Importing Libraries

```python
import pandas as pd
import numpy as np

import os
import sys
import math
# librosa is a Python library for analyzing audio and music. It can be used to e
import librosa
import librosa.display
import seaborn as sns
import matplotlib.pyplot as plt

from sklearn.preprocessing import StandardScaler, OneHotEncoder
from sklearn.metrics import confusion_matrix, classification_report
from sklearn.model_selection import train_test_split

# to play the audio files
from IPython.display import Audio

import keras
from keras.callbacks import ReduceLROnPlateau
from keras.models import Sequential
from keras.layers import Dense, Conv1D, MaxPooling1D, Flatten, Dropout, BatchNor
from keras.utils import np_utils
from tensorflow.keras.utils import to_categorical
from keras.callbacks import ModelCheckpoint

import warnings
if not sys.warnoptions:
    warnings.simplefilter("ignore")
warnings.filterwarnings("ignore", category=DeprecationWarning)
```

Importing Path of the datasets with respect to the present working directory

```python
Ravdess = "Dataset/Ravdees/"
Crema = "Dataset/Crema/AudioWAV/"
Tess="Dataset/Tess/TESS Toronto emotional speech set data/"
```

Importing RAVDEES Dataset

```python
replace={}
for i in range(1,25):
    if(i%2==0):
        replace[i]='female'
    else:
        replace[i]='male'
ravdess_directory_list = os.listdir(Ravdess)
```

```python
# list all the directories


file_emotion = []
file_path = []
file_gender=[]

for dir in ravdess_directory_list:        #iterate through all the directories one
                                           # as their are 20 different actors in ou


    actor = os.listdir(Ravdess + dir)
                                   # List the contents (wav files) of each
    for file in actor:
        part = file.split('.')[0]     # split the file into two parts 01-01-02
        part = part.split('-')
        if part[2]!='01':
            file_gender.append(int(part[6]))
                               # third part in each file represents the
            file_emotion.append(int(part[2]))
            file_path.append(Ravdess + dir + '/' + file)

        #creating two lists one with the emotions and another with corresponding

# dataframe for emotion of files
emotion_df = pd.DataFrame(file_emotion, columns=['Emotions'])
gender_df=  pd.DataFrame(file_gender, columns=['gender'])

# dataframe for path of files.
path_df = pd.DataFrame(file_path, columns=['Path'])
Ravdess_df = pd.concat([emotion_df,gender_df,path_df], axis=1)    #concatinate b
                                                        # 0   01   path1
                                                        #1    02   path2
                                                        # 2   03   path3
                                                        #1    04   path4
# changing integers to actual emotions.
Ravdess_df.Emotions.replace({1:'neutral', 2:'calm', 3:'happy', 4:'sad', 5:'angry
Ravdess_df.gender.replace(replace, inplace=True)
Ravdess_df.head()

#replace 2 nd column by actual emotions
```

Out[4]:

	Emotions	gender	Path
0	calm	male	Dataset/Ravdees/Actor_01/03-01-02-01-01-01-01.wav
1	calm	male	Dataset/Ravdees/Actor_01/03-01-02-01-01-02-01.wav
2	calm	male	Dataset/Ravdees/Actor_01/03-01-02-01-02-01-01.wav
3	calm	male	Dataset/Ravdees/Actor_01/03-01-02-01-02-02-01.wav
4	calm	male	Dataset/Ravdees/Actor_01/03-01-02-02-01-01-01.wav

Importing CREMA D Dataset

In [5]:
```python
crema_directory_list = os.listdir(Crema)
male = [1001,1005,1011,1014,1015,1016,1017,1019,1022,1023,1024,1026,1027,1031,10
female = [1002,1003,1004,1006,1007,1008,1009,1010,1012,1013,1018,1020,1021,1025,
```

```python
file_emotion = []
file_path = []
file_gender=[]
for file in crema_directory_list:
    # storing file paths
    file_path.append(Crema + file)
    # storing file emotions
    part=file.split('_')          # 3rd part of each file contains emotion, crea
                                  # emotion and  corrseponding file path

    if part[2] == 'SAD':
        file_emotion.append('sad')
    elif part[2] == 'ANG':
        file_emotion.append('angry')
    elif part[2] == 'DIS':
        file_emotion.append('disgust')
    elif part[2] == 'FEA':
        file_emotion.append('fear')
    elif part[2] == 'HAP':
        file_emotion.append('happy')
    elif part[2] == 'NEU':
        file_emotion.append('neutral')
    else:
        file_emotion.append('Unknown')
    id = int(part[0])
    if id in male:
        file_gender.append('male')
    else:
        file_gender.append('female')

# dataframe for emotion of files
emotion_df = pd.DataFrame(file_emotion, columns=['Emotions'])
gender_df=  pd.DataFrame(file_gender, columns=['gender'])

# dataframe for path of files.
path_df = pd.DataFrame(file_path, columns=['Path'])
Crema_df = pd.concat([emotion_df,gender_df, path_df], axis=1)
Crema_df.head()
```

Out[5]:

	Emotions	gender	Path
0	angry	male	Dataset/Crema/AudioWAV/1001_DFA_ANG_XX.wav
1	disgust	male	Dataset/Crema/AudioWAV/1001_DFA_DIS_XX.wav
2	fear	male	Dataset/Crema/AudioWAV/1001_DFA_FEA_XX.wav
3	happy	male	Dataset/Crema/AudioWAV/1001_DFA_HAP_XX.wav
4	neutral	male	Dataset/Crema/AudioWAV/1001_DFA_NEU_XX.wav

Importing TESS Dataset

In [6]:
```python
tess_directory_list = os.listdir(Tess)

file_emotion = []
file_gender=[]
file_path = []

for dir in tess_directory_list:
```

```
    directories = os.listdir(Tess + dir)
    for file in directories:                    #OAF_back_neutral.wav
        part = file.split('_')[-1]              # OAF_back_angry.wav     OAF[0]
        part = part.split('.')[0]               #OAF_back_ps.wav
        if part=='ps':
            file_emotion.append('surprise')
            file_gender.append('female')
        else:                                   #since only surprise emotion is gi
            file_emotion.append(part)
            file_gender.append('female')
        file_path.append(Tess + dir + '/' + file)

    # dataframe for emotion of files
    emotion_df = pd.DataFrame(file_emotion, columns=['Emotions'])
    gender_df=  pd.DataFrame(file_gender, columns=['gender'])

    # dataframe for path of files.
    path_df = pd.DataFrame(file_path, columns=['Path'])
    Tess_df = pd.concat([emotion_df,gender_df,path_df], axis=1)
    Tess_df.head()
```

Out[6]:

	Emotions	gender	Path
0	angry	female	Dataset/Tess/TESS Toronto emotional speech set...
1	angry	female	Dataset/Tess/TESS Toronto emotional speech set...
2	angry	female	Dataset/Tess/TESS Toronto emotional speech set...
3	angry	female	Dataset/Tess/TESS Toronto emotional speech set...
4	angry	female	Dataset/Tess/TESS Toronto emotional speech set...

IMPORTING DATASET ACCORDING TO OUR REQUIREMENT

In [7]:
```
data_path = pd.concat([Ravdess_df], axis = 0)
data_path.to_csv("data_path.csv",index=False)
data_path.head()
```

Out[7]:

	Emotions	gender	Path
0	calm	male	Dataset/Ravdees/Actor_01/03-01-02-01-01-01-01.wav
1	calm	male	Dataset/Ravdees/Actor_01/03-01-02-01-01-02-01.wav
2	calm	male	Dataset/Ravdees/Actor_01/03-01-02-01-02-01-01.wav
3	calm	male	Dataset/Ravdees/Actor_01/03-01-02-01-02-02-01.wav
4	calm	male	Dataset/Ravdees/Actor_01/03-01-02-02-01-01-01.wav

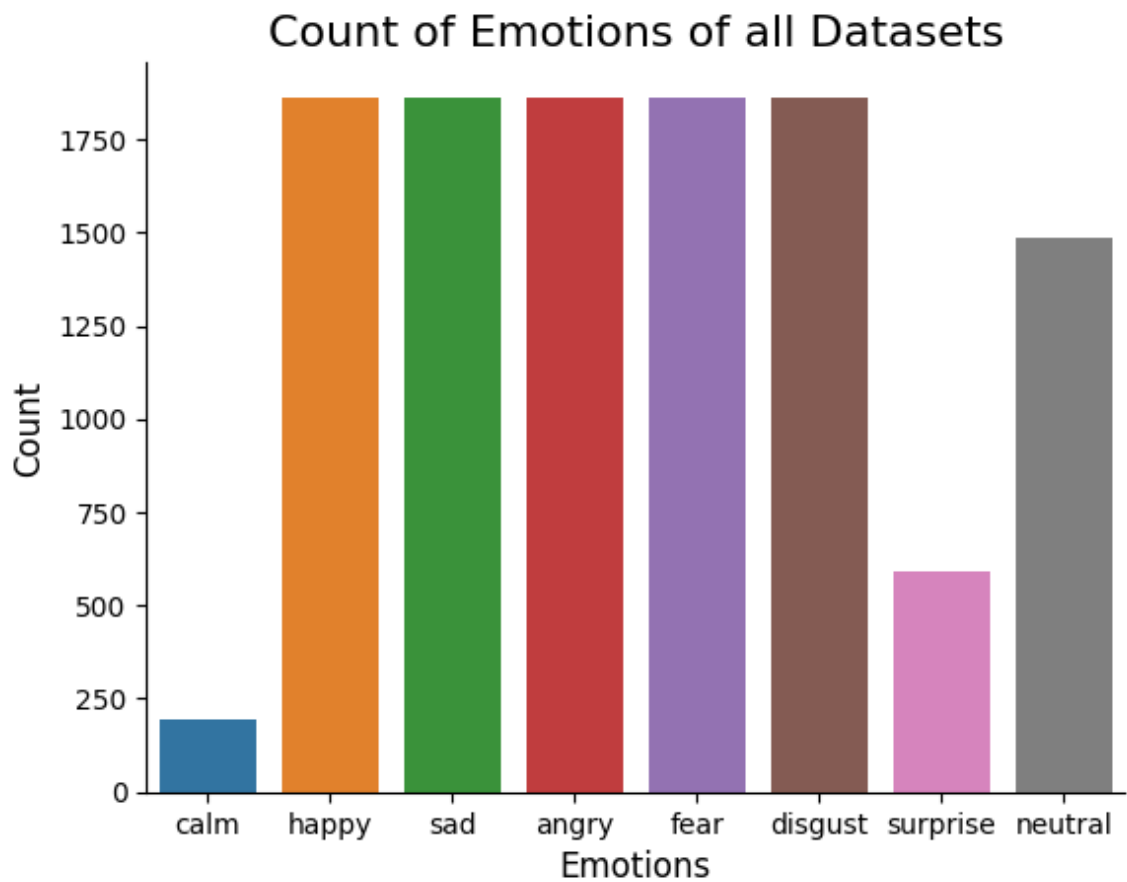# Counting all Emotions and Dataset of Corresponding Dataset

In [8]:
```
plt.title('Count of Emotions of all Datasets', size=16)
data = pd.concat([Ravdess_df,Tess_df,Crema_df], axis = 0)
```
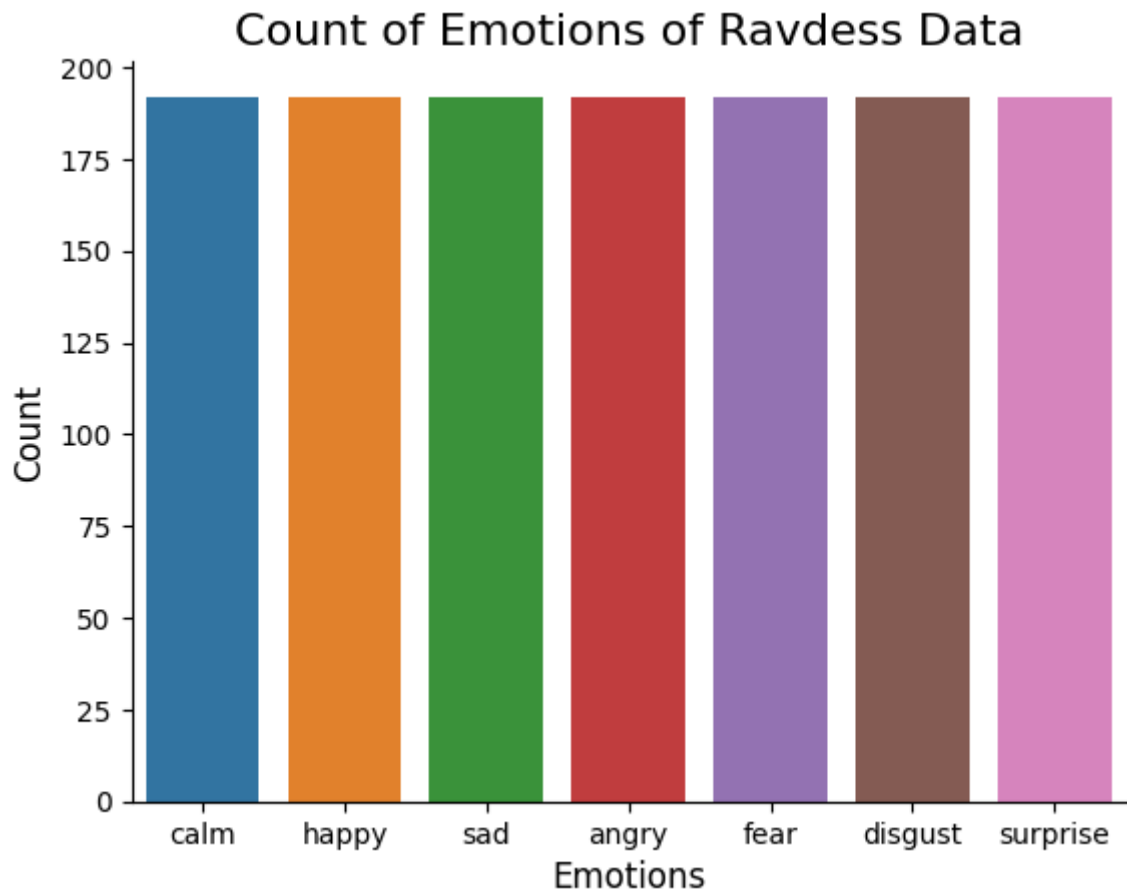
```
sns.countplot(x="Emotions",data=data)
plt.ylabel('Count', size=12)
plt.xlabel('Emotions', size=12)
sns.despine(top=True, right=True, left=False, bottom=False)
plt.show()
data.count()
```

Count of Emotions of all Datasets



```
Out[8]: Emotions    11586
        gender      11586
        Path        11586
        dtype: int64
```

```
In [9]: plt.title('Count of Emotions of Ravdess Data', size=16)
        sns.countplot(x="Emotions",data=data_path)
        plt.ylabel('Count', size=12)
        plt.xlabel('Emotions', size=12)
        sns.despine(top=True, right=True, left=False, bottom=False)
        plt.show()
        data_path.count()
```

Count of Emotions of Ravdess Data



```
Out[9]: Emotions    1344
        gender      1344
        Path        1344
        dtype: int64
```

```
In [10]: Data_Crema = pd.concat([Crema_df], axis = 0)
         plt.title('Count of Emotions of Crema Data', size=16)
         sns.countplot(x="Emotions",data=Data_Crema)
         plt.ylabel('Count', size=12)
         plt.xlabel('Emotions', size=12)
         sns.despine(top=True, right=True, left=False, bottom=False)
         plt.show()
         Data_Crema.count()
```

Count of Emotions of Crema Data
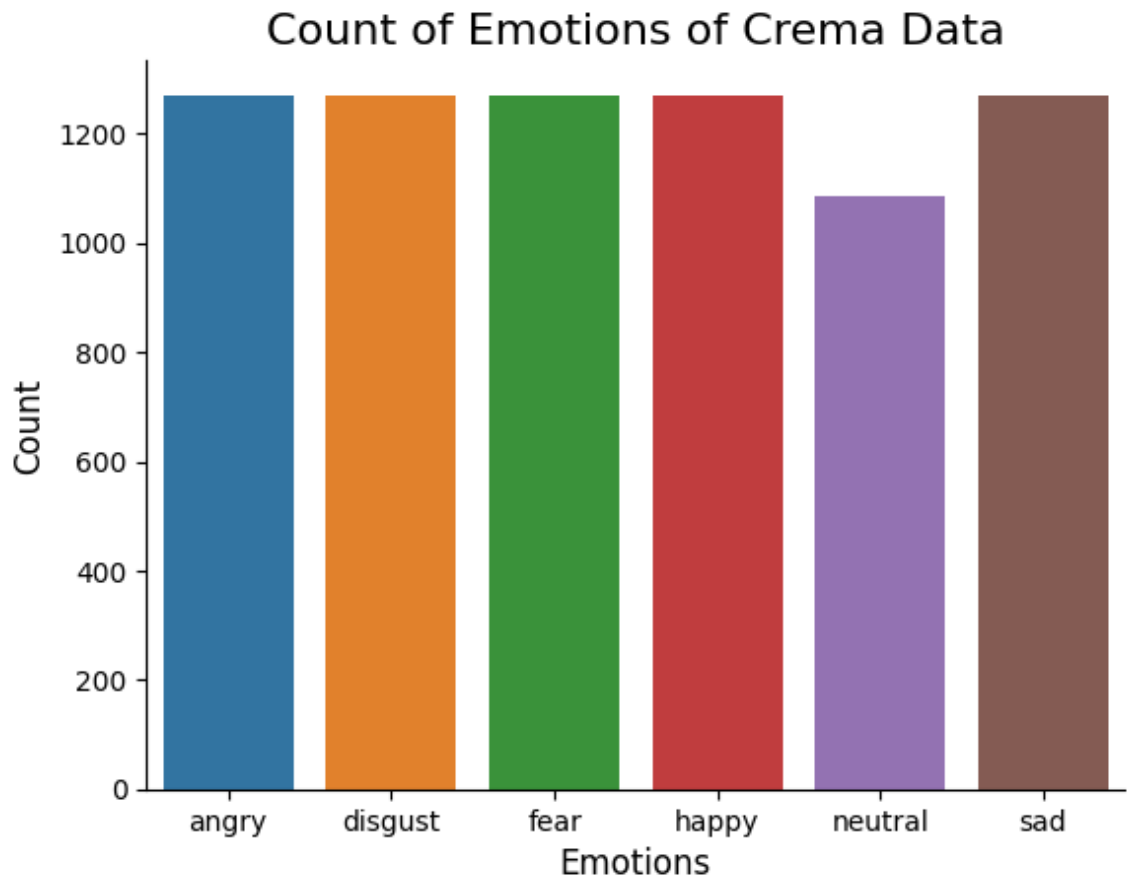

```
Out[10]: Emotions    7442
         gender      7442
         Path        7442
         dtype: int64
```
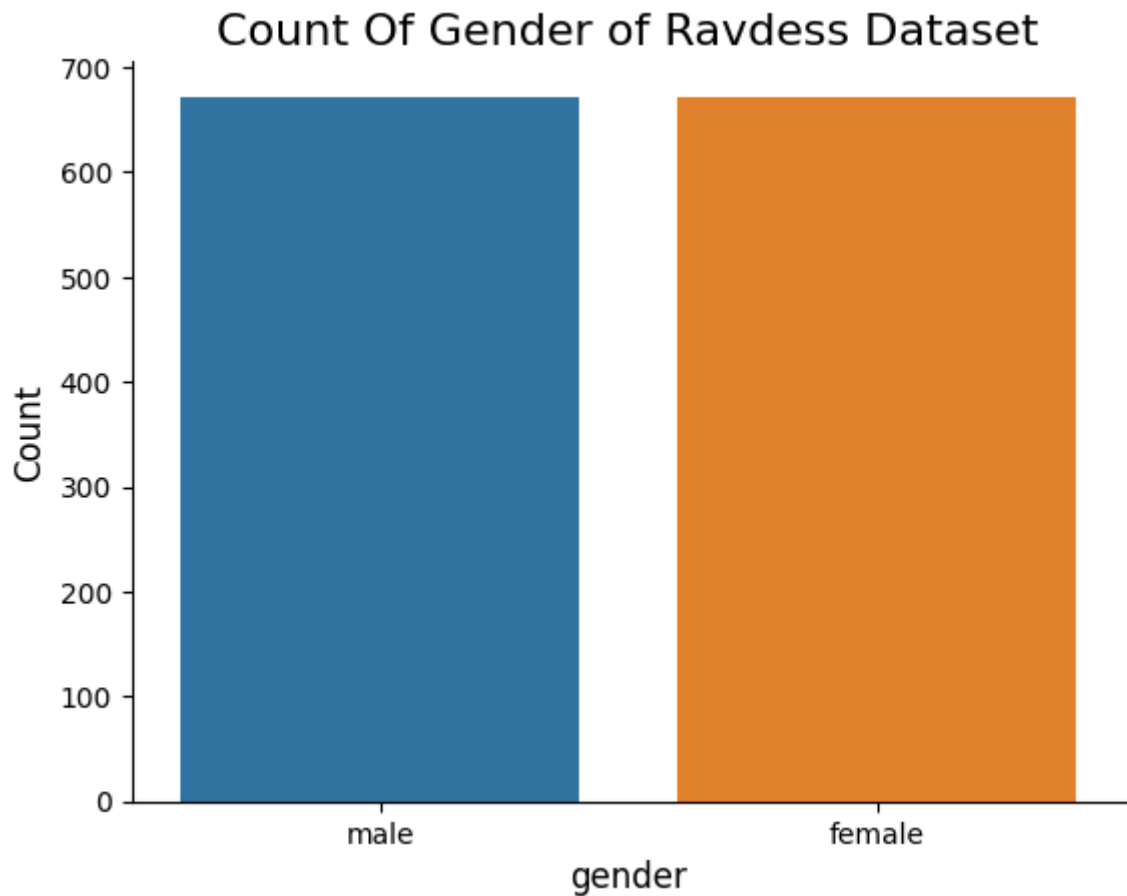
```
In [11]: Data_Tess = pd.concat([Tess_df], axis = 0)
         plt.title('Count of Emotions of Crema Data', size=16)
         sns.countplot(x="Emotions",data=Data_Tess)
         plt.ylabel('Count', size=12)
         plt.xlabel('Emotions', size=12)
         sns.despine(top=True, right=True, left=False, bottom=False)
         plt.show()
         Data_Tess.count()
```

Count of Emotions of Crema Data
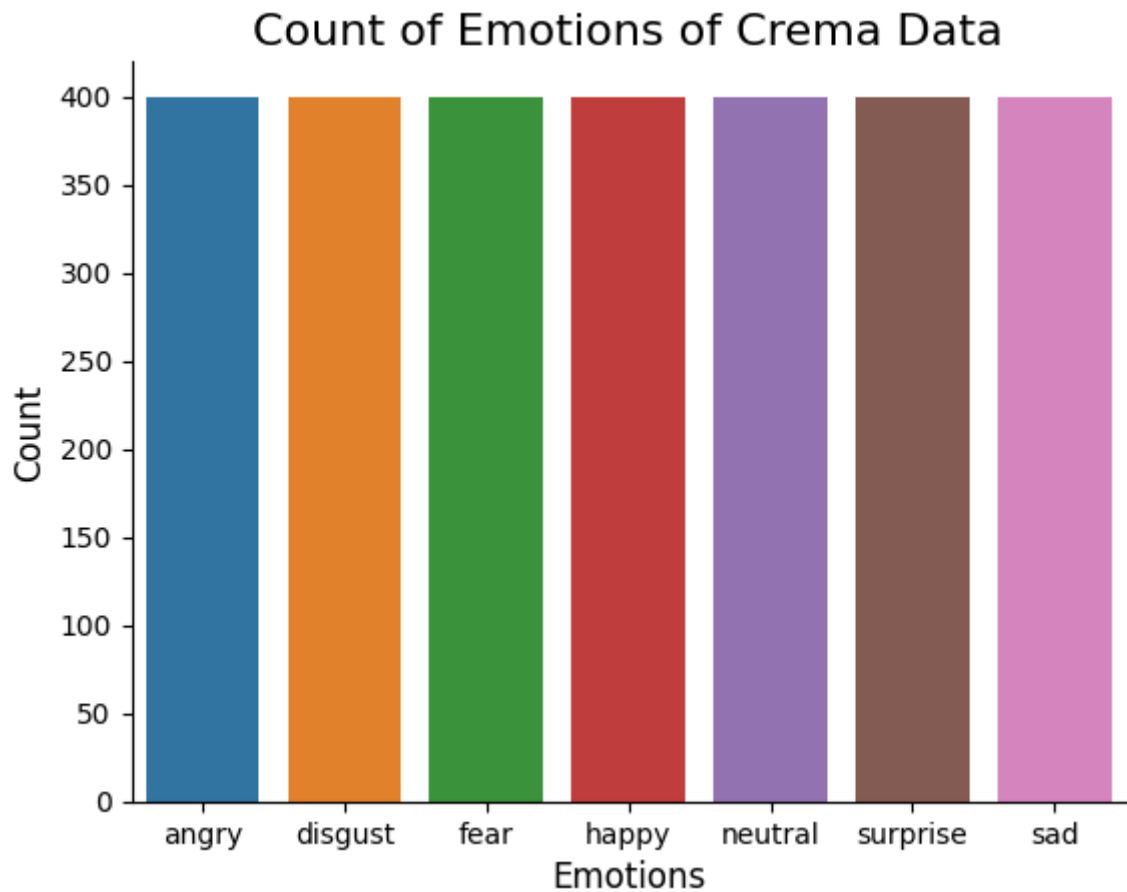
Out[11]:
```
Emotions    2800
gender      2800
Path        2800
dtype: int64
```
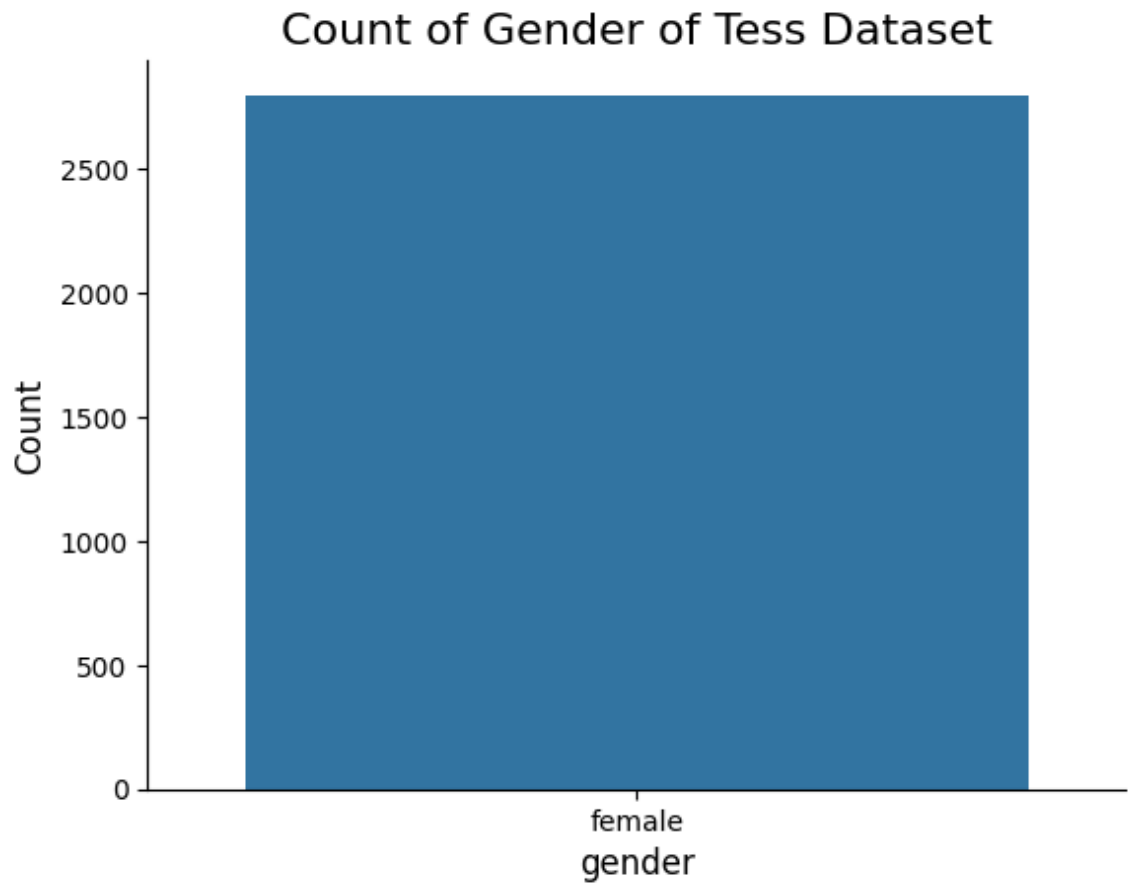
Counting The Genders(Male and Female)

In [12]:
```python
plt.title('Count Of Gender of Ravdess Dataset', size=16)
sns.countplot(x="gender",data=data_path)
plt.ylabel('Count', size=12)
plt.xlabel('gender', size=12)
sns.despine(top=True, right=True, left=False, bottom=False)
plt.show()
male=0;
female=0
for i in Ravdess_df.gender:
    if i=='male':
        male+=1
    else:
        female+=1
print(f'male: {male}')
print(f'female: {female}')
```
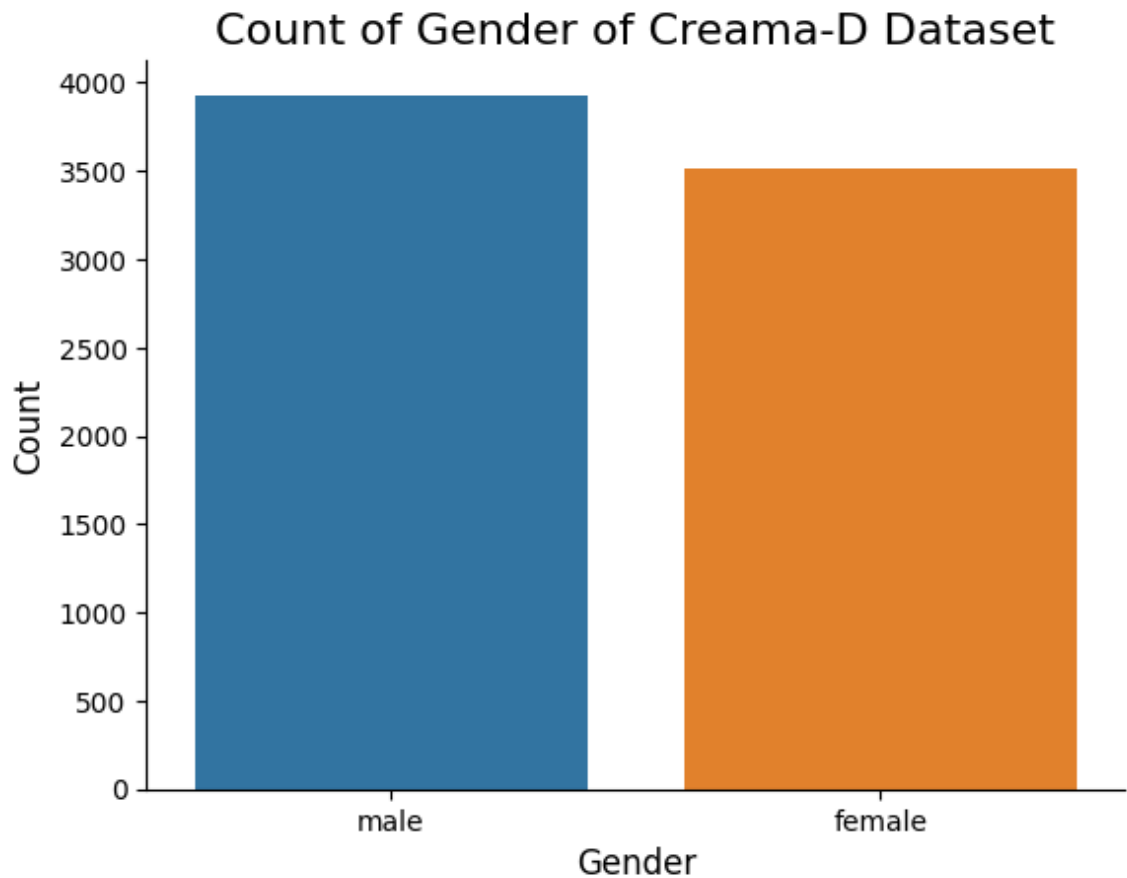
Count Of Gender of Ravdess Dataset


```
male: 672
female: 672
```

In [13]:
```python
Data_Tess = pd.concat([Tess_df], axis = 0)
plt.title('Count of Gender of Tess Dataset', size=16)
sns.countplot(x="gender",data=Data_Tess)
plt.ylabel('Count', size=12)
plt.xlabel('gender', size=12)
sns.despine(top=True, right=True, left=False, bottom=False)
plt.show()
Data_Tess.count()
male1=0
female1=0
for i in Tess_df .gender:
    if i=='male':
        male1+=1
    else:
        female1+=1
print(f'male: {male1}')
print(f'female: {female1}')
```

Count of Gender of Tess Dataset


```
male: 0
female: 2800
```

In [14]:
```python
Data_Crema = pd.concat([Crema_df], axis = 0)
plt.title('Count of Gender of Creama-D Dataset', size=16)
sns.countplot(x="gender",data=Data_Crema)
plt.ylabel('Count', size=12)
plt.xlabel('Gender', size=12)
sns.despine(top=True, right=True, left=False, bottom=False)
plt.show()
Data_Tess.count()
male2=0
female2=0
for i in Crema_df .gender:
    if i=='male':
        male2+=1
    else:
        female2+=1
print(f'male: {male2}')
print(f'female: {female2}')
```

Count of Gender of Creama-D Dataset


```
male: 3930
female: 3512
```

In [15]:
```python
Gender_Total= pd.concat([Ravdess_df,Tess_df,Crema_df], axis = 0)
plt.title('Total Count of Gender', size=16)
sns.countplot(x="gender",data=Gender_Total)
plt.ylabel('Count', size=12)
plt.xlabel('Emotions', size=12)
sns.despine(top=True, right=True, left=False, bottom=False)
plt.show()
print(f'Total male: {male+male1+male2}')
print(f'Total Female: {female+female1+female2}')
```

Total Count of Gender
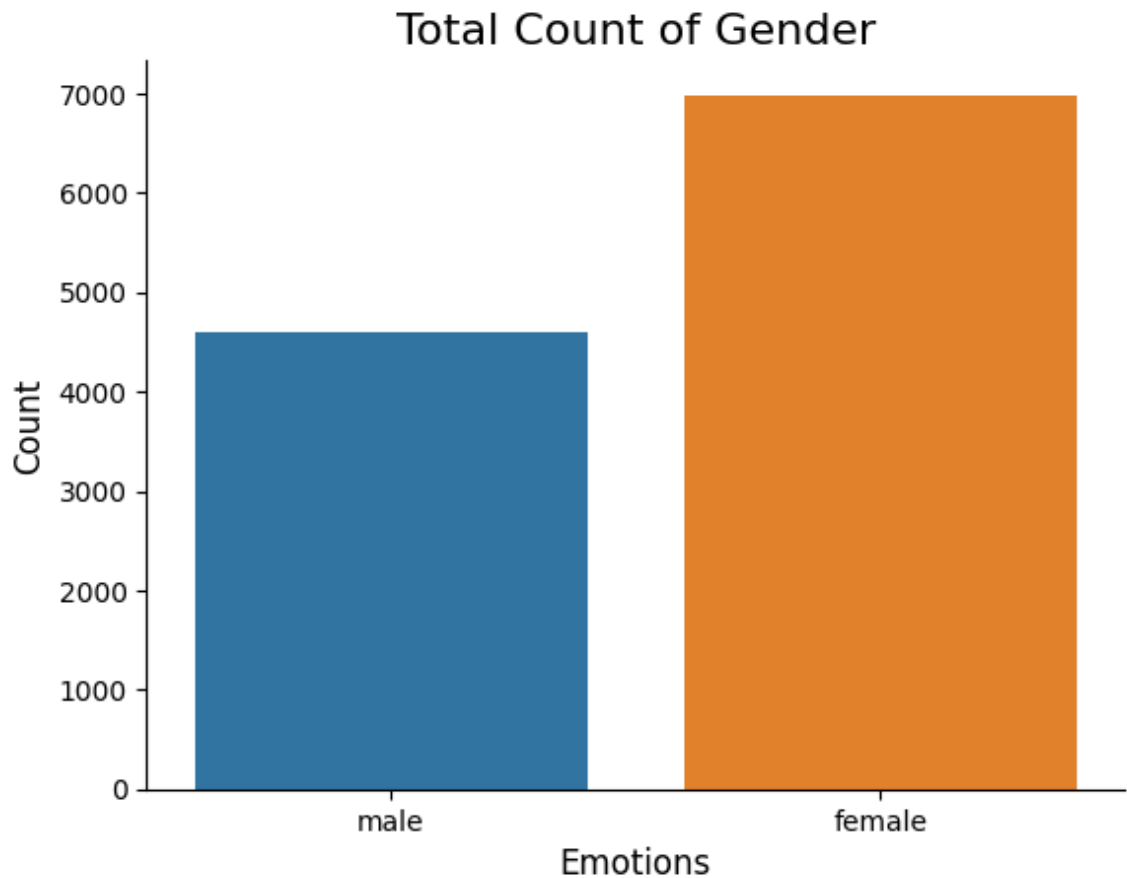

```
Total male: 4602
Total Female: 6984
```

Count of Different Emotions

```
In [16]:  Happy=0
          Sad=0
          fear=0
          disgust=0
          angry=0
          surprise=0
          neutral=0
          calm=0
          for i in data_path.Emotions:
              if i=='calm':
                  calm+=1
              if i=='neutral':
                  neutral+=1
              if i=='surprise':
                  surprise+=1
              if i=='fear':
                  fear+=1
              if i=='sad':
                  Sad+=1
              if i=='happy':
                  Happy+=1
              if i=='angry':
                  angry+=1
              if i=='disgust':
                  disgust+=1
          print(Happy,Sad,fear,disgust,angry,neutral,calm,surprise)
```

```
192 192 192 192 192 0 192 192
```

In [17]:
```python
Happy=0
Sad=0
fear=0
disgust=0
angry=0
surprise=0
neutral=0
calm=0
for i in Data_Crema.Emotions:
    if i=='calm':
        calm+=1
    if i=='neutral':
        neutral+=1
    if i=='surprise':
        surprise+=1
    if i=='fear':
        fear+=1
    if i=='sad':
        Sad+=1
    if i=='happy':
        Happy+=1
    if i=='angry':
        angry+=1
    if i=='disgust':
        disgust+=1
print(Happy,Sad,fear,disgust,angry,neutral,calm,surprise)
```

```
1271 1271 1271 1271 1271 1087 0 0
```

In [18]:
```python
Happy=0
Sad=0
fear=0
disgust=0
angry=0
surprise=0
neutral=0
calm=0
for i in Data_Tess.Emotions:
    if i=='calm':
        calm+=1
    if i=='neutral':
        neutral+=1
    if i=='surprise':
        surprise+=1
    if i=='fear':
        fear+=1
    if i=='sad':
        Sad+=1
    if i=='happy':
        Happy+=1
    if i=='angry':
        angry+=1
    if i=='disgust':
        disgust+=1
print(Happy,Sad,fear,disgust,angry,neutral,calm,surprise)
```

```
400 400 400 400 400 400 0 400
```

In [19]:
```python
Happy=0
```

```python
Sad=0
fear=0
disgust=0
angry=0
surprise=0
neutral=0
calm=0
for i in Gender_Total.Emotions:
    if i=='calm':
        calm+=1
    if i=='neutral':
        neutral+=1
    if i=='surprise':
        surprise+=1
    if i=='fear':
        fear+=1
    if i=='sad':
        Sad+=1
    if i=='happy':
        Happy+=1
    if i=='angry':
        angry+=1
    if i=='disgust':
        disgust+=1
print(Happy,Sad,fear,disgust,angry,neutral,calm,surprise)
```

1863 1863 1863 1863 1863 1487 192 592

Waveplots - Waveplots let us know the loudness of the audio at a given time.

