accuracy: 1.0000
Epoch 151/300
2/2 [=====] - 2s 734ms/step - loss: 0.4847 - accuracy: 0.5000 - val_loss: 0.4580 - val_accuracy: 1.0000
Epoch 152/300
2/2 [=====] - 2s 753ms/step - loss: 0.5014 - accuracy: 0.5000 - val_loss: 0.5470 - val_accuracy: 0.0000e+00
Epoch 153/300
2/2 [=====] - 2s 736ms/step - loss: 0.5128 - accuracy: 0.5000 - val_loss: 1.0010 - val_accuracy: 0.5000
Epoch 154/300
2/2 [=====] - 2s 753ms/step - loss: 0.5071 - accuracy: 0.5000 - val_loss: 0.6117 - val_accuracy: 1.0000
Epoch 155/300
2/2 [=====] - 2s 721ms/step - loss: 0.5449 - accuracy: 0.5000 - val_loss: 0.8482 - val_accuracy: 1.0000
Epoch 156/300
2/2 [=====] - 2s 737ms/step - loss: 0.4277 - accuracy: 0.5000 - val_loss: 0.2975 - val_accuracy: 0.5000
Epoch 157/300
2/2 [=====] - 2s 736ms/step - loss: 0.5078 - accuracy: 0.5000 - val_loss: 0.8493 - val_accuracy: 0.0000e+00
Epoch 158/300
2/2 [=====] - 2s 736ms/step - loss: 0.4800 - accuracy: 0.5000 - val_loss: 0.8522 - val_accuracy: 1.0000
Epoch 159/300
2/2 [=====] - 2s 718ms/step - loss: 0.4915 -

accuracy: 0.5000 - val_loss: 0.8503 - val_accuracy: 1.0000
Epoch 160/300
2/2 [=====] - 2s 750ms/step - loss: 0.5228 -
accuracy: 0.5000 - val_loss: 0.7243 - val_accuracy: 0.5000
Epoch 161/300
2/2 [=====] - 2s 737ms/step - loss: 0.5700 -
accuracy: 0.5000 - val_loss: 0.4301 - val_accuracy: 1.0000
Epoch 162/300
2/2 [=====] - 2s 735ms/step - loss: 0.4738 -
accuracy: 0.5000 - val_loss: 1.2952 - val_accuracy: 0.5000
Epoch 163/300
2/2 [=====] - 2s 750ms/step - loss: 0.4886 -
accuracy: 0.5000 - val_loss: 0.3832 - val_accuracy: 0.5000
Epoch 164/300
2/2 [=====] - 2s 750ms/step - loss: 0.4903 -
accuracy: 0.5000 - val_loss: 0.1934 - val_accuracy: 0.5000
Epoch 165/300
2/2 [=====] - 2s 751ms/step - loss: 0.4802 -
accuracy: 0.5000 - val_loss: 0.7285 - val_accuracy: 0.5000
Epoch 166/300
2/2 [=====] - 2s 735ms/step - loss: 0.5701 -
accuracy: 0.5000 - val_loss: 0.3781 - val_accuracy: 1.0000
Epoch 167/300
2/2 [=====] - 2s 774ms/step - loss: 0.4702 -
accuracy: 0.5000 - val_loss: 0.5060 - val_accuracy: 0.5000
Epoch 168/300
2/2 [=====] - 2s 754ms/step - loss: 0.4714 -
accuracy: 0.5000 - val_loss: 0.6474 - val_accuracy: 0.5000
Epoch 169/300
2/2 [=====] - 2s 743ms/step - loss: 0.4669 -
accuracy: 0.5000 - val_loss: 0.7456 - val_accuracy: 0.5000
Epoch 170/300
2/2 [=====] - 2s 753ms/step - loss: 0.4334 -
accuracy: 0.5000 - val_loss: 0.5742 - val_accuracy: 0.0000e+00
Epoch 171/300
2/2 [=====] - 2s 734ms/step - loss: 0.4820 -
accuracy: 0.5000 - val_loss: 0.7148 - val_accuracy: 0.5000
Epoch 172/300
2/2 [=====] - 2s 769ms/step - loss: 0.4028 -
accuracy: 0.5000 - val_loss: 1.1570 - val_accuracy: 0.0000e+00
Epoch 173/300
2/2 [=====] - 2s 744ms/step - loss: 0.4869 -
accuracy: 0.5000 - val_loss: 1.2213 - val_accuracy: 0.5000
Epoch 174/300
2/2 [=====] - 2s 756ms/step - loss: 0.4829 -
accuracy: 0.5000 - val_loss: 1.4359 - val_accuracy: 0.5000
Epoch 175/300
2/2 [=====] - 2s 755ms/step - loss: 0.4026 -
accuracy: 0.5000 - val_loss: 0.1410 - val_accuracy: 1.0000

Epoch 176/300
2/2 [=====] - 2s 736ms/step - loss: 0.5601 - accuracy: 0.5000 - val_loss: 0.2781 - val_accuracy: 0.5000
Epoch 177/300
2/2 [=====] - 2s 752ms/step - loss: 0.5217 - accuracy: 0.5000 - val_loss: 0.4513 - val_accuracy: 0.5000
Epoch 178/300
2/2 [=====] - 2s 736ms/step - loss: 0.4281 - accuracy: 0.5000 - val_loss: 0.7656 - val_accuracy: 0.5000
Epoch 179/300
2/2 [=====] - 2s 720ms/step - loss: 0.4830 - accuracy: 0.5000 - val_loss: 1.0725 - val_accuracy: 0.5000
Epoch 180/300
2/2 [=====] - 2s 726ms/step - loss: 0.5100 - accuracy: 0.5000 - val_loss: 0.0844 - val_accuracy: 1.0000
Epoch 181/300
2/2 [=====] - 2s 770ms/step - loss: 0.4188 - accuracy: 0.5000 - val_loss: 12.3657 - val_accuracy: 0.5000
Epoch 182/300
2/2 [=====] - 2s 735ms/step - loss: 0.4495 - accuracy: 0.5000 - val_loss: 0.5580 - val_accuracy: 0.0000e+00
Epoch 183/300
2/2 [=====] - 2s 750ms/step - loss: 0.4455 - accuracy: 0.5000 - val_loss: 0.3826 - val_accuracy: 0.5000
Epoch 184/300
2/2 [=====] - 2s 750ms/step - loss: 0.4288 - accuracy: 0.5000 - val_loss: 0.6265 - val_accuracy: 0.5000
Epoch 185/300
2/2 [=====] - 2s 734ms/step - loss: 0.4637 - accuracy: 0.5000 - val_loss: 2.5035e-04 - val_accuracy: 1.0000
Epoch 186/300
2/2 [=====] - 2s 740ms/step - loss: 0.4846 - accuracy: 0.5000 - val_loss: 1.3084 - val_accuracy: 0.0000e+00
Epoch 187/300
2/2 [=====] - 2s 750ms/step - loss: 0.4004 - accuracy: 0.5000 - val_loss: 0.1890 - val_accuracy: 0.5000
Epoch 188/300
2/2 [=====] - 2s 776ms/step - loss: 0.3752 - accuracy: 0.5000 - val_loss: 0.6577 - val_accuracy: 0.5000
Epoch 189/300
2/2 [=====] - 2s 753ms/step - loss: 0.4365 - accuracy: 0.5000 - val_loss: 14.1023 - val_accuracy: 0.5000
Epoch 190/300
2/2 [=====] - 2s 737ms/step - loss: 0.4826 - accuracy: 0.5000 - val_loss: 0.6994 - val_accuracy: 1.0000
Epoch 191/300
2/2 [=====] - 2s 773ms/step - loss: 0.3772 - accuracy: 0.5000 - val_loss: 0.9560 - val_accuracy: 0.0000e+00
Epoch 192/300
2/2 [=====] - 2s 766ms/step - loss: 0.4586 -