Spectograms - A spectrogram is a visual representation of the spectrum of frequencies of sound or other signals as they vary with time. It's a representation of frequencies changing with respect to time for given audio/music signals.

In [20]:
```python
def create_waveplot(data, sr, e):                    ##function to create waveplot
    plt.figure(figsize=(10, 3))
    plt.title('Waveplot for audio with {} emotion'.format(e), size=15)      #for
    librosa.display.waveshow(data, sr=sr)                                   #Vis
    plt.show()

def create_spectrogram(data, sr, e):                  #function to create spectrogra

    X = librosa.stft(data)                            # stft function converts the a
    Xdb = librosa.amplitude_to_db(abs(X))       #convert amplitude into dB
    plt.figure(figsize=(12, 3))
    plt.title('Spectrogram for audio with {} emotion'.format(e), size=15)
    librosa.display.specshow(Xdb, sr=sr, x_axis='time', y_axis='hz')
    #librosa.display.specshow(Xdb, sr=sr, x_axis='time', y_axis='log')
    plt.colorbar()
```

In [21]:
```python
emotion='fear'
path = np.array(data_path.Path[data_path.Emotions==emotion])[1]   # convert the
                                                                  # emotion colu
                                                                  #and select a
```

```
                                                        #waveplot and

data, sampling_rate = librosa.load(path)      #librosa.load(path) converts data i
                                              # if librosa.load(path,sr=none) is u
                                              #else default sampling frequency of

create_waveplot(data, sampling_rate, emotion)                        #call waveplot
create_spectrogram(data, sampling_rate, emotion)
Audio(path)                                                          #load audio fi
```
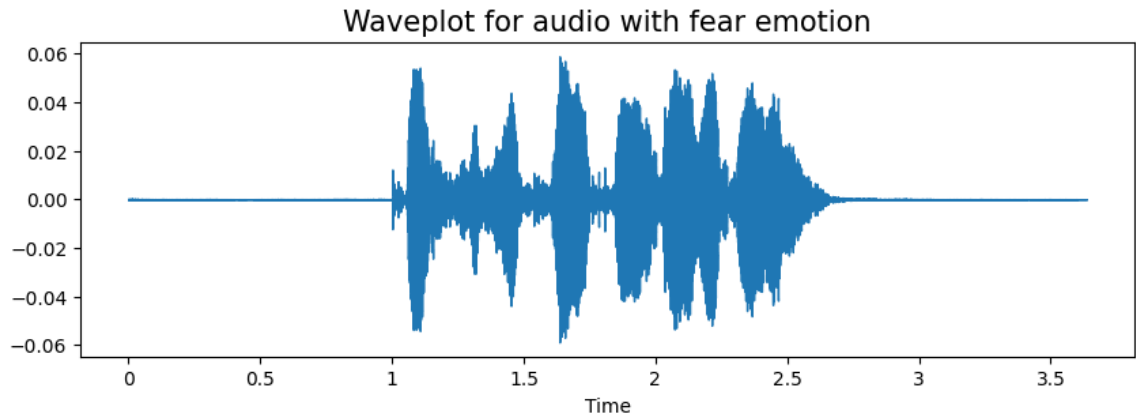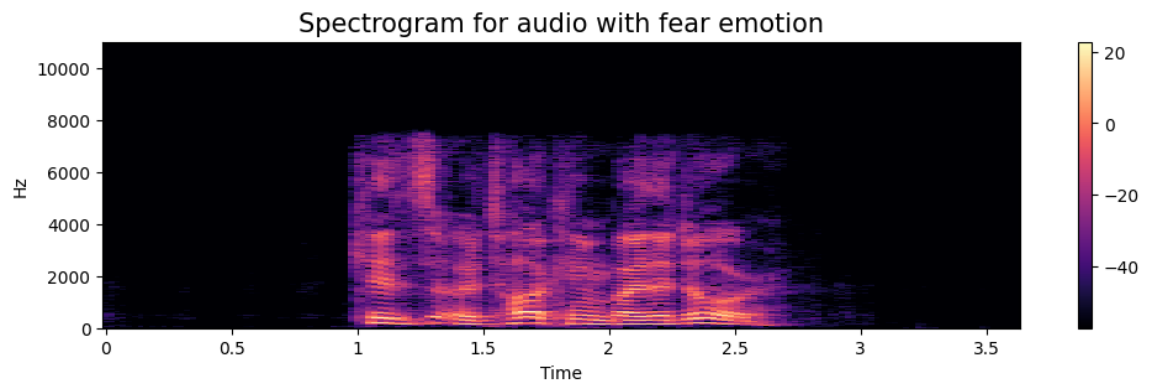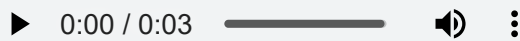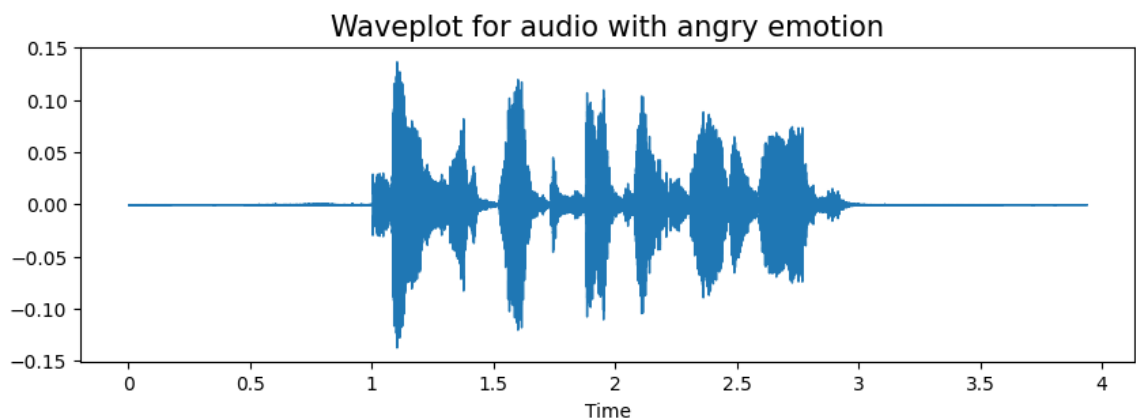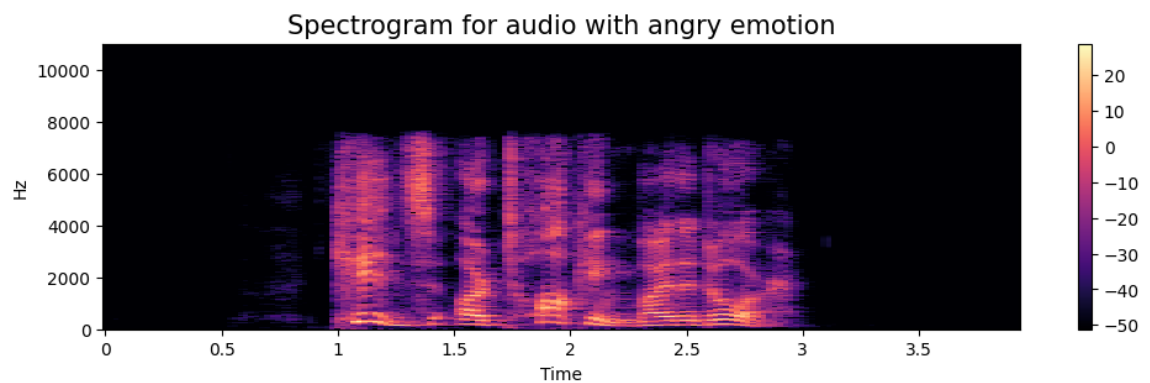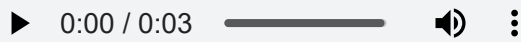
Waveplot for audio with fear emotion

Out[21]:

Spectrogram for audio with fear emotion

In [22]:
```
emotion='angry'
path = np.array(data_path.Path[data_path.Emotions==emotion])[1]
data, sampling_rate = librosa.load(path)
create_waveplot(data, sampling_rate, emotion)
create_spectrogram(data, sampling_rate, emotion)
Audio(path)
```
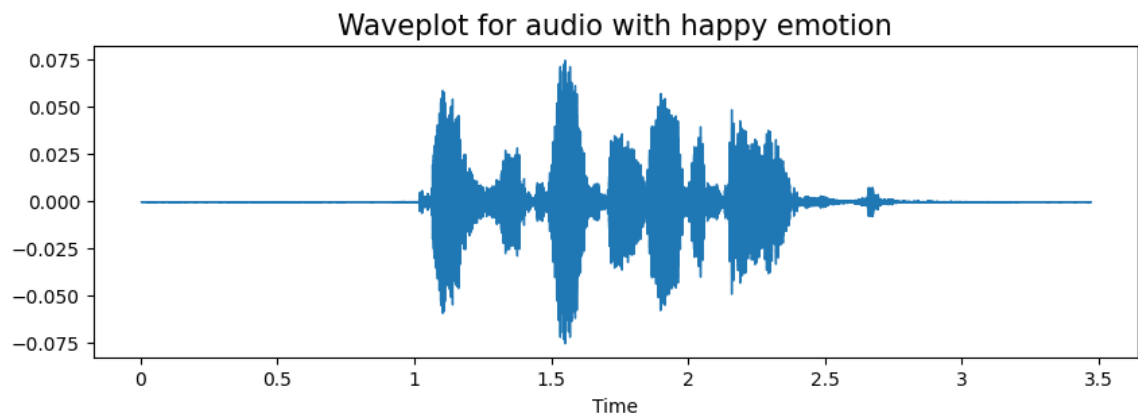
Waveplot for audio with angry emotion

▶ 0:00 / 0:03 ━━━━━━━ 🔊 ⋮

Spectrogram for audio with angry emotion

```python
emotion='sad'
path = np.array(data_path.Path[data_path.Emotions==emotion])[1]
data, sampling_rate = librosa.load(path)
create_waveplot(data, sampling_rate, emotion)
create_spectrogram(data, sampling_rate, emotion)
Audio(path)
```
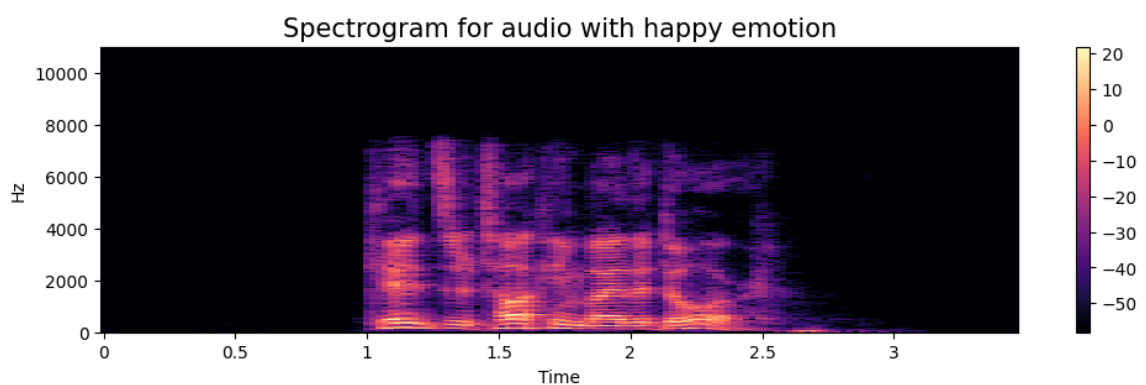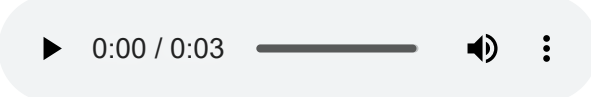
Waveplot for audio with sad emotion

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Spectrogram for audio with sad emotion
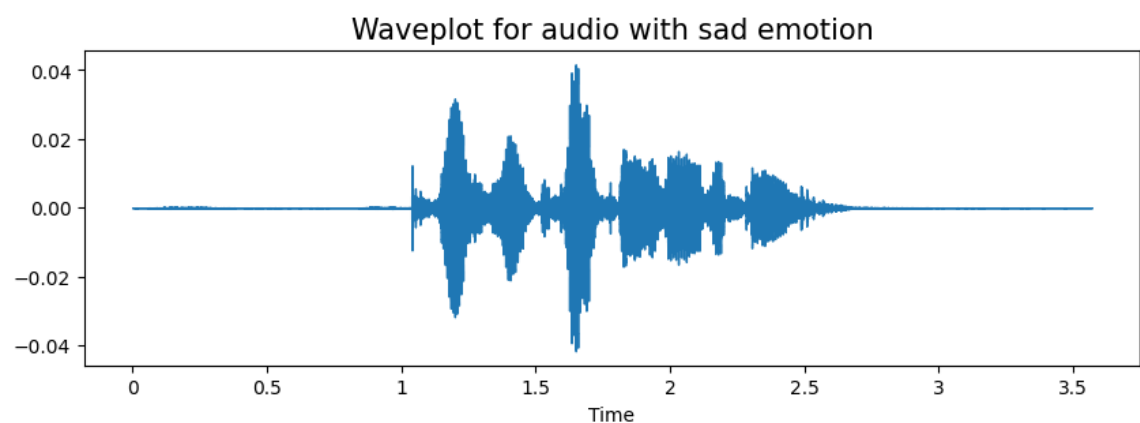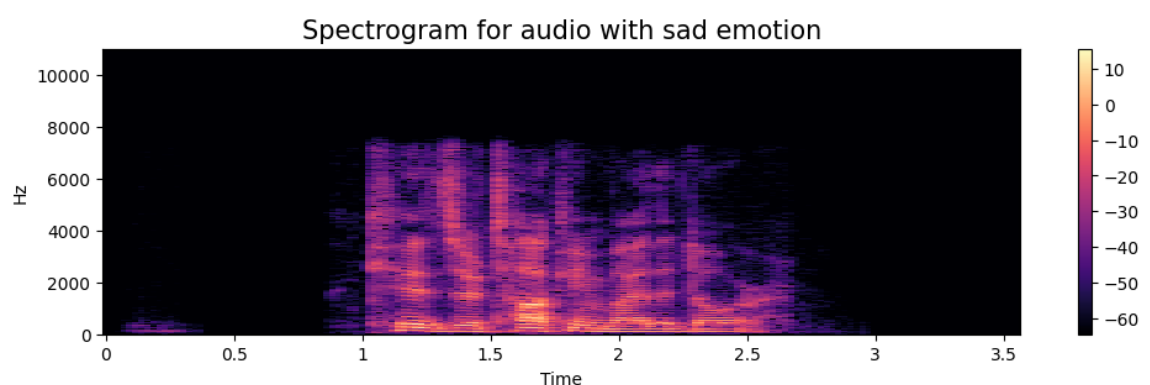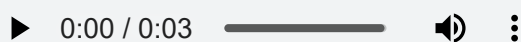
```python
emotion='happy'
path = np.array(data_path.Path[data_path.Emotions==emotion])[1]
data, sampling_rate = librosa.load(path)
create_waveplot(data, sampling_rate, emotion)
create_spectrogram(data, sampling_rate, emotion)
Audio(path)
```

Waveplot for audio with happy emotion

Out[24]:

▶ 0:00 / 0:03 ━━━━━━━━━ 🔊 ⋮

Spectrogram for audio with happy emotion

Data augmentaion

Data augmentation is the process by which we create new synthetic data samples by adding small perturbations on our initial training set.

To generate syntactic data for audio, we can apply noise injection, shifting time, changing pitch and speed.

The objective is to make our model invariant to those perturbations and enhace its ability to generalize.

In [25]:
```python
def get_white_noise(signal,SNR) :
    #RMS value of signal
    RMS_s=math.sqrt(np.mean(signal**2))
    #RMS values of noise
    RMS_n=math.sqrt(RMS_s**2/(pow(10,SNR/10)))
    #Additive white gausian noise. Thereore mean=0
    #Because sample length is large (typically > 40000)
    #we can use the population formula for standard daviation.
    #because mean=0 STD=RMS
    STD_n=RMS_n
    noise=np.random.normal(0, STD_n, signal.shape[0])
    return noise

#given a signal, noise (audio) and desired SNR, this gives the noise (scaled ver
```

```python
def noise(data):
    noise_amp = 0.035*np.random.uniform()*np.amax(data)         #creating noi
    data = data + noise_amp*np.random.normal(size=data.shape[0])  # add given si
    return data
#***convert complex np array to polar arrays (2 apprays; abs and angle)
def gaussian_noise(path):
    signal_file= path
    signal, sr = librosa.load(signal_file)
    signal=np.interp(signal, (signal.min(), signal.max()), (-1, 1))
    noise=get_white_noise(signal,SNR=30)                               #SNR i
    data = signal + noise
    return data

def stretch(data, rate=0.8):
    return librosa.effects.time_stretch(data, rate)            # strech the s


def shift(data):
    shift_range = int(np.random.uniform(low=-5, high = 5)*1000)  #choose a rand
    return np.roll(data, shift_range)                            #The numpy.roll
                                                                 #the specified
                                                                 #elements of th




def pitch(data, sampling_rate, pitch_factor=0.7):
    return librosa.effects.pitch_shift(data, sampling_rate, pitch_factor)


path = np.array(data_path.Path)[1]
data, sample_rate = librosa.load(path)
```
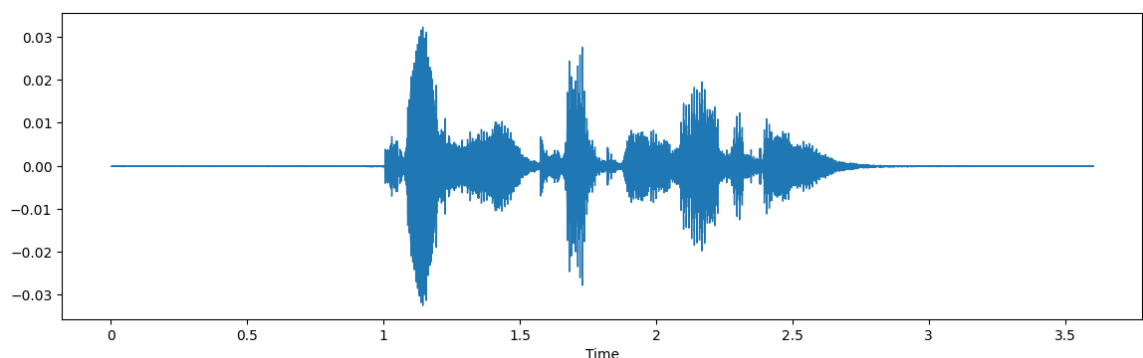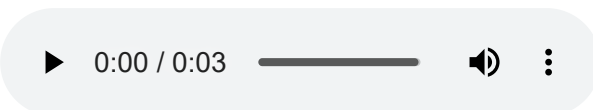
In [26]:
```python
plt.figure(figsize=(14,4))
librosa.display.waveshow(y=data, sr=sample_rate)     #waveplot of single audio fi
Audio(path)
```
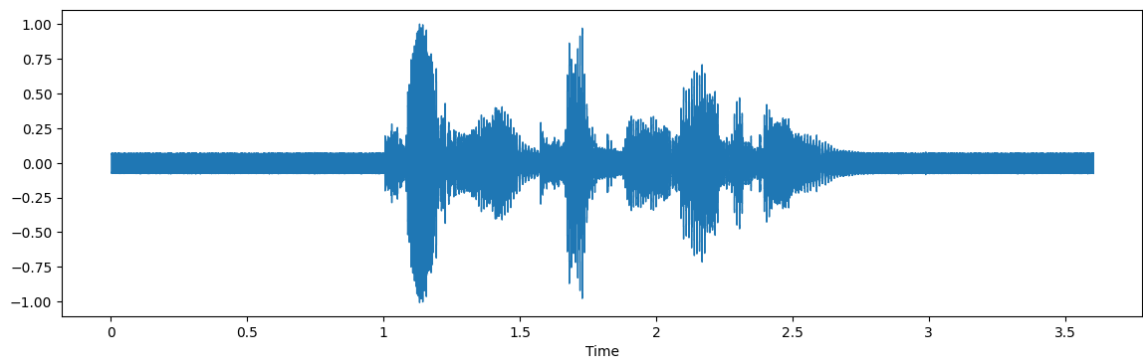
Out[26]:

▶ 0:00 / 0:03 ────── 🔊 ⋮

In [27]:
```python
x = gaussian_noise(path)
plt.figure(figsize=(14,4))
librosa.display.waveshow(y=x, sr=sample_rate)     # waveplot with noise added
Audio(x, rate=sample_rate)
```
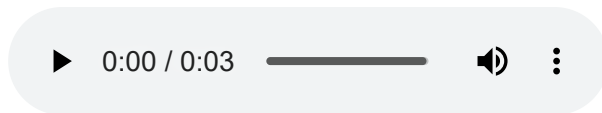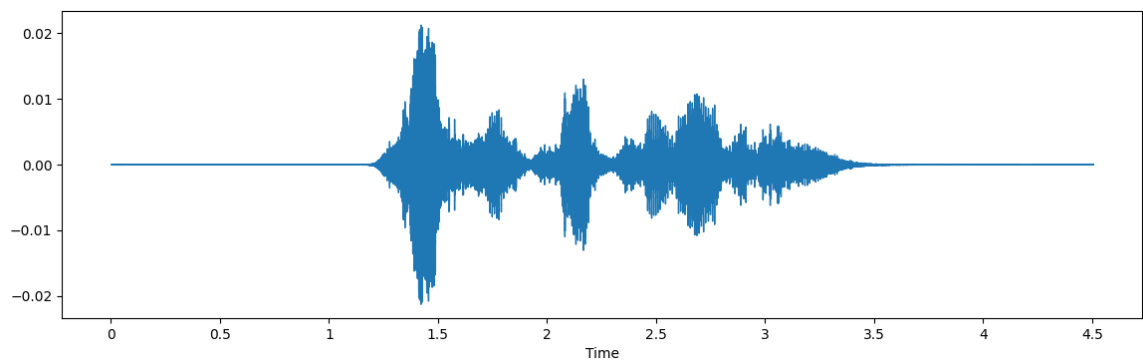
▶ 0:00 / 0:03 ━━━━ 🔊 ⋮

In [28]:
```python
x = stretch(data)
plt.figure(figsize=(14,4))
librosa.display.waveshow(y=x, sr=sample_rate)     #waveplot of stretched data
Audio(x, rate=sample_rate)
```
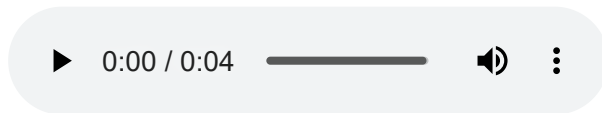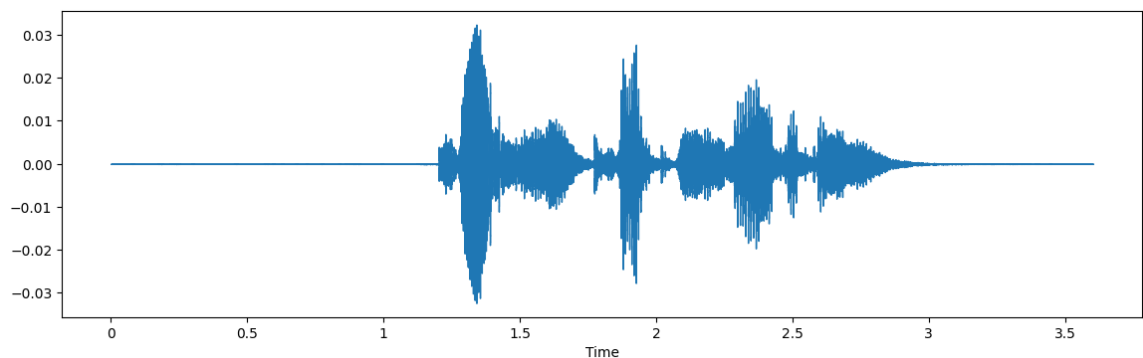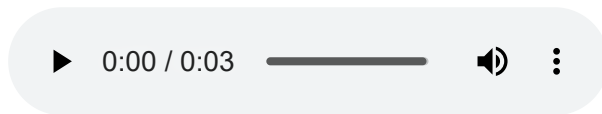
Out[28]:

▶ 0:00 / 0:04 ━━━━ 🔊 ⋮

In [29]:
```python
x = shift(data)
plt.figure(figsize=(14,4))
librosa.display.waveshow(y=x, sr=sample_rate)  #waveplot of shifted data
Audio(x, rate=sample_rate)
```
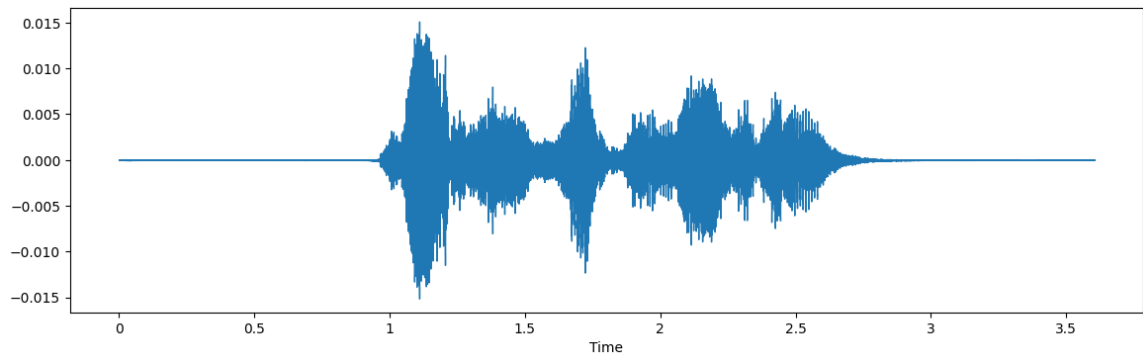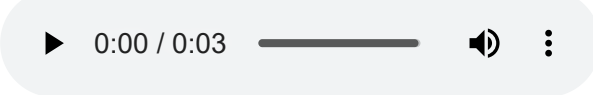
Out[29]:

▶ 0:00 / 0:03 ━━━━ 🔊 ⋮

In [30]:
```python
x = pitch(data, sample_rate)
plt.figure(figsize=(14,4))
```

```
librosa.display.waveshow(y=x, sr=sample_rate)      #waveplot of data with scaled
Audio(x, rate=sample_rate)
```

Out[30]:

▶ 0:00 / 0:03 ━━━━━━━ 🔊 ⋮

EXTRACTING FEATURES

In [30]:
```python
def extract_features(data,sample_rate):
    result = np.array([])

    # MFCC
    mfcc = np.mean(librosa.feature.mfcc(y=data, sr=sample_rate).T, axis=0)
    result = np.hstack((result, mfcc)) # stacking horizontally

    # MelSpectogram
    mel = np.mean(librosa.feature.melspectrogram(y=data, sr=sample_rate).T, axis
    result = np.hstack((result, mel)) # stacking horizontally

    return result

def get_features(path):
    # duration and offset are used to take care of the no audio in start and the
    data, sample_rate = librosa.load(path, duration=2.5, offset=0.6)

    # without augmentation
    res1 = extract_features(data,sample_rate)
    result = np.array(res1)

    # data with noise
    noise_data = gaussian_noise(data)
    res2 = extract_features(noise_data,sample_rate)
    result = np.vstack((result, res2)) # stacking vertically

    # data with pitching)
    data_stretch_pitch = pitch(data, sample_rate)
    res3 = extract_features(data_stretch_pitch,sample_rate)
    result = np.vstack((result, res3)) # stacking vertically

    return result
```

In [ ]:
```python
X, Y = [], []
for path, emotion in zip(data_path.Path, data_path.Emotions):
    feature = get_features(path)
    for ele in feature:
        X.append(ele)
```

```
          # appending emotion 3 times as we have made 3 augmentation techniques on
          Y.append(emotion)
```

In [33]:
```
len(X), len(Y), data_path.Path.shape
```

Out[33]: `(4032, 4032, (1344,))`

IMPORTING FEATURES TO CSV FILE

In [34]:
```
Features = pd.DataFrame(X)
Features['labels'] = Y
Features.to_csv('features.csv', index=False)
Features
```

Out[34]:

	0	1	2	3	4	5	6
0	-664.521118	105.086784	-14.334901	35.750858	-2.922972	12.071979	-12.819363	-1.90(
1	-502.258021	40.172791	11.668841	13.202699	5.970155	1.472990	-4.053561	-6.77
2	-694.677429	101.071388	-12.095994	36.136307	-5.951420	11.208563	-15.341566	-2.41
3	-644.531677	111.879288	-12.482704	29.493940	1.852232	10.470756	-13.204048	-3.07!
4	-466.852132	37.387810	14.690685	11.655795	6.921600	2.951682	-3.465657	-6.37!
...	...	...	...	...	...	...	...
4027	-275.954646	17.244226	-6.014878	1.529202	-14.085451	-2.077833	-9.069314	-4.86;
4028	-438.700378	67.884155	-43.224350	29.731983	-45.709114	13.971882	-35.074360	0.89;
4029	-471.755981	72.697395	-32.784992	20.881147	-29.685863	7.488073	-27.214539	-1.40;
4030	-471.725226	72.689081	-32.780011	20.897380	-29.692800	7.497864	-27.209980	-1.39;
4031	-492.301208	71.468369	-34.351131	18.694498	-32.959282	7.515962	-31.663589	1.23;

4032 rows × 149 columns

Loading Features from csv File

In [52]:
```
raw_data = open("features.csv", 'rt')
Features = pd.read_csv(raw_data, delimiter=',')
```

In [53]:
```
X = Features.iloc[: ,:-1].values
Y = Features['labels'].values
```

```
In [37]:   encoder = OneHotEncoder()
           Y = encoder.fit_transform(np.array(Y).reshape(-1,1)).toarray()
```

Splitting of Data

```
In [38]:   # splitting data
           x_train, x_test, y_train, y_test = train_test_split(X, Y,test_size=0.25, random_
           x_train.shape, y_train.shape, x_test.shape, y_test.shape
```

Out[38]:   ((3628, 148), (3628, 7), (1210, 148), (1210, 7))

```
In [39]:   # scaling our data with sklearn's Standard scaler
           scaler = StandardScaler()
           x_train = scaler.fit_transform(x_train)
           x_test = scaler.transform(x_test)
           x_train.shape, y_train.shape, x_test.shape, y_test.shape
```

Out[39]:   ((3628, 148), (3628, 7), (1210, 148), (1210, 7))

```
In [40]:   # making our data compatible to model.
           x_train = np.expand_dims(x_train, axis=2)
           x_test = np.expand_dims(x_test, axis=2)
           x_train.shape, y_train.shape, x_test.shape, y_test.shape
```

Out[40]:   ((3628, 148, 1), (3628, 7), (1210, 148, 1), (1210, 7))

Creating Model

```
In [41]:   model=Sequential()
           model.add(Conv1D(256, kernel_size=5, strides=1, padding='same', activation='relu
           model.add(MaxPooling1D(pool_size=5, strides = 2, padding = 'same'))
           model.add(Conv1D(256, kernel_size=5, strides=1, padding='same', activation='relu
           model.add(MaxPooling1D(pool_size=5, strides = 2, padding = 'same'))
           model.add(Dropout(0.2))
           model.add(Conv1D(128, kernel_size=5, strides=1, padding='same', activation='relu
           model.add(MaxPooling1D(pool_size=5, strides = 2, padding = 'same'))
           model.add(Dropout(0.2))
           model.add(Conv1D(64, kernel_size=5, strides=1, padding='same', activation='relu'
           model.add(MaxPooling1D(pool_size=5, strides = 2, padding = 'same'))
           model.add(Dropout(0.2))
           model.add(Flatten())
           model.add(Dense(units=32, activation='relu'))
           model.add(Dropout(0.4))
           model.add(Dense(units=7, activation='softmax'))
           model.compile(optimizer = 'Adam' , loss = 'categorical_crossentropy' , metrics =
           model.summary()
```

```
Model: "sequential_3"
_____
Layer (type)                 Output Shape              Param #
=================================================================
conv1d_12 (Conv1D)           (None, 148, 256)          1536
_____
max_pooling1d_12 (MaxPooling (None, 74, 256)           0
_____
conv1d_13 (Conv1D)           (None, 74, 256)           327936
_____
max_pooling1d_13 (MaxPooling (None, 37, 256)           0
_____
dropout_12 (Dropout)         (None, 37, 256)           0
_____
conv1d_14 (Conv1D)           (None, 37, 128)           163968
_____
max_pooling1d_14 (MaxPooling (None, 19, 128)           0
_____
dropout_13 (Dropout)         (None, 19, 128)           0
_____
conv1d_15 (Conv1D)           (None, 19, 64)            41024
_____
max_pooling1d_15 (MaxPooling (None, 10, 64)            0
_____
dropout_14 (Dropout)         (None, 10, 64)            0
_____
flatten_3 (Flatten)          (None, 640)               0
_____
dense_6 (Dense)              (None, 32)                20512
_____
dropout_15 (Dropout)         (None, 32)                0
_____
dense_7 (Dense)              (None, 7)                 231
=================================================================
Total params: 555,207
Trainable params: 555,207
Non-trainable params: 0
_____
```

Execution of Model

```
In [42]:   #rlrp = ReduceLROnPlateau(monitor='loss', factor=0.4, verbose=0, patience=2, min
           from keras import callbacks
           earlystopping = callbacks.EarlyStopping(monitor ="val_loss", verbose=1,
                                           mode ="min", patience = 5,
                                           restore_best_weights = True)
           history=model.fit(x_train, y_train, batch_size=64, epochs=100, validation_data=(
```

```
Epoch 1/100
57/57 [==============================] - ETA: 10:09 - loss: 1.9717 - accuracy:
0.093 - ETA: 20s - loss: 1.9880 - accuracy: 0.1172  - ETA: 19s - loss: 1.9912 -
accuracy: 0.126 - ETA: 20s - loss: 1.9870 - accuracy: 0.130 - ETA: 20s - loss:
1.9821 - accuracy: 0.134 - ETA: 20s - loss: 1.9775 - accuracy: 0.139 - ETA: 20s
- loss: 1.9748 - accuracy: 0.143 - ETA: 19s - loss: 1.9705 - accuracy: 0.146 -
ETA: 19s - loss: 1.9675 - accuracy: 0.149 - ETA: 19s - loss: 1.9641 - accuracy:
0.152 - ETA: 18s - loss: 1.9606 - accuracy: 0.154 - ETA: 18s - loss: 1.9572 - a
ccuracy: 0.156 - ETA: 18s - loss: 1.9544 - accuracy: 0.158 - ETA: 17s - loss:
1.9514 - accuracy: 0.160 - ETA: 16s - loss: 1.9496 - accuracy: 0.161 - ETA: 16s
- loss: 1.9478 - accuracy: 0.163 - ETA: 16s - loss: 1.9461 - accuracy: 0.164 -
ETA: 15s - loss: 1.9442 - accuracy: 0.165 - ETA: 15s - loss: 1.9423 - accuracy:
0.167 - ETA: 15s - loss: 1.9407 - accuracy: 0.168 - ETA: 14s - loss: 1.9390 - a
ccuracy: 0.169 - ETA: 14s - loss: 1.9376 - accuracy: 0.170 - ETA: 13s - loss:
1.9362 - accuracy: 0.171 - ETA: 13s - loss: 1.9348 - accuracy: 0.172 - ETA: 12s
- loss: 1.9334 - accuracy: 0.172 - ETA: 12s - loss: 1.9320 - accuracy: 0.173 -
ETA: 12s - loss: 1.9307 - accuracy: 0.174 - ETA: 11s - loss: 1.9295 - accuracy:
0.174 - ETA: 11s - loss: 1.9282 - accuracy: 0.175 - ETA: 11s - loss: 1.9270 - a
ccuracy: 0.176 - ETA: 10s - loss: 1.9258 - accuracy: 0.176 - ETA: 10s - loss:
1.9249 - accuracy: 0.177 - ETA: 9s - loss: 1.9241 - accuracy: 0.177 - ETA: 9s -
loss: 1.9232 - accuracy: 0.17 - ETA: 8s - loss: 1.9223 - accuracy: 0.17 - ETA:
8s - loss: 1.9214 - accuracy: 0.17 - ETA: 7s - loss: 1.9204 - accuracy: 0.17 -
ETA: 7s - loss: 1.9195 - accuracy: 0.18 - ETA: 6s - loss: 1.9186 - accuracy: 0.
18 - ETA: 6s - loss: 1.9178 - accuracy: 0.18 - ETA: 5s - loss: 1.9170 - accurac
y: 0.18 - ETA: 5s - loss: 1.9162 - accuracy: 0.18 - ETA: 5s - loss: 1.9154 - ac
curacy: 0.18 - ETA: 4s - loss: 1.9146 - accuracy: 0.18 - ETA: 4s - loss: 1.9138
- accuracy: 0.18 - ETA: 3s - loss: 1.9130 - accuracy: 0.18 - ETA: 3s - loss: 1.
9123 - accuracy: 0.18 - ETA: 3s - loss: 1.9116 - accuracy: 0.18 - ETA: 2s - los
s: 1.9109 - accuracy: 0.18 - ETA: 2s - loss: 1.9103 - accuracy: 0.18 - ETA: 2s
- loss: 1.9096 - accuracy: 0.18 - ETA: 1s - loss: 1.9090 - accuracy: 0.18 - ET
A: 1s - loss: 1.9083 - accuracy: 0.18 - ETA: 1s - loss: 1.9077 - accuracy: 0.18
- ETA: 0s - loss: 1.9070 - accuracy: 0.18 - ETA: 0s - loss: 1.9063 - accuracy:
0.18 - ETA: 0s - loss: 1.9056 - accuracy: 0.18 - 36s 457ms/step - loss: 1.9050
- accuracy: 0.1886 - val_loss: 1.7958 - val_accuracy: 0.2793
Epoch 2/100
57/57 [==============================] - ETA: 20s - loss: 1.7772 - accuracy: 0.
296 - ETA: 20s - loss: 1.7814 - accuracy: 0.269 - ETA: 21s - loss: 1.7729 - acc
uracy: 0.263 - ETA: 21s - loss: 1.7624 - accuracy: 0.262 - ETA: 21s - loss: 1.7
584 - accuracy: 0.260 - ETA: 20s - loss: 1.7587 - accuracy: 0.260 - ETA: 20s -
loss: 1.7585 - accuracy: 0.260 - ETA: 20s - loss: 1.7586 - accuracy: 0.261 - ET
A: 20s - loss: 1.7592 - accuracy: 0.261 - ETA: 19s - loss: 1.7602 - accuracy:
0.261 - ETA: 19s - loss: 1.7620 - accuracy: 0.261 - ETA: 18s - loss: 1.7648 - a
ccuracy: 0.260 - ETA: 18s - loss: 1.7678 - accuracy: 0.259 - ETA: 17s - loss:
1.7703 - accuracy: 0.258 - ETA: 17s - loss: 1.7724 - accuracy: 0.257 - ETA: 16s
- loss: 1.7745 - accuracy: 0.256 - ETA: 16s - loss: 1.7766 - accuracy: 0.255 -
ETA: 15s - loss: 1.7784 - accuracy: 0.254 - ETA: 15s - loss: 1.7803 - accuracy:
0.253 - ETA: 14s - loss: 1.7821 - accuracy: 0.252 - ETA: 14s - loss: 1.7836 - a
ccuracy: 0.251 - ETA: 13s - loss: 1.7850 - accuracy: 0.250 - ETA: 13s - loss:
1.7863 - accuracy: 0.249 - ETA: 13s - loss: 1.7875 - accuracy: 0.249 - ETA: 12s
- loss: 1.7888 - accuracy: 0.248 - ETA: 12s - loss: 1.7901 - accuracy: 0.247 -
ETA: 11s - loss: 1.7914 - accuracy: 0.246 - ETA: 11s - loss: 1.7925 - accuracy:
0.246 - ETA: 11s - loss: 1.7936 - accuracy: 0.245 - ETA: 10s - loss: 1.7946 - a
ccuracy: 0.244 - ETA: 10s - loss: 1.7954 - accuracy: 0.244 - ETA: 9s - loss: 1.
7962 - accuracy: 0.243 - ETA: 9s - loss: 1.7969 - accuracy: 0.24 - ETA: 9s - lo
ss: 1.7977 - accuracy: 0.24 - ETA: 8s - loss: 1.7983 - accuracy: 0.24 - ETA: 8s
- loss: 1.7990 - accuracy: 0.24 - ETA: 8s - loss: 1.7996 - accuracy: 0.24 - ET
A: 7s - loss: 1.8002 - accuracy: 0.24 - ETA: 7s - loss: 1.8008 - accuracy: 0.24
- ETA: 7s - loss: 1.8013 - accuracy: 0.24 - ETA: 6s - loss: 1.8018 - accuracy:
0.23 - ETA: 6s - loss: 1.8022 - accuracy: 0.23 - ETA: 5s - loss: 1.8027 - accur
acy: 0.23 - ETA: 5s - loss: 1.8030 - accuracy: 0.23 - ETA: 4s - loss: 1.8034 -
```

accuracy: 0.23 - ETA: 4s - loss: 1.8038 - accuracy: 0.23 - ETA: 4s - loss: 1.80
41 - accuracy: 0.23 - ETA: 3s - loss: 1.8044 - accuracy: 0.23 - ETA: 3s - loss:
1.8046 - accuracy: 0.23 - ETA: 2s - loss: 1.8048 - accuracy: 0.23 - ETA: 2s - l
oss: 1.8050 - accuracy: 0.23 - ETA: 2s - loss: 1.8052 - accuracy: 0.23 - ETA: 1
s - loss: 1.8053 - accuracy: 0.23 - ETA: 1s - loss: 1.8055 - accuracy: 0.23 - E
TA: 0s - loss: 1.8056 - accuracy: 0.23 - ETA: 0s - loss: 1.8057 - accuracy: 0.2
3 - ETA: 0s - loss: 1.8058 - accuracy: 0.23 - 25s 435ms/step - loss: 1.8059 - a
ccuracy: 0.2365 - val_loss: 1.7348 - val_accuracy: 0.2884
Epoch 3/100
57/57 [==============================] - ETA: 29s - loss: 1.8165 - accuracy: 0.
203 - ETA: 22s - loss: 1.8243 - accuracy: 0.203 - ETA: 21s - loss: 1.8300 - acc
uracy: 0.192 - ETA: 21s - loss: 1.8271 - accuracy: 0.192 - ETA: 20s - loss: 1.8
210 - accuracy: 0.193 - ETA: 20s - loss: 1.8177 - accuracy: 0.195 - ETA: 19s -
loss: 1.8170 - accuracy: 0.196 - ETA: 19s - loss: 1.8144 - accuracy: 0.199 - ET
A: 18s - loss: 1.8122 - accuracy: 0.202 - ETA: 18s - loss: 1.8103 - accuracy:
0.205 - ETA: 18s - loss: 1.8090 - accuracy: 0.208 - ETA: 17s - loss: 1.8080 - a
ccuracy: 0.210 - ETA: 16s - loss: 1.8069 - accuracy: 0.213 - ETA: 16s - loss:
1.8057 - accuracy: 0.216 - ETA: 16s - loss: 1.8045 - accuracy: 0.218 - ETA: 15s
- loss: 1.8032 - accuracy: 0.220 - ETA: 15s - loss: 1.8019 - accuracy: 0.222 -
ETA: 15s - loss: 1.8007 - accuracy: 0.224 - ETA: 14s - loss: 1.7997 - accuracy:
0.225 - ETA: 14s - loss: 1.7987 - accuracy: 0.226 - ETA: 14s - loss: 1.7978 - a
ccuracy: 0.227 - ETA: 13s - loss: 1.7971 - accuracy: 0.228 - ETA: 13s - loss:
1.7965 - accuracy: 0.229 - ETA: 13s - loss: 1.7959 - accuracy: 0.230 - ETA: 12s
- loss: 1.7953 - accuracy: 0.231 - ETA: 12s - loss: 1.7945 - accuracy: 0.232 -
ETA: 11s - loss: 1.7939 - accuracy: 0.233 - ETA: 11s - loss: 1.7933 - accuracy:
0.234 - ETA: 11s - loss: 1.7927 - accuracy: 0.235 - ETA: 10s - loss: 1.7922 - a
ccuracy: 0.236 - ETA: 10s - loss: 1.7916 - accuracy: 0.236 - ETA: 10s - loss:
1.7912 - accuracy: 0.237 - ETA: 9s - loss: 1.7907 - accuracy: 0.238 - ETA: 9s -
loss: 1.7903 - accuracy: 0.23 - ETA: 8s - loss: 1.7898 - accuracy: 0.24 - ETA:
8s - loss: 1.7893 - accuracy: 0.24 - ETA: 7s - loss: 1.7888 - accuracy: 0.24 -
ETA: 7s - loss: 1.7883 - accuracy: 0.24 - ETA: 7s - loss: 1.7878 - accuracy: 0.
24 - ETA: 6s - loss: 1.7873 - accuracy: 0.24 - ETA: 6s - loss: 1.7869 - accurac
y: 0.24 - ETA: 5s - loss: 1.7865 - accuracy: 0.24 - ETA: 5s - loss: 1.7861 - ac
curacy: 0.24 - ETA: 5s - loss: 1.7858 - accuracy: 0.24 - ETA: 4s - loss: 1.7854
- accuracy: 0.24 - ETA: 4s - loss: 1.7850 - accuracy: 0.24 - ETA: 3s - loss: 1.
7846 - accuracy: 0.24 - ETA: 3s - loss: 1.7842 - accuracy: 0.24 - ETA: 3s - los
s: 1.7838 - accuracy: 0.24 - ETA: 2s - loss: 1.7834 - accuracy: 0.24 - ETA: 2s
- loss: 1.7832 - accuracy: 0.24 - ETA: 1s - loss: 1.7829 - accuracy: 0.24 - ET
A: 1s - loss: 1.7826 - accuracy: 0.24 - ETA: 1s - loss: 1.7823 - accuracy: 0.24
- ETA: 0s - loss: 1.7820 - accuracy: 0.25 - ETA: 0s - loss: 1.7816 - accuracy:
0.25 - ETA: 0s - loss: 1.7813 - accuracy: 0.25 - 23s 407ms/step - loss: 1.7810
- accuracy: 0.2511 - val_loss: 1.6924 - val_accuracy: 0.3264
Epoch 4/100
57/57 [==============================] - ETA: 21s - loss: 1.6786 - accuracy: 0.
312 - ETA: 22s - loss: 1.7067 - accuracy: 0.300 - ETA: 21s - loss: 1.7250 - acc
uracy: 0.290 - ETA: 21s - loss: 1.7305 - accuracy: 0.288 - ETA: 22s - loss: 1.7
354 - accuracy: 0.285 - ETA: 21s - loss: 1.7346 - accuracy: 0.287 - ETA: 21s -
loss: 1.7365 - accuracy: 0.288 - ETA: 21s - loss: 1.7374 - accuracy: 0.287 - ET
A: 21s - loss: 1.7367 - accuracy: 0.288 - ETA: 21s - loss: 1.7348 - accuracy:
0.289 - ETA: 20s - loss: 1.7340 - accuracy: 0.289 - ETA: 20s - loss: 1.7334 - a
ccuracy: 0.290 - ETA: 19s - loss: 1.7331 - accuracy: 0.290 - ETA: 18s - loss:
1.7330 - accuracy: 0.290 - ETA: 18s - loss: 1.7330 - accuracy: 0.290 - ETA: 17s
- loss: 1.7326 - accuracy: 0.290 - ETA: 17s - loss: 1.7327 - accuracy: 0.289 -
ETA: 16s - loss: 1.7323 - accuracy: 0.290 - ETA: 16s - loss: 1.7320 - accuracy:
0.290 - ETA: 15s - loss: 1.7317 - accuracy: 0.290 - ETA: 15s - loss: 1.7316 - a
ccuracy: 0.290 - ETA: 14s - loss: 1.7311 - accuracy: 0.290 - ETA: 14s - loss:
1.7308 - accuracy: 0.291 - ETA: 14s - loss: 1.7304 - accuracy: 0.291 - ETA: 13s
- loss: 1.7301 - accuracy: 0.291 - ETA: 13s - loss: 1.7300 - accuracy: 0.291 -
ETA: 12s - loss: 1.7298 - accuracy: 0.292 - ETA: 12s - loss: 1.7296 - accuracy:
0.292 - ETA: 11s - loss: 1.7292 - accuracy: 0.292 - ETA: 11s - loss: 1.7289 - a

ccuracy: 0.292 - ETA: 11s - loss: 1.7285 - accuracy: 0.292 - ETA: 10s - loss: 1.7281 - accuracy: 0.293 - ETA: 10s - loss: 1.7277 - accuracy: 0.293 - ETA: 9s - loss: 1.7273 - accuracy: 0.293 - ETA: 9s - loss: 1.7269 - accuracy: 0.29 - ETA: 9s - loss: 1.7264 - accuracy: 0.29 - ETA: 8s - loss: 1.7259 - accuracy: 0.29 - ETA: 8s - loss: 1.7257 - accuracy: 0.29 - ETA: 7s - loss: 1.7254 - accuracy: 0.29 - ETA: 7s - loss: 1.7252 - accuracy: 0.29 - ETA: 7s - loss: 1.7251 - accuracy: 0.29 - ETA: 6s - loss: 1.7250 - accuracy: 0.29 - ETA: 6s - loss: 1.7249 - accuracy: 0.29 - ETA: 5s - loss: 1.7250 - accuracy: 0.29 - ETA: 5s - loss: 1.7250 - accuracy: 0.29 - ETA: 4s - loss: 1.7250 - accuracy: 0.29 - ETA: 4s - loss: 1.7251 - accuracy: 0.29 - ETA: 3s - loss: 1.7252 - accuracy: 0.29 - ETA: 3s - loss: 1.7252 - accuracy: 0.29 - ETA: 3s - loss: 1.7253 - accuracy: 0.29 - ETA: 2s - loss: 1.7254 - accuracy: 0.29 - ETA: 2s - loss: 1.7255 - accuracy: 0.29 - ETA: 1s - loss: 1.7256 - accuracy: 0.29 - ETA: 1s - loss: 1.7257 - accuracy: 0.29 - ETA: 0s - loss: 1.7258 - accuracy: 0.29 - ETA: 0s - loss: 1.7258 - accuracy: 0.29 - ETA: 0s - loss: 1.7258 - accuracy: 0.29 - 26s 455ms/step - loss: 1.7259 - accuracy: 0.2954 - val_loss: 1.7105 - val_accuracy: 0.3017
Epoch 5/100
57/57 [==============================] - ETA: 27s - loss: 1.6607 - accuracy: 0.281 - ETA: 20s - loss: 1.6977 - accuracy: 0.253 - ETA: 19s - loss: 1.7075 - accuracy: 0.245 - ETA: 19s - loss: 1.7174 - accuracy: 0.241 - ETA: 19s - loss: 1.7166 - accuracy: 0.243 - ETA: 19s - loss: 1.7189 - accuracy: 0.245 - ETA: 18s - loss: 1.7256 - accuracy: 0.243 - ETA: 18s - loss: 1.7296 - accuracy: 0.244 - ETA: 18s - loss: 1.7343 - accuracy: 0.244 - ETA: 17s - loss: 1.7377 - accuracy: 0.245 - ETA: 17s - loss: 1.7411 - accuracy: 0.245 - ETA: 17s - loss: 1.7438 - accuracy: 0.246 - ETA: 17s - loss: 1.7466 - accuracy: 0.246 - ETA: 16s - loss: 1.7491 - accuracy: 0.246 - ETA: 16s - loss: 1.7509 - accuracy: 0.246 - ETA: 16s - loss: 1.7527 - accuracy: 0.246 - ETA: 15s - loss: 1.7542 - accuracy: 0.246 - ETA: 15s - loss: 1.7549 - accuracy: 0.247 - ETA: 14s - loss: 1.7553 - accuracy: 0.248 - ETA: 14s - loss: 1.7550 - accuracy: 0.250 - ETA: 14s - loss: 1.7550 - accuracy: 0.251 - ETA: 13s - loss: 1.7548 - accuracy: 0.252 - ETA: 13s - loss: 1.7545 - accuracy: 0.253 - ETA: 12s - loss: 1.7542 - accuracy: 0.254 - ETA: 12s - loss: 1.7540 - accuracy: 0.255 - ETA: 12s - loss: 1.7536 - accuracy: 0.256 - ETA: 11s - loss: 1.7533 - accuracy: 0.257 - ETA: 11s - loss: 1.7529 - accuracy: 0.258 - ETA: 11s - loss: 1.7526 - accuracy: 0.259 - ETA: 10s - loss: 1.7521 - accuracy: 0.260 - ETA: 10s - loss: 1.7518 - accuracy: 0.260 - ETA: 9s - loss: 1.7514 - accuracy: 0.261 - ETA: 9s - loss: 1.7510 - accuracy: 0.26 - ETA: 9s - loss: 1.7505 - accuracy: 0.26 - ETA: 8s - loss: 1.7500 - accuracy: 0.26 - ETA: 8s - loss: 1.7496 - accuracy: 0.26 - ETA: 8s - loss: 1.7491 - accuracy: 0.26 - ETA: 7s - loss: 1.7486 - accuracy: 0.26 - ETA: 7s - loss: 1.7481 - accuracy: 0.26 - ETA: 6s - loss: 1.7477 - accuracy: 0.26 - ETA: 6s - loss: 1.7472 - accuracy: 0.26 - ETA: 6s - loss: 1.7466 - accuracy: 0.26 - ETA: 5s - loss: 1.7461 - accuracy: 0.27 - ETA: 5s - loss: 1.7456 - accuracy: 0.27 - ETA: 4s - loss: 1.7450 - accuracy: 0.27 - ETA: 4s - loss: 1.7445 - accuracy: 0.27 - ETA: 4s - loss: 1.7439 - accuracy: 0.27 - ETA: 3s - loss: 1.7434 - accuracy: 0.27 - ETA: 3s - loss: 1.7427 - accuracy: 0.27 - ETA: 2s - loss: 1.7421 - accuracy: 0.27 - ETA: 2s - loss: 1.7416 - accuracy: 0.27 - ETA: 2s - loss: 1.7411 - accuracy: 0.27 - ETA: 1s - loss: 1.7406 - accuracy: 0.27 - ETA: 1s - loss: 1.7401 - accuracy: 0.27 - ETA: 0s - loss: 1.7397 - accuracy: 0.27 - ETA: 0s - loss: 1.7392 - accuracy: 0.27 - ETA: 0s - loss: 1.7387 - accuracy: 0.27 - 24s 427ms/step - loss: 1.7383 - accuracy: 0.2781 - val_loss: 1.6425 - val_accuracy: 0.3818
Epoch 6/100
57/57 [==============================] - ETA: 31s - loss: 1.6196 - accuracy: 0.359 - ETA: 22s - loss: 1.6216 - accuracy: 0.355 - ETA: 23s - loss: 1.6444 - accuracy: 0.342 - ETA: 22s - loss: 1.6514 - accuracy: 0.343 - ETA: 22s - loss: 1.6523 - accuracy: 0.346 - ETA: 21s - loss: 1.6531 - accuracy: 0.347 - ETA: 21s - loss: 1.6553 - accuracy: 0.347 - ETA: 20s - loss: 1.6574 - accuracy: 0.346 - ETA: 20s - loss: 1.6585 - accuracy: 0.344 - ETA: 19s - loss: 1.6602 - accuracy: 0.342 - ETA: 19s - loss: 1.6615 - accuracy: 0.340 - ETA: 18s - loss: 1.6633 - accuracy: 0.339 - ETA: 18s - loss: 1.6639 - accuracy: 0.338 - ETA: 17s - loss: 1.6639 - accuracy: 0.338 - ETA: 17s - loss: 1.6631 - accuracy: 0.338 - ETA: 16s

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- loss: 1.6626 - accuracy: 0.338 - ETA: 16s - loss: 1.6620 - accuracy: 0.338 -
ETA: 15s - loss: 1.6612 - accuracy: 0.337 - ETA: 15s - loss: 1.6604 - accuracy:
0.337 - ETA: 15s - loss: 1.6596 - accuracy: 0.337 - ETA: 14s - loss: 1.6590 - a
ccuracy: 0.337 - ETA: 14s - loss: 1.6584 - accuracy: 0.337 - ETA: 14s - loss:
1.6581 - accuracy: 0.337 - ETA: 13s - loss: 1.6578 - accuracy: 0.337 - ETA: 13s
- loss: 1.6576 - accuracy: 0.337 - ETA: 13s - loss: 1.6573 - accuracy: 0.337 -
ETA: 12s - loss: 1.6573 - accuracy: 0.337 - ETA: 12s - loss: 1.6573 - accuracy:
0.337 - ETA: 11s - loss: 1.6571 - accuracy: 0.338 - ETA: 11s - loss: 1.6570 - a
ccuracy: 0.338 - ETA: 11s - loss: 1.6570 - accuracy: 0.338 - ETA: 10s - loss:
1.6570 - accuracy: 0.338 - ETA: 10s - loss: 1.6572 - accuracy: 0.338 - ETA: 9s
- loss: 1.6574 - accuracy: 0.338 - ETA: 9s - loss: 1.6576 - accuracy: 0.33 - ET
A: 8s - loss: 1.6578 - accuracy: 0.33 - ETA: 8s - loss: 1.6581 - accuracy: 0.33
- ETA: 8s - loss: 1.6584 - accuracy: 0.33 - ETA: 7s - loss: 1.6585 - accuracy:
0.33 - ETA: 7s - loss: 1.6587 - accuracy: 0.33 - ETA: 6s - loss: 1.6589 - accur
acy: 0.33 - ETA: 6s - loss: 1.6591 - accuracy: 0.33 - ETA: 5s - loss: 1.6593 -
accuracy: 0.33 - ETA: 5s - loss: 1.6594 - accuracy: 0.33 - ETA: 5s - loss: 1.65
95 - accuracy: 0.33 - ETA: 4s - loss: 1.6596 - accuracy: 0.33 - ETA: 4s - loss:
1.6597 - accuracy: 0.33 - ETA: 3s - loss: 1.6598 - accuracy: 0.33 - ETA: 3s - l
oss: 1.6599 - accuracy: 0.33 - ETA: 2s - loss: 1.6600 - accuracy: 0.33 - ETA: 2
s - loss: 1.6601 - accuracy: 0.33 - ETA: 2s - loss: 1.6602 - accuracy: 0.33 - E
TA: 1s - loss: 1.6602 - accuracy: 0.33 - ETA: 1s - loss: 1.6603 - accuracy: 0.3
3 - ETA: 0s - loss: 1.6604 - accuracy: 0.33 - ETA: 0s - loss: 1.6605 - accurac
y: 0.33 - ETA: 0s - loss: 1.6607 - accuracy: 0.33 - 25s 445ms/step - loss: 1.66
08 - accuracy: 0.3397 - val_loss: 1.6054 - val_accuracy: 0.3769
Epoch 7/100
57/57 [==============================] - ETA: 20s - loss: 1.6376 - accuracy: 0.
328 - ETA: 20s - loss: 1.6819 - accuracy: 0.316 - ETA: 22s - loss: 1.6887 - acc
uracy: 0.316 - ETA: 23s - loss: 1.6979 - accuracy: 0.312 - ETA: 23s - loss: 1.7
029 - accuracy: 0.310 - ETA: 22s - loss: 1.7050 - accuracy: 0.308 - ETA: 22s -
loss: 1.7033 - accuracy: 0.310 - ETA: 22s - loss: 1.7017 - accuracy: 0.312 - ET
A: 22s - loss: 1.7011 - accuracy: 0.313 - ETA: 21s - loss: 1.7014 - accuracy:
0.314 - ETA: 21s - loss: 1.7004 - accuracy: 0.316 - ETA: 21s - loss: 1.6996 - a
ccuracy: 0.317 - ETA: 20s - loss: 1.6982 - accuracy: 0.318 - ETA: 20s - loss:
1.6969 - accuracy: 0.319 - ETA: 19s - loss: 1.6958 - accuracy: 0.320 - ETA: 19s
- loss: 1.6944 - accuracy: 0.321 - ETA: 18s - loss: 1.6925 - accuracy: 0.322 -
ETA: 17s - loss: 1.6907 - accuracy: 0.323 - ETA: 17s - loss: 1.6887 - accuracy:
0.324 - ETA: 16s - loss: 1.6867 - accuracy: 0.325 - ETA: 15s - loss: 1.6848 - a
ccuracy: 0.325 - ETA: 15s - loss: 1.6831 - accuracy: 0.326 - ETA: 15s - loss:
1.6816 - accuracy: 0.327 - ETA: 14s - loss: 1.6801 - accuracy: 0.327 - ETA: 13s
- loss: 1.6789 - accuracy: 0.328 - ETA: 13s - loss: 1.6778 - accuracy: 0.328 -
ETA: 12s - loss: 1.6769 - accuracy: 0.328 - ETA: 12s - loss: 1.6762 - accuracy:
0.329 - ETA: 11s - loss: 1.6754 - accuracy: 0.329 - ETA: 11s - loss: 1.6745 - a
ccuracy: 0.329 - ETA: 11s - loss: 1.6738 - accuracy: 0.330 - ETA: 10s - loss:
1.6732 - accuracy: 0.330 - ETA: 10s - loss: 1.6725 - accuracy: 0.330 - ETA: 9s
- loss: 1.6720 - accuracy: 0.330 - ETA: 9s - loss: 1.6716 - accuracy: 0.33 - ET
A: 8s - loss: 1.6713 - accuracy: 0.33 - ETA: 8s - loss: 1.6709 - accuracy: 0.33
- ETA: 7s - loss: 1.6706 - accuracy: 0.33 - ETA: 7s - loss: 1.6704 - accuracy:
0.33 - ETA: 7s - loss: 1.6701 - accuracy: 0.33 - ETA: 6s - loss: 1.6699 - accur
acy: 0.33 - ETA: 6s - loss: 1.6697 - accuracy: 0.33 - ETA: 5s - loss: 1.6696 -
accuracy: 0.33 - ETA: 5s - loss: 1.6694 - accuracy: 0.33 - ETA: 4s - loss: 1.66
92 - accuracy: 0.33 - ETA: 4s - loss: 1.6691 - accuracy: 0.33 - ETA: 4s - loss:
1.6689 - accuracy: 0.33 - ETA: 3s - loss: 1.6687 - accuracy: 0.33 - ETA: 3s - l
oss: 1.6686 - accuracy: 0.33 - ETA: 2s - loss: 1.6684 - accuracy: 0.33 - ETA: 2
s - loss: 1.6682 - accuracy: 0.33 - ETA: 2s - loss: 1.6680 - accuracy: 0.33 - E
TA: 1s - loss: 1.6679 - accuracy: 0.33 - ETA: 1s - loss: 1.6677 - accuracy: 0.3
3 - ETA: 0s - loss: 1.6676 - accuracy: 0.33 - ETA: 0s - loss: 1.6675 - accurac
y: 0.33 - ETA: 0s - loss: 1.6674 - accuracy: 0.33 - 24s 425ms/step - loss: 1.66
73 - accuracy: 0.3324 - val_loss: 1.6126 - val_accuracy: 0.3686
Epoch 8/100
57/57 [==============================] - ETA: 21s - loss: 1.6363 - accuracy: 0.
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328 - ETA: 19s - loss: 1.6142 - accuracy: 0.332 - ETA: 20s - loss: 1.6113 - acc
uracy: 0.330 - ETA: 20s - loss: 1.6121 - accuracy: 0.325 - ETA: 20s - loss: 1.6
127 - accuracy: 0.325 - ETA: 19s - loss: 1.6166 - accuracy: 0.322 - ETA: 18s -
loss: 1.6215 - accuracy: 0.318 - ETA: 18s - loss: 1.6268 - accuracy: 0.316 - ET
A: 18s - loss: 1.6292 - accuracy: 0.317 - ETA: 17s - loss: 1.6302 - accuracy:
0.318 - ETA: 17s - loss: 1.6306 - accuracy: 0.319 - ETA: 17s - loss: 1.6309 - a
ccuracy: 0.320 - ETA: 16s - loss: 1.6310 - accuracy: 0.321 - ETA: 16s - loss:
1.6303 - accuracy: 0.323 - ETA: 16s - loss: 1.6294 - accuracy: 0.324 - ETA: 15s
- loss: 1.6288 - accuracy: 0.326 - ETA: 15s - loss: 1.6284 - accuracy: 0.327 -
ETA: 15s - loss: 1.6280 - accuracy: 0.328 - ETA: 14s - loss: 1.6277 - accuracy:
0.330 - ETA: 14s - loss: 1.6277 - accuracy: 0.331 - ETA: 14s - loss: 1.6274 - a
ccuracy: 0.333 - ETA: 13s - loss: 1.6273 - accuracy: 0.334 - ETA: 13s - loss:
1.6269 - accuracy: 0.335 - ETA: 12s - loss: 1.6266 - accuracy: 0.336 - ETA: 12s
- loss: 1.6262 - accuracy: 0.338 - ETA: 12s - loss: 1.6261 - accuracy: 0.339 -
ETA: 11s - loss: 1.6260 - accuracy: 0.339 - ETA: 11s - loss: 1.6258 - accuracy:
0.340 - ETA: 10s - loss: 1.6256 - accuracy: 0.341 - ETA: 10s - loss: 1.6253 - a
ccuracy: 0.342 - ETA: 10s - loss: 1.6250 - accuracy: 0.343 - ETA: 9s - loss: 1.
6246 - accuracy: 0.343 - ETA: 9s - loss: 1.6244 - accuracy: 0.34 - ETA: 8s - lo
ss: 1.6240 - accuracy: 0.34 - ETA: 8s - loss: 1.6238 - accuracy: 0.34 - ETA: 8s
- loss: 1.6236 - accuracy: 0.34 - ETA: 7s - loss: 1.6233 - accuracy: 0.34 - ET
A: 7s - loss: 1.6230 - accuracy: 0.34 - ETA: 7s - loss: 1.6227 - accuracy: 0.34
- ETA: 6s - loss: 1.6222 - accuracy: 0.34 - ETA: 6s - loss: 1.6218 - accuracy:
0.34 - ETA: 5s - loss: 1.6214 - accuracy: 0.34 - ETA: 5s - loss: 1.6210 - accur
acy: 0.34 - ETA: 5s - loss: 1.6206 - accuracy: 0.35 - ETA: 4s - loss: 1.6201 -
accuracy: 0.35 - ETA: 4s - loss: 1.6196 - accuracy: 0.35 - ETA: 3s - loss: 1.61
91 - accuracy: 0.35 - ETA: 3s - loss: 1.6186 - accuracy: 0.35 - ETA: 3s - loss:
1.6183 - accuracy: 0.35 - ETA: 2s - loss: 1.6179 - accuracy: 0.35 - ETA: 2s - l
oss: 1.6174 - accuracy: 0.35 - ETA: 1s - loss: 1.6170 - accuracy: 0.35 - ETA: 1
s - loss: 1.6166 - accuracy: 0.35 - ETA: 1s - loss: 1.6161 - accuracy: 0.35 - E
TA: 0s - loss: 1.6156 - accuracy: 0.35 - ETA: 0s - loss: 1.6151 - accuracy: 0.3
5 - ETA: 0s - loss: 1.6146 - accuracy: 0.35 - 23s 408ms/step - loss: 1.6142 - a
ccuracy: 0.3551 - val_loss: 1.4736 - val_accuracy: 0.4074
Epoch 9/100
57/57 [==============================] - ETA: 21s - loss: 1.5162 - accuracy: 0.
406 - ETA: 22s - loss: 1.5659 - accuracy: 0.382 - ETA: 21s - loss: 1.5810 - acc
uracy: 0.380 - ETA: 20s - loss: 1.5911 - accuracy: 0.375 - ETA: 20s - loss: 1.5
948 - accuracy: 0.371 - ETA: 19s - loss: 1.6047 - accuracy: 0.369 - ETA: 19s -
loss: 1.6088 - accuracy: 0.369 - ETA: 18s - loss: 1.6113 - accuracy: 0.370 - ET
A: 18s - loss: 1.6123 - accuracy: 0.369 - ETA: 18s - loss: 1.6125 - accuracy:
0.369 - ETA: 18s - loss: 1.6128 - accuracy: 0.369 - ETA: 17s - loss: 1.6130 - a
ccuracy: 0.369 - ETA: 17s - loss: 1.6138 - accuracy: 0.369 - ETA: 17s - loss:
1.6139 - accuracy: 0.368 - ETA: 16s - loss: 1.6141 - accuracy: 0.368 - ETA: 16s
- loss: 1.6138 - accuracy: 0.368 - ETA: 15s - loss: 1.6134 - accuracy: 0.369 -
ETA: 15s - loss: 1.6129 - accuracy: 0.369 - ETA: 15s - loss: 1.6123 - accuracy:
0.370 - ETA: 14s - loss: 1.6118 - accuracy: 0.370 - ETA: 14s - loss: 1.6113 - a
ccuracy: 0.370 - ETA: 13s - loss: 1.6109 - accuracy: 0.370 - ETA: 13s - loss:
1.6101 - accuracy: 0.371 - ETA: 13s - loss: 1.6092 - accuracy: 0.371 - ETA: 12s
- loss: 1.6084 - accuracy: 0.371 - ETA: 12s - loss: 1.6080 - accuracy: 0.371 -
ETA: 11s - loss: 1.6077 - accuracy: 0.371 - ETA: 11s - loss: 1.6074 - accuracy:
0.371 - ETA: 11s - loss: 1.6072 - accuracy: 0.371 - ETA: 10s - loss: 1.6070 - a
ccuracy: 0.371 - ETA: 10s - loss: 1.6068 - accuracy: 0.371 - ETA: 9s - loss: 1.
6066 - accuracy: 0.371 - ETA: 9s - loss: 1.6064 - accuracy: 0.37 - ETA: 9s - lo
ss: 1.6062 - accuracy: 0.37 - ETA: 8s - loss: 1.6060 - accuracy: 0.37 - ETA: 8s
- loss: 1.6057 - accuracy: 0.37 - ETA: 7s - loss: 1.6055 - accuracy: 0.37 - ET
A: 7s - loss: 1.6053 - accuracy: 0.37 - ETA: 7s - loss: 1.6051 - accuracy: 0.37
- ETA: 6s - loss: 1.6049 - accuracy: 0.37 - ETA: 6s - loss: 1.6046 - accuracy:
0.37 - ETA: 5s - loss: 1.6043 - accuracy: 0.37 - ETA: 5s - loss: 1.6041 - accur
acy: 0.37 - ETA: 5s - loss: 1.6039 - accuracy: 0.36 - ETA: 4s - loss: 1.6038 -
accuracy: 0.36 - ETA: 4s - loss: 1.6037 - accuracy: 0.36 - ETA: 3s - loss: 1.60
36 - accuracy: 0.36 - ETA: 3s - loss: 1.6035 - accuracy: 0.36 - ETA: 3s - loss:
```

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1.6033 - accuracy: 0.36 - ETA: 2s - loss: 1.6033 - accuracy: 0.36 - ETA: 2s - l
oss: 1.6033 - accuracy: 0.36 - ETA: 1s - loss: 1.6033 - accuracy: 0.36 - ETA: 1
s - loss: 1.6033 - accuracy: 0.36 - ETA: 1s - loss: 1.6033 - accuracy: 0.36 - E
TA: 0s - loss: 1.6033 - accuracy: 0.36 - ETA: 0s - loss: 1.6032 - accuracy: 0.3
6 - ETA: 0s - loss: 1.6032 - accuracy: 0.36 - 23s 412ms/step - loss: 1.6032 - a
ccuracy: 0.3688 - val_loss: 1.5167 - val_accuracy: 0.4182
Epoch 10/100
57/57 [==============================] - ETA: 20s - loss: 1.5053 - accuracy: 0.
343 - ETA: 20s - loss: 1.4761 - accuracy: 0.390 - ETA: 20s - loss: 1.4908 - acc
uracy: 0.395 - ETA: 19s - loss: 1.5026 - accuracy: 0.399 - ETA: 19s - loss: 1.5
102 - accuracy: 0.396 - ETA: 19s - loss: 1.5160 - accuracy: 0.394 - ETA: 19s -
loss: 1.5207 - accuracy: 0.391 - ETA: 18s - loss: 1.5239 - accuracy: 0.389 - ET
A: 18s - loss: 1.5264 - accuracy: 0.389 - ETA: 17s - loss: 1.5276 - accuracy:
0.389 - ETA: 17s - loss: 1.5288 - accuracy: 0.389 - ETA: 17s - loss: 1.5302 - a
ccuracy: 0.388 - ETA: 16s - loss: 1.5301 - accuracy: 0.389 - ETA: 16s - loss:
1.5300 - accuracy: 0.389 - ETA: 15s - loss: 1.5302 - accuracy: 0.389 - ETA: 15s
- loss: 1.5307 - accuracy: 0.389 - ETA: 15s - loss: 1.5307 - accuracy: 0.390 -
ETA: 14s - loss: 1.5306 - accuracy: 0.390 - ETA: 14s - loss: 1.5308 - accuracy:
0.391 - ETA: 13s - loss: 1.5308 - accuracy: 0.391 - ETA: 13s - loss: 1.5305 - a
ccuracy: 0.391 - ETA: 13s - loss: 1.5302 - accuracy: 0.392 - ETA: 12s - loss:
1.5299 - accuracy: 0.392 - ETA: 12s - loss: 1.5298 - accuracy: 0.393 - ETA: 12s
- loss: 1.5295 - accuracy: 0.393 - ETA: 11s - loss: 1.5292 - accuracy: 0.393 -
ETA: 11s - loss: 1.5290 - accuracy: 0.394 - ETA: 11s - loss: 1.5289 - accuracy:
0.394 - ETA: 10s - loss: 1.5288 - accuracy: 0.394 - ETA: 10s - loss: 1.5287 - a
ccuracy: 0.395 - ETA: 9s - loss: 1.5286 - accuracy: 0.395 - ETA: 9s - loss: 1.5
285 - accuracy: 0.39 - ETA: 9s - loss: 1.5284 - accuracy: 0.39 - ETA: 8s - los
s: 1.5283 - accuracy: 0.39 - ETA: 8s - loss: 1.5284 - accuracy: 0.39 - ETA: 8s
- loss: 1.5286 - accuracy: 0.39 - ETA: 7s - loss: 1.5287 - accuracy: 0.39 - ET
A: 7s - loss: 1.5289 - accuracy: 0.39 - ETA: 6s - loss: 1.5291 - accuracy: 0.39
- ETA: 6s - loss: 1.5293 - accuracy: 0.39 - ETA: 6s - loss: 1.5294 - accuracy:
0.39 - ETA: 5s - loss: 1.5297 - accuracy: 0.39 - ETA: 5s - loss: 1.5299 - accur
acy: 0.39 - ETA: 4s - loss: 1.5301 - accuracy: 0.39 - ETA: 4s - loss: 1.5304 -
accuracy: 0.39 - ETA: 4s - loss: 1.5307 - accuracy: 0.39 - ETA: 3s - loss: 1.53
10 - accuracy: 0.39 - ETA: 3s - loss: 1.5312 - accuracy: 0.39 - ETA: 3s - loss:
1.5315 - accuracy: 0.39 - ETA: 2s - loss: 1.5317 - accuracy: 0.39 - ETA: 2s - l
oss: 1.5318 - accuracy: 0.39 - ETA: 1s - loss: 1.5319 - accuracy: 0.39 - ETA: 1
s - loss: 1.5320 - accuracy: 0.39 - ETA: 1s - loss: 1.5321 - accuracy: 0.39 - E
TA: 0s - loss: 1.5321 - accuracy: 0.39 - ETA: 0s - loss: 1.5321 - accuracy: 0.3
9 - ETA: 0s - loss: 1.5321 - accuracy: 0.39 - 23s 405ms/step - loss: 1.5321 - a
ccuracy: 0.3955 - val_loss: 1.4327 - val_accuracy: 0.4388
Epoch 11/100
57/57 [==============================] - ETA: 19s - loss: 1.5473 - accuracy: 0.
390 - ETA: 21s - loss: 1.5805 - accuracy: 0.386 - ETA: 21s - loss: 1.5613 - acc
uracy: 0.391 - ETA: 20s - loss: 1.5526 - accuracy: 0.398 - ETA: 20s - loss: 1.5
435 - accuracy: 0.406 - ETA: 20s - loss: 1.5369 - accuracy: 0.412 - ETA: 19s -
loss: 1.5316 - accuracy: 0.415 - ETA: 19s - loss: 1.5262 - accuracy: 0.418 - ET
A: 18s - loss: 1.5211 - accuracy: 0.420 - ETA: 18s - loss: 1.5183 - accuracy:
0.421 - ETA: 18s - loss: 1.5157 - accuracy: 0.422 - ETA: 17s - loss: 1.5134 - a
ccuracy: 0.423 - ETA: 17s - loss: 1.5103 - accuracy: 0.424 - ETA: 16s - loss:
1.5078 - accuracy: 0.425 - ETA: 16s - loss: 1.5060 - accuracy: 0.425 - ETA: 15s
- loss: 1.5046 - accuracy: 0.425 - ETA: 15s - loss: 1.5035 - accuracy: 0.425 -
ETA: 15s - loss: 1.5024 - accuracy: 0.425 - ETA: 14s - loss: 1.5014 - accuracy:
0.425 - ETA: 14s - loss: 1.5006 - accuracy: 0.425 - ETA: 13s - loss: 1.5001 - a
ccuracy: 0.425 - ETA: 13s - loss: 1.4999 - accuracy: 0.425 - ETA: 13s - loss:
1.4999 - accuracy: 0.424 - ETA: 12s - loss: 1.5000 - accuracy: 0.424 - ETA: 12s
- loss: 1.5000 - accuracy: 0.424 - ETA: 12s - loss: 1.5001 - accuracy: 0.424 -
ETA: 11s - loss: 1.5000 - accuracy: 0.424 - ETA: 11s - loss: 1.4999 - accuracy:
0.423 - ETA: 10s - loss: 1.4999 - accuracy: 0.423 - ETA: 10s - loss: 1.4998 - a
ccuracy: 0.423 - ETA: 10s - loss: 1.4997 - accuracy: 0.423 - ETA: 9s - loss: 1.
4998 - accuracy: 0.423 - ETA: 9s - loss: 1.5000 - accuracy: 0.42 - ETA: 8s - lo
```