accuracy: 0.5000 - val_loss: 0.8835 - val_accuracy: 0.5000
Epoch 193/300
2/2 [=====] - 2s 783ms/step - loss: 0.3504 -
accuracy: 0.5000 - val_loss: 0.2389 - val_accuracy: 0.5000
Epoch 194/300
2/2 [=====] - 2s 762ms/step - loss: 0.3279 -
accuracy: 0.5000 - val_loss: 0.1407 - val_accuracy: 1.0000
Epoch 195/300
2/2 [=====] - 2s 745ms/step - loss: 0.4030 -
accuracy: 0.5000 - val_loss: 0.2902 - val_accuracy: 0.0000e+00
Epoch 196/300
2/2 [=====] - 2s 780ms/step - loss: 0.3795 -
accuracy: 0.5000 - val_loss: 1.9773 - val_accuracy: 0.5000
Epoch 197/300
2/2 [=====] - 2s 764ms/step - loss: 0.2822 -
accuracy: 0.5000 - val_loss: 0.8899 - val_accuracy: 0.0000e+00
Epoch 198/300
2/2 [=====] - 2s 753ms/step - loss: 0.5035 -
accuracy: 0.5000 - val_loss: 0.4609 - val_accuracy: 0.0000e+00
Epoch 199/300
2/2 [=====] - 2s 742ms/step - loss: 0.4782 -
accuracy: 0.5000 - val_loss: 0.2321 - val_accuracy: 0.0000e+00
Epoch 200/300
2/2 [=====] - 2s 737ms/step - loss: 0.4986 -
accuracy: 0.5000 - val_loss: 0.4388 - val_accuracy: 0.0000e+00
Epoch 201/300
2/2 [=====] - 2s 738ms/step - loss: 0.4601 -
accuracy: 0.5000 - val_loss: 0.5166 - val_accuracy: 0.0000e+00
Epoch 202/300
2/2 [=====] - 2s 766ms/step - loss: 0.4399 -
accuracy: 0.5000 - val_loss: 0.2746 - val_accuracy: 0.5000
Epoch 203/300
2/2 [=====] - 2s 750ms/step - loss: 0.4372 -
accuracy: 0.5000 - val_loss: 1.2153 - val_accuracy: 0.0000e+00
Epoch 204/300
2/2 [=====] - 2s 735ms/step - loss: 0.4097 -
accuracy: 0.5000 - val_loss: 0.2040 - val_accuracy: 0.5000
Epoch 205/300
2/2 [=====] - 2s 751ms/step - loss: 0.3402 -
accuracy: 0.5000 - val_loss: 2.5506 - val_accuracy: 1.0000
Epoch 206/300
2/2 [=====] - 2s 720ms/step - loss: 0.3940 -
accuracy: 0.5000 - val_loss: 1.0313 - val_accuracy: 0.5000
Epoch 207/300
2/2 [=====] - 2s 767ms/step - loss: 0.5197 -
accuracy: 0.5000 - val_loss: 16.1299 - val_accuracy: 0.5000
Epoch 208/300
2/2 [=====] - 2s 735ms/step - loss: 0.4602 -
accuracy: 0.5000 - val_loss: 0.2923 - val_accuracy: 0.5000
Epoch 209/300

2/2 [=====] - 2s 734ms/step - loss: 0.4344 -
accuracy: 0.5000 - val_loss: 0.9657 - val_accuracy: 1.0000
Epoch 210/300
2/2 [=====] - 2s 738ms/step - loss: 0.4044 -
accuracy: 0.5000 - val_loss: 0.8934 - val_accuracy: 0.5000
Epoch 211/300
2/2 [=====] - 2s 750ms/step - loss: 0.4243 -
accuracy: 0.5000 - val_loss: 0.2170 - val_accuracy: 0.5000
Epoch 212/300
2/2 [=====] - 2s 751ms/step - loss: 0.4598 -
accuracy: 0.5000 - val_loss: 0.6884 - val_accuracy: 0.5000
Epoch 213/300
2/2 [=====] - 2s 733ms/step - loss: 0.4162 -
accuracy: 0.5000 - val_loss: 0.4464 - val_accuracy: 0.0000e+00
Epoch 214/300
2/2 [=====] - 2s 753ms/step - loss: 0.4007 -
accuracy: 0.5000 - val_loss: 0.5539 - val_accuracy: 0.5000
Epoch 215/300
2/2 [=====] - 2s 735ms/step - loss: 0.4370 -
accuracy: 0.5000 - val_loss: 0.4997 - val_accuracy: 0.5000
Epoch 216/300
2/2 [=====] - 2s 751ms/step - loss: 0.4602 -
accuracy: 0.5000 - val_loss: 2.0525 - val_accuracy: 0.5000
Epoch 217/300
2/2 [=====] - 2s 746ms/step - loss: 0.6387 -
accuracy: 0.5000 - val_loss: 0.2697 - val_accuracy: 0.0000e+00
Epoch 218/300
2/2 [=====] - 2s 770ms/step - loss: 0.4543 -
accuracy: 0.5000 - val_loss: 1.4058 - val_accuracy: 1.0000
Epoch 219/300
2/2 [=====] - 2s 751ms/step - loss: 0.5272 -
accuracy: 0.5000 - val_loss: 0.7739 - val_accuracy: 0.5000
Epoch 220/300
2/2 [=====] - 2s 722ms/step - loss: 0.4180 -
accuracy: 0.5000 - val_loss: 0.6439 - val_accuracy: 0.5000
Epoch 221/300
2/2 [=====] - 2s 734ms/step - loss: 0.4409 -
accuracy: 0.5000 - val_loss: 0.3530 - val_accuracy: 0.0000e+00
Epoch 222/300
2/2 [=====] - 2s 752ms/step - loss: 0.4759 -
accuracy: 0.5000 - val_loss: 0.8442 - val_accuracy: 1.0000
Epoch 223/300
2/2 [=====] - 2s 771ms/step - loss: 0.4918 -
accuracy: 0.5000 - val_loss: 0.5480 - val_accuracy: 0.5000
Epoch 224/300
2/2 [=====] - 2s 948ms/step - loss: 0.4915 -
accuracy: 0.5000 - val_loss: 1.0045 - val_accuracy: 1.0000
Epoch 225/300
2/2 [=====] - 2s 756ms/step - loss: 0.3625 -
accuracy: 0.5000 - val_loss: 0.2539 - val_accuracy: 0.5000