ss: 1.5001 - accuracy: 0.42 - ETA: 8s - loss: 1.5004 - accuracy: 0.42 - ETA: 8s - loss: 1.5006 - accuracy: 0.42 - ETA: 7s - loss: 1.5008 - accuracy: 0.42 - ETA: 7s - loss: 1.5011 - accuracy: 0.42 - ETA: 7s - loss: 1.5014 - accuracy: 0.42 - ETA: 6s - loss: 1.5018 - accuracy: 0.42 - ETA: 6s - loss: 1.5020 - accuracy: 0.42 - ETA: 5s - loss: 1.5022 - accuracy: 0.42 - ETA: 5s - loss: 1.5024 - accuracy: 0.42 - ETA: 5s - loss: 1.5026 - accuracy: 0.42 - ETA: 4s - loss: 1.5027 - accuracy: 0.42 - ETA: 4s - loss: 1.5028 - accuracy: 0.42 - ETA: 3s - loss: 1.5029 - accuracy: 0.42 - ETA: 3s - loss: 1.5030 - accuracy: 0.42 - ETA: 3s - loss: 1.5031 - accuracy: 0.42 - ETA: 2s - loss: 1.5032 - accuracy: 0.42 - ETA: 2s - loss: 1.5033 - accuracy: 0.42 - ETA: 1s - loss: 1.5033 - accuracy: 0.42 - ETA: 1s - loss: 1.5034 - accuracy: 0.42 - ETA: 1s - loss: 1.5035 - accuracy: 0.42 - ETA: 0s - loss: 1.5035 - accuracy: 0.42 - ETA: 0s - loss: 1.5036 - accuracy: 0.41 - ETA: 0s - loss: 1.5037 - accuracy: 0.41 - 23s 413ms/step - loss: 1.5038 - accuracy: 0.4197 - val_loss: 1.3808 - val_accuracy: 0.4793
Epoch 12/100
57/57 [==============================] - ETA: 21s - loss: 1.5531 - accuracy: 0.437 - ETA: 22s - loss: 1.5079 - accuracy: 0.437 - ETA: 19s - loss: 1.4893 - accuracy: 0.441 - ETA: 20s - loss: 1.4792 - accuracy: 0.444 - ETA: 20s - loss: 1.4726 - accuracy: 0.442 - ETA: 19s - loss: 1.4695 - accuracy: 0.441 - ETA: 19s - loss: 1.4678 - accuracy: 0.442 - ETA: 18s - loss: 1.4680 - accuracy: 0.441 - ETA: 18s - loss: 1.4687 - accuracy: 0.440 - ETA: 18s - loss: 1.4707 - accuracy: 0.439 - ETA: 17s - loss: 1.4707 - accuracy: 0.439 - ETA: 17s - loss: 1.4704 - accuracy: 0.438 - ETA: 17s - loss: 1.4706 - accuracy: 0.437 - ETA: 16s - loss: 1.4700 - accuracy: 0.437 - ETA: 16s - loss: 1.4693 - accuracy: 0.437 - ETA: 16s - loss: 1.4686 - accuracy: 0.437 - ETA: 15s - loss: 1.4678 - accuracy: 0.436 - ETA: 15s - loss: 1.4669 - accuracy: 0.436 - ETA: 14s - loss: 1.4661 - accuracy: 0.436 - ETA: 14s - loss: 1.4661 - accuracy: 0.435 - ETA: 14s - loss: 1.4662 - accuracy: 0.435 - ETA: 13s - loss: 1.4664 - accuracy: 0.435 - ETA: 13s - loss: 1.4663 - accuracy: 0.435 - ETA: 13s - loss: 1.4658 - accuracy: 0.434 - ETA: 12s - loss: 1.4656 - accuracy: 0.434 - ETA: 12s - loss: 1.4655 - accuracy: 0.434 - ETA: 11s - loss: 1.4656 - accuracy: 0.434 - ETA: 11s - loss: 1.4656 - accuracy: 0.433 - ETA: 11s - loss: 1.4657 - accuracy: 0.433 - ETA: 11s - loss: 1.4658 - accuracy: 0.433 - ETA: 10s - loss: 1.4661 - accuracy: 0.433 - ETA: 10s - loss: 1.4663 - accuracy: 0.432 - ETA: 9s - loss: 1.4665 - accuracy: 0.432 - ETA: 9s - loss: 1.4667 - accuracy: 0.43 - ETA: 9s - loss: 1.4669 - accuracy: 0.43 - ETA: 8s - loss: 1.4670 - accuracy: 0.43 - ETA: 8s - loss: 1.4673 - accuracy: 0.43 - ETA: 7s - loss: 1.4675 - accuracy: 0.43 - ETA: 7s - loss: 1.4676 - accuracy: 0.43 - ETA: 7s - loss: 1.4678 - accuracy: 0.43 - ETA: 6s - loss: 1.4680 - accuracy: 0.43 - ETA: 6s - loss: 1.4681 - accuracy: 0.43 - ETA: 5s - loss: 1.4683 - accuracy: 0.43 - ETA: 5s - loss: 1.4684 - accuracy: 0.43 - ETA: 5s - loss: 1.4686 - accuracy: 0.43 - ETA: 4s - loss: 1.4688 - accuracy: 0.43 - ETA: 4s - loss: 1.4691 - accuracy: 0.43 - ETA: 3s - loss: 1.4692 - accuracy: 0.43 - ETA: 3s - loss: 1.4693 - accuracy: 0.43 - ETA: 2s - loss: 1.4695 - accuracy: 0.43 - ETA: 2s - loss: 1.4697 - accuracy: 0.43 - ETA: 2s - loss: 1.4698 - accuracy: 0.43 - ETA: 1s - loss: 1.4700 - accuracy: 0.42 - ETA: 1s - loss: 1.4701 - accuracy: 0.42 - ETA: 0s - loss: 1.4703 - accuracy: 0.42 - ETA: 0s - loss: 1.4705 - accuracy: 0.42 - ETA: 0s - loss: 1.4707 - accuracy: 0.42 - 24s 431ms/step - loss: 1.4708 - accuracy: 0.4296 - val_loss: 1.3886 - val_accuracy: 0.4736
Epoch 13/100
57/57 [==============================] - ETA: 18s - loss: 1.4480 - accuracy: 0.437 - ETA: 21s - loss: 1.4522 - accuracy: 0.418 - ETA: 21s - loss: 1.4475 - accuracy: 0.422 - ETA: 21s - loss: 1.4532 - accuracy: 0.419 - ETA: 20s - loss: 1.4585 - accuracy: 0.419 - ETA: 19s - loss: 1.4622 - accuracy: 0.420 - ETA: 19s - loss: 1.4653 - accuracy: 0.422 - ETA: 18s - loss: 1.4658 - accuracy: 0.424 - ETA: 18s - loss: 1.4670 - accuracy: 0.424 - ETA: 17s - loss: 1.4675 - accuracy: 0.424 - ETA: 17s - loss: 1.4680 - accuracy: 0.424 - ETA: 17s - loss: 1.4684 - accuracy: 0.423 - ETA: 16s - loss: 1.4688 - accuracy: 0.423 - ETA: 16s - loss: 1.4682 - accuracy: 0.423 - ETA: 15s - loss: 1.4668 - accuracy: 0.424 - ETA: 15s - loss: 1.4651 - accuracy: 0.425 - ETA: 14s - loss: 1.4643 - accuracy: 0.426 - ETA: 14s - loss: 1.4641 - accuracy: 0.426 - ETA: 14s - loss: 1.4641 - accuracy:

0.426 - ETA: 13s - loss: 1.4642 - accuracy: 0.426 - ETA: 13s - loss: 1.4643 - a
ccuracy: 0.427 - ETA: 12s - loss: 1.4645 - accuracy: 0.426 - ETA: 12s - loss:
1.4649 - accuracy: 0.426 - ETA: 12s - loss: 1.4654 - accuracy: 0.426 - ETA: 11s
- loss: 1.4657 - accuracy: 0.426 - ETA: 11s - loss: 1.4658 - accuracy: 0.426 -
ETA: 11s - loss: 1.4658 - accuracy: 0.426 - ETA: 10s - loss: 1.4655 - accuracy:
0.426 - ETA: 10s - loss: 1.4652 - accuracy: 0.426 - ETA: 9s - loss: 1.4650 - ac
curacy: 0.426 - ETA: 9s - loss: 1.4647 - accuracy: 0.42 - ETA: 9s - loss: 1.464
5 - accuracy: 0.42 - ETA: 8s - loss: 1.4647 - accuracy: 0.42 - ETA: 8s - loss:
1.4648 - accuracy: 0.42 - ETA: 8s - loss: 1.4651 - accuracy: 0.42 - ETA: 7s - l
oss: 1.4654 - accuracy: 0.42 - ETA: 7s - loss: 1.4656 - accuracy: 0.42 - ETA: 7
s - loss: 1.4658 - accuracy: 0.42 - ETA: 6s - loss: 1.4661 - accuracy: 0.42 - E
TA: 6s - loss: 1.4663 - accuracy: 0.42 - ETA: 5s - loss: 1.4665 - accuracy: 0.4
2 - ETA: 5s - loss: 1.4666 - accuracy: 0.42 - ETA: 5s - loss: 1.4668 - accurac
y: 0.42 - ETA: 4s - loss: 1.4670 - accuracy: 0.42 - ETA: 4s - loss: 1.4671 - ac
curacy: 0.42 - ETA: 4s - loss: 1.4671 - accuracy: 0.42 - ETA: 3s - loss: 1.4673
- accuracy: 0.42 - ETA: 3s - loss: 1.4674 - accuracy: 0.42 - ETA: 2s - loss: 1.
4675 - accuracy: 0.42 - ETA: 2s - loss: 1.4677 - accuracy: 0.42 - ETA: 2s - los
s: 1.4678 - accuracy: 0.42 - ETA: 1s - loss: 1.4679 - accuracy: 0.42 - ETA: 1s
- loss: 1.4680 - accuracy: 0.42 - ETA: 1s - loss: 1.4681 - accuracy: 0.42 - ET
A: 0s - loss: 1.4681 - accuracy: 0.42 - ETA: 0s - loss: 1.4681 - accuracy: 0.42
- ETA: 0s - loss: 1.4681 - accuracy: 0.42 - 22s 390ms/step - loss: 1.4680 - acc
uracy: 0.4264 - val_loss: 1.3263 - val_accuracy: 0.4893
Epoch 14/100
57/57 [==============================] - ETA: 21s - loss: 1.3685 - accuracy: 0.
515 - ETA: 20s - loss: 1.4331 - accuracy: 0.492 - ETA: 19s - loss: 1.4627 - acc
uracy: 0.475 - ETA: 19s - loss: 1.4772 - accuracy: 0.464 - ETA: 19s - loss: 1.4
788 - accuracy: 0.462 - ETA: 19s - loss: 1.4775 - accuracy: 0.461 - ETA: 19s -
loss: 1.4740 - accuracy: 0.460 - ETA: 18s - loss: 1.4707 - accuracy: 0.459 - ET
A: 18s - loss: 1.4691 - accuracy: 0.457 - ETA: 17s - loss: 1.4690 - accuracy:
0.455 - ETA: 17s - loss: 1.4681 - accuracy: 0.452 - ETA: 16s - loss: 1.4670 - a
ccuracy: 0.451 - ETA: 16s - loss: 1.4653 - accuracy: 0.449 - ETA: 16s - loss:
1.4631 - accuracy: 0.448 - ETA: 15s - loss: 1.4615 - accuracy: 0.448 - ETA: 15s
- loss: 1.4598 - accuracy: 0.447 - ETA: 14s - loss: 1.4586 - accuracy: 0.446 -
ETA: 14s - loss: 1.4582 - accuracy: 0.445 - ETA: 14s - loss: 1.4575 - accuracy:
0.445 - ETA: 13s - loss: 1.4568 - accuracy: 0.444 - ETA: 13s - loss: 1.4565 - a
ccuracy: 0.443 - ETA: 12s - loss: 1.4563 - accuracy: 0.443 - ETA: 12s - loss:
1.4560 - accuracy: 0.443 - ETA: 12s - loss: 1.4558 - accuracy: 0.443 - ETA: 11s
- loss: 1.4558 - accuracy: 0.442 - ETA: 11s - loss: 1.4557 - accuracy: 0.442 -
ETA: 10s - loss: 1.4553 - accuracy: 0.442 - ETA: 10s - loss: 1.4549 - accuracy:
0.442 - ETA: 10s - loss: 1.4546 - accuracy: 0.441 - ETA: 9s - loss: 1.4541 - ac
curacy: 0.441 - ETA: 9s - loss: 1.4534 - accuracy: 0.44 - ETA: 9s - loss: 1.452
6 - accuracy: 0.44 - ETA: 8s - loss: 1.4520 - accuracy: 0.44 - ETA: 8s - loss:
1.4514 - accuracy: 0.44 - ETA: 8s - loss: 1.4509 - accuracy: 0.44 - ETA: 7s - l
oss: 1.4504 - accuracy: 0.44 - ETA: 7s - loss: 1.4499 - accuracy: 0.44 - ETA: 7
s - loss: 1.4494 - accuracy: 0.44 - ETA: 6s - loss: 1.4489 - accuracy: 0.44 - E
TA: 6s - loss: 1.4484 - accuracy: 0.44 - ETA: 5s - loss: 1.4479 - accuracy: 0.4
4 - ETA: 5s - loss: 1.4473 - accuracy: 0.44 - ETA: 5s - loss: 1.4467 - accurac
y: 0.44 - ETA: 4s - loss: 1.4461 - accuracy: 0.44 - ETA: 4s - loss: 1.4455 - ac
curacy: 0.44 - ETA: 4s - loss: 1.4449 - accuracy: 0.44 - ETA: 3s - loss: 1.4444
- accuracy: 0.44 - ETA: 3s - loss: 1.4439 - accuracy: 0.44 - ETA: 2s - loss: 1.
4434 - accuracy: 0.44 - ETA: 2s - loss: 1.4430 - accuracy: 0.44 - ETA: 2s - los
s: 1.4426 - accuracy: 0.44 - ETA: 1s - loss: 1.4422 - accuracy: 0.44 - ETA: 1s
- loss: 1.4419 - accuracy: 0.44 - ETA: 1s - loss: 1.4416 - accuracy: 0.44 - ET
A: 0s - loss: 1.4413 - accuracy: 0.44 - ETA: 0s - loss: 1.4410 - accuracy: 0.44
- ETA: 0s - loss: 1.4408 - accuracy: 0.44 - 22s 392ms/step - loss: 1.4405 - acc
uracy: 0.4449 - val_loss: 1.2983 - val_accuracy: 0.4826
Epoch 15/100
57/57 [==============================] - ETA: 17s - loss: 1.5014 - accuracy: 0.
437 - ETA: 19s - loss: 1.4909 - accuracy: 0.433 - ETA: 19s - loss: 1.4672 - acc
uracy: 0.448 - ETA: 19s - loss: 1.4439 - accuracy: 0.459 - ETA: 19s - loss: 1.4

347 - accuracy: 0.464 - ETA: 18s - loss: 1.4288 - accuracy: 0.466 - ETA: 18s - loss: 1.4272 - accuracy: 0.464 - ETA: 17s - loss: 1.4270 - accuracy: 0.463 - ETA: 17s - loss: 1.4265 - accuracy: 0.462 - ETA: 17s - loss: 1.4261 - accuracy: 0.462 - ETA: 17s - loss: 1.4261 - accuracy: 0.462 - ETA: 16s - loss: 1.4243 - accuracy: 0.464 - ETA: 16s - loss: 1.4217 - accuracy: 0.465 - ETA: 15s - loss: 1.4203 - accuracy: 0.466 - ETA: 15s - loss: 1.4181 - accuracy: 0.467 - ETA: 15s - loss: 1.4168 - accuracy: 0.469 - ETA: 14s - loss: 1.4152 - accuracy: 0.470 - ETA: 14s - loss: 1.4139 - accuracy: 0.471 - ETA: 14s - loss: 1.4126 - accuracy: 0.472 - ETA: 14s - loss: 1.4115 - accuracy: 0.473 - ETA: 13s - loss: 1.4110 - accuracy: 0.473 - ETA: 13s - loss: 1.4104 - accuracy: 0.473 - ETA: 13s - loss: 1.4101 - accuracy: 0.473 - ETA: 12s - loss: 1.4098 - accuracy: 0.473 - ETA: 12s - loss: 1.4097 - accuracy: 0.473 - ETA: 12s - loss: 1.4099 - accuracy: 0.473 - ETA: 11s - loss: 1.4100 - accuracy: 0.473 - ETA: 11s - loss: 1.4102 - accuracy: 0.472 - ETA: 10s - loss: 1.4104 - accuracy: 0.472 - ETA: 10s - loss: 1.4104 - accuracy: 0.472 - ETA: 10s - loss: 1.4104 - accuracy: 0.472 - ETA: 9s - loss: 1.4103 - accuracy: 0.472 - ETA: 9s - loss: 1.4103 - accuracy: 0.47 - ETA: 8s - loss: 1.4104 - accuracy: 0.47 - ETA: 8s - loss: 1.4103 - accuracy: 0.47 - ETA: 8s - loss: 1.4102 - accuracy: 0.47 - ETA: 7s - loss: 1.4099 - accuracy: 0.47 - ETA: 7s - loss: 1.4095 - accuracy: 0.47 - ETA: 7s - loss: 1.4091 - accuracy: 0.47 - ETA: 6s - loss: 1.4088 - accuracy: 0.47 - ETA: 6s - loss: 1.4085 - accuracy: 0.47 - ETA: 5s - loss: 1.4081 - accuracy: 0.47 - ETA: 5s - loss: 1.4079 - accuracy: 0.47 - ETA: 5s - loss: 1.4077 - accuracy: 0.47 - ETA: 4s - loss: 1.4075 - accuracy: 0.47 - ETA: 4s - loss: 1.4073 - accuracy: 0.47 - ETA: 3s - loss: 1.4072 - accuracy: 0.47 - ETA: 3s - loss: 1.4071 - accuracy: 0.47 - ETA: 3s - loss: 1.4069 - accuracy: 0.47 - ETA: 2s - loss: 1.4068 - accuracy: 0.47 - ETA: 2s - loss: 1.4066 - accuracy: 0.47 - ETA: 1s - loss: 1.4064 - accuracy: 0.47 - ETA: 1s - loss: 1.4061 - accuracy: 0.47 - ETA: 1s - loss: 1.4058 - accuracy: 0.47 - ETA: 0s - loss: 1.4054 - accuracy: 0.47 - ETA: 0s - loss: 1.4051 - accuracy: 0.47 - ETA: 0s - loss: 1.4047 - accuracy: 0.47 - 24s 423ms/step - loss: 1.4043 - accuracy: 0.4707 - val_loss: 1.2478 - val_accuracy: 0.5207
Epoch 16/100
57/57 [==============================] - ETA: 22s - loss: 1.3468 - accuracy: 0.468 - ETA: 24s - loss: 1.3077 - accuracy: 0.496 - ETA: 22s - loss: 1.3204 - accuracy: 0.492 - ETA: 21s - loss: 1.3327 - accuracy: 0.487 - ETA: 21s - loss: 1.3459 - accuracy: 0.483 - ETA: 20s - loss: 1.3528 - accuracy: 0.482 - ETA: 20s - loss: 1.3569 - accuracy: 0.480 - ETA: 20s - loss: 1.3621 - accuracy: 0.478 - ETA: 20s - loss: 1.3667 - accuracy: 0.476 - ETA: 19s - loss: 1.3701 - accuracy: 0.476 - ETA: 19s - loss: 1.3727 - accuracy: 0.475 - ETA: 18s - loss: 1.3742 - accuracy: 0.475 - ETA: 18s - loss: 1.3755 - accuracy: 0.474 - ETA: 17s - loss: 1.3763 - accuracy: 0.474 - ETA: 17s - loss: 1.3756 - accuracy: 0.474 - ETA: 16s - loss: 1.3749 - accuracy: 0.474 - ETA: 16s - loss: 1.3738 - accuracy: 0.474 - ETA: 15s - loss: 1.3731 - accuracy: 0.475 - ETA: 15s - loss: 1.3727 - accuracy: 0.475 - ETA: 15s - loss: 1.3723 - accuracy: 0.475 - ETA: 14s - loss: 1.3715 - accuracy: 0.476 - ETA: 14s - loss: 1.3711 - accuracy: 0.476 - ETA: 13s - loss: 1.3705 - accuracy: 0.477 - ETA: 13s - loss: 1.3700 - accuracy: 0.477 - ETA: 12s - loss: 1.3692 - accuracy: 0.477 - ETA: 12s - loss: 1.3684 - accuracy: 0.478 - ETA: 11s - loss: 1.3674 - accuracy: 0.478 - ETA: 11s - loss: 1.3664 - accuracy: 0.478 - ETA: 11s - loss: 1.3652 - accuracy: 0.479 - ETA: 10s - loss: 1.3639 - accuracy: 0.479 - ETA: 10s - loss: 1.3626 - accuracy: 0.480 - ETA: 9s - loss: 1.3613 - accuracy: 0.480 - ETA: 9s - loss: 1.3600 - accuracy: 0.48 - ETA: 9s - loss: 1.3587 - accuracy: 0.48 - ETA: 8s - loss: 1.3574 - accuracy: 0.48 - ETA: 8s - loss: 1.3562 - accuracy: 0.48 - ETA: 7s - loss: 1.3552 - accuracy: 0.48 - ETA: 7s - loss: 1.3544 - accuracy: 0.48 - ETA: 7s - loss: 1.3536 - accuracy: 0.48 - ETA: 6s - loss: 1.3528 - accuracy: 0.48 - ETA: 6s - loss: 1.3523 - accuracy: 0.48 - ETA: 5s - loss: 1.3520 - accuracy: 0.48 - ETA: 5s - loss: 1.3517 - accuracy: 0.48 - ETA: 5s - loss: 1.3513 - accuracy: 0.48 - ETA: 4s - loss: 1.3509 - accuracy: 0.48 - ETA: 4s - loss: 1.3507 - accuracy: 0.48 - ETA: 3s - loss: 1.3504 - accuracy: 0.48 - ETA: 3s - loss: 1.3502 - accuracy: 0.48 - ETA: 3s - loss: 1.3500 - accuracy: 0.48 - ETA: 2s - loss: 1.3498 - accuracy: 0.48 - ETA: 2s - loss: 1.3496 - accuracy: 0.48 - ETA: 1s - loss: 1.3495 - accuracy: 0.48 - ETA: 1

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s - loss: 1.3495 - accuracy: 0.48 - ETA: 1s - loss: 1.3494 - accuracy: 0.48 - E
TA: 0s - loss: 1.3495 - accuracy: 0.48 - ETA: 0s - loss: 1.3495 - accuracy: 0.4
8 - ETA: 0s - loss: 1.3495 - accuracy: 0.48 - 23s 407ms/step - loss: 1.3496 - a
ccuracy: 0.4861 - val_loss: 1.2514 - val_accuracy: 0.5413
Epoch 17/100
57/57 [==============================] - ETA: 19s - loss: 1.4006 - accuracy: 0.
531 - ETA: 19s - loss: 1.3347 - accuracy: 0.543 - ETA: 20s - loss: 1.3106 - acc
uracy: 0.544 - ETA: 19s - loss: 1.3081 - accuracy: 0.544 - ETA: 19s - loss: 1.3
021 - accuracy: 0.545 - ETA: 18s - loss: 1.2981 - accuracy: 0.544 - ETA: 18s -
loss: 1.2973 - accuracy: 0.543 - ETA: 17s - loss: 1.2985 - accuracy: 0.540 - ET
A: 17s - loss: 1.3013 - accuracy: 0.539 - ETA: 16s - loss: 1.3037 - accuracy:
0.536 - ETA: 16s - loss: 1.3066 - accuracy: 0.533 - ETA: 16s - loss: 1.3083 - a
ccuracy: 0.532 - ETA: 15s - loss: 1.3101 - accuracy: 0.530 - ETA: 15s - loss:
1.3127 - accuracy: 0.528 - ETA: 15s - loss: 1.3149 - accuracy: 0.527 - ETA: 14s
- loss: 1.3169 - accuracy: 0.525 - ETA: 14s - loss: 1.3181 - accuracy: 0.524 -
ETA: 14s - loss: 1.3189 - accuracy: 0.524 - ETA: 13s - loss: 1.3189 - accuracy:
0.523 - ETA: 13s - loss: 1.3186 - accuracy: 0.523 - ETA: 13s - loss: 1.3183 - a
ccuracy: 0.522 - ETA: 12s - loss: 1.3184 - accuracy: 0.522 - ETA: 12s - loss:
1.3181 - accuracy: 0.522 - ETA: 12s - loss: 1.3177 - accuracy: 0.522 - ETA: 11s
- loss: 1.3173 - accuracy: 0.521 - ETA: 11s - loss: 1.3171 - accuracy: 0.521 -
ETA: 10s - loss: 1.3169 - accuracy: 0.521 - ETA: 10s - loss: 1.3168 - accuracy:
0.520 - ETA: 10s - loss: 1.3169 - accuracy: 0.520 - ETA: 9s - loss: 1.3171 - ac
curacy: 0.520 - ETA: 9s - loss: 1.3172 - accuracy: 0.51 - ETA: 9s - loss: 1.317
3 - accuracy: 0.51 - ETA: 8s - loss: 1.3174 - accuracy: 0.51 - ETA: 8s - loss:
1.3175 - accuracy: 0.51 - ETA: 8s - loss: 1.3177 - accuracy: 0.51 - ETA: 7s - l
oss: 1.3181 - accuracy: 0.51 - ETA: 7s - loss: 1.3186 - accuracy: 0.51 - ETA: 6
s - loss: 1.3192 - accuracy: 0.51 - ETA: 6s - loss: 1.3198 - accuracy: 0.51 - E
TA: 6s - loss: 1.3204 - accuracy: 0.51 - ETA: 5s - loss: 1.3208 - accuracy: 0.5
1 - ETA: 5s - loss: 1.3212 - accuracy: 0.51 - ETA: 5s - loss: 1.3216 - accurac
y: 0.51 - ETA: 4s - loss: 1.3218 - accuracy: 0.51 - ETA: 4s - loss: 1.3221 - ac
curacy: 0.51 - ETA: 4s - loss: 1.3223 - accuracy: 0.51 - ETA: 3s - loss: 1.3226
- accuracy: 0.51 - ETA: 3s - loss: 1.3228 - accuracy: 0.51 - ETA: 2s - loss: 1.
3230 - accuracy: 0.51 - ETA: 2s - loss: 1.3233 - accuracy: 0.51 - ETA: 2s - los
s: 1.3235 - accuracy: 0.51 - ETA: 1s - loss: 1.3237 - accuracy: 0.51 - ETA: 1s
- loss: 1.3239 - accuracy: 0.51 - ETA: 1s - loss: 1.3240 - accuracy: 0.51 - ET
A: 0s - loss: 1.3242 - accuracy: 0.51 - ETA: 0s - loss: 1.3243 - accuracy: 0.51
- ETA: 0s - loss: 1.3244 - accuracy: 0.50 - 22s 387ms/step - loss: 1.3245 - acc
uracy: 0.5096 - val_loss: 1.1696 - val_accuracy: 0.5579
Epoch 18/100
57/57 [==============================] - ETA: 20s - loss: 1.2488 - accuracy: 0.
515 - ETA: 21s - loss: 1.3016 - accuracy: 0.511 - ETA: 20s - loss: 1.3236 - acc
uracy: 0.506 - ETA: 22s - loss: 1.3315 - accuracy: 0.499 - ETA: 22s - loss: 1.3
343 - accuracy: 0.495 - ETA: 22s - loss: 1.3342 - accuracy: 0.491 - ETA: 22s -
loss: 1.3320 - accuracy: 0.488 - ETA: 22s - loss: 1.3310 - accuracy: 0.487 - ET
A: 22s - loss: 1.3291 - accuracy: 0.486 - ETA: 22s - loss: 1.3270 - accuracy:
0.487 - ETA: 21s - loss: 1.3254 - accuracy: 0.488 - ETA: 21s - loss: 1.3245 - a
ccuracy: 0.489 - ETA: 21s - loss: 1.3241 - accuracy: 0.489 - ETA: 20s - loss:
1.3240 - accuracy: 0.489 - ETA: 20s - loss: 1.3237 - accuracy: 0.490 - ETA: 19s
- loss: 1.3230 - accuracy: 0.491 - ETA: 18s - loss: 1.3222 - accuracy: 0.491 -
ETA: 17s - loss: 1.3217 - accuracy: 0.491 - ETA: 17s - loss: 1.3218 - accuracy:
0.491 - ETA: 16s - loss: 1.3221 - accuracy: 0.490 - ETA: 16s - loss: 1.3227 - a
ccuracy: 0.490 - ETA: 15s - loss: 1.3235 - accuracy: 0.489 - ETA: 15s - loss:
1.3242 - accuracy: 0.488 - ETA: 14s - loss: 1.3250 - accuracy: 0.487 - ETA: 13s
- loss: 1.3259 - accuracy: 0.487 - ETA: 13s - loss: 1.3265 - accuracy: 0.486 -
ETA: 12s - loss: 1.3270 - accuracy: 0.486 - ETA: 12s - loss: 1.3276 - accuracy:
0.486 - ETA: 11s - loss: 1.3281 - accuracy: 0.486 - ETA: 11s - loss: 1.3286 - a
ccuracy: 0.485 - ETA: 11s - loss: 1.3290 - accuracy: 0.485 - ETA: 10s - loss:
1.3293 - accuracy: 0.485 - ETA: 10s - loss: 1.3296 - accuracy: 0.485 - ETA: 9s
- loss: 1.3298 - accuracy: 0.485 - ETA: 9s - loss: 1.3299 - accuracy: 0.48 - ET
A: 8s - loss: 1.3301 - accuracy: 0.48 - ETA: 8s - loss: 1.3302 - accuracy: 0.48
```

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- ETA: 7s - loss: 1.3303 - accuracy: 0.48 - ETA: 7s - loss: 1.3303 - accuracy:
0.48 - ETA: 6s - loss: 1.3304 - accuracy: 0.48 - ETA: 6s - loss: 1.3304 - accur
acy: 0.48 - ETA: 6s - loss: 1.3304 - accuracy: 0.48 - ETA: 5s - loss: 1.3304 -
accuracy: 0.48 - ETA: 5s - loss: 1.3303 - accuracy: 0.48 - ETA: 4s - loss: 1.33
02 - accuracy: 0.48 - ETA: 4s - loss: 1.3300 - accuracy: 0.48 - ETA: 4s - loss:
1.3299 - accuracy: 0.48 - ETA: 3s - loss: 1.3298 - accuracy: 0.48 - ETA: 3s - l
oss: 1.3298 - accuracy: 0.48 - ETA: 2s - loss: 1.3297 - accuracy: 0.48 - ETA: 2
s - loss: 1.3297 - accuracy: 0.48 - ETA: 2s - loss: 1.3297 - accuracy: 0.48 - E
TA: 1s - loss: 1.3296 - accuracy: 0.48 - ETA: 1s - loss: 1.3295 - accuracy: 0.4
8 - ETA: 0s - loss: 1.3294 - accuracy: 0.48 - ETA: 0s - loss: 1.3293 - accurac
y: 0.48 - ETA: 0s - loss: 1.3292 - accuracy: 0.48 - 24s 418ms/step - loss: 1.32
91 - accuracy: 0.4867 - val_loss: 1.1678 - val_accuracy: 0.5694
Epoch 19/100
57/57 [==============================] - ETA: 19s - loss: 1.2547 - accuracy: 0.
546 - ETA: 20s - loss: 1.2792 - accuracy: 0.535 - ETA: 20s - loss: 1.2980 - acc
uracy: 0.525 - ETA: 20s - loss: 1.3079 - accuracy: 0.517 - ETA: 19s - loss: 1.3
102 - accuracy: 0.512 - ETA: 19s - loss: 1.3108 - accuracy: 0.509 - ETA: 19s -
loss: 1.3080 - accuracy: 0.507 - ETA: 18s - loss: 1.3063 - accuracy: 0.506 - ET
A: 18s - loss: 1.3042 - accuracy: 0.505 - ETA: 17s - loss: 1.3040 - accuracy:
0.504 - ETA: 17s - loss: 1.3034 - accuracy: 0.503 - ETA: 16s - loss: 1.3037 - a
ccuracy: 0.502 - ETA: 16s - loss: 1.3043 - accuracy: 0.501 - ETA: 16s - loss:
1.3055 - accuracy: 0.500 - ETA: 15s - loss: 1.3068 - accuracy: 0.499 - ETA: 15s
- loss: 1.3080 - accuracy: 0.497 - ETA: 15s - loss: 1.3095 - accuracy: 0.496 -
ETA: 14s - loss: 1.3108 - accuracy: 0.495 - ETA: 14s - loss: 1.3123 - accuracy:
0.494 - ETA: 13s - loss: 1.3136 - accuracy: 0.493 - ETA: 13s - loss: 1.3146 - a
ccuracy: 0.493 - ETA: 12s - loss: 1.3155 - accuracy: 0.492 - ETA: 12s - loss:
1.3164 - accuracy: 0.491 - ETA: 12s - loss: 1.3175 - accuracy: 0.490 - ETA: 11s
- loss: 1.3179 - accuracy: 0.490 - ETA: 11s - loss: 1.3180 - accuracy: 0.490 -
ETA: 10s - loss: 1.3184 - accuracy: 0.490 - ETA: 10s - loss: 1.3185 - accuracy:
0.490 - ETA: 10s - loss: 1.3185 - accuracy: 0.490 - ETA: 9s - loss: 1.3183 - ac
curacy: 0.490 - ETA: 9s - loss: 1.3183 - accuracy: 0.49 - ETA: 9s - loss: 1.317
8 - accuracy: 0.49 - ETA: 8s - loss: 1.3175 - accuracy: 0.49 - ETA: 8s - loss:
1.3172 - accuracy: 0.49 - ETA: 8s - loss: 1.3169 - accuracy: 0.49 - ETA: 7s - l
oss: 1.3167 - accuracy: 0.49 - ETA: 7s - loss: 1.3163 - accuracy: 0.49 - ETA: 6
s - loss: 1.3159 - accuracy: 0.49 - ETA: 6s - loss: 1.3155 - accuracy: 0.49 - E
TA: 6s - loss: 1.3150 - accuracy: 0.49 - ETA: 5s - loss: 1.3147 - accuracy: 0.4
9 - ETA: 5s - loss: 1.3143 - accuracy: 0.49 - ETA: 5s - loss: 1.3140 - accurac
y: 0.49 - ETA: 4s - loss: 1.3137 - accuracy: 0.49 - ETA: 4s - loss: 1.3133 - ac
curacy: 0.49 - ETA: 4s - loss: 1.3130 - accuracy: 0.49 - ETA: 3s - loss: 1.3127
- accuracy: 0.49 - ETA: 3s - loss: 1.3124 - accuracy: 0.49 - ETA: 2s - loss: 1.
3121 - accuracy: 0.49 - ETA: 2s - loss: 1.3117 - accuracy: 0.49 - ETA: 2s - los
s: 1.3113 - accuracy: 0.49 - ETA: 1s - loss: 1.3110 - accuracy: 0.49 - ETA: 1s
- loss: 1.3107 - accuracy: 0.49 - ETA: 1s - loss: 1.3104 - accuracy: 0.49 - ET
A: 0s - loss: 1.3100 - accuracy: 0.49 - ETA: 0s - loss: 1.3097 - accuracy: 0.49
- ETA: 0s - loss: 1.3093 - accuracy: 0.49 - 22s 387ms/step - loss: 1.3090 - acc
uracy: 0.4932 - val_loss: 1.1297 - val_accuracy: 0.5678
Epoch 20/100
57/57 [==============================] - ETA: 20s - loss: 1.4224 - accuracy: 0.
500 - ETA: 21s - loss: 1.3851 - accuracy: 0.492 - ETA: 21s - loss: 1.3568 - acc
uracy: 0.491 - ETA: 20s - loss: 1.3438 - accuracy: 0.491 - ETA: 19s - loss: 1.3
363 - accuracy: 0.493 - ETA: 19s - loss: 1.3282 - accuracy: 0.493 - ETA: 18s -
loss: 1.3200 - accuracy: 0.496 - ETA: 18s - loss: 1.3149 - accuracy: 0.496 - ET
A: 18s - loss: 1.3095 - accuracy: 0.497 - ETA: 17s - loss: 1.3065 - accuracy:
0.497 - ETA: 17s - loss: 1.3024 - accuracy: 0.499 - ETA: 16s - loss: 1.2994 - a
ccuracy: 0.500 - ETA: 16s - loss: 1.2974 - accuracy: 0.499 - ETA: 16s - loss:
1.2958 - accuracy: 0.499 - ETA: 15s - loss: 1.2940 - accuracy: 0.500 - ETA: 15s
- loss: 1.2922 - accuracy: 0.500 - ETA: 15s - loss: 1.2904 - accuracy: 0.500 -
ETA: 14s - loss: 1.2888 - accuracy: 0.501 - ETA: 14s - loss: 1.2871 - accuracy:
0.502 - ETA: 13s - loss: 1.2856 - accuracy: 0.503 - ETA: 13s - loss: 1.2842 - a
ccuracy: 0.503 - ETA: 13s - loss: 1.2835 - accuracy: 0.504 - ETA: 12s - loss:
```

1.2830 - accuracy: 0.504 - ETA: 12s - loss: 1.2823 - accuracy: 0.505 - ETA: 12s - loss: 1.2816 - accuracy: 0.505 - ETA: 11s - loss: 1.2809 - accuracy: 0.506 - ETA: 11s - loss: 1.2801 - accuracy: 0.507 - ETA: 10s - loss: 1.2795 - accuracy: 0.507 - ETA: 10s - loss: 1.2788 - accuracy: 0.508 - ETA: 10s - loss: 1.2784 - accuracy: 0.508 - ETA: 9s - loss: 1.2778 - accuracy: 0.509 - ETA: 9s - loss: 1.2771 - accuracy: 0.50 - ETA: 8s - loss: 1.2766 - accuracy: 0.51 - ETA: 8s - loss: 1.2763 - accuracy: 0.51 - ETA: 8s - loss: 1.2760 - accuracy: 0.51 - ETA: 7s - loss: 1.2756 - accuracy: 0.51 - ETA: 7s - loss: 1.2752 - accuracy: 0.51 - ETA: 7s - loss: 1.2749 - accuracy: 0.51 - ETA: 6s - loss: 1.2747 - accuracy: 0.51 - ETA: 6s - loss: 1.2745 - accuracy: 0.51 - ETA: 5s - loss: 1.2744 - accuracy: 0.51 - ETA: 5s - loss: 1.2744 - accuracy: 0.51 - ETA: 5s - loss: 1.2745 - accuracy: 0.51 - ETA: 4s - loss: 1.2745 - accuracy: 0.51 - ETA: 4s - loss: 1.2745 - accuracy: 0.51 - ETA: 4s - loss: 1.2745 - accuracy: 0.51 - ETA: 3s - loss: 1.2745 - accuracy: 0.51 - ETA: 3s - loss: 1.2744 - accuracy: 0.51 - ETA: 2s - loss: 1.2744 - accuracy: 0.51 - ETA: 2s - loss: 1.2745 - accuracy: 0.51 - ETA: 2s - loss: 1.2746 - accuracy: 0.51 - ETA: 1s - loss: 1.2746 - accuracy: 0.51 - ETA: 1s - loss: 1.2746 - accuracy: 0.51 - ETA: 1s - loss: 1.2747 - accuracy: 0.51 - ETA: 0s - loss: 1.2747 - accuracy: 0.51 - ETA: 0s - loss: 1.2747 - accuracy: 0.51 - ETA: 0s - loss: 1.2747 - accuracy: 0.51 - 23s 400ms/step - loss: 1.2747 - accuracy: 0.5149 - val_loss: 1.1098 - val_accuracy: 0.5851
Epoch 21/100
57/57 [==============================] - ETA: 22s - loss: 0.9041 - accuracy: 0.609 - ETA: 19s - loss: 1.0107 - accuracy: 0.570 - ETA: 19s - loss: 1.0798 - accuracy: 0.546 - ETA: 19s - loss: 1.1213 - accuracy: 0.531 - ETA: 19s - loss: 1.1403 - accuracy: 0.523 - ETA: 18s - loss: 1.1544 - accuracy: 0.518 - ETA: 18s - loss: 1.1650 - accuracy: 0.514 - ETA: 18s - loss: 1.1717 - accuracy: 0.512 - ETA: 19s - loss: 1.1763 - accuracy: 0.510 - ETA: 19s - loss: 1.1803 - accuracy: 0.509 - ETA: 19s - loss: 1.1824 - accuracy: 0.509 - ETA: 18s - loss: 1.1858 - accuracy: 0.508 - ETA: 18s - loss: 1.1890 - accuracy: 0.508 - ETA: 18s - loss: 1.1917 - accuracy: 0.507 - ETA: 17s - loss: 1.1938 - accuracy: 0.508 - ETA: 17s - loss: 1.1955 - accuracy: 0.508 - ETA: 16s - loss: 1.1971 - accuracy: 0.508 - ETA: 16s - loss: 1.1985 - accuracy: 0.508 - ETA: 15s - loss: 1.1996 - accuracy: 0.509 - ETA: 15s - loss: 1.2007 - accuracy: 0.509 - ETA: 15s - loss: 1.2015 - accuracy: 0.510 - ETA: 14s - loss: 1.2026 - accuracy: 0.510 - ETA: 14s - loss: 1.2033 - accuracy: 0.511 - ETA: 13s - loss: 1.2045 - accuracy: 0.511 - ETA: 13s - loss: 1.2058 - accuracy: 0.511 - ETA: 12s - loss: 1.2067 - accuracy: 0.511 - ETA: 12s - loss: 1.2078 - accuracy: 0.512 - ETA: 12s - loss: 1.2088 - accuracy: 0.512 - ETA: 11s - loss: 1.2098 - accuracy: 0.512 - ETA: 11s - loss: 1.2107 - accuracy: 0.512 - ETA: 10s - loss: 1.2117 - accuracy: 0.513 - ETA: 10s - loss: 1.2126 - accuracy: 0.513 - ETA: 9s - loss: 1.2134 - accuracy: 0.513 - ETA: 9s - loss: 1.2142 - accuracy: 0.51 - ETA: 8s - loss: 1.2149 - accuracy: 0.51 - ETA: 8s - loss: 1.2155 - accuracy: 0.51 - ETA: 8s - loss: 1.2161 - accuracy: 0.51 - ETA: 7s - loss: 1.2166 - accuracy: 0.51 - ETA: 7s - loss: 1.2171 - accuracy: 0.51 - ETA: 6s - loss: 1.2177 - accuracy: 0.51 - ETA: 6s - loss: 1.2184 - accuracy: 0.51 - ETA: 6s - loss: 1.2191 - accuracy: 0.51 - ETA: 5s - loss: 1.2197 - accuracy: 0.51 - ETA: 5s - loss: 1.2204 - accuracy: 0.51 - ETA: 4s - loss: 1.2210 - accuracy: 0.51 - ETA: 4s - loss: 1.2217 - accuracy: 0.51 - ETA: 4s - loss: 1.2225 - accuracy: 0.51 - ETA: 3s - loss: 1.2232 - accuracy: 0.51 - ETA: 3s - loss: 1.2239 - accuracy: 0.51 - ETA: 2s - loss: 1.2246 - accuracy: 0.51 - ETA: 2s - loss: 1.2252 - accuracy: 0.51 - ETA: 1s - loss: 1.2258 - accuracy: 0.51 - ETA: 1s - loss: 1.2263 - accuracy: 0.51 - ETA: 1s - loss: 1.2268 - accuracy: 0.51 - ETA: 0s - loss: 1.2272 - accuracy: 0.51 - ETA: 0s - loss: 1.2276 - accuracy: 0.51 - ETA: 0s - loss: 1.2280 - accuracy: 0.51 - 24s 413ms/step - loss: 1.2284 - accuracy: 0.5160 - val_loss: 1.1217 - val_accuracy: 0.5653
Epoch 22/100
57/57 [==============================] - ETA: 19s - loss: 1.2875 - accuracy: 0.515 - ETA: 21s - loss: 1.2981 - accuracy: 0.519 - ETA: 20s - loss: 1.2940 - accuracy: 0.514 - ETA: 20s - loss: 1.2837 - accuracy: 0.513 - ETA: 20s - loss: 1.2808 - accuracy: 0.510 - ETA: 19s - loss: 1.2735 - accuracy: 0.510 - ETA: 19s - loss: 1.2687 - accuracy: 0.510 - ETA: 18s - loss: 1.2632 - accuracy: 0.512 - ET

A: 18s - loss: 1.2581 - accuracy: 0.513 - ETA: 17s - loss: 1.2534 - accuracy: 0.514 - ETA: 17s - loss: 1.2500 - accuracy: 0.515 - ETA: 16s - loss: 1.2467 - accuracy: 0.517 - ETA: 16s - loss: 1.2436 - accuracy: 0.518 - ETA: 15s - loss: 1.2420 - accuracy: 0.519 - ETA: 15s - loss: 1.2394 - accuracy: 0.520 - ETA: 15s - loss: 1.2374 - accuracy: 0.521 - ETA: 14s - loss: 1.2360 - accuracy: 0.522 - ETA: 14s - loss: 1.2355 - accuracy: 0.523 - ETA: 14s - loss: 1.2349 - accuracy: 0.524 - ETA: 13s - loss: 1.2344 - accuracy: 0.525 - ETA: 13s - loss: 1.2335 - accuracy: 0.526 - ETA: 12s - loss: 1.2325 - accuracy: 0.526 - ETA: 12s - loss: 1.2317 - accuracy: 0.527 - ETA: 12s - loss: 1.2310 - accuracy: 0.527 - ETA: 11s - loss: 1.2304 - accuracy: 0.528 - ETA: 11s - loss: 1.2298 - accuracy: 0.528 - ETA: 10s - loss: 1.2290 - accuracy: 0.529 - ETA: 10s - loss: 1.2282 - accuracy: 0.529 - ETA: 10s - loss: 1.2276 - accuracy: 0.530 - ETA: 9s - loss: 1.2269 - accuracy: 0.530 - ETA: 9s - loss: 1.2264 - accuracy: 0.53 - ETA: 9s - loss: 1.2258 - accuracy: 0.53 - ETA: 8s - loss: 1.2253 - accuracy: 0.53 - ETA: 8s - loss: 1.2248 - accuracy: 0.53 - ETA: 8s - loss: 1.2245 - accuracy: 0.53 - ETA: 7s - loss: 1.2242 - accuracy: 0.53 - ETA: 7s - loss: 1.2239 - accuracy: 0.53 - ETA: 6s - loss: 1.2237 - accuracy: 0.53 - ETA: 6s - loss: 1.2236 - accuracy: 0.53 - ETA: 6s - loss: 1.2235 - accuracy: 0.53 - ETA: 5s - loss: 1.2233 - accuracy: 0.53 - ETA: 5s - loss: 1.2231 - accuracy: 0.53 - ETA: 5s - loss: 1.2230 - accuracy: 0.53 - ETA: 4s - loss: 1.2229 - accuracy: 0.53 - ETA: 4s - loss: 1.2228 - accuracy: 0.53 - ETA: 4s - loss: 1.2226 - accuracy: 0.53 - ETA: 3s - loss: 1.2225 - accuracy: 0.53 - ETA: 3s - loss: 1.2223 - accuracy: 0.53 - ETA: 2s - loss: 1.2222 - accuracy: 0.53 - ETA: 2s - loss: 1.2219 - accuracy: 0.53 - ETA: 2s - loss: 1.2217 - accuracy: 0.53 - ETA: 1s - loss: 1.2215 - accuracy: 0.53 - ETA: 1s - loss: 1.2212 - accuracy: 0.53 - ETA: 1s - loss: 1.2209 - accuracy: 0.53 - ETA: 0s - loss: 1.2207 - accuracy: 0.53 - ETA: 0s - loss: 1.2204 - accuracy: 0.53 - ETA: 0s - loss: 1.2201 - accuracy: 0.53 - 22s 391ms/step - loss: 1.2198 - accuracy: 0.5355 - val_loss: 1.0367 - val_accuracy: 0.6124
Epoch 23/100
57/57 [==============================] - ETA: 20s - loss: 1.1580 - accuracy: 0.531 - ETA: 21s - loss: 1.1554 - accuracy: 0.531 - ETA: 20s - loss: 1.1354 - accuracy: 0.545 - ETA: 19s - loss: 1.1201 - accuracy: 0.559 - ETA: 19s - loss: 1.1185 - accuracy: 0.564 - ETA: 18s - loss: 1.1170 - accuracy: 0.568 - ETA: 18s - loss: 1.1190 - accuracy: 0.568 - ETA: 18s - loss: 1.1207 - accuracy: 0.569 - ETA: 17s - loss: 1.1240 - accuracy: 0.568 - ETA: 17s - loss: 1.1265 - accuracy: 0.569 - ETA: 17s - loss: 1.1285 - accuracy: 0.569 - ETA: 16s - loss: 1.1321 - accuracy: 0.569 - ETA: 16s - loss: 1.1341 - accuracy: 0.569 - ETA: 15s - loss: 1.1363 - accuracy: 0.569 - ETA: 15s - loss: 1.1384 - accuracy: 0.569 - ETA: 15s - loss: 1.1407 - accuracy: 0.569 - ETA: 14s - loss: 1.1435 - accuracy: 0.568 - ETA: 14s - loss: 1.1463 - accuracy: 0.568 - ETA: 14s - loss: 1.1489 - accuracy: 0.567 - ETA: 13s - loss: 1.1517 - accuracy: 0.566 - ETA: 13s - loss: 1.1542 - accuracy: 0.565 - ETA: 12s - loss: 1.1561 - accuracy: 0.564 - ETA: 12s - loss: 1.1577 - accuracy: 0.564 - ETA: 12s - loss: 1.1592 - accuracy: 0.563 - ETA: 11s - loss: 1.1606 - accuracy: 0.563 - ETA: 11s - loss: 1.1621 - accuracy: 0.563 - ETA: 11s - loss: 1.1632 - accuracy: 0.562 - ETA: 10s - loss: 1.1643 - accuracy: 0.562 - ETA: 10s - loss: 1.1656 - accuracy: 0.562 - ETA: 9s - loss: 1.1668 - accuracy: 0.562 - ETA: 9s - loss: 1.1679 - accuracy: 0.56 - ETA: 9s - loss: 1.1688 - accuracy: 0.56 - ETA: 8s - loss: 1.1698 - accuracy: 0.56 - ETA: 8s - loss: 1.1706 - accuracy: 0.56 - ETA: 8s - loss: 1.1716 - accuracy: 0.56 - ETA: 7s - loss: 1.1724 - accuracy: 0.55 - ETA: 7s - loss: 1.1734 - accuracy: 0.55 - ETA: 7s - loss: 1.1745 - accuracy: 0.55 - ETA: 6s - loss: 1.1755 - accuracy: 0.55 - ETA: 6s - loss: 1.1764 - accuracy: 0.55 - ETA: 6s - loss: 1.1773 - accuracy: 0.55 - ETA: 5s - loss: 1.1781 - accuracy: 0.55 - ETA: 5s - loss: 1.1787 - accuracy: 0.55 - ETA: 5s - loss: 1.1792 - accuracy: 0.55 - ETA: 4s - loss: 1.1797 - accuracy: 0.55 - ETA: 4s - loss: 1.1801 - accuracy: 0.55 - ETA: 4s - loss: 1.1804 - accuracy: 0.55 - ETA: 3s - loss: 1.1808 - accuracy: 0.55 - ETA: 3s - loss: 1.1811 - accuracy: 0.55 - ETA: 2s - loss: 1.1814 - accuracy: 0.55 - ETA: 2s - loss: 1.1817 - accuracy: 0.55 - ETA: 1s - loss: 1.1820 - accuracy: 0.55 - ETA: 1s - loss: 1.1823 - accuracy: 0.55 - ETA: 1s - loss: 1.1825 - accuracy: 0.55 - ETA: 0s - loss: 1.1827 - accuracy: 0.55 - ETA: 0s - loss: 1.1830 - accuracy: 0.55

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- ETA: 0s - loss: 1.1832 - accuracy: 0.55 - 24s 417ms/step - loss: 1.1834 - acc
uracy: 0.5546 - val_loss: 1.0298 - val_accuracy: 0.6091
Epoch 24/100
57/57 [==============================] - ETA: 20s - loss: 1.2420 - accuracy: 0.
531 - ETA: 20s - loss: 1.1576 - accuracy: 0.543 - ETA: 20s - loss: 1.1241 - acc
uracy: 0.547 - ETA: 20s - loss: 1.1148 - accuracy: 0.549 - ETA: 19s - loss: 1.1
174 - accuracy: 0.547 - ETA: 19s - loss: 1.1178 - accuracy: 0.548 - ETA: 18s -
loss: 1.1184 - accuracy: 0.550 - ETA: 18s - loss: 1.1181 - accuracy: 0.552 - ET
A: 18s - loss: 1.1202 - accuracy: 0.554 - ETA: 17s - loss: 1.1217 - accuracy:
0.556 - ETA: 17s - loss: 1.1225 - accuracy: 0.558 - ETA: 16s - loss: 1.1237 - a
ccuracy: 0.559 - ETA: 16s - loss: 1.1239 - accuracy: 0.560 - ETA: 15s - loss:
1.1248 - accuracy: 0.560 - ETA: 15s - loss: 1.1254 - accuracy: 0.560 - ETA: 15s
- loss: 1.1253 - accuracy: 0.560 - ETA: 14s - loss: 1.1255 - accuracy: 0.561 -
ETA: 14s - loss: 1.1257 - accuracy: 0.561 - ETA: 13s - loss: 1.1258 - accuracy:
0.561 - ETA: 13s - loss: 1.1262 - accuracy: 0.562 - ETA: 13s - loss: 1.1265 - a
ccuracy: 0.562 - ETA: 12s - loss: 1.1268 - accuracy: 0.562 - ETA: 12s - loss:
1.1275 - accuracy: 0.562 - ETA: 12s - loss: 1.1284 - accuracy: 0.561 - ETA: 11s
- loss: 1.1292 - accuracy: 0.561 - ETA: 11s - loss: 1.1297 - accuracy: 0.561 -
ETA: 11s - loss: 1.1303 - accuracy: 0.561 - ETA: 10s - loss: 1.1309 - accuracy:
0.561 - ETA: 10s - loss: 1.1315 - accuracy: 0.561 - ETA: 9s - loss: 1.1320 - ac
curacy: 0.561 - ETA: 9s - loss: 1.1327 - accuracy: 0.56 - ETA: 9s - loss: 1.133
5 - accuracy: 0.56 - ETA: 8s - loss: 1.1345 - accuracy: 0.56 - ETA: 8s - loss:
1.1352 - accuracy: 0.56 - ETA: 8s - loss: 1.1360 - accuracy: 0.56 - ETA: 7s - l
oss: 1.1368 - accuracy: 0.56 - ETA: 7s - loss: 1.1374 - accuracy: 0.56 - ETA: 7
s - loss: 1.1379 - accuracy: 0.56 - ETA: 6s - loss: 1.1384 - accuracy: 0.56 - E
TA: 6s - loss: 1.1388 - accuracy: 0.56 - ETA: 6s - loss: 1.1394 - accuracy: 0.5
6 - ETA: 5s - loss: 1.1399 - accuracy: 0.56 - ETA: 5s - loss: 1.1405 - accurac
y: 0.56 - ETA: 4s - loss: 1.1409 - accuracy: 0.56 - ETA: 4s - loss: 1.1413 - ac
curacy: 0.56 - ETA: 4s - loss: 1.1417 - accuracy: 0.56 - ETA: 3s - loss: 1.1421
- accuracy: 0.56 - ETA: 3s - loss: 1.1425 - accuracy: 0.56 - ETA: 3s - loss: 1.
1430 - accuracy: 0.56 - ETA: 2s - loss: 1.1434 - accuracy: 0.56 - ETA: 2s - los
s: 1.1437 - accuracy: 0.56 - ETA: 1s - loss: 1.1440 - accuracy: 0.56 - ETA: 1s
- loss: 1.1444 - accuracy: 0.56 - ETA: 1s - loss: 1.1447 - accuracy: 0.56 - ET
A: 0s - loss: 1.1449 - accuracy: 0.56 - ETA: 0s - loss: 1.1452 - accuracy: 0.56
- ETA: 0s - loss: 1.1455 - accuracy: 0.56 - 24s 416ms/step - loss: 1.1458 - acc
uracy: 0.5602 - val_loss: 1.0414 - val_accuracy: 0.6207
Epoch 25/100
57/57 [==============================] - ETA: 19s - loss: 1.2484 - accuracy: 0.
546 - ETA: 19s - loss: 1.2129 - accuracy: 0.558 - ETA: 19s - loss: 1.1965 - acc
uracy: 0.563 - ETA: 19s - loss: 1.1878 - accuracy: 0.567 - ETA: 19s - loss: 1.1
864 - accuracy: 0.566 - ETA: 19s - loss: 1.1884 - accuracy: 0.566 - ETA: 19s -
loss: 1.1884 - accuracy: 0.565 - ETA: 19s - loss: 1.1857 - accuracy: 0.566 - ET
A: 19s - loss: 1.1820 - accuracy: 0.568 - ETA: 19s - loss: 1.1787 - accuracy:
0.570 - ETA: 18s - loss: 1.1755 - accuracy: 0.571 - ETA: 18s - loss: 1.1727 - a
ccuracy: 0.572 - ETA: 18s - loss: 1.1707 - accuracy: 0.573 - ETA: 18s - loss:
1.1689 - accuracy: 0.574 - ETA: 17s - loss: 1.1672 - accuracy: 0.574 - ETA: 17s
- loss: 1.1665 - accuracy: 0.575 - ETA: 16s - loss: 1.1656 - accuracy: 0.575 -
ETA: 16s - loss: 1.1655 - accuracy: 0.575 - ETA: 16s - loss: 1.1652 - accuracy:
0.575 - ETA: 15s - loss: 1.1650 - accuracy: 0.575 - ETA: 14s - loss: 1.1649 - a
ccuracy: 0.575 - ETA: 14s - loss: 1.1649 - accuracy: 0.575 - ETA: 13s - loss:
1.1649 - accuracy: 0.575 - ETA: 13s - loss: 1.1645 - accuracy: 0.575 - ETA: 13s
- loss: 1.1641 - accuracy: 0.575 - ETA: 12s - loss: 1.1632 - accuracy: 0.575 -
ETA: 12s - loss: 1.1625 - accuracy: 0.575 - ETA: 11s - loss: 1.1617 - accuracy:
0.575 - ETA: 11s - loss: 1.1610 - accuracy: 0.576 - ETA: 10s - loss: 1.1604 - a
ccuracy: 0.576 - ETA: 10s - loss: 1.1597 - accuracy: 0.575 - ETA: 10s - loss:
1.1591 - accuracy: 0.575 - ETA: 9s - loss: 1.1587 - accuracy: 0.575 - ETA: 9s -
loss: 1.1581 - accuracy: 0.57 - ETA: 8s - loss: 1.1576 - accuracy: 0.57 - ETA:
8s - loss: 1.1570 - accuracy: 0.57 - ETA: 7s - loss: 1.1563 - accuracy: 0.57 -
ETA: 7s - loss: 1.1558 - accuracy: 0.57 - ETA: 7s - loss: 1.1553 - accuracy: 0.
57 - ETA: 6s - loss: 1.1548 - accuracy: 0.57 - ETA: 6s - loss: 1.1545 - accurac
```

y: 0.57 - ETA: 5s - loss: 1.1541 - accuracy: 0.57 - ETA: 5s - loss: 1.1538 - ac
curacy: 0.57 - ETA: 5s - loss: 1.1536 - accuracy: 0.57 - ETA: 4s - loss: 1.1536
- accuracy: 0.57 - ETA: 4s - loss: 1.1536 - accuracy: 0.57 - ETA: 3s - loss: 1.
1536 - accuracy: 0.57 - ETA: 3s - loss: 1.1536 - accuracy: 0.57 - ETA: 3s - los
s: 1.1535 - accuracy: 0.57 - ETA: 2s - loss: 1.1534 - accuracy: 0.57 - ETA: 2s
- loss: 1.1534 - accuracy: 0.57 - ETA: 1s - loss: 1.1533 - accuracy: 0.57 - ET
A: 1s - loss: 1.1532 - accuracy: 0.57 - ETA: 1s - loss: 1.1532 - accuracy: 0.57
- ETA: 0s - loss: 1.1532 - accuracy: 0.57 - ETA: 0s - loss: 1.1532 - accuracy:
0.57 - ETA: 0s - loss: 1.1533 - accuracy: 0.57 - 23s 408ms/step - loss: 1.1534
- accuracy: 0.5736 - val_loss: 1.0506 - val_accuracy: 0.6066
Epoch 26/100
57/57 [==============================] - ETA: 19s - loss: 1.1561 - accuracy: 0.
562 - ETA: 22s - loss: 1.1566 - accuracy: 0.562 - ETA: 20s - loss: 1.1338 - acc
uracy: 0.569 - ETA: 19s - loss: 1.1247 - accuracy: 0.571 - ETA: 19s - loss: 1.1
246 - accuracy: 0.572 - ETA: 19s - loss: 1.1196 - accuracy: 0.576 - ETA: 18s -
loss: 1.1150 - accuracy: 0.580 - ETA: 18s - loss: 1.1128 - accuracy: 0.582 - ET
A: 17s - loss: 1.1103 - accuracy: 0.583 - ETA: 17s - loss: 1.1080 - accuracy:
0.584 - ETA: 17s - loss: 1.1077 - accuracy: 0.584 - ETA: 17s - loss: 1.1060 - a
ccuracy: 0.585 - ETA: 16s - loss: 1.1049 - accuracy: 0.585 - ETA: 16s - loss:
 1.1036 - accuracy: 0.585 - ETA: 15s - loss: 1.1021 - accuracy: 0.585 - ETA: 15
s - loss: 1.1004 - accuracy: 0.586 - ETA: 15s - loss: 1.0986 - accuracy: 0.586
 - ETA: 14s - loss: 1.0971 - accuracy: 0.586 - ETA: 14s - loss: 1.0953 - accura
cy: 0.587 - ETA: 13s - loss: 1.0936 - accuracy: 0.587 - ETA: 13s - loss: 1.0916
- accuracy: 0.588 - ETA: 13s - loss: 1.0897 - accuracy: 0.588 - ETA: 12s - los
s: 1.0882 - accuracy: 0.589 - ETA: 12s - loss: 1.0868 - accuracy: 0.590 - ETA:
 12s - loss: 1.0854 - accuracy: 0.590 - ETA: 11s - loss: 1.0844 - accuracy: 0.5
90 - ETA: 11s - loss: 1.0835 - accuracy: 0.591 - ETA: 10s - loss: 1.0827 - accu
racy: 0.591 - ETA: 10s - loss: 1.0820 - accuracy: 0.591 - ETA: 10s - loss: 1.08
14 - accuracy: 0.591 - ETA: 9s - loss: 1.0812 - accuracy: 0.591 - ETA: 9s - los
s: 1.0809 - accuracy: 0.59 - ETA: 9s - loss: 1.0809 - accuracy: 0.59 - ETA: 8s
 - loss: 1.0809 - accuracy: 0.59 - ETA: 8s - loss: 1.0807 - accuracy: 0.59 - ET
A: 7s - loss: 1.0806 - accuracy: 0.59 - ETA: 7s - loss: 1.0803 - accuracy: 0.59
- ETA: 7s - loss: 1.0802 - accuracy: 0.59 - ETA: 6s - loss: 1.0801 - accuracy:
 0.59 - ETA: 6s - loss: 1.0799 - accuracy: 0.59 - ETA: 6s - loss: 1.0798 - accu
racy: 0.59 - ETA: 5s - loss: 1.0798 - accuracy: 0.59 - ETA: 5s - loss: 1.0797 -
accuracy: 0.59 - ETA: 4s - loss: 1.0797 - accuracy: 0.59 - ETA: 4s - loss: 1.07
97 - accuracy: 0.59 - ETA: 4s - loss: 1.0799 - accuracy: 0.59 - ETA: 3s - loss:
1.0801 - accuracy: 0.59 - ETA: 3s - loss: 1.0802 - accuracy: 0.59 - ETA: 3s - l
oss: 1.0804 - accuracy: 0.59 - ETA: 2s - loss: 1.0805 - accuracy: 0.59 - ETA: 2
s - loss: 1.0807 - accuracy: 0.59 - ETA: 1s - loss: 1.0809 - accuracy: 0.59 - E
TA: 1s - loss: 1.0811 - accuracy: 0.59 - ETA: 1s - loss: 1.0812 - accuracy: 0.5
9 - ETA: 0s - loss: 1.0814 - accuracy: 0.59 - ETA: 0s - loss: 1.0816 - accurac
y: 0.59 - ETA: 0s - loss: 1.0818 - accuracy: 0.59 - 23s 397ms/step - loss: 1.08
19 - accuracy: 0.5917 - val_loss: 0.9621 - val_accuracy: 0.6438
Epoch 27/100
57/57 [==============================] - ETA: 18s - loss: 1.1608 - accuracy: 0.
578 - ETA: 19s - loss: 1.1572 - accuracy: 0.574 - ETA: 21s - loss: 1.1376 - acc
uracy: 0.582 - ETA: 20s - loss: 1.1162 - accuracy: 0.587 - ETA: 20s - loss: 1.1
113 - accuracy: 0.586 - ETA: 20s - loss: 1.1061 - accuracy: 0.587 - ETA: 19s -
 loss: 1.0988 - accuracy: 0.589 - ETA: 19s - loss: 1.0956 - accuracy: 0.590 - E
TA: 18s - loss: 1.0936 - accuracy: 0.590 - ETA: 18s - loss: 1.0926 - accuracy:
 0.590 - ETA: 17s - loss: 1.0897 - accuracy: 0.591 - ETA: 17s - loss: 1.0878 -
 accuracy: 0.592 - ETA: 16s - loss: 1.0863 - accuracy: 0.592 - ETA: 16s - loss:
1.0852 - accuracy: 0.592 - ETA: 16s - loss: 1.0839 - accuracy: 0.593 - ETA: 15s
- loss: 1.0824 - accuracy: 0.593 - ETA: 15s - loss: 1.0815 - accuracy: 0.593 -
 ETA: 14s - loss: 1.0803 - accuracy: 0.593 - ETA: 14s - loss: 1.0788 - accurac
y: 0.594 - ETA: 14s - loss: 1.0772 - accuracy: 0.595 - ETA: 13s - loss: 1.0757
 - accuracy: 0.596 - ETA: 13s - loss: 1.0751 - accuracy: 0.596 - ETA: 12s - los
s: 1.0744 - accuracy: 0.597 - ETA: 12s - loss: 1.0739 - accuracy: 0.597 - ETA:
 12s - loss: 1.0735 - accuracy: 0.597 - ETA: 11s - loss: 1.0731 - accuracy: 0.5

97 - ETA: 11s - loss: 1.0725 - accuracy: 0.597 - ETA: 10s - loss: 1.0722 - accuracy: 0.597 - ETA: 10s - loss: 1.0721 - accuracy: 0.597 - ETA: 10s - loss: 1.0721 - accuracy: 0.597 - ETA: 9s - loss: 1.0722 - accuracy: 0.597 - ETA: 9s - loss: 1.0723 - accuracy: 0.59 - ETA: 8s - loss: 1.0722 - accuracy: 0.59 - ETA: 8s - loss: 1.0720 - accuracy: 0.59 - ETA: 8s - loss: 1.0719 - accuracy: 0.59 - ETA: 7s - loss: 1.0717 - accuracy: 0.59 - ETA: 7s - loss: 1.0715 - accuracy: 0.59 - ETA: 7s - loss: 1.0713 - accuracy: 0.59 - ETA: 6s - loss: 1.0711 - accuracy: 0.59 - ETA: 6s - loss: 1.0709 - accuracy: 0.59 - ETA: 5s - loss: 1.0708 - accuracy: 0.59 - ETA: 5s - loss: 1.0707 - accuracy: 0.59 - ETA: 5s - loss: 1.0706 - accuracy: 0.59 - ETA: 4s - loss: 1.0707 - accuracy: 0.59 - ETA: 4s - loss: 1.0708 - accuracy: 0.59 - ETA: 4s - loss: 1.0708 - accuracy: 0.59 - ETA: 3s - loss: 1.0708 - accuracy: 0.59 - ETA: 3s - loss: 1.0708 - accuracy: 0.59 - ETA: 2s - loss: 1.0709 - accuracy: 0.59 - ETA: 2s - loss: 1.0709 - accuracy: 0.59 - ETA: 2s - loss: 1.0709 - accuracy: 0.59 - ETA: 1s - loss: 1.0710 - accuracy: 0.59 - ETA: 1s - loss: 1.0710 - accuracy: 0.59 - ETA: 1s - loss: 1.0710 - accuracy: 0.59 - ETA: 0s - loss: 1.0710 - accuracy: 0.59 - ETA: 0s - loss: 1.0710 - accuracy: 0.59 - ETA: 0s - loss: 1.0710 - accuracy: 0.59 - 22s 392ms/step - loss: 1.0710 - accuracy: 0.5962 - val_loss: 0.9109 - val_accuracy: 0.6628
Epoch 28/100
57/57 [==============================] - ETA: 21s - loss: 1.0559 - accuracy: 0.625 - ETA: 20s - loss: 1.0163 - accuracy: 0.632 - ETA: 21s - loss: 1.0072 - accuracy: 0.640 - ETA: 20s - loss: 0.9946 - accuracy: 0.645 - ETA: 19s - loss: 0.9910 - accuracy: 0.646 - ETA: 19s - loss: 0.9925 - accuracy: 0.643 - ETA: 18s - loss: 0.9943 - accuracy: 0.641 - ETA: 18s - loss: 0.9977 - accuracy: 0.638 - ETA: 18s - loss: 0.9987 - accuracy: 0.636 - ETA: 18s - loss: 0.9990 - accuracy: 0.635 - ETA: 17s - loss: 0.9999 - accuracy: 0.634 - ETA: 17s - loss: 1.0006 - accuracy: 0.634 - ETA: 17s - loss: 1.0029 - accuracy: 0.634 - ETA: 16s - loss: 1.0040 - accuracy: 0.633 - ETA: 16s - loss: 1.0053 - accuracy: 0.633 - ETA: 16s - loss: 1.0066 - accuracy: 0.632 - ETA: 15s - loss: 1.0077 - accuracy: 0.632 - ETA: 15s - loss: 1.0086 - accuracy: 0.631 - ETA: 14s - loss: 1.0090 - accuracy: 0.631 - ETA: 14s - loss: 1.0100 - accuracy: 0.631 - ETA: 14s - loss: 1.0113 - accuracy: 0.631 - ETA: 14s - loss: 1.0125 - accuracy: 0.631 - ETA: 13s - loss: 1.0133 - accuracy: 0.631 - ETA: 13s - loss: 1.0138 - accuracy: 0.631 - ETA: 12s - loss: 1.0144 - accuracy: 0.630 - ETA: 12s - loss: 1.0152 - accuracy: 0.630 - ETA: 11s - loss: 1.0160 - accuracy: 0.630 - ETA: 11s - loss: 1.0167 - accuracy: 0.629 - ETA: 11s - loss: 1.0172 - accuracy: 0.629 - ETA: 10s - loss: 1.0177 - accuracy: 0.629 - ETA: 10s - loss: 1.0183 - accuracy: 0.629 - ETA: 9s - loss: 1.0189 - accuracy: 0.629 - ETA: 9s - loss: 1.0194 - accuracy: 0.62 - ETA: 9s - loss: 1.0199 - accuracy: 0.62 - ETA: 8s - loss: 1.0204 - accuracy: 0.62 - ETA: 8s - loss: 1.0208 - accuracy: 0.62 - ETA: 7s - loss: 1.0212 - accuracy: 0.62 - ETA: 7s - loss: 1.0216 - accuracy: 0.62 - ETA: 7s - loss: 1.0221 - accuracy: 0.62 - ETA: 6s - loss: 1.0225 - accuracy: 0.62 - ETA: 6s - loss: 1.0229 - accuracy: 0.62 - ETA: 5s - loss: 1.0232 - accuracy: 0.62 - ETA: 5s - loss: 1.0235 - accuracy: 0.62 - ETA: 5s - loss: 1.0238 - accuracy: 0.62 - ETA: 4s - loss: 1.0241 - accuracy: 0.62 - ETA: 4s - loss: 1.0245 - accuracy: 0.62 - ETA: 3s - loss: 1.0249 - accuracy: 0.62 - ETA: 3s - loss: 1.0253 - accuracy: 0.62 - ETA: 3s - loss: 1.0255 - accuracy: 0.62 - ETA: 2s - loss: 1.0257 - accuracy: 0.62 - ETA: 2s - loss: 1.0260 - accuracy: 0.62 - ETA: 1s - loss: 1.0262 - accuracy: 0.62 - ETA: 1s - loss: 1.0265 - accuracy: 0.62 - ETA: 1s - loss: 1.0268 - accuracy: 0.62 - ETA: 0s - loss: 1.0271 - accuracy: 0.62 - ETA: 0s - loss: 1.0274 - accuracy: 0.62 - ETA: 0s - loss: 1.0278 - accuracy: 0.62 - 24s 421ms/step - loss: 1.0281 - accuracy: 0.6244 - val_loss: 0.8998 - val_accuracy: 0.6727
Epoch 29/100
57/57 [==============================] - ETA: 19s - loss: 1.0364 - accuracy: 0.609 - ETA: 27s - loss: 1.0007 - accuracy: 0.625 - ETA: 26s - loss: 0.9869 - accuracy: 0.631 - ETA: 24s - loss: 0.9887 - accuracy: 0.634 - ETA: 22s - loss: 0.9914 - accuracy: 0.633 - ETA: 21s - loss: 0.9965 - accuracy: 0.632 - ETA: 20s - loss: 1.0009 - accuracy: 0.629 - ETA: 20s - loss: 1.0062 - accuracy: 0.627 - ETA: 20s - loss: 1.0087 - accuracy: 0.625 - ETA: 19s - loss: 1.0103 - accuracy: 0.625 - ETA: 19s - loss: 1.0105 - accuracy: 0.625 - ETA: 18s - loss: 1.0117 -