Epoch 226/300
2/2 [=====] - 2s 776ms/step - loss: 0.3743 - accuracy: 0.5000 - val_loss: 0.2462 - val_accuracy: 0.5000
Epoch 227/300
2/2 [=====] - 2s 799ms/step - loss: 0.4621 - accuracy: 0.5000 - val_loss: 6.4105e-04 - val_accuracy: 1.0000
Epoch 228/300
2/2 [=====] - 2s 803ms/step - loss: 0.4590 - accuracy: 0.5000 - val_loss: 0.6713 - val_accuracy: 0.5000

Epoch 229/300
2/2 [=====] - 2s 821ms/step - loss: 0.3855 - accuracy: 0.5000 - val_loss: 1.6957 - val_accuracy: 1.0000
Epoch 230/300
2/2 [=====] - 2s 759ms/step - loss: 0.3818 - accuracy: 0.5000 - val_loss: 1.0382 - val_accuracy: 0.0000e+00
Epoch 231/300
2/2 [=====] - 2s 751ms/step - loss: 0.3236 - accuracy: 0.5000 - val_loss: 0.6505 - val_accuracy: 0.5000
Epoch 232/300
2/2 [=====] - 2s 736ms/step - loss: 0.4023 - accuracy: 0.5000 - val_loss: 0.2572 - val_accuracy: 0.5000
Epoch 233/300
2/2 [=====] - 2s 732ms/step - loss: 0.4733 - accuracy: 0.5000 - val_loss: 2.0326 - val_accuracy: 1.0000
Epoch 234/300
2/2 [=====] - 2s 748ms/step - loss: 0.4782 - accuracy: 0.5000 - val_loss: 2.4072 - val_accuracy: 0.5000
Epoch 235/300
2/2 [=====] - 2s 750ms/step - loss: 0.4763 - accuracy: 0.5000 - val_loss: 5.3822 - val_accuracy: 0.5000
Epoch 236/300
2/2 [=====] - 2s 750ms/step - loss: 0.5532 - accuracy: 0.5000 - val_loss: 0.6656 - val_accuracy: 0.5000
Epoch 237/300
2/2 [=====] - 2s 733ms/step - loss: 0.5111 - accuracy: 0.5000 - val_loss: 0.1453 - val_accuracy: 0.0000e+00
Epoch 238/300
2/2 [=====] - 2s 752ms/step - loss: 0.5623 - accuracy: 0.5000 - val_loss: 0.9838 - val_accuracy: 0.5000
Epoch 239/300
2/2 [=====] - 2s 752ms/step - loss: 0.4936 - accuracy: 0.5000 - val_loss: 1.6135 - val_accuracy: 0.5000
Epoch 240/300
2/2 [=====] - 2s 734ms/step - loss: 0.6297 - accuracy: 0.5000 - val_loss: 0.3465 - val_accuracy: 0.0000e+00
Epoch 241/300
2/2 [=====] - 2s 751ms/step - loss: 0.5620 - accuracy: 0.5000 - val_loss: 0.6184 - val_accuracy: 0.5000
Epoch 242/300