```
 accuracy: 0.624 - ETA: 18s - loss: 1.0131 - accuracy: 0.623 - ETA: 18s - loss:
1.0136 - accuracy: 0.623 - ETA: 17s - loss: 1.0139 - accuracy: 0.622 - ETA: 17s
 - loss: 1.0146 - accuracy: 0.622 - ETA: 17s - loss: 1.0151 - accuracy: 0.621 -
 ETA: 16s - loss: 1.0149 - accuracy: 0.621 - ETA: 16s - loss: 1.0144 - accurac
y: 0.621 - ETA: 15s - loss: 1.0142 - accuracy: 0.621 - ETA: 15s - loss: 1.0143
 - accuracy: 0.621 - ETA: 14s - loss: 1.0144 - accuracy: 0.621 - ETA: 14s - los
s: 1.0140 - accuracy: 0.621 - ETA: 13s - loss: 1.0138 - accuracy: 0.621 - ETA:
 13s - loss: 1.0135 - accuracy: 0.621 - ETA: 13s - loss: 1.0129 - accuracy: 0.6
21 - ETA: 12s - loss: 1.0125 - accuracy: 0.621 - ETA: 12s - loss: 1.0119 - accu
racy: 0.622 - ETA: 11s - loss: 1.0114 - accuracy: 0.622 - ETA: 11s - loss: 1.01
08 - accuracy: 0.622 - ETA: 10s - loss: 1.0103 - accuracy: 0.622 - ETA: 10s - l
oss: 1.0098 - accuracy: 0.622 - ETA: 9s - loss: 1.0093 - accuracy: 0.622 - ETA:
9s - loss: 1.0090 - accuracy: 0.62 - ETA: 8s - loss: 1.0088 - accuracy: 0.62 -
 ETA: 8s - loss: 1.0085 - accuracy: 0.62 - ETA: 8s - loss: 1.0082 - accuracy:
 0.62 - ETA: 7s - loss: 1.0080 - accuracy: 0.62 - ETA: 7s - loss: 1.0080 - accu
racy: 0.62 - ETA: 6s - loss: 1.0080 - accuracy: 0.62 - ETA: 6s - loss: 1.0081 -
accuracy: 0.62 - ETA: 5s - loss: 1.0083 - accuracy: 0.62 - ETA: 5s - loss: 1.00
84 - accuracy: 0.62 - ETA: 5s - loss: 1.0085 - accuracy: 0.62 - ETA: 4s - loss:
1.0086 - accuracy: 0.62 - ETA: 4s - loss: 1.0087 - accuracy: 0.62 - ETA: 3s - l
oss: 1.0089 - accuracy: 0.62 - ETA: 3s - loss: 1.0093 - accuracy: 0.62 - ETA: 3
s - loss: 1.0097 - accuracy: 0.62 - ETA: 2s - loss: 1.0101 - accuracy: 0.62 - E
TA: 2s - loss: 1.0103 - accuracy: 0.62 - ETA: 1s - loss: 1.0107 - accuracy: 0.6
2 - ETA: 1s - loss: 1.0110 - accuracy: 0.62 - ETA: 1s - loss: 1.0113 - accurac
y: 0.62 - ETA: 0s - loss: 1.0116 - accuracy: 0.62 - ETA: 0s - loss: 1.0119 - ac
curacy: 0.62 - ETA: 0s - loss: 1.0122 - accuracy: 0.62 - 24s 414ms/step - loss:
1.0125 - accuracy: 0.6208 - val_loss: 0.9527 - val_accuracy: 0.6298
Epoch 30/100
57/57 [==============================] - ETA: 20s - loss: 1.0060 - accuracy: 0.
593 - ETA: 24s - loss: 1.0272 - accuracy: 0.574 - ETA: 21s - loss: 1.0432 - acc
uracy: 0.563 - ETA: 21s - loss: 1.0540 - accuracy: 0.563 - ETA: 22s - loss: 1.0
659 - accuracy: 0.560 - ETA: 21s - loss: 1.0715 - accuracy: 0.560 - ETA: 20s -
 loss: 1.0703 - accuracy: 0.560 - ETA: 19s - loss: 1.0677 - accuracy: 0.561 - E
TA: 19s - loss: 1.0653 - accuracy: 0.564 - ETA: 19s - loss: 1.0636 - accuracy:
 0.565 - ETA: 18s - loss: 1.0632 - accuracy: 0.566 - ETA: 18s - loss: 1.0620 -
 accuracy: 0.568 - ETA: 17s - loss: 1.0611 - accuracy: 0.569 - ETA: 17s - loss:
1.0611 - accuracy: 0.570 - ETA: 16s - loss: 1.0614 - accuracy: 0.571 - ETA: 16s
 - loss: 1.0607 - accuracy: 0.572 - ETA: 15s - loss: 1.0599 - accuracy: 0.573 -
 ETA: 15s - loss: 1.0597 - accuracy: 0.574 - ETA: 15s - loss: 1.0597 - accurac
y: 0.574 - ETA: 14s - loss: 1.0597 - accuracy: 0.575 - ETA: 14s - loss: 1.0593
 - accuracy: 0.576 - ETA: 13s - loss: 1.0592 - accuracy: 0.577 - ETA: 13s - los
s: 1.0590 - accuracy: 0.578 - ETA: 12s - loss: 1.0592 - accuracy: 0.579 - ETA:
 12s - loss: 1.0591 - accuracy: 0.579 - ETA: 12s - loss: 1.0590 - accuracy: 0.5
80 - ETA: 11s - loss: 1.0592 - accuracy: 0.581 - ETA: 11s - loss: 1.0592 - accu
racy: 0.581 - ETA: 10s - loss: 1.0593 - accuracy: 0.581 - ETA: 10s - loss: 1.05
91 - accuracy: 0.582 - ETA: 10s - loss: 1.0590 - accuracy: 0.582 - ETA: 9s - lo
ss: 1.0589 - accuracy: 0.583 - ETA: 9s - loss: 1.0588 - accuracy: 0.58 - ETA: 8
s - loss: 1.0585 - accuracy: 0.58 - ETA: 8s - loss: 1.0583 - accuracy: 0.58 - E
TA: 8s - loss: 1.0581 - accuracy: 0.58 - ETA: 7s - loss: 1.0579 - accuracy: 0.5
8 - ETA: 7s - loss: 1.0576 - accuracy: 0.58 - ETA: 6s - loss: 1.0574 - accurac
y: 0.58 - ETA: 6s - loss: 1.0572 - accuracy: 0.58 - ETA: 6s - loss: 1.0570 - ac
curacy: 0.58 - ETA: 5s - loss: 1.0567 - accuracy: 0.58 - ETA: 5s - loss: 1.0565
 - accuracy: 0.58 - ETA: 5s - loss: 1.0563 - accuracy: 0.58 - ETA: 4s - loss: 1.
0560 - accuracy: 0.58 - ETA: 4s - loss: 1.0557 - accuracy: 0.58 - ETA: 3s - los
s: 1.0554 - accuracy: 0.58 - ETA: 3s - loss: 1.0550 - accuracy: 0.58 - ETA: 3s
 - loss: 1.0546 - accuracy: 0.58 - ETA: 2s - loss: 1.0543 - accuracy: 0.58 - ET
A: 2s - loss: 1.0539 - accuracy: 0.58 - ETA: 1s - loss: 1.0535 - accuracy: 0.58
 - ETA: 1s - loss: 1.0533 - accuracy: 0.58 - ETA: 1s - loss: 1.0530 - accuracy:
 0.58 - ETA: 0s - loss: 1.0528 - accuracy: 0.58 - ETA: 0s - loss: 1.0525 - accu
racy: 0.58 - ETA: 0s - loss: 1.0522 - accuracy: 0.59 - 23s 403ms/step - loss:
 1.0520 - accuracy: 0.5902 - val_loss: 0.8402 - val_accuracy: 0.6818
```

Epoch 31/100
57/57 [==============================] - ETA: 18s - loss: 0.8809 - accuracy: 0.687 - ETA: 18s - loss: 0.8930 - accuracy: 0.683 - ETA: 20s - loss: 0.9072 - accuracy: 0.676 - ETA: 19s - loss: 0.9013 - accuracy: 0.679 - ETA: 19s - loss: 0.9015 - accuracy: 0.678 - ETA: 19s - loss: 0.9059 - accuracy: 0.676 - ETA: 19s - loss: 0.9053 - accuracy: 0.676 - ETA: 18s - loss: 0.9046 - accuracy: 0.676 - ETA: 18s - loss: 0.9046 - accuracy: 0.675 - ETA: 17s - loss: 0.9047 - accuracy: 0.674 - ETA: 17s - loss: 0.9033 - accuracy: 0.673 - ETA: 16s - loss: 0.9027 - accuracy: 0.672 - ETA: 16s - loss: 0.9027 - accuracy: 0.671 - ETA: 15s - loss: 0.9035 - accuracy: 0.670 - ETA: 15s - loss: 0.9043 - accuracy: 0.669 - ETA: 15s - loss: 0.9053 - accuracy: 0.668 - ETA: 14s - loss: 0.9052 - accuracy: 0.668 - ETA: 14s - loss: 0.9056 - accuracy: 0.667 - ETA: 14s - loss: 0.9062 - accuracy: 0.667 - ETA: 13s - loss: 0.9063 - accuracy: 0.666 - ETA: 13s - loss: 0.9070 - accuracy: 0.666 - ETA: 13s - loss: 0.9081 - accuracy: 0.665 - ETA: 12s - loss: 0.9089 - accuracy: 0.665 - ETA: 12s - loss: 0.9098 - accuracy: 0.665 - ETA: 11s - loss: 0.9108 - accuracy: 0.664 - ETA: 11s - loss: 0.9115 - accuracy: 0.664 - ETA: 11s - loss: 0.9123 - accuracy: 0.663 - ETA: 10s - loss: 0.9133 - accuracy: 0.663 - ETA: 10s - loss: 0.9141 - accuracy: 0.662 - ETA: 10s - loss: 0.9151 - accuracy: 0.662 - ETA: 9s - loss: 0.9162 - accuracy: 0.661 - ETA: 9s - loss: 0.9173 - accuracy: 0.66 - ETA: 8s - loss: 0.9183 - accuracy: 0.66 - ETA: 8s - loss: 0.9194 - accuracy: 0.65 - ETA: 8s - loss: 0.9205 - accuracy: 0.65 - ETA: 7s - loss: 0.9216 - accuracy: 0.65 - ETA: 7s - loss: 0.9227 - accuracy: 0.65 - ETA: 7s - loss: 0.9237 - accuracy: 0.65 - ETA: 6s - loss: 0.9246 - accuracy: 0.65 - ETA: 6s - loss: 0.9257 - accuracy: 0.65 - ETA: 5s - loss: 0.9269 - accuracy: 0.65 - ETA: 5s - loss: 0.9280 - accuracy: 0.65 - ETA: 5s - loss: 0.9290 - accuracy: 0.65 - ETA: 4s - loss: 0.9301 - accuracy: 0.65 - ETA: 4s - loss: 0.9311 - accuracy: 0.65 - ETA: 4s - loss: 0.9321 - accuracy: 0.65 - ETA: 3s - loss: 0.9331 - accuracy: 0.65 - ETA: 3s - loss: 0.9340 - accuracy: 0.65 - ETA: 2s - loss: 0.9349 - accuracy: 0.65 - ETA: 2s - loss: 0.9358 - accuracy: 0.65 - ETA: 2s - loss: 0.9369 - accuracy: 0.65 - ETA: 1s - loss: 0.9379 - accuracy: 0.65 - ETA: 1s - loss: 0.9388 - accuracy: 0.65 - ETA: 1s - loss: 0.9399 - accuracy: 0.65 - ETA: 0s - loss: 0.9409 - accuracy: 0.65 - ETA: 0s - loss: 0.9420 - accuracy: 0.65 - ETA: 0s - loss: 0.9429 - accuracy: 0.65 - 22s 391ms/step - loss: 0.9439 - accuracy: 0.6499 - val_loss: 0.8910 - val_accuracy: 0.6909
Epoch 32/100
57/57 [==============================] - ETA: 23s - loss: 1.0237 - accuracy: 0.593 - ETA: 19s - loss: 1.0149 - accuracy: 0.609 - ETA: 19s - loss: 1.0017 - accuracy: 0.618 - ETA: 19s - loss: 0.9989 - accuracy: 0.618 - ETA: 19s - loss: 1.0010 - accuracy: 0.618 - ETA: 19s - loss: 0.9999 - accuracy: 0.619 - ETA: 18s - loss: 1.0013 - accuracy: 0.620 - ETA: 17s - loss: 1.0028 - accuracy: 0.621 - ETA: 17s - loss: 1.0021 - accuracy: 0.622 - ETA: 17s - loss: 1.0022 - accuracy: 0.623 - ETA: 16s - loss: 1.0001 - accuracy: 0.625 - ETA: 16s - loss: 0.9976 - accuracy: 0.627 - ETA: 16s - loss: 0.9950 - accuracy: 0.629 - ETA: 15s - loss: 0.9930 - accuracy: 0.630 - ETA: 15s - loss: 0.9905 - accuracy: 0.631 - ETA: 15s - loss: 0.9881 - accuracy: 0.633 - ETA: 14s - loss: 0.9859 - accuracy: 0.634 - ETA: 14s - loss: 0.9836 - accuracy: 0.635 - ETA: 14s - loss: 0.9815 - accuracy: 0.636 - ETA: 13s - loss: 0.9798 - accuracy: 0.637 - ETA: 13s - loss: 0.9780 - accuracy: 0.638 - ETA: 13s - loss: 0.9766 - accuracy: 0.639 - ETA: 12s - loss: 0.9751 - accuracy: 0.640 - ETA: 12s - loss: 0.9741 - accuracy: 0.640 - ETA: 12s - loss: 0.9731 - accuracy: 0.641 - ETA: 11s - loss: 0.9719 - accuracy: 0.641 - ETA: 11s - loss: 0.9711 - accuracy: 0.641 - ETA: 10s - loss: 0.9705 - accuracy: 0.642 - ETA: 10s - loss: 0.9700 - accuracy: 0.642 - ETA: 10s - loss: 0.9695 - accuracy: 0.642 - ETA: 9s - loss: 0.9691 - accuracy: 0.642 - ETA: 9s - loss: 0.9687 - accuracy: 0.64 - ETA: 9s - loss: 0.9683 - accuracy: 0.64 - ETA: 8s - loss: 0.9678 - accuracy: 0.64 - ETA: 8s - loss: 0.9672 - accuracy: 0.64 - ETA: 8s - loss: 0.9667 - accuracy: 0.64 - ETA: 7s - loss: 0.9663 - accuracy: 0.64 - ETA: 7s - loss: 0.9659 - accuracy: 0.64 - ETA: 6s - loss: 0.9658 - accuracy: 0.64 - ETA: 6s - loss: 0.9656 - accuracy: 0.64 - ETA: 6s - loss: 0.9653 - accuracy: 0.64 - ETA: 5s - loss: 0.9651 - accuracy: 0.64 - ETA: 5s - loss: 0.9650 - accuracy: 0.64 - ETA: 5s - loss: 0.9648 - accuracy: 0.64 - ETA: 4s - loss: 0.96

46 - accuracy: 0.64 - ETA: 4s - loss: 0.9645 - accuracy: 0.64 - ETA: 3s - loss: 0.9644 - accuracy: 0.64 - ETA: 3s - loss: 0.9645 - accuracy: 0.64 - ETA: 3s - loss: 0.9645 - accuracy: 0.64 - ETA: 2s - loss: 0.9645 - accuracy: 0.64 - ETA: 2s - loss: 0.9645 - accuracy: 0.64 - ETA: 1s - loss: 0.9645 - accuracy: 0.64 - ETA: 1s - loss: 0.9645 - accuracy: 0.64 - ETA: 1s - loss: 0.9645 - accuracy: 0.64 - ETA: 0s - loss: 0.9645 - accuracy: 0.64 - ETA: 0s - loss: 0.9645 - accuracy: 0.64 - ETA: 0s - loss: 0.9645 - accuracy: 0.64 - 24s 421ms/step - loss: 0.9645 - accuracy: 0.6418 - val_loss: 0.8305 - val_accuracy: 0.7000
Epoch 33/100
57/57 [==============================] - ETA: 18s - loss: 0.8736 - accuracy: 0.703 - ETA: 20s - loss: 0.9304 - accuracy: 0.660 - ETA: 20s - loss: 0.9535 - accuracy: 0.648 - ETA: 20s - loss: 0.9633 - accuracy: 0.642 - ETA: 19s - loss: 0.9591 - accuracy: 0.644 - ETA: 19s - loss: 0.9594 - accuracy: 0.644 - ETA: 19s - loss: 0.9601 - accuracy: 0.644 - ETA: 18s - loss: 0.9597 - accuracy: 0.645 - ETA: 18s - loss: 0.9593 - accuracy: 0.647 - ETA: 17s - loss: 0.9590 - accuracy: 0.648 - ETA: 17s - loss: 0.9583 - accuracy: 0.649 - ETA: 16s - loss: 0.9586 - accuracy: 0.649 - ETA: 16s - loss: 0.9586 - accuracy: 0.650 - ETA: 16s - loss: 0.9593 - accuracy: 0.650 - ETA: 15s - loss: 0.9598 - accuracy: 0.651 - ETA: 15s - loss: 0.9605 - accuracy: 0.651 - ETA: 14s - loss: 0.9615 - accuracy: 0.651 - ETA: 14s - loss: 0.9622 - accuracy: 0.651 - ETA: 14s - loss: 0.9623 - accuracy: 0.651 - ETA: 14s - loss: 0.9622 - accuracy: 0.651 - ETA: 13s - loss: 0.9621 - accuracy: 0.651 - ETA: 13s - loss: 0.9615 - accuracy: 0.651 - ETA: 12s - loss: 0.9613 - accuracy: 0.651 - ETA: 12s - loss: 0.9608 - accuracy: 0.651 - ETA: 12s - loss: 0.9603 - accuracy: 0.651 - ETA: 11s - loss: 0.9599 - accuracy: 0.651 - ETA: 11s - loss: 0.9597 - accuracy: 0.651 - ETA: 10s - loss: 0.9594 - accuracy: 0.651 - ETA: 10s - loss: 0.9595 - accuracy: 0.651 - ETA: 10s - loss: 0.9595 - accuracy: 0.651 - ETA: 9s - loss: 0.9595 - accuracy: 0.651 - ETA: 9s - loss: 0.9594 - accuracy: 0.65 - ETA: 9s - loss: 0.9593 - accuracy: 0.65 - ETA: 8s - loss: 0.9591 - accuracy: 0.65 - ETA: 8s - loss: 0.9589 - accuracy: 0.65 - ETA: 7s - loss: 0.9585 - accuracy: 0.65 - ETA: 7s - loss: 0.9581 - accuracy: 0.65 - ETA: 7s - loss: 0.9578 - accuracy: 0.65 - ETA: 6s - loss: 0.9574 - accuracy: 0.65 - ETA: 6s - loss: 0.9572 - accuracy: 0.65 - ETA: 6s - loss: 0.9570 - accuracy: 0.65 - ETA: 5s - loss: 0.9569 - accuracy: 0.65 - ETA: 5s - loss: 0.9567 - accuracy: 0.65 - ETA: 4s - loss: 0.9566 - accuracy: 0.65 - ETA: 4s - loss: 0.9563 - accuracy: 0.65 - ETA: 4s - loss: 0.9561 - accuracy: 0.65 - ETA: 3s - loss: 0.9558 - accuracy: 0.65 - ETA: 3s - loss: 0.9555 - accuracy: 0.65 - ETA: 3s - loss: 0.9553 - accuracy: 0.65 - ETA: 2s - loss: 0.9551 - accuracy: 0.65 - ETA: 2s - loss: 0.9549 - accuracy: 0.65 - ETA: 1s - loss: 0.9547 - accuracy: 0.65 - ETA: 1s - loss: 0.9545 - accuracy: 0.65 - ETA: 1s - loss: 0.9544 - accuracy: 0.65 - ETA: 0s - loss: 0.9542 - accuracy: 0.65 - ETA: 0s - loss: 0.9542 - accuracy: 0.65 - ETA: 0s - loss: 0.9541 - accuracy: 0.65 - 22s 394ms/step - loss: 0.9540 - accuracy: 0.6514 - val_loss: 0.7912 - val_accuracy: 0.7223
Epoch 34/100
57/57 [==============================] - ETA: 18s - loss: 0.8395 - accuracy: 0.640 - ETA: 22s - loss: 0.8992 - accuracy: 0.632 - ETA: 21s - loss: 0.8942 - accuracy: 0.644 - ETA: 20s - loss: 0.9017 - accuracy: 0.651 - ETA: 19s - loss: 0.9084 - accuracy: 0.654 - ETA: 18s - loss: 0.9117 - accuracy: 0.656 - ETA: 18s - loss: 0.9122 - accuracy: 0.659 - ETA: 18s - loss: 0.9096 - accuracy: 0.661 - ETA: 17s - loss: 0.9074 - accuracy: 0.663 - ETA: 17s - loss: 0.9053 - accuracy: 0.664 - ETA: 17s - loss: 0.9051 - accuracy: 0.665 - ETA: 16s - loss: 0.9037 - accuracy: 0.665 - ETA: 16s - loss: 0.9028 - accuracy: 0.666 - ETA: 16s - loss: 0.9019 - accuracy: 0.666 - ETA: 15s - loss: 0.9016 - accuracy: 0.666 - ETA: 15s - loss: 0.9021 - accuracy: 0.666 - ETA: 14s - loss: 0.9027 - accuracy: 0.665 - ETA: 14s - loss: 0.9030 - accuracy: 0.665 - ETA: 14s - loss: 0.9036 - accuracy: 0.665 - ETA: 13s - loss: 0.9041 - accuracy: 0.664 - ETA: 13s - loss: 0.9044 - accuracy: 0.664 - ETA: 13s - loss: 0.9044 - accuracy: 0.663 - ETA: 12s - loss: 0.9047 - accuracy: 0.663 - ETA: 12s - loss: 0.9049 - accuracy: 0.663 - ETA: 11s - loss: 0.9048 - accuracy: 0.663 - ETA: 11s - loss: 0.9049 - accuracy: 0.662 - ETA: 11s - loss: 0.9049 - accuracy: 0.662 - ETA: 11s - loss: 0.9052 - accuracy: 0.662 - ETA: 10s - loss: 0.9056 - accuracy: 0.662 - ETA: 10s - loss: 0.90

60 - accuracy: 0.661 - ETA: 9s - loss: 0.9062 - accuracy: 0.661 - ETA: 9s - loss: 0.9063 - accuracy: 0.66 - ETA: 9s - loss: 0.9064 - accuracy: 0.66 - ETA: 8s - loss: 0.9065 - accuracy: 0.66 - ETA: 8s - loss: 0.9067 - accuracy: 0.66 - ETA: 8s - loss: 0.9068 - accuracy: 0.66 - ETA: 7s - loss: 0.9069 - accuracy: 0.66 - ETA: 7s - loss: 0.9069 - accuracy: 0.66 - ETA: 6s - loss: 0.9070 - accuracy: 0.66 - ETA: 6s - loss: 0.9071 - accuracy: 0.66 - ETA: 6s - loss: 0.9072 - accuracy: 0.66 - ETA: 5s - loss: 0.9074 - accuracy: 0.66 - ETA: 5s - loss: 0.9077 - accuracy: 0.66 - ETA: 5s - loss: 0.9080 - accuracy: 0.66 - ETA: 4s - loss: 0.9083 - accuracy: 0.65 - ETA: 4s - loss: 0.9085 - accuracy: 0.65 - ETA: 3s - loss: 0.9087 - accuracy: 0.65 - ETA: 3s - loss: 0.9089 - accuracy: 0.65 - ETA: 3s - loss: 0.9091 - accuracy: 0.65 - ETA: 2s - loss: 0.9094 - accuracy: 0.65 - ETA: 2s - loss: 0.9096 - accuracy: 0.65 - ETA: 2s - loss: 0.9099 - accuracy: 0.65 - ETA: 1s - loss: 0.9103 - accuracy: 0.65 - ETA: 1s - loss: 0.9106 - accuracy: 0.65 - ETA: 0s - loss: 0.9109 - accuracy: 0.65 - ETA: 0s - loss: 0.9113 - accuracy: 0.65 - ETA: 0s - loss: 0.9116 - accuracy: 0.65 - 24s 428ms/step - loss: 0.9120 - accuracy: 0.6577 - val_loss: 0.7787 - val_accuracy: 0.7240
Epoch 35/100
57/57 [==============================] - ETA: 24s - loss: 0.9158 - accuracy: 0.671 - ETA: 23s - loss: 0.9015 - accuracy: 0.675 - ETA: 22s - loss: 0.9271 - accuracy: 0.667 - ETA: 21s - loss: 0.9352 - accuracy: 0.662 - ETA: 21s - loss: 0.9372 - accuracy: 0.659 - ETA: 20s - loss: 0.9357 - accuracy: 0.656 - ETA: 19s - loss: 0.9346 - accuracy: 0.653 - ETA: 19s - loss: 0.9323 - accuracy: 0.652 - ETA: 18s - loss: 0.9318 - accuracy: 0.651 - ETA: 18s - loss: 0.9316 - accuracy: 0.650 - ETA: 17s - loss: 0.9305 - accuracy: 0.649 - ETA: 17s - loss: 0.9298 - accuracy: 0.649 - ETA: 17s - loss: 0.9285 - accuracy: 0.649 - ETA: 16s - loss: 0.9279 - accuracy: 0.650 - ETA: 16s - loss: 0.9280 - accuracy: 0.650 - ETA: 16s - loss: 0.9275 - accuracy: 0.650 - ETA: 15s - loss: 0.9265 - accuracy: 0.650 - ETA: 15s - loss: 0.9254 - accuracy: 0.651 - ETA: 15s - loss: 0.9245 - accuracy: 0.651 - ETA: 14s - loss: 0.9232 - accuracy: 0.651 - ETA: 14s - loss: 0.9215 - accuracy: 0.652 - ETA: 13s - loss: 0.9195 - accuracy: 0.653 - ETA: 13s - loss: 0.9177 - accuracy: 0.653 - ETA: 13s - loss: 0.9159 - accuracy: 0.654 - ETA: 12s - loss: 0.9141 - accuracy: 0.654 - ETA: 12s - loss: 0.9130 - accuracy: 0.655 - ETA: 11s - loss: 0.9119 - accuracy: 0.655 - ETA: 11s - loss: 0.9108 - accuracy: 0.656 - ETA: 11s - loss: 0.9096 - accuracy: 0.656 - ETA: 10s - loss: 0.9086 - accuracy: 0.657 - ETA: 10s - loss: 0.9077 - accuracy: 0.657 - ETA: 9s - loss: 0.9070 - accuracy: 0.658 - ETA: 9s - loss: 0.9064 - accuracy: 0.65 - ETA: 9s - loss: 0.9057 - accuracy: 0.65 - ETA: 8s - loss: 0.9051 - accuracy: 0.65 - ETA: 8s - loss: 0.9046 - accuracy: 0.65 - ETA: 8s - loss: 0.9040 - accuracy: 0.65 - ETA: 7s - loss: 0.9035 - accuracy: 0.65 - ETA: 7s - loss: 0.9031 - accuracy: 0.66 - ETA: 6s - loss: 0.9027 - accuracy: 0.66 - ETA: 6s - loss: 0.9022 - accuracy: 0.66 - ETA: 6s - loss: 0.9017 - accuracy: 0.66 - ETA: 5s - loss: 0.9012 - accuracy: 0.66 - ETA: 5s - loss: 0.9008 - accuracy: 0.66 - ETA: 4s - loss: 0.9004 - accuracy: 0.66 - ETA: 4s - loss: 0.9000 - accuracy: 0.66 - ETA: 4s - loss: 0.8997 - accuracy: 0.66 - ETA: 3s - loss: 0.8995 - accuracy: 0.66 - ETA: 3s - loss: 0.8993 - accuracy: 0.66 - ETA: 2s - loss: 0.8992 - accuracy: 0.66 - ETA: 2s - loss: 0.8991 - accuracy: 0.66 - ETA: 2s - loss: 0.8990 - accuracy: 0.66 - ETA: 1s - loss: 0.8990 - accuracy: 0.66 - ETA: 1s - loss: 0.8989 - accuracy: 0.66 - ETA: 0s - loss: 0.8989 - accuracy: 0.66 - ETA: 0s - loss: 0.8989 - accuracy: 0.66 - ETA: 0s - loss: 0.8988 - accuracy: 0.66 - 24s 420ms/step - loss: 0.8988 - accuracy: 0.6635 - val_loss: 0.7969 - val_accuracy: 0.7289
Epoch 36/100
57/57 [==============================] - ETA: 22s - loss: 1.0968 - accuracy: 0.546 - ETA: 23s - loss: 1.0217 - accuracy: 0.578 - ETA: 21s - loss: 1.0005 - accuracy: 0.595 - ETA: 20s - loss: 0.9968 - accuracy: 0.599 - ETA: 20s - loss: 0.9904 - accuracy: 0.605 - ETA: 19s - loss: 0.9801 - accuracy: 0.614 - ETA: 19s - loss: 0.9721 - accuracy: 0.620 - ETA: 19s - loss: 0.9661 - accuracy: 0.625 - ETA: 18s - loss: 0.9624 - accuracy: 0.628 - ETA: 18s - loss: 0.9577 - accuracy: 0.632 - ETA: 18s - loss: 0.9535 - accuracy: 0.634 - ETA: 17s - loss: 0.9503 - accuracy: 0.636 - ETA: 17s - loss: 0.9475 - accuracy: 0.637 - ETA: 17s - loss: 0.9456 - accuracy: 0.639 - ETA: 16s - loss: 0.9438 - accuracy: 0.640 - ETA: 16s