2/2 [=====] - 2s 753ms/step - loss: 0.3846 -
accuracy: 0.5000 - val_loss: 2.0468 - val_accuracy: 0.5000
Epoch 243/300
2/2 [=====] - 2s 751ms/step - loss: 0.3660 -
accuracy: 0.5000 - val_loss: 1.5666 - val_accuracy: 0.5000
Epoch 244/300
2/2 [=====] - 2s 734ms/step - loss: 0.4547 -
accuracy: 0.5000 - val_loss: 0.5385 - val_accuracy: 0.0000e+00
Epoch 245/300
2/2 [=====] - 2s 751ms/step - loss: 0.3559 -
accuracy: 0.5000 - val_loss: 1.9855 - val_accuracy: 1.0000
Epoch 246/300
2/2 [=====] - 2s 751ms/step - loss: 0.3922 -
accuracy: 0.5000 - val_loss: 0.5791 - val_accuracy: 1.0000
Epoch 247/300
2/2 [=====] - 2s 734ms/step - loss: 0.4389 -
accuracy: 0.5000 - val_loss: 0.4650 - val_accuracy: 0.5000
Epoch 248/300
2/2 [=====] - 2s 730ms/step - loss: 0.4643 -
accuracy: 0.5000 - val_loss: 0.4180 - val_accuracy: 0.5000
Epoch 249/300
2/2 [=====] - 2s 771ms/step - loss: 0.3538 -
accuracy: 0.5000 - val_loss: 0.2620 - val_accuracy: 0.5000
Epoch 250/300
2/2 [=====] - 2s 734ms/step - loss: 0.3468 -
accuracy: 0.5000 - val_loss: 8.8490 - val_accuracy: 0.0000e+00
Epoch 251/300
2/2 [=====] - 2s 751ms/step - loss: 0.3896 -
accuracy: 0.5000 - val_loss: 0.3854 - val_accuracy: 1.0000
Epoch 252/300
2/2 [=====] - 2s 719ms/step - loss: 0.3339 -
accuracy: 0.5000 - val_loss: 1.0251 - val_accuracy: 0.0000e+00
Epoch 253/300
2/2 [=====] - 2s 718ms/step - loss: 0.4634 -
accuracy: 0.5000 - val_loss: 0.0106 - val_accuracy: 0.5000
Epoch 254/300
2/2 [=====] - 2s 754ms/step - loss: 0.3573 -
accuracy: 0.5000 - val_loss: 0.1810 - val_accuracy: 1.0000
Epoch 255/300
2/2 [=====] - 2s 751ms/step - loss: 0.3784 -
accuracy: 0.5000 - val_loss: 0.2376 - val_accuracy: 0.5000
Epoch 256/300
2/2 [=====] - 2s 720ms/step - loss: 0.3729 -
accuracy: 0.5000 - val_loss: 1.8531 - val_accuracy: 0.5000
Epoch 257/300
2/2 [=====] - 2s 752ms/step - loss: 0.4188 -
accuracy: 0.5000 - val_loss: 0.3549 - val_accuracy: 0.5000
Epoch 258/300
2/2 [=====] - 2s 753ms/step - loss: 0.3514 -
accuracy: 0.5000 - val_loss: 0.7347 - val_accuracy: 0.5000

Epoch 259/300
2/2 [=====] - 2s 818ms/step - loss: 0.3719 - accuracy: 0.5000 - val_loss: 0.5157 - val_accuracy: 0.5000
Epoch 260/300
2/2 [=====] - 2s 736ms/step - loss: 0.3779 - accuracy: 0.5000 - val_loss: 0.3810 - val_accuracy: 0.0000e+00
Epoch 261/300
2/2 [=====] - 2s 740ms/step - loss: 0.3713 - accuracy: 0.5000 - val_loss: 0.8813 - val_accuracy: 1.0000
Epoch 262/300
2/2 [=====] - 2s 736ms/step - loss: 0.3833 - accuracy: 0.5000 - val_loss: 0.0180 - val_accuracy: 0.0000e+00
Epoch 263/300
2/2 [=====] - 2s 736ms/step - loss: 0.3641 - accuracy: 0.5000 - val_loss: 0.7285 - val_accuracy: 0.0000e+00
Epoch 264/300
2/2 [=====] - 2s 734ms/step - loss: 0.2989 - accuracy: 0.5000 - val_loss: 0.0475 - val_accuracy: 0.5000
Epoch 265/300
2/2 [=====] - 2s 750ms/step - loss: 0.3606 - accuracy: 0.5000 - val_loss: 0.1515 - val_accuracy: 1.0000
Epoch 266/300
2/2 [=====] - 2s 754ms/step - loss: 0.3757 - accuracy: 0.5000 - val_loss: 0.6091 - val_accuracy: 1.0000
Epoch 267/300
2/2 [=====] - 2s 735ms/step - loss: 0.4261 - accuracy: 0.5000 - val_loss: 0.2027 - val_accuracy: 0.0000e+00
Epoch 268/300
2/2 [=====] - 2s 720ms/step - loss: 0.3936 - accuracy: 0.5000 - val_loss: 0.1599 - val_accuracy: 0.0000e+00
Epoch 269/300
2/2 [=====] - 2s 760ms/step - loss: 0.4347 - accuracy: 0.5000 - val_loss: 1.4134 - val_accuracy: 1.0000
Epoch 270/300
2/2 [=====] - 2s 753ms/step - loss: 0.2510 - accuracy: 0.5000 - val_loss: 0.0046 - val_accuracy: 1.0000
Epoch 271/300
2/2 [=====] - 2s 736ms/step - loss: 0.3213 - accuracy: 0.5000 - val_loss: 0.8609 - val_accuracy: 0.5000
Epoch 272/300
2/2 [=====] - 2s 721ms/step - loss: 0.4138 - accuracy: 0.5000 - val_loss: 0.2167 - val_accuracy: 0.0000e+00
Epoch 273/300
2/2 [=====] - 2s 768ms/step - loss: 0.3798 - accuracy: 0.5000 - val_loss: 0.0729 - val_accuracy: 0.5000
Epoch 274/300
2/2 [=====] - 2s 766ms/step - loss: 0.3007 - accuracy: 0.5000 - val_loss: 0.5268 - val_accuracy: 0.5000
Epoch 275/300
2/2 [=====] - 2s 758ms/step - loss: 0.2891 -

accuracy: 0.5000 - val_loss: 0.4022 - val_accuracy: 0.0000e+00
Epoch 276/300
2/2 [=====] - 2s 736ms/step - loss: 0.3684 -
accuracy: 0.5000 - val_loss: 0.8315 - val_accuracy: 1.0000
Epoch 277/300
2/2 [=====] - 2s 739ms/step - loss: 0.3644 -
accuracy: 0.5000 - val_loss: 1.0882 - val_accuracy: 0.5000
Epoch 278/300
2/2 [=====] - 2s 737ms/step - loss: 0.3414 -
accuracy: 0.5000 - val_loss: 1.0017 - val_accuracy: 0.0000e+00
Epoch 279/300
2/2 [=====] - 2s 749ms/step - loss: 0.2847 -
accuracy: 0.5000 - val_loss: 4.8068 - val_accuracy: 1.0000
Epoch 280/300
2/2 [=====] - 2s 749ms/step - loss: 0.3389 -
accuracy: 0.5000 - val_loss: 0.6358 - val_accuracy: 0.5000
Epoch 281/300
2/2 [=====] - 2s 727ms/step - loss: 0.2798 -
accuracy: 0.5000 - val_loss: 1.3282 - val_accuracy: 0.5000
Epoch 282/300
2/2 [=====] - 2s 739ms/step - loss: 0.2995 -
accuracy: 0.5000 - val_loss: 1.8597 - val_accuracy: 0.5000
Epoch 283/300
2/2 [=====] - 2s 721ms/step - loss: 0.2446 -
accuracy: 0.5000 - val_loss: 0.2002 - val_accuracy: 0.0000e+00
Epoch 284/300
2/2 [=====] - 2s 725ms/step - loss: 0.3736 -
accuracy: 0.5000 - val_loss: 0.1295 - val_accuracy: 0.5000
Epoch 285/300
2/2 [=====] - 2s 736ms/step - loss: 0.2541 -
accuracy: 0.5000 - val_loss: 0.8033 - val_accuracy: 0.5000

Epoch 286/300
2/2 [=====] - 2s 720ms/step - loss: 0.2517 -
accuracy: 0.5000 - val_loss: 0.7211 - val_accuracy: 0.5000
Epoch 287/300
2/2 [=====] - 2s 718ms/step - loss: 0.3352 -
accuracy: 0.5000 - val_loss: 0.7029 - val_accuracy: 1.0000
Epoch 288/300
2/2 [=====] - 2s 753ms/step - loss: 0.3432 -
accuracy: 0.5000 - val_loss: 0.2245 - val_accuracy: 1.0000
Epoch 289/300
2/2 [=====] - 2s 765ms/step - loss: 0.4045 -
accuracy: 0.5000 - val_loss: 0.4681 - val_accuracy: 0.5000
Epoch 290/300
2/2 [=====] - 2s 731ms/step - loss: 0.2850 -
accuracy: 0.5000 - val_loss: 13.1989 - val_accuracy: 0.5000
Epoch 291/300
2/2 [=====] - 2s 802ms/step - loss: 0.2700 -
accuracy: 0.5000 - val_loss: 0.1389 - val_accuracy: 0.5000

```
Epoch 292/300
2/2 [=====] - 2s 759ms/step - loss: 0.2737 -
accuracy: 0.5000 - val_loss: 0.9715 - val_accuracy: 1.0000
Epoch 293/300
2/2 [=====] - 2s 721ms/step - loss: 0.2286 -
accuracy: 0.5000 - val_loss: 5.7828 - val_accuracy: 0.5000
Epoch 294/300
2/2 [=====] - 2s 738ms/step - loss: 0.3850 -
accuracy: 0.5000 - val_loss: 0.7117 - val_accuracy: 0.5000
Epoch 295/300
2/2 [=====] - 2s 782ms/step - loss: 0.3860 -
accuracy: 0.5000 - val_loss: 1.0082 - val_accuracy: 0.5000
Epoch 296/300
2/2 [=====] - 2s 768ms/step - loss: 0.3544 -
accuracy: 0.5000 - val_loss: 0.6956 - val_accuracy: 0.5000
Epoch 297/300
2/2 [=====] - 2s 776ms/step - loss: 0.3148 -
accuracy: 0.5000 - val_loss: 0.2121 - val_accuracy: 0.0000e+00
Epoch 298/300
2/2 [=====] - 2s 773ms/step - loss: 0.3190 -
accuracy: 0.5000 - val_loss: 0.8855 - val_accuracy: 0.5000
Epoch 299/300
2/2 [=====] - 2s 782ms/step - loss: 0.2885 -
accuracy: 0.5000 - val_loss: 4.2741 - val_accuracy: 0.0000e+00
Epoch 300/300
2/2 [=====] - 2s 847ms/step - loss: 0.2709 -
accuracy: 0.5000 - val_loss: 0.6208 - val_accuracy: 0.5000
```

<keras.callbacks.History at 0x2948d8c5730>

```
pred = model.predict_generator(test_set)
```

```
plt.subplots(4,5,figsize=(20,10))
plt.subplots_adjust(hspace=0.5)
for i in range(20):
    plt.subplot(4,5,i+1)
    img = np.squeeze(test_set[i][0])
    plt.imshow(img)
    if pred[i]==0:
        plt.title('predicted as CAT',loc='center')
    else:
        plt.title('predicted as DOG',loc='center')
    plt.axis('off')
plt.show()
```

<IPython.core.display.Javascript object>

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<IPython.core.display.Javascript object>

predicted as DOG



predicted as DOG



predicted as DOG



predicted as DOG



predicted as DOG



predicted as DOG



predicted as DOG



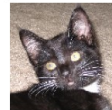
predicted as DOG



predicted as DOG



predicted as DOG



predicted as DOG



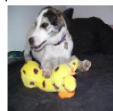
predicted as DOG



predicted as DOG



predicted as DOG



predicted as DOG



predicted as DOG



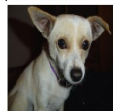
predicted as DOG



predicted as DOG



predicted as DOG



predicted as DOG



#we can see that all the images are predicted as 'DOG'

The results are very unpleasing since we used ' SOFTMAX ' activation in the final output layer . ' SIGMOID ' activation would have given great results for the kind of problem . But as the problem stated to use softmax activation , we used that .