```
- loss: 0.9432 - accuracy: 0.641 - ETA: 16s - loss: 0.9422 - accuracy: 0.642 -
 ETA: 15s - loss: 0.9418 - accuracy: 0.643 - ETA: 15s - loss: 0.9409 - accurac
y: 0.644 - ETA: 15s - loss: 0.9401 - accuracy: 0.644 - ETA: 14s - loss: 0.9396
 - accuracy: 0.645 - ETA: 14s - loss: 0.9387 - accuracy: 0.645 - ETA: 14s - los
s: 0.9378 - accuracy: 0.646 - ETA: 13s - loss: 0.9372 - accuracy: 0.647 - ETA:
 13s - loss: 0.9367 - accuracy: 0.647 - ETA: 13s - loss: 0.9360 - accuracy: 0.6
48 - ETA: 12s - loss: 0.9354 - accuracy: 0.648 - ETA: 12s - loss: 0.9347 - accu
racy: 0.649 - ETA: 11s - loss: 0.9341 - accuracy: 0.649 - ETA: 11s - loss: 0.93
34 - accuracy: 0.650 - ETA: 10s - loss: 0.9328 - accuracy: 0.650 - ETA: 10s - l
oss: 0.9322 - accuracy: 0.651 - ETA: 9s - loss: 0.9315 - accuracy: 0.651 - ETA:
9s - loss: 0.9308 - accuracy: 0.65 - ETA: 9s - loss: 0.9301 - accuracy: 0.65 -
 ETA: 8s - loss: 0.9294 - accuracy: 0.65 - ETA: 8s - loss: 0.9287 - accuracy:
 0.65 - ETA: 7s - loss: 0.9281 - accuracy: 0.65 - ETA: 7s - loss: 0.9276 - accu
racy: 0.65 - ETA: 7s - loss: 0.9270 - accuracy: 0.65 - ETA: 6s - loss: 0.9266 -
accuracy: 0.65 - ETA: 6s - loss: 0.9262 - accuracy: 0.65 - ETA: 5s - loss: 0.92
56 - accuracy: 0.65 - ETA: 5s - loss: 0.9249 - accuracy: 0.65 - ETA: 4s - loss:
0.9243 - accuracy: 0.65 - ETA: 4s - loss: 0.9237 - accuracy: 0.65 - ETA: 4s - l
oss: 0.9230 - accuracy: 0.65 - ETA: 3s - loss: 0.9224 - accuracy: 0.65 - ETA: 3
s - loss: 0.9217 - accuracy: 0.65 - ETA: 2s - loss: 0.9210 - accuracy: 0.65 - E
TA: 2s - loss: 0.9203 - accuracy: 0.65 - ETA: 2s - loss: 0.9197 - accuracy: 0.6
5 - ETA: 1s - loss: 0.9191 - accuracy: 0.65 - ETA: 1s - loss: 0.9184 - accurac
y: 0.65 - ETA: 0s - loss: 0.9177 - accuracy: 0.65 - ETA: 0s - loss: 0.9171 - ac
curacy: 0.65 - ETA: 0s - loss: 0.9165 - accuracy: 0.66 - 25s 431ms/step - loss:
0.9159 - accuracy: 0.6603 - val_loss: 0.7510 - val_accuracy: 0.7215
Epoch 37/100
57/57 [==============================] - ETA: 21s - loss: 0.9223 - accuracy: 0.
656 - ETA: 19s - loss: 0.8486 - accuracy: 0.675 - ETA: 19s - loss: 0.8648 - acc
uracy: 0.667 - ETA: 19s - loss: 0.8648 - accuracy: 0.666 - ETA: 19s - loss: 0.8
642 - accuracy: 0.664 - ETA: 19s - loss: 0.8651 - accuracy: 0.664 - ETA: 18s -
 loss: 0.8648 - accuracy: 0.663 - ETA: 18s - loss: 0.8667 - accuracy: 0.663 - E
TA: 18s - loss: 0.8680 - accuracy: 0.663 - ETA: 18s - loss: 0.8679 - accuracy:
 0.664 - ETA: 17s - loss: 0.8688 - accuracy: 0.663 - ETA: 17s - loss: 0.8688 -
 accuracy: 0.664 - ETA: 16s - loss: 0.8696 - accuracy: 0.664 - ETA: 16s - loss:
0.8705 - accuracy: 0.664 - ETA: 15s - loss: 0.8713 - accuracy: 0.664 - ETA: 15s
 - loss: 0.8719 - accuracy: 0.664 - ETA: 14s - loss: 0.8728 - accuracy: 0.665 -
 ETA: 14s - loss: 0.8736 - accuracy: 0.665 - ETA: 14s - loss: 0.8740 - accurac
y: 0.665 - ETA: 13s - loss: 0.8746 - accuracy: 0.665 - ETA: 13s - loss: 0.8751
 - accuracy: 0.666 - ETA: 13s - loss: 0.8753 - accuracy: 0.666 - ETA: 12s - los
s: 0.8757 - accuracy: 0.666 - ETA: 12s - loss: 0.8759 - accuracy: 0.667 - ETA:
 12s - loss: 0.8760 - accuracy: 0.667 - ETA: 11s - loss: 0.8759 - accuracy: 0.6
67 - ETA: 11s - loss: 0.8758 - accuracy: 0.667 - ETA: 10s - loss: 0.8760 - accu
racy: 0.667 - ETA: 10s - loss: 0.8760 - accuracy: 0.667 - ETA: 10s - loss: 0.87
60 - accuracy: 0.667 - ETA: 9s - loss: 0.8759 - accuracy: 0.668 - ETA: 9s - los
s: 0.8758 - accuracy: 0.66 - ETA: 9s - loss: 0.8756 - accuracy: 0.66 - ETA: 8s
 - loss: 0.8754 - accuracy: 0.66 - ETA: 8s - loss: 0.8752 - accuracy: 0.66 - ET
A: 7s - loss: 0.8751 - accuracy: 0.66 - ETA: 7s - loss: 0.8748 - accuracy: 0.66
 - ETA: 7s - loss: 0.8747 - accuracy: 0.66 - ETA: 6s - loss: 0.8746 - accuracy:
 0.66 - ETA: 6s - loss: 0.8746 - accuracy: 0.66 - ETA: 6s - loss: 0.8746 - accu
racy: 0.66 - ETA: 5s - loss: 0.8747 - accuracy: 0.66 - ETA: 5s - loss: 0.8747 -
accuracy: 0.66 - ETA: 4s - loss: 0.8748 - accuracy: 0.66 - ETA: 4s - loss: 0.87
48 - accuracy: 0.66 - ETA: 4s - loss: 0.8749 - accuracy: 0.66 - ETA: 3s - loss:
0.8749 - accuracy: 0.66 - ETA: 3s - loss: 0.8748 - accuracy: 0.67 - ETA: 2s - l
oss: 0.8747 - accuracy: 0.67 - ETA: 2s - loss: 0.8747 - accuracy: 0.67 - ETA: 2
s - loss: 0.8746 - accuracy: 0.67 - ETA: 1s - loss: 0.8746 - accuracy: 0.67 - E
TA: 1s - loss: 0.8745 - accuracy: 0.67 - ETA: 1s - loss: 0.8743 - accuracy: 0.6
7 - ETA: 0s - loss: 0.8743 - accuracy: 0.67 - ETA: 0s - loss: 0.8742 - accurac
y: 0.67 - ETA: 0s - loss: 0.8742 - accuracy: 0.67 - 22s 391ms/step - loss: 0.87
42 - accuracy: 0.6706 - val_loss: 0.7714 - val_accuracy: 0.7157
Epoch 38/100
57/57 [==============================] - ETA: 20s - loss: 0.9735 - accuracy: 0.
```

640 - ETA: 21s - loss: 0.9128 - accuracy: 0.660 - ETA: 20s - loss: 0.8843 - accuracy: 0.667 - ETA: 19s - loss: 0.8649 - accuracy: 0.676 - ETA: 19s - loss: 0.8571 - accuracy: 0.676 - ETA: 18s - loss: 0.8504 - accuracy: 0.678 - ETA: 18s - loss: 0.8513 - accuracy: 0.678 - ETA: 18s - loss: 0.8487 - accuracy: 0.681 - ETA: 17s - loss: 0.8465 - accuracy: 0.682 - ETA: 17s - loss: 0.8444 - accuracy: 0.683 - ETA: 17s - loss: 0.8430 - accuracy: 0.684 - ETA: 16s - loss: 0.8412 - accuracy: 0.685 - ETA: 16s - loss: 0.8407 - accuracy: 0.685 - ETA: 15s - loss: 0.8412 - accuracy: 0.685 - ETA: 15s - loss: 0.8419 - accuracy: 0.685 - ETA: 15s - loss: 0.8429 - accuracy: 0.685 - ETA: 14s - loss: 0.8433 - accuracy: 0.685 - ETA: 14s - loss: 0.8437 - accuracy: 0.686 - ETA: 14s - loss: 0.8447 - accuracy: 0.685 - ETA: 13s - loss: 0.8455 - accuracy: 0.685 - ETA: 13s - loss: 0.8459 - accuracy: 0.685 - ETA: 13s - loss: 0.8459 - accuracy: 0.685 - ETA: 12s - loss: 0.8461 - accuracy: 0.686 - ETA: 12s - loss: 0.8461 - accuracy: 0.686 - ETA: 11s - loss: 0.8464 - accuracy: 0.686 - ETA: 11s - loss: 0.8466 - accuracy: 0.686 - ETA: 11s - loss: 0.8469 - accuracy: 0.686 - ETA: 10s - loss: 0.8472 - accuracy: 0.686 - ETA: 10s - loss: 0.8472 - accuracy: 0.686 - ETA: 9s - loss: 0.8471 - accuracy: 0.686 - ETA: 9s - loss: 0.8468 - accuracy: 0.68 - ETA: 9s - loss: 0.8466 - accuracy: 0.68 - ETA: 8s - loss: 0.8462 - accuracy: 0.68 - ETA: 8s - loss: 0.8457 - accuracy: 0.68 - ETA: 8s - loss: 0.8452 - accuracy: 0.68 - ETA: 7s - loss: 0.8448 - accuracy: 0.68 - ETA: 7s - loss: 0.8443 - accuracy: 0.68 - ETA: 6s - loss: 0.8438 - accuracy: 0.68 - ETA: 6s - loss: 0.8433 - accuracy: 0.68 - ETA: 6s - loss: 0.8427 - accuracy: 0.68 - ETA: 5s - loss: 0.8420 - accuracy: 0.68 - ETA: 5s - loss: 0.8414 - accuracy: 0.68 - ETA: 5s - loss: 0.8410 - accuracy: 0.68 - ETA: 4s - loss: 0.8406 - accuracy: 0.68 - ETA: 4s - loss: 0.8403 - accuracy: 0.69 - ETA: 4s - loss: 0.8400 - accuracy: 0.69 - ETA: 3s - loss: 0.8398 - accuracy: 0.69 - ETA: 3s - loss: 0.8396 - accuracy: 0.69 - ETA: 2s - loss: 0.8395 - accuracy: 0.69 - ETA: 2s - loss: 0.8394 - accuracy: 0.69 - ETA: 2s - loss: 0.8393 - accuracy: 0.69 - ETA: 1s - loss: 0.8392 - accuracy: 0.69 - ETA: 1s - loss: 0.8391 - accuracy: 0.69 - ETA: 1s - loss: 0.8390 - accuracy: 0.69 - ETA: 0s - loss: 0.8389 - accuracy: 0.69 - ETA: 0s - loss: 0.8387 - accuracy: 0.69 - ETA: 0s - loss: 0.8385 - accuracy: 0.69 - 22s 383ms/step - loss: 0.8383 - accuracy: 0.6911 - val_loss: 0.6793 - val_accuracy: 0.7545
Epoch 39/100
57/57 [==============================] - ETA: 20s - loss: 0.9435 - accuracy: 0.640 - ETA: 20s - loss: 0.9299 - accuracy: 0.636 - ETA: 20s - loss: 0.8823 - accuracy: 0.660 - ETA: 20s - loss: 0.8576 - accuracy: 0.671 - ETA: 19s - loss: 0.8480 - accuracy: 0.675 - ETA: 19s - loss: 0.8370 - accuracy: 0.679 - ETA: 19s - loss: 0.8303 - accuracy: 0.682 - ETA: 18s - loss: 0.8291 - accuracy: 0.684 - ETA: 18s - loss: 0.8268 - accuracy: 0.686 - ETA: 17s - loss: 0.8250 - accuracy: 0.688 - ETA: 16s - loss: 0.8227 - accuracy: 0.690 - ETA: 16s - loss: 0.8197 - accuracy: 0.692 - ETA: 16s - loss: 0.8167 - accuracy: 0.694 - ETA: 15s - loss: 0.8144 - accuracy: 0.696 - ETA: 15s - loss: 0.8135 - accuracy: 0.696 - ETA: 15s - loss: 0.8133 - accuracy: 0.697 - ETA: 14s - loss: 0.8134 - accuracy: 0.697 - ETA: 14s - loss: 0.8139 - accuracy: 0.697 - ETA: 14s - loss: 0.8139 - accuracy: 0.697 - ETA: 13s - loss: 0.8135 - accuracy: 0.698 - ETA: 13s - loss: 0.8129 - accuracy: 0.698 - ETA: 13s - loss: 0.8128 - accuracy: 0.699 - ETA: 12s - loss: 0.8125 - accuracy: 0.699 - ETA: 12s - loss: 0.8120 - accuracy: 0.699 - ETA: 11s - loss: 0.8115 - accuracy: 0.700 - ETA: 11s - loss: 0.8111 - accuracy: 0.700 - ETA: 11s - loss: 0.8105 - accuracy: 0.700 - ETA: 10s - loss: 0.8101 - accuracy: 0.701 - ETA: 10s - loss: 0.8097 - accuracy: 0.701 - ETA: 10s - loss: 0.8092 - accuracy: 0.701 - ETA: 9s - loss: 0.8087 - accuracy: 0.702 - ETA: 9s - loss: 0.8081 - accuracy: 0.70 - ETA: 9s - loss: 0.8076 - accuracy: 0.70 - ETA: 8s - loss: 0.8072 - accuracy: 0.70 - ETA: 8s - loss: 0.8069 - accuracy: 0.70 - ETA: 7s - loss: 0.8066 - accuracy: 0.70 - ETA: 7s - loss: 0.8064 - accuracy: 0.70 - ETA: 7s - loss: 0.8061 - accuracy: 0.70 - ETA: 6s - loss: 0.8058 - accuracy: 0.70 - ETA: 6s - loss: 0.8057 - accuracy: 0.70 - ETA: 6s - loss: 0.8056 - accuracy: 0.70 - ETA: 5s - loss: 0.8056 - accuracy: 0.70 - ETA: 5s - loss: 0.8057 - accuracy: 0.70 - ETA: 4s - loss: 0.8058 - accuracy: 0.70 - ETA: 4s - loss: 0.8058 - accuracy: 0.70 - ETA: 4s - loss: 0.8058 - accuracy: 0.70 - ETA: 3s - loss: 0.8060 - accuracy: 0.70 - ETA: 3s - loss: 0.8061 - accuracy: 0.70 - ETA: 3s - l

```
oss: 0.8062 - accuracy: 0.70 - ETA: 2s - loss: 0.8063 - accuracy: 0.70 - ETA: 2
s - loss: 0.8063 - accuracy: 0.70 - ETA: 1s - loss: 0.8063 - accuracy: 0.70 - E
TA: 1s - loss: 0.8064 - accuracy: 0.70 - ETA: 1s - loss: 0.8064 - accuracy: 0.7
0 - ETA: 0s - loss: 0.8064 - accuracy: 0.70 - ETA: 0s - loss: 0.8065 - accurac
y: 0.70 - ETA: 0s - loss: 0.8065 - accuracy: 0.70 - 23s 400ms/step - loss: 0.80
66 - accuracy: 0.7041 - val_loss: 0.6758 - val_accuracy: 0.7678
Epoch 40/100
57/57 [==============================] - ETA: 20s - loss: 0.8074 - accuracy: 0.
687 - ETA: 21s - loss: 0.8115 - accuracy: 0.703 - ETA: 21s - loss: 0.7994 - acc
uracy: 0.711 - ETA: 20s - loss: 0.8009 - accuracy: 0.712 - ETA: 20s - loss: 0.8
006 - accuracy: 0.710 - ETA: 20s - loss: 0.7966 - accuracy: 0.710 - ETA: 20s -
 loss: 0.7934 - accuracy: 0.711 - ETA: 20s - loss: 0.7910 - accuracy: 0.711 - E
TA: 20s - loss: 0.7898 - accuracy: 0.711 - ETA: 19s - loss: 0.7888 - accuracy:
 0.712 - ETA: 19s - loss: 0.7885 - accuracy: 0.713 - ETA: 18s - loss: 0.7900 -
 accuracy: 0.713 - ETA: 18s - loss: 0.7922 - accuracy: 0.713 - ETA: 17s - loss:
0.7937 - accuracy: 0.713 - ETA: 17s - loss: 0.7942 - accuracy: 0.713 - ETA: 16s
 - loss: 0.7947 - accuracy: 0.713 - ETA: 16s - loss: 0.7954 - accuracy: 0.714 -
 ETA: 16s - loss: 0.7962 - accuracy: 0.714 - ETA: 15s - loss: 0.7970 - accurac
y: 0.713 - ETA: 15s - loss: 0.7979 - accuracy: 0.713 - ETA: 14s - loss: 0.7984
 - accuracy: 0.713 - ETA: 14s - loss: 0.7989 - accuracy: 0.713 - ETA: 13s - los
s: 0.7994 - accuracy: 0.712 - ETA: 13s - loss: 0.7996 - accuracy: 0.712 - ETA:
 13s - loss: 0.7999 - accuracy: 0.712 - ETA: 12s - loss: 0.8002 - accuracy: 0.7
11 - ETA: 12s - loss: 0.8007 - accuracy: 0.711 - ETA: 11s - loss: 0.8012 - accu
racy: 0.711 - ETA: 11s - loss: 0.8014 - accuracy: 0.710 - ETA: 11s - loss: 0.80
15 - accuracy: 0.710 - ETA: 10s - loss: 0.8017 - accuracy: 0.710 - ETA: 10s - l
oss: 0.8020 - accuracy: 0.710 - ETA: 9s - loss: 0.8022 - accuracy: 0.710 - ETA:
9s - loss: 0.8025 - accuracy: 0.70 - ETA: 9s - loss: 0.8029 - accuracy: 0.70 -
 ETA: 8s - loss: 0.8035 - accuracy: 0.70 - ETA: 8s - loss: 0.8040 - accuracy:
 0.70 - ETA: 7s - loss: 0.8046 - accuracy: 0.70 - ETA: 7s - loss: 0.8052 - accu
racy: 0.70 - ETA: 6s - loss: 0.8058 - accuracy: 0.70 - ETA: 6s - loss: 0.8064 -
accuracy: 0.70 - ETA: 6s - loss: 0.8070 - accuracy: 0.70 - ETA: 5s - loss: 0.80
74 - accuracy: 0.70 - ETA: 5s - loss: 0.8078 - accuracy: 0.70 - ETA: 4s - loss:
0.8083 - accuracy: 0.70 - ETA: 4s - loss: 0.8086 - accuracy: 0.70 - ETA: 4s - l
oss: 0.8092 - accuracy: 0.70 - ETA: 3s - loss: 0.8096 - accuracy: 0.70 - ETA: 3
s - loss: 0.8101 - accuracy: 0.70 - ETA: 2s - loss: 0.8105 - accuracy: 0.70 - E
TA: 2s - loss: 0.8109 - accuracy: 0.70 - ETA: 2s - loss: 0.8112 - accuracy: 0.7
0 - ETA: 1s - loss: 0.8116 - accuracy: 0.70 - ETA: 1s - loss: 0.8119 - accurac
y: 0.70 - ETA: 0s - loss: 0.8122 - accuracy: 0.70 - ETA: 0s - loss: 0.8124 - ac
curacy: 0.70 - ETA: 0s - loss: 0.8127 - accuracy: 0.70 - 24s 419ms/step - loss:
0.8130 - accuracy: 0.7024 - val_loss: 0.6886 - val_accuracy: 0.7446
Epoch 41/100
57/57 [==============================] - ETA: 24s - loss: 0.7787 - accuracy: 0.
718 - ETA: 20s - loss: 0.7526 - accuracy: 0.714 - ETA: 20s - loss: 0.7449 - acc
uracy: 0.717 - ETA: 19s - loss: 0.7396 - accuracy: 0.718 - ETA: 19s - loss: 0.7
344 - accuracy: 0.719 - ETA: 18s - loss: 0.7440 - accuracy: 0.716 - ETA: 18s -
 loss: 0.7490 - accuracy: 0.715 - ETA: 18s - loss: 0.7512 - accuracy: 0.715 - E
TA: 17s - loss: 0.7547 - accuracy: 0.714 - ETA: 17s - loss: 0.7586 - accuracy:
 0.713 - ETA: 16s - loss: 0.7609 - accuracy: 0.713 - ETA: 16s - loss: 0.7625 -
 accuracy: 0.713 - ETA: 16s - loss: 0.7650 - accuracy: 0.713 - ETA: 15s - loss:
0.7668 - accuracy: 0.714 - ETA: 15s - loss: 0.7684 - accuracy: 0.714 - ETA: 15s
 - loss: 0.7692 - accuracy: 0.714 - ETA: 14s - loss: 0.7704 - accuracy: 0.714 -
 ETA: 14s - loss: 0.7702 - accuracy: 0.715 - ETA: 14s - loss: 0.7700 - accurac
y: 0.715 - ETA: 13s - loss: 0.7696 - accuracy: 0.715 - ETA: 13s - loss: 0.7694
 - accuracy: 0.716 - ETA: 13s - loss: 0.7692 - accuracy: 0.716 - ETA: 12s - los
s: 0.7689 - accuracy: 0.716 - ETA: 12s - loss: 0.7688 - accuracy: 0.716 - ETA:
 11s - loss: 0.7691 - accuracy: 0.716 - ETA: 11s - loss: 0.7693 - accuracy: 0.7
16 - ETA: 11s - loss: 0.7694 - accuracy: 0.716 - ETA: 10s - loss: 0.7691 - accu
racy: 0.716 - ETA: 10s - loss: 0.7690 - accuracy: 0.716 - ETA: 10s - loss: 0.76
88 - accuracy: 0.716 - ETA: 9s - loss: 0.7686 - accuracy: 0.716 - ETA: 9s - los
s: 0.7682 - accuracy: 0.71 - ETA: 8s - loss: 0.7677 - accuracy: 0.71 - ETA: 8s
```

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 - loss: 0.7672 - accuracy: 0.71 - ETA: 8s - loss: 0.7668 - accuracy: 0.71 - ET
A: 7s - loss: 0.7664 - accuracy: 0.71 - ETA: 7s - loss: 0.7659 - accuracy: 0.71
 - ETA: 7s - loss: 0.7657 - accuracy: 0.71 - ETA: 6s - loss: 0.7655 - accuracy:
 0.71 - ETA: 6s - loss: 0.7653 - accuracy: 0.71 - ETA: 5s - loss: 0.7650 - accu
racy: 0.71 - ETA: 5s - loss: 0.7647 - accuracy: 0.71 - ETA: 5s - loss: 0.7643 -
accuracy: 0.71 - ETA: 4s - loss: 0.7641 - accuracy: 0.71 - ETA: 4s - loss: 0.76
39 - accuracy: 0.71 - ETA: 4s - loss: 0.7637 - accuracy: 0.71 - ETA: 3s - loss:
0.7636 - accuracy: 0.71 - ETA: 3s - loss: 0.7635 - accuracy: 0.71 - ETA: 2s - l
oss: 0.7634 - accuracy: 0.71 - ETA: 2s - loss: 0.7633 - accuracy: 0.71 - ETA: 2
s - loss: 0.7632 - accuracy: 0.71 - ETA: 1s - loss: 0.7631 - accuracy: 0.71 - E
TA: 1s - loss: 0.7630 - accuracy: 0.71 - ETA: 1s - loss: 0.7630 - accuracy: 0.7
1 - ETA: 0s - loss: 0.7630 - accuracy: 0.71 - ETA: 0s - loss: 0.7629 - accurac
y: 0.71 - ETA: 0s - loss: 0.7629 - accuracy: 0.71 - 22s 391ms/step - loss: 0.76
28 - accuracy: 0.7182 - val_loss: 0.6619 - val_accuracy: 0.7686
Epoch 42/100
57/57 [==============================] - ETA: 17s - loss: 0.7649 - accuracy: 0.
656 - ETA: 19s - loss: 0.7511 - accuracy: 0.683 - ETA: 20s - loss: 0.7399 - acc
uracy: 0.704 - ETA: 20s - loss: 0.7283 - accuracy: 0.718 - ETA: 21s - loss: 0.7
271 - accuracy: 0.726 - ETA: 20s - loss: 0.7273 - accuracy: 0.730 - ETA: 20s -
 loss: 0.7297 - accuracy: 0.732 - ETA: 19s - loss: 0.7300 - accuracy: 0.732 - E
TA: 18s - loss: 0.7307 - accuracy: 0.733 - ETA: 18s - loss: 0.7318 - accuracy:
 0.734 - ETA: 18s - loss: 0.7343 - accuracy: 0.733 - ETA: 18s - loss: 0.7362 -
 accuracy: 0.733 - ETA: 17s - loss: 0.7375 - accuracy: 0.733 - ETA: 17s - loss:
0.7383 - accuracy: 0.733 - ETA: 17s - loss: 0.7382 - accuracy: 0.733 - ETA: 16s
 - loss: 0.7394 - accuracy: 0.733 - ETA: 16s - loss: 0.7405 - accuracy: 0.733 -
 ETA: 15s - loss: 0.7416 - accuracy: 0.733 - ETA: 15s - loss: 0.7430 - accurac
y: 0.732 - ETA: 14s - loss: 0.7442 - accuracy: 0.732 - ETA: 14s - loss: 0.7456
 - accuracy: 0.731 - ETA: 13s - loss: 0.7463 - accuracy: 0.731 - ETA: 13s - los
s: 0.7472 - accuracy: 0.731 - ETA: 13s - loss: 0.7481 - accuracy: 0.730 - ETA:
 12s - loss: 0.7489 - accuracy: 0.730 - ETA: 12s - loss: 0.7498 - accuracy: 0.7
30 - ETA: 11s - loss: 0.7506 - accuracy: 0.729 - ETA: 11s - loss: 0.7514 - accu
racy: 0.729 - ETA: 11s - loss: 0.7523 - accuracy: 0.729 - ETA: 10s - loss: 0.75
31 - accuracy: 0.728 - ETA: 10s - loss: 0.7537 - accuracy: 0.728 - ETA: 9s - lo
ss: 0.7544 - accuracy: 0.728 - ETA: 9s - loss: 0.7551 - accuracy: 0.72 - ETA: 9
s - loss: 0.7557 - accuracy: 0.72 - ETA: 8s - loss: 0.7564 - accuracy: 0.72 - E
TA: 8s - loss: 0.7570 - accuracy: 0.72 - ETA: 7s - loss: 0.7577 - accuracy: 0.7
2 - ETA: 7s - loss: 0.7582 - accuracy: 0.72 - ETA: 7s - loss: 0.7586 - accurac
y: 0.72 - ETA: 6s - loss: 0.7589 - accuracy: 0.72 - ETA: 6s - loss: 0.7592 - ac
curacy: 0.72 - ETA: 5s - loss: 0.7594 - accuracy: 0.72 - ETA: 5s - loss: 0.7596
 - accuracy: 0.72 - ETA: 5s - loss: 0.7597 - accuracy: 0.72 - ETA: 4s - loss: 0.
7599 - accuracy: 0.72 - ETA: 4s - loss: 0.7601 - accuracy: 0.72 - ETA: 3s - los
s: 0.7602 - accuracy: 0.72 - ETA: 3s - loss: 0.7603 - accuracy: 0.72 - ETA: 3s
 - loss: 0.7603 - accuracy: 0.72 - ETA: 2s - loss: 0.7603 - accuracy: 0.72 - ET
A: 2s - loss: 0.7603 - accuracy: 0.72 - ETA: 1s - loss: 0.7604 - accuracy: 0.72
 - ETA: 1s - loss: 0.7606 - accuracy: 0.72 - ETA: 1s - loss: 0.7607 - accuracy:
 0.72 - ETA: 0s - loss: 0.7608 - accuracy: 0.72 - ETA: 0s - loss: 0.7609 - accu
racy: 0.72 - ETA: 0s - loss: 0.7610 - accuracy: 0.72 - 24s 421ms/step - loss:
 0.7611 - accuracy: 0.7256 - val_loss: 0.6169 - val_accuracy: 0.7876
Epoch 43/100
57/57 [==============================] - ETA: 25s - loss: 0.7512 - accuracy: 0.
781 - ETA: 27s - loss: 0.7817 - accuracy: 0.761 - ETA: 24s - loss: 0.7813 - acc
uracy: 0.750 - ETA: 22s - loss: 0.7699 - accuracy: 0.745 - ETA: 21s - loss: 0.7
599 - accuracy: 0.742 - ETA: 20s - loss: 0.7534 - accuracy: 0.741 - ETA: 20s -
 loss: 0.7493 - accuracy: 0.742 - ETA: 19s - loss: 0.7462 - accuracy: 0.743 - E
TA: 18s - loss: 0.7415 - accuracy: 0.744 - ETA: 18s - loss: 0.7359 - accuracy:
 0.745 - ETA: 18s - loss: 0.7313 - accuracy: 0.747 - ETA: 17s - loss: 0.7276 -
 accuracy: 0.748 - ETA: 17s - loss: 0.7252 - accuracy: 0.748 - ETA: 17s - loss:
0.7241 - accuracy: 0.748 - ETA: 16s - loss: 0.7238 - accuracy: 0.747 - ETA: 16s
 - loss: 0.7240 - accuracy: 0.747 - ETA: 15s - loss: 0.7233 - accuracy: 0.747 -
 ETA: 15s - loss: 0.7226 - accuracy: 0.747 - ETA: 14s - loss: 0.7219 - accurac
```

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y: 0.746 - ETA: 14s - loss: 0.7214 - accuracy: 0.746 - ETA: 14s - loss: 0.7212
 - accuracy: 0.746 - ETA: 13s - loss: 0.7207 - accuracy: 0.746 - ETA: 13s - los
s: 0.7201 - accuracy: 0.746 - ETA: 12s - loss: 0.7194 - accuracy: 0.746 - ETA:
 12s - loss: 0.7189 - accuracy: 0.746 - ETA: 12s - loss: 0.7184 - accuracy: 0.7
46 - ETA: 11s - loss: 0.7180 - accuracy: 0.746 - ETA: 11s - loss: 0.7173 - accu
racy: 0.746 - ETA: 11s - loss: 0.7166 - accuracy: 0.746 - ETA: 10s - loss: 0.71
59 - accuracy: 0.747 - ETA: 10s - loss: 0.7151 - accuracy: 0.747 - ETA: 10s - l
oss: 0.7143 - accuracy: 0.747 - ETA: 9s - loss: 0.7136 - accuracy: 0.747 - ETA:
9s - loss: 0.7131 - accuracy: 0.74 - ETA: 8s - loss: 0.7126 - accuracy: 0.74 -
 ETA: 8s - loss: 0.7125 - accuracy: 0.74 - ETA: 8s - loss: 0.7125 - accuracy:
 0.74 - ETA: 7s - loss: 0.7125 - accuracy: 0.74 - ETA: 7s - loss: 0.7127 - accu
racy: 0.74 - ETA: 6s - loss: 0.7130 - accuracy: 0.74 - ETA: 6s - loss: 0.7133 -
accuracy: 0.74 - ETA: 6s - loss: 0.7135 - accuracy: 0.74 - ETA: 5s - loss: 0.71
36 - accuracy: 0.74 - ETA: 5s - loss: 0.7138 - accuracy: 0.74 - ETA: 4s - loss:
0.7139 - accuracy: 0.74 - ETA: 4s - loss: 0.7139 - accuracy: 0.74 - ETA: 4s - l
oss: 0.7140 - accuracy: 0.74 - ETA: 3s - loss: 0.7141 - accuracy: 0.74 - ETA: 3
s - loss: 0.7143 - accuracy: 0.74 - ETA: 2s - loss: 0.7146 - accuracy: 0.74 - E
TA: 2s - loss: 0.7150 - accuracy: 0.74 - ETA: 2s - loss: 0.7154 - accuracy: 0.7
4 - ETA: 1s - loss: 0.7159 - accuracy: 0.74 - ETA: 1s - loss: 0.7164 - accurac
y: 0.74 - ETA: 0s - loss: 0.7169 - accuracy: 0.74 - ETA: 0s - loss: 0.7174 - ac
curacy: 0.74 - ETA: 0s - loss: 0.7180 - accuracy: 0.74 - 24s 425ms/step - loss:
0.7185 - accuracy: 0.7448 - val_loss: 0.6422 - val_accuracy: 0.7785
Epoch 44/100
57/57 [==============================] - ETA: 20s - loss: 0.6187 - accuracy: 0.
781 - ETA: 21s - loss: 0.7083 - accuracy: 0.722 - ETA: 20s - loss: 0.7504 - acc
uracy: 0.705 - ETA: 19s - loss: 0.7662 - accuracy: 0.702 - ETA: 19s - loss: 0.7
796 - accuracy: 0.698 - ETA: 18s - loss: 0.7852 - accuracy: 0.696 - ETA: 18s -
 loss: 0.7869 - accuracy: 0.695 - ETA: 18s - loss: 0.7897 - accuracy: 0.695 - E
TA: 18s - loss: 0.7905 - accuracy: 0.696 - ETA: 17s - loss: 0.7919 - accuracy:
 0.696 - ETA: 17s - loss: 0.7926 - accuracy: 0.696 - ETA: 16s - loss: 0.7923 -
 accuracy: 0.697 - ETA: 16s - loss: 0.7908 - accuracy: 0.698 - ETA: 16s - loss:
0.7893 - accuracy: 0.699 - ETA: 15s - loss: 0.7879 - accuracy: 0.700 - ETA: 15s
 - loss: 0.7867 - accuracy: 0.701 - ETA: 14s - loss: 0.7849 - accuracy: 0.702 -
 ETA: 14s - loss: 0.7833 - accuracy: 0.703 - ETA: 14s - loss: 0.7820 - accurac
y: 0.704 - ETA: 13s - loss: 0.7802 - accuracy: 0.705 - ETA: 13s - loss: 0.7784
 - accuracy: 0.705 - ETA: 12s - loss: 0.7767 - accuracy: 0.706 - ETA: 12s - los
s: 0.7749 - accuracy: 0.707 - ETA: 12s - loss: 0.7734 - accuracy: 0.708 - ETA:
 11s - loss: 0.7718 - accuracy: 0.708 - ETA: 11s - loss: 0.7701 - accuracy: 0.7
09 - ETA: 11s - loss: 0.7681 - accuracy: 0.710 - ETA: 10s - loss: 0.7664 - accu
racy: 0.711 - ETA: 10s - loss: 0.7649 - accuracy: 0.711 - ETA: 10s - loss: 0.76
33 - accuracy: 0.712 - ETA: 9s - loss: 0.7617 - accuracy: 0.713 - ETA: 9s - los
s: 0.7602 - accuracy: 0.71 - ETA: 8s - loss: 0.7589 - accuracy: 0.71 - ETA: 8s
 - loss: 0.7576 - accuracy: 0.71 - ETA: 8s - loss: 0.7564 - accuracy: 0.71 - ET
A: 7s - loss: 0.7552 - accuracy: 0.71 - ETA: 7s - loss: 0.7541 - accuracy: 0.71
 - ETA: 7s - loss: 0.7529 - accuracy: 0.71 - ETA: 6s - loss: 0.7517 - accuracy:
 0.71 - ETA: 6s - loss: 0.7505 - accuracy: 0.71 - ETA: 5s - loss: 0.7494 - accu
racy: 0.71 - ETA: 5s - loss: 0.7483 - accuracy: 0.72 - ETA: 5s - loss: 0.7472 -
accuracy: 0.72 - ETA: 4s - loss: 0.7463 - accuracy: 0.72 - ETA: 4s - loss: 0.74
54 - accuracy: 0.72 - ETA: 4s - loss: 0.7446 - accuracy: 0.72 - ETA: 3s - loss:
0.7440 - accuracy: 0.72 - ETA: 3s - loss: 0.7434 - accuracy: 0.72 - ETA: 2s - l
oss: 0.7429 - accuracy: 0.72 - ETA: 2s - loss: 0.7423 - accuracy: 0.72 - ETA: 2
s - loss: 0.7418 - accuracy: 0.72 - ETA: 1s - loss: 0.7412 - accuracy: 0.72 - E
TA: 1s - loss: 0.7407 - accuracy: 0.72 - ETA: 1s - loss: 0.7402 - accuracy: 0.7
2 - ETA: 0s - loss: 0.7398 - accuracy: 0.72 - ETA: 0s - loss: 0.7394 - accurac
y: 0.72 - ETA: 0s - loss: 0.7390 - accuracy: 0.72 - 23s 397ms/step - loss: 0.73
86 - accuracy: 0.7255 - val_loss: 0.6221 - val_accuracy: 0.7835
Epoch 45/100
57/57 [==============================] - ETA: 20s - loss: 0.5521 - accuracy: 0.
828 - ETA: 16s - loss: 0.5575 - accuracy: 0.820 - ETA: 18s - loss: 0.5684 - acc
uracy: 0.814 - ETA: 18s - loss: 0.5831 - accuracy: 0.803 - ETA: 18s - loss: 0.5
```

911 - accuracy: 0.796 - ETA: 18s - loss: 0.5987 - accuracy: 0.792 - ETA: 18s - loss: 0.6078 - accuracy: 0.789 - ETA: 19s - loss: 0.6125 - accuracy: 0.789 - ETA: 19s - loss: 0.6146 - accuracy: 0.788 - ETA: 19s - loss: 0.6180 - accuracy: 0.787 - ETA: 19s - loss: 0.6224 - accuracy: 0.785 - ETA: 18s - loss: 0.6268 - accuracy: 0.784 - ETA: 18s - loss: 0.6319 - accuracy: 0.783 - ETA: 17s - loss: 0.6362 - accuracy: 0.781 - ETA: 17s - loss: 0.6405 - accuracy: 0.779 - ETA: 16s - loss: 0.6442 - accuracy: 0.777 - ETA: 16s - loss: 0.6473 - accuracy: 0.776 - ETA: 15s - loss: 0.6506 - accuracy: 0.775 - ETA: 15s - loss: 0.6542 - accuracy: 0.774 - ETA: 14s - loss: 0.6574 - accuracy: 0.772 - ETA: 14s - loss: 0.6601 - accuracy: 0.772 - ETA: 13s - loss: 0.6627 - accuracy: 0.771 - ETA: 13s - loss: 0.6652 - accuracy: 0.769 - ETA: 13s - loss: 0.6677 - accuracy: 0.768 - ETA: 12s - loss: 0.6703 - accuracy: 0.767 - ETA: 12s - loss: 0.6729 - accuracy: 0.766 - ETA: 12s - loss: 0.6754 - accuracy: 0.765 - ETA: 11s - loss: 0.6779 - accuracy: 0.764 - ETA: 11s - loss: 0.6806 - accuracy: 0.762 - ETA: 10s - loss: 0.6832 - accuracy: 0.761 - ETA: 10s - loss: 0.6856 - accuracy: 0.760 - ETA: 10s - loss: 0.6879 - accuracy: 0.759 - ETA: 9s - loss: 0.6899 - accuracy: 0.759 - ETA: 9s - loss: 0.6918 - accuracy: 0.75 - ETA: 8s - loss: 0.6935 - accuracy: 0.75 - ETA: 8s - loss: 0.6952 - accuracy: 0.75 - ETA: 8s - loss: 0.6969 - accuracy: 0.75 - ETA: 7s - loss: 0.6984 - accuracy: 0.75 - ETA: 7s - loss: 0.6997 - accuracy: 0.75 - ETA: 6s - loss: 0.7010 - accuracy: 0.75 - ETA: 6s - loss: 0.7021 - accuracy: 0.75 - ETA: 6s - loss: 0.7032 - accuracy: 0.75 - ETA: 5s - loss: 0.7041 - accuracy: 0.75 - ETA: 5s - loss: 0.7050 - accuracy: 0.75 - ETA: 4s - loss: 0.7059 - accuracy: 0.75 - ETA: 4s - loss: 0.7067 - accuracy: 0.75 - ETA: 4s - loss: 0.7074 - accuracy: 0.75 - ETA: 3s - loss: 0.7082 - accuracy: 0.75 - ETA: 3s - loss: 0.7089 - accuracy: 0.75 - ETA: 2s - loss: 0.7095 - accuracy: 0.75 - ETA: 2s - loss: 0.7101 - accuracy: 0.74 - ETA: 1s - loss: 0.7107 - accuracy: 0.74 - ETA: 1s - loss: 0.7114 - accuracy: 0.74 - ETA: 1s - loss: 0.7121 - accuracy: 0.74 - ETA: 0s - loss: 0.7127 - accuracy: 0.74 - ETA: 0s - loss: 0.7133 - accuracy: 0.74 - ETA: 0s - loss: 0.7138 - accuracy: 0.74 - 24s 422ms/step - loss: 0.7144 - accuracy: 0.7477 - val_loss: 0.6239 - val_accuracy: 0.7694
Epoch 46/100
57/57 [==============================] - ETA: 21s - loss: 0.5567 - accuracy: 0.796 - ETA: 22s - loss: 0.6532 - accuracy: 0.800 - ETA: 22s - loss: 0.6987 - accuracy: 0.789 - ETA: 22s - loss: 0.7112 - accuracy: 0.785 - ETA: 21s - loss: 0.7159 - accuracy: 0.781 - ETA: 21s - loss: 0.7171 - accuracy: 0.779 - ETA: 21s - loss: 0.7132 - accuracy: 0.780 - ETA: 21s - loss: 0.7115 - accuracy: 0.780 - ETA: 20s - loss: 0.7096 - accuracy: 0.780 - ETA: 20s - loss: 0.7061 - accuracy: 0.781 - ETA: 19s - loss: 0.7035 - accuracy: 0.781 - ETA: 19s - loss: 0.7028 - accuracy: 0.780 - ETA: 18s - loss: 0.7018 - accuracy: 0.779 - ETA: 18s - loss: 0.7008 - accuracy: 0.779 - ETA: 17s - loss: 0.7000 - accuracy: 0.778 - ETA: 17s - loss: 0.6991 - accuracy: 0.777 - ETA: 16s - loss: 0.6982 - accuracy: 0.777 - ETA: 16s - loss: 0.6972 - accuracy: 0.776 - ETA: 16s - loss: 0.6958 - accuracy: 0.776 - ETA: 15s - loss: 0.6948 - accuracy: 0.775 - ETA: 15s - loss: 0.6942 - accuracy: 0.775 - ETA: 15s - loss: 0.6934 - accuracy: 0.774 - ETA: 14s - loss: 0.6927 - accuracy: 0.774 - ETA: 14s - loss: 0.6925 - accuracy: 0.773 - ETA: 13s - loss: 0.6920 - accuracy: 0.772 - ETA: 13s - loss: 0.6914 - accuracy: 0.772 - ETA: 12s - loss: 0.6908 - accuracy: 0.772 - ETA: 12s - loss: 0.6902 - accuracy: 0.771 - ETA: 11s - loss: 0.6898 - accuracy: 0.771 - ETA: 11s - loss: 0.6897 - accuracy: 0.770 - ETA: 11s - loss: 0.6895 - accuracy: 0.770 - ETA: 10s - loss: 0.6891 - accuracy: 0.770 - ETA: 10s - loss: 0.6887 - accuracy: 0.769 - ETA: 9s - loss: 0.6883 - accuracy: 0.769 - ETA: 9s - loss: 0.6879 - accuracy: 0.76 - ETA: 8s - loss: 0.6876 - accuracy: 0.76 - ETA: 8s - loss: 0.6875 - accuracy: 0.76 - ETA: 7s - loss: 0.6874 - accuracy: 0.76 - ETA: 7s - loss: 0.6873 - accuracy: 0.76 - ETA: 7s - loss: 0.6871 - accuracy: 0.76 - ETA: 6s - loss: 0.6872 - accuracy: 0.76 - ETA: 6s - loss: 0.6873 - accuracy: 0.76 - ETA: 5s - loss: 0.6873 - accuracy: 0.76 - ETA: 5s - loss: 0.6873 - accuracy: 0.76 - ETA: 4s - loss: 0.6873 - accuracy: 0.76 - ETA: 4s - loss: 0.6873 - accuracy: 0.76 - ETA: 4s - loss: 0.6873 - accuracy: 0.76 - ETA: 3s - loss: 0.6873 - accuracy: 0.76 - ETA: 3s - loss: 0.6873 - accuracy: 0.76 - ETA: 2s - loss: 0.6873 - accuracy: 0.76 - ETA: 2s - loss: 0.6874 - accuracy: 0.76 - ETA: 2s - loss: 0.6875 - accuracy:

```
    0.76 - ETA: 1s - loss: 0.6875 - accuracy: 0.76 - ETA: 1s - loss: 0.6877 - accu
racy: 0.76 - ETA: 0s - loss: 0.6879 - accuracy: 0.76 - ETA: 0s - loss: 0.6881 -
accuracy: 0.76 - ETA: 0s - loss: 0.6883 - accuracy: 0.76 - 25s 439ms/step - los
s: 0.6885 - accuracy: 0.7640 - val_loss: 0.6034 - val_accuracy: 0.7884
Epoch 47/100
57/57 [==============================] - ETA: 21s - loss: 0.6341 - accuracy: 0.
734 - ETA: 22s - loss: 0.6670 - accuracy: 0.738 - ETA: 22s - loss: 0.6612 - acc
uracy: 0.738 - ETA: 21s - loss: 0.6707 - accuracy: 0.734 - ETA: 21s - loss: 0.6
740 - accuracy: 0.735 - ETA: 20s - loss: 0.6762 - accuracy: 0.733 - ETA: 19s -
 loss: 0.6785 - accuracy: 0.732 - ETA: 19s - loss: 0.6824 - accuracy: 0.730 - E
TA: 19s - loss: 0.6853 - accuracy: 0.730 - ETA: 19s - loss: 0.6853 - accuracy:
 0.731 - ETA: 18s - loss: 0.6858 - accuracy: 0.731 - ETA: 18s - loss: 0.6862 -
 accuracy: 0.731 - ETA: 18s - loss: 0.6868 - accuracy: 0.731 - ETA: 18s - loss:
0.6870 - accuracy: 0.732 - ETA: 17s - loss: 0.6870 - accuracy: 0.733 - ETA: 17s
- loss: 0.6868 - accuracy: 0.733 - ETA: 16s - loss: 0.6872 - accuracy: 0.734 -
 ETA: 16s - loss: 0.6871 - accuracy: 0.734 - ETA: 15s - loss: 0.6869 - accurac
y: 0.735 - ETA: 15s - loss: 0.6866 - accuracy: 0.735 - ETA: 15s - loss: 0.6867
 - accuracy: 0.735 - ETA: 14s - loss: 0.6865 - accuracy: 0.736 - ETA: 14s - los
s: 0.6863 - accuracy: 0.736 - ETA: 13s - loss: 0.6860 - accuracy: 0.737 - ETA:
 13s - loss: 0.6856 - accuracy: 0.737 - ETA: 13s - loss: 0.6854 - accuracy: 0.7
38 - ETA: 12s - loss: 0.6853 - accuracy: 0.738 - ETA: 12s - loss: 0.6853 - accu
racy: 0.738 - ETA: 11s - loss: 0.6854 - accuracy: 0.738 - ETA: 11s - loss: 0.68
54 - accuracy: 0.739 - ETA: 10s - loss: 0.6854 - accuracy: 0.739 - ETA: 10s - l
oss: 0.6854 - accuracy: 0.739 - ETA: 9s - loss: 0.6852 - accuracy: 0.739 - ETA:
9s - loss: 0.6849 - accuracy: 0.73 - ETA: 9s - loss: 0.6845 - accuracy: 0.74 -
 ETA: 8s - loss: 0.6840 - accuracy: 0.74 - ETA: 8s - loss: 0.6834 - accuracy:
 0.74 - ETA: 7s - loss: 0.6829 - accuracy: 0.74 - ETA: 7s - loss: 0.6824 - accu
racy: 0.74 - ETA: 7s - loss: 0.6819 - accuracy: 0.74 - ETA: 6s - loss: 0.6813 -
accuracy: 0.74 - ETA: 6s - loss: 0.6807 - accuracy: 0.74 - ETA: 5s - loss: 0.68
01 - accuracy: 0.74 - ETA: 5s - loss: 0.6797 - accuracy: 0.74 - ETA: 4s - loss:
0.6794 - accuracy: 0.74 - ETA: 4s - loss: 0.6790 - accuracy: 0.74 - ETA: 4s - l
oss: 0.6787 - accuracy: 0.74 - ETA: 3s - loss: 0.6784 - accuracy: 0.74 - ETA: 3
s - loss: 0.6781 - accuracy: 0.74 - ETA: 2s - loss: 0.6778 - accuracy: 0.74 - E
TA: 2s - loss: 0.6775 - accuracy: 0.74 - ETA: 2s - loss: 0.6772 - accuracy: 0.7
4 - ETA: 1s - loss: 0.6770 - accuracy: 0.74 - ETA: 1s - loss: 0.6768 - accurac
y: 0.74 - ETA: 0s - loss: 0.6767 - accuracy: 0.74 - ETA: 0s - loss: 0.6765 - ac
curacy: 0.74 - ETA: 0s - loss: 0.6764 - accuracy: 0.74 - 25s 434ms/step - loss:
0.6763 - accuracy: 0.7453 - val_loss: 0.5779 - val_accuracy: 0.7826
Epoch 48/100
57/57 [==============================] - ETA: 21s - loss: 0.3932 - accuracy: 0.
859 - ETA: 24s - loss: 0.4965 - accuracy: 0.816 - ETA: 21s - loss: 0.5300 - acc
uracy: 0.797 - ETA: 21s - loss: 0.5624 - accuracy: 0.785 - ETA: 20s - loss: 0.5
823 - accuracy: 0.778 - ETA: 19s - loss: 0.5991 - accuracy: 0.773 - ETA: 19s -
 loss: 0.6103 - accuracy: 0.770 - ETA: 18s - loss: 0.6187 - accuracy: 0.768 - E
TA: 18s - loss: 0.6253 - accuracy: 0.766 - ETA: 18s - loss: 0.6298 - accuracy:
 0.766 - ETA: 17s - loss: 0.6334 - accuracy: 0.765 - ETA: 17s - loss: 0.6349 -
 accuracy: 0.766 - ETA: 17s - loss: 0.6350 - accuracy: 0.766 - ETA: 16s - loss:
0.6349 - accuracy: 0.767 - ETA: 16s - loss: 0.6357 - accuracy: 0.767 - ETA: 16s
- loss: 0.6361 - accuracy: 0.767 - ETA: 15s - loss: 0.6365 - accuracy: 0.767 -
 ETA: 15s - loss: 0.6366 - accuracy: 0.768 - ETA: 14s - loss: 0.6361 - accurac
y: 0.768 - ETA: 14s - loss: 0.6356 - accuracy: 0.769 - ETA: 13s - loss: 0.6349
 - accuracy: 0.770 - ETA: 13s - loss: 0.6347 - accuracy: 0.770 - ETA: 13s - los
s: 0.6347 - accuracy: 0.770 - ETA: 12s - loss: 0.6348 - accuracy: 0.771 - ETA:
 12s - loss: 0.6349 - accuracy: 0.771 - ETA: 12s - loss: 0.6352 - accuracy: 0.7
71 - ETA: 11s - loss: 0.6354 - accuracy: 0.771 - ETA: 11s - loss: 0.6355 - accu
racy: 0.771 - ETA: 10s - loss: 0.6356 - accuracy: 0.771 - ETA: 10s - loss: 0.63
59 - accuracy: 0.771 - ETA: 10s - loss: 0.6364 - accuracy: 0.771 - ETA: 9s - lo
ss: 0.6367 - accuracy: 0.771 - ETA: 9s - loss: 0.6370 - accuracy: 0.77 - ETA: 8
s - loss: 0.6373 - accuracy: 0.77 - ETA: 8s - loss: 0.6376 - accuracy: 0.77 - E
TA: 8s - loss: 0.6378 - accuracy: 0.77 - ETA: 7s - loss: 0.6381 - accuracy: 0.7
```

7 - ETA: 7s - loss: 0.6382 - accuracy: 0.77 - ETA: 6s - loss: 0.6382 - accuracy: 0.77 - ETA: 6s - loss: 0.6384 - accuracy: 0.77 - ETA: 6s - loss: 0.6384 - accuracy: 0.77 - ETA: 5s - loss: 0.6386 - accuracy: 0.77 - ETA: 5s - loss: 0.6387 - accuracy: 0.77 - ETA: 5s - loss: 0.6389 - accuracy: 0.77 - ETA: 4s - loss: 0.6391 - accuracy: 0.77 - ETA: 4s - loss: 0.6392 - accuracy: 0.77 - ETA: 3s - loss: 0.6393 - accuracy: 0.77 - ETA: 3s - loss: 0.6395 - accuracy: 0.77 - ETA: 3s - loss: 0.6396 - accuracy: 0.77 - ETA: 2s - loss: 0.6398 - accuracy: 0.77 - ETA: 2s - loss: 0.6399 - accuracy: 0.77 - ETA: 1s - loss: 0.6401 - accuracy: 0.77 - ETA: 1s - loss: 0.6403 - accuracy: 0.77 - ETA: 1s - loss: 0.6406 - accuracy: 0.77 - ETA: 0s - loss: 0.6409 - accuracy: 0.77 - ETA: 0s - loss: 0.6412 - accuracy: 0.77 - ETA: 0s - loss: 0.6416 - accuracy: 0.77 - 23s 408ms/step - loss: 0.6419 - accuracy: 0.7704 - val_loss: 0.5586 - val_accuracy: 0.8190
Epoch 49/100
57/57 [==============================] - ETA: 20s - loss: 0.5434 - accuracy: 0.796 - ETA: 21s - loss: 0.5671 - accuracy: 0.781 - ETA: 20s - loss: 0.5786 - accuracy: 0.777 - ETA: 19s - loss: 0.5895 - accuracy: 0.775 - ETA: 20s - loss: 0.5988 - accuracy: 0.773 - ETA: 19s - loss: 0.6073 - accuracy: 0.772 - ETA: 19s - loss: 0.6118 - accuracy: 0.773 - ETA: 20s - loss: 0.6135 - accuracy: 0.774 - ETA: 19s - loss: 0.6165 - accuracy: 0.774 - ETA: 19s - loss: 0.6168 - accuracy: 0.776 - ETA: 18s - loss: 0.6173 - accuracy: 0.777 - ETA: 18s - loss: 0.6186 - accuracy: 0.778 - ETA: 17s - loss: 0.6197 - accuracy: 0.778 - ETA: 17s - loss: 0.6204 - accuracy: 0.779 - ETA: 16s - loss: 0.6213 - accuracy: 0.779 - ETA: 16s - loss: 0.6223 - accuracy: 0.779 - ETA: 16s - loss: 0.6227 - accuracy: 0.780 - ETA: 15s - loss: 0.6227 - accuracy: 0.780 - ETA: 15s - loss: 0.6223 - accuracy: 0.781 - ETA: 15s - loss: 0.6218 - accuracy: 0.781 - ETA: 14s - loss: 0.6210 - accuracy: 0.781 - ETA: 14s - loss: 0.6204 - accuracy: 0.782 - ETA: 13s - loss: 0.6197 - accuracy: 0.782 - ETA: 13s - loss: 0.6189 - accuracy: 0.782 - ETA: 13s - loss: 0.6183 - accuracy: 0.782 - ETA: 12s - loss: 0.6181 - accuracy: 0.782 - ETA: 12s - loss: 0.6179 - accuracy: 0.782 - ETA: 11s - loss: 0.6178 - accuracy: 0.782 - ETA: 11s - loss: 0.6176 - accuracy: 0.782 - ETA: 11s - loss: 0.6173 - accuracy: 0.782 - ETA: 10s - loss: 0.6172 - accuracy: 0.782 - ETA: 10s - loss: 0.6171 - accuracy: 0.782 - ETA: 9s - loss: 0.6170 - accuracy: 0.782 - ETA: 9s - loss: 0.6170 - accuracy: 0.78 - ETA: 8s - loss: 0.6171 - accuracy: 0.78 - ETA: 8s - loss: 0.6171 - accuracy: 0.78 - ETA: 8s - loss: 0.6171 - accuracy: 0.78 - ETA: 7s - loss: 0.6171 - accuracy: 0.78 - ETA: 7s - loss: 0.6170 - accuracy: 0.78 - ETA: 6s - loss: 0.6170 - accuracy: 0.78 - ETA: 6s - loss: 0.6170 - accuracy: 0.78 - ETA: 6s - loss: 0.6169 - accuracy: 0.78 - ETA: 5s - loss: 0.6170 - accuracy: 0.78 - ETA: 5s - loss: 0.6170 - accuracy: 0.78 - ETA: 4s - loss: 0.6170 - accuracy: 0.78 - ETA: 4s - loss: 0.6170 - accuracy: 0.78 - ETA: 3s - loss: 0.6170 - accuracy: 0.78 - ETA: 3s - loss: 0.6169 - accuracy: 0.78 - ETA: 2s - loss: 0.6170 - accuracy: 0.78 - ETA: 2s - loss: 0.6170 - accuracy: 0.78 - ETA: 2s - loss: 0.6170 - accuracy: 0.78 - ETA: 1s - loss: 0.6169 - accuracy: 0.78 - ETA: 1s - loss: 0.6169 - accuracy: 0.78 - ETA: 0s - loss: 0.6169 - accuracy: 0.78 - ETA: 0s - loss: 0.6168 - accuracy: 0.78 - ETA: 0s - loss: 0.6168 - accuracy: 0.78 - 24s 427ms/step - loss: 0.6167 - accuracy: 0.7807 - val_loss: 0.6159 - val_accuracy: 0.7876
Epoch 50/100
57/57 [==============================] - ETA: 25s - loss: 0.5121 - accuracy: 0.812 - ETA: 23s - loss: 0.5478 - accuracy: 0.793 - ETA: 22s - loss: 0.5676 - accuracy: 0.789 - ETA: 22s - loss: 0.5740 - accuracy: 0.787 - ETA: 22s - loss: 0.5752 - accuracy: 0.787 - ETA: 21s - loss: 0.5788 - accuracy: 0.787 - ETA: 20s - loss: 0.5839 - accuracy: 0.786 - ETA: 20s - loss: 0.5933 - accuracy: 0.783 - ETA: 19s - loss: 0.6018 - accuracy: 0.781 - ETA: 19s - loss: 0.6070 - accuracy: 0.780 - ETA: 19s - loss: 0.6135 - accuracy: 0.778 - ETA: 19s - loss: 0.6183 - accuracy: 0.777 - ETA: 18s - loss: 0.6218 - accuracy: 0.776 - ETA: 18s - loss: 0.6244 - accuracy: 0.776 - ETA: 17s - loss: 0.6268 - accuracy: 0.775 - ETA: 17s - loss: 0.6286 - accuracy: 0.775 - ETA: 16s - loss: 0.6303 - accuracy: 0.774 - ETA: 16s - loss: 0.6316 - accuracy: 0.774 - ETA: 15s - loss: 0.6326 - accuracy: 0.774 - ETA: 15s - loss: 0.6331 - accuracy: 0.774 - ETA: 15s - loss: 0.6337 - accuracy: 0.774 - ETA: 14s - loss: 0.6339 - accuracy: 0.774 - ETA: 14s - los

s: 0.6341 - accuracy: 0.774 - ETA: 14s - loss: 0.6342 - accuracy: 0.774 - ETA: 13s - loss: 0.6343 - accuracy: 0.774 - ETA: 13s - loss: 0.6342 - accuracy: 0.774 - ETA: 12s - loss: 0.6339 - accuracy: 0.774 - ETA: 12s - loss: 0.6335 - accuracy: 0.775 - ETA: 11s - loss: 0.6335 - accuracy: 0.775 - ETA: 11s - loss: 0.6335 - accuracy: 0.775 - ETA: 11s - loss: 0.6338 - accuracy: 0.775 - ETA: 10s - loss: 0.6341 - accuracy: 0.775 - ETA: 10s - loss: 0.6342 - accuracy: 0.775 - ETA: 9s - loss: 0.6342 - accuracy: 0.775 - ETA: 9s - loss: 0.6344 - accuracy: 0.77 - ETA: 8s - loss: 0.6348 - accuracy: 0.77 - ETA: 8s - loss: 0.6351 - accuracy: 0.77 - ETA: 7s - loss: 0.6353 - accuracy: 0.77 - ETA: 7s - loss: 0.6355 - accuracy: 0.77 - ETA: 6s - loss: 0.6356 - accuracy: 0.77 - ETA: 6s - loss: 0.6356 - accuracy: 0.77 - ETA: 5s - loss: 0.6356 - accuracy: 0.77 - ETA: 5s - loss: 0.6356 - accuracy: 0.77 - ETA: 5s - loss: 0.6356 - accuracy: 0.77 - ETA: 4s - loss: 0.6355 - accuracy: 0.77 - ETA: 4s - loss: 0.6355 - accuracy: 0.77 - ETA: 3s - loss: 0.6355 - accuracy: 0.77 - ETA: 3s - loss: 0.6353 - accuracy: 0.77 - ETA: 2s - loss: 0.6351 - accuracy: 0.77 - ETA: 2s - loss: 0.6349 - accuracy: 0.77 - ETA: 2s - loss: 0.6347 - accuracy: 0.77 - ETA: 1s - loss: 0.6345 - accuracy: 0.77 - ETA: 1s - loss: 0.6344 - accuracy: 0.77 - ETA: 1s - loss: 0.6343 - accuracy: 0.77 - ETA: 0s - loss: 0.6342 - accuracy: 0.77 - ETA: 0s - loss: 0.6340 - accuracy: 0.77 - ETA: 0s - loss: 0.6339 - accuracy: 0.77 - 21s 368ms/step - loss: 0.6338 - accuracy: 0.7751 - val_loss: 0.5332 - val_accuracy: 0.8165
Epoch 51/100
57/57 [==============================] - ETA: 14s - loss: 0.6240 - accuracy: 0.828 - ETA: 13s - loss: 0.5839 - accuracy: 0.824 - ETA: 13s - loss: 0.5522 - accuracy: 0.829 - ETA: 13s - loss: 0.5461 - accuracy: 0.827 - ETA: 12s - loss: 0.5427 - accuracy: 0.826 - ETA: 12s - loss: 0.5452 - accuracy: 0.824 - ETA: 12s - loss: 0.5448 - accuracy: 0.823 - ETA: 12s - loss: 0.5439 - accuracy: 0.823 - ETA: 11s - loss: 0.5452 - accuracy: 0.822 - ETA: 11s - loss: 0.5474 - accuracy: 0.821 - ETA: 11s - loss: 0.5489 - accuracy: 0.820 - ETA: 11s - loss: 0.5497 - accuracy: 0.819 - ETA: 10s - loss: 0.5519 - accuracy: 0.818 - ETA: 10s - loss: 0.5538 - accuracy: 0.816 - ETA: 10s - loss: 0.5545 - accuracy: 0.815 - ETA: 9s - loss: 0.5555 - accuracy: 0.814 - ETA: 9s - loss: 0.5563 - accuracy: 0.81 - ETA: 9s - loss: 0.5568 - accuracy: 0.81 - ETA: 9s - loss: 0.5575 - accuracy: 0.81 - ETA: 8s - loss: 0.5578 - accuracy: 0.81 - ETA: 8s - loss: 0.5582 - accuracy: 0.81 - ETA: 8s - loss: 0.5586 - accuracy: 0.80 - ETA: 8s - loss: 0.5586 - accuracy: 0.80 - ETA: 7s - loss: 0.5588 - accuracy: 0.80 - ETA: 7s - loss: 0.5589 - accuracy: 0.80 - ETA: 7s - loss: 0.5595 - accuracy: 0.80 - ETA: 7s - loss: 0.5602 - accuracy: 0.80 - ETA: 6s - loss: 0.5609 - accuracy: 0.80 - ETA: 6s - loss: 0.5614 - accuracy: 0.80 - ETA: 6s - loss: 0.5621 - accuracy: 0.80 - ETA: 6s - loss: 0.5627 - accuracy: 0.80 - ETA: 5s - loss: 0.5633 - accuracy: 0.80 - ETA: 5s - loss: 0.5636 - accuracy: 0.80 - ETA: 5s - loss: 0.5638 - accuracy: 0.80 - ETA: 5s - loss: 0.5640 - accuracy: 0.80 - ETA: 5s - loss: 0.5642 - accuracy: 0.80 - ETA: 4s - loss: 0.5645 - accuracy: 0.80 - ETA: 4s - loss: 0.5649 - accuracy: 0.80 - ETA: 4s - loss: 0.5654 - accuracy: 0.80 - ETA: 4s - loss: 0.5658 - accuracy: 0.80 - ETA: 3s - loss: 0.5662 - accuracy: 0.80 - ETA: 3s - loss: 0.5666 - accuracy: 0.80 - ETA: 3s - loss: 0.5669 - accuracy: 0.80 - ETA: 3s - loss: 0.5672 - accuracy: 0.79 - ETA: 2s - loss: 0.5675 - accuracy: 0.79 - ETA: 2s - loss: 0.5679 - accuracy: 0.79 - ETA: 2s - loss: 0.5683 - accuracy: 0.79 - ETA: 2s - loss: 0.5688 - accuracy: 0.79 - ETA: 1s - loss: 0.5693 - accuracy: 0.79 - ETA: 1s - loss: 0.5697 - accuracy: 0.79 - ETA: 1s - loss: 0.5702 - accuracy: 0.79 - ETA: 1s - loss: 0.5707 - accuracy: 0.79 - ETA: 0s - loss: 0.5712 - accuracy: 0.79 - ETA: 0s - loss: 0.5717 - accuracy: 0.79 - ETA: 0s - loss: 0.5723 - accuracy: 0.79 - ETA: 0s - loss: 0.5728 - accuracy: 0.79 - ETA: 0s - loss: 0.5733 - accuracy: 0.79 - 14s 254ms/step - loss: 0.5737 - accuracy: 0.7962 - val_loss: 0.4967 - val_accuracy: 0.8347
Epoch 52/100
57/57 [==============================] - ETA: 12s - loss: 0.4053 - accuracy: 0.875 - ETA: 12s - loss: 0.4385 - accuracy: 0.863 - ETA: 12s - loss: 0.4569 - accuracy: 0.855 - ETA: 12s - loss: 0.4626 - accuracy: 0.849 - ETA: 12s - loss: 0.4730 - accuracy: 0.843 - ETA: 11s - loss: 0.4834 - accuracy: 0.837 - ETA: 11s - loss: 0.4915 - accuracy: 0.832 - ETA: 11s - loss: 0.4998 - accuracy: 0.828 - E

TA: 11s - loss: 0.5069 - accuracy: 0.825 - ETA: 10s - loss: 0.5149 - accuracy: 0.822 - ETA: 10s - loss: 0.5210 - accuracy: 0.819 - ETA: 10s - loss: 0.5263 - accuracy: 0.817 - ETA: 10s - loss: 0.5308 - accuracy: 0.815 - ETA: 10s - loss: 0.5342 - accuracy: 0.814 - ETA: 9s - loss: 0.5372 - accuracy: 0.812 - ETA: 9s - loss: 0.5399 - accuracy: 0.81 - ETA: 9s - loss: 0.5420 - accuracy: 0.81 - ETA: 9s - loss: 0.5447 - accuracy: 0.80 - ETA: 9s - loss: 0.5471 - accuracy: 0.80 - ETA: 8s - loss: 0.5488 - accuracy: 0.80 - ETA: 8s - loss: 0.5504 - accuracy: 0.80 - ETA: 8s - loss: 0.5523 - accuracy: 0.80 - ETA: 8s - loss: 0.5542 - accuracy: 0.80 - ETA: 7s - loss: 0.5560 - accuracy: 0.80 - ETA: 7s - loss: 0.5575 - accuracy: 0.80 - ETA: 7s - loss: 0.5591 - accuracy: 0.80 - ETA: 7s - loss: 0.5606 - accuracy: 0.80 - ETA: 6s - loss: 0.5621 - accuracy: 0.80 - ETA: 6s - loss: 0.5634 - accuracy: 0.80 - ETA: 6s - loss: 0.5648 - accuracy: 0.80 - ETA: 6s - loss: 0.5662 - accuracy: 0.80 - ETA: 5s - loss: 0.5674 - accuracy: 0.80 - ETA: 5s - loss: 0.5685 - accuracy: 0.80 - ETA: 5s - loss: 0.5698 - accuracy: 0.80 - ETA: 5s - loss: 0.5710 - accuracy: 0.79 - ETA: 5s - loss: 0.5721 - accuracy: 0.79 - ETA: 4s - loss: 0.5730 - accuracy: 0.79 - ETA: 4s - loss: 0.5739 - accuracy: 0.79 - ETA: 4s - loss: 0.5749 - accuracy: 0.79 - ETA: 4s - loss: 0.5758 - accuracy: 0.79 - ETA: 3s - loss: 0.5766 - accuracy: 0.79 - ETA: 3s - loss: 0.5775 - accuracy: 0.79 - ETA: 3s - loss: 0.5783 - accuracy: 0.79 - ETA: 3s - loss: 0.5791 - accuracy: 0.79 - ETA: 2s - loss: 0.5799 - accuracy: 0.79 - ETA: 2s - loss: 0.5807 - accuracy: 0.79 - ETA: 2s - loss: 0.5814 - accuracy: 0.79 - ETA: 2s - loss: 0.5822 - accuracy: 0.79 - ETA: 1s - loss: 0.5830 - accuracy: 0.79 - ETA: 1s - loss: 0.5837 - accuracy: 0.79 - ETA: 1s - loss: 0.5845 - accuracy: 0.79 - ETA: 1s - loss: 0.5852 - accuracy: 0.79 - ETA: 0s - loss: 0.5859 - accuracy: 0.79 - ETA: 0s - loss: 0.5866 - accuracy: 0.79 - ETA: 0s - loss: 0.5873 - accuracy: 0.79 - ETA: 0s - loss: 0.5880 - accuracy: 0.79 - ETA: 0s - loss: 0.5887 - accuracy: 0.79 - 15s 256ms/step - loss: 0.5894 - accuracy: 0.7931 - val_loss: 0.5623 - val_accuracy: 0.8050
Epoch 53/100
57/57 [==============================] - ETA: 12s - loss: 0.4879 - accuracy: 0.843 - ETA: 12s - loss: 0.5483 - accuracy: 0.804 - ETA: 12s - loss: 0.5647 - accuracy: 0.791 - ETA: 12s - loss: 0.5868 - accuracy: 0.779 - ETA: 12s - loss: 0.6027 - accuracy: 0.772 - ETA: 11s - loss: 0.6067 - accuracy: 0.771 - ETA: 11s - loss: 0.6069 - accuracy: 0.770 - ETA: 11s - loss: 0.6073 - accuracy: 0.769 - ETA: 11s - loss: 0.6094 - accuracy: 0.768 - ETA: 10s - loss: 0.6106 - accuracy: 0.767 - ETA: 10s - loss: 0.6102 - accuracy: 0.767 - ETA: 10s - loss: 0.6104 - accuracy: 0.767 - ETA: 10s - loss: 0.6098 - accuracy: 0.767 - ETA: 10s - loss: 0.6101 - accuracy: 0.767 - ETA: 9s - loss: 0.6100 - accuracy: 0.767 - ETA: 9s - loss: 0.6099 - accuracy: 0.76 - ETA: 9s - loss: 0.6094 - accuracy: 0.76 - ETA: 9s - loss: 0.6087 - accuracy: 0.76 - ETA: 8s - loss: 0.6085 - accuracy: 0.76 - ETA: 8s - loss: 0.6080 - accuracy: 0.76 - ETA: 8s - loss: 0.6077 - accuracy: 0.77 - ETA: 8s - loss: 0.6074 - accuracy: 0.77 - ETA: 8s - loss: 0.6074 - accuracy: 0.77 - ETA: 7s - loss: 0.6074 - accuracy: 0.77 - ETA: 7s - loss: 0.6073 - accuracy: 0.77 - ETA: 7s - loss: 0.6070 - accuracy: 0.77 - ETA: 7s - loss: 0.6068 - accuracy: 0.77 - ETA: 7s - loss: 0.6068 - accuracy: 0.77 - ETA: 6s - loss: 0.6067 - accuracy: 0.77 - ETA: 6s - loss: 0.6065 - accuracy: 0.77 - ETA: 6s - loss: 0.6064 - accuracy: 0.77 - ETA: 6s - loss: 0.6062 - accuracy: 0.77 - ETA: 5s - loss: 0.6061 - accuracy: 0.77 - ETA: 5s - loss: 0.6061 - accuracy: 0.77 - ETA: 5s - loss: 0.6060 - accuracy: 0.77 - ETA: 5s - loss: 0.6059 - accuracy: 0.77 - ETA: 4s - loss: 0.6060 - accuracy: 0.77 - ETA: 4s - loss: 0.6060 - accuracy: 0.77 - ETA: 4s - loss: 0.6059 - accuracy: 0.77 - ETA: 4s - loss: 0.6058 - accuracy: 0.77 - ETA: 3s - loss: 0.6058 - accuracy: 0.77 - ETA: 3s - loss: 0.6059 - accuracy: 0.77 - ETA: 3s - loss: 0.6060 - accuracy: 0.77 - ETA: 3s - loss: 0.6061 - accuracy: 0.77 - ETA: 2s - loss: 0.6062 - accuracy: 0.77 - ETA: 2s - loss: 0.6065 - accuracy: 0.77 - ETA: 2s - loss: 0.6068 - accuracy: 0.77 - ETA: 2s - loss: 0.6071 - accuracy: 0.77 - ETA: 1s - loss: 0.6074 - accuracy: 0.77 - ETA: 1s - loss: 0.6076 - accuracy: 0.77 - ETA: 1s - loss: 0.6079 - accuracy: 0.77 - ETA: 1s - loss: 0.6082 - accuracy: 0.77 - ETA: 0s - loss: 0.6084 - accuracy: 0.77 - ETA: 0s - loss: 0.6086 - accuracy: 0.77 - ETA: 0s - loss: 0.6087 - accuracy: 0.77 - ETA: 0s - loss: 0.6088 - accuracy: 0.77 - ETA: 0s - loss: 0.6090 - ac

```
curacy: 0.77 - 14s 253ms/step - loss: 0.6092 - accuracy: 0.7778 - val_loss: 0.5
379 - val_accuracy: 0.8215
Epoch 54/100
57/57 [==============================] - ETA: 16s - loss: 0.6498 - accuracy: 0.
828 - ETA: 17s - loss: 0.6157 - accuracy: 0.828 - ETA: 15s - loss: 0.5967 - acc
uracy: 0.826 - ETA: 14s - loss: 0.5798 - accuracy: 0.825 - ETA: 14s - loss: 0.5
771 - accuracy: 0.823 - ETA: 13s - loss: 0.5713 - accuracy: 0.824 - ETA: 13s -
 loss: 0.5624 - accuracy: 0.825 - ETA: 12s - loss: 0.5556 - accuracy: 0.826 - E
TA: 12s - loss: 0.5503 - accuracy: 0.825 - ETA: 11s - loss: 0.5472 - accuracy:
 0.825 - ETA: 11s - loss: 0.5450 - accuracy: 0.825 - ETA: 11s - loss: 0.5437 -
 accuracy: 0.824 - ETA: 11s - loss: 0.5429 - accuracy: 0.823 - ETA: 10s - loss:
0.5428 - accuracy: 0.823 - ETA: 10s - loss: 0.5427 - accuracy: 0.822 - ETA: 10s
 - loss: 0.5429 - accuracy: 0.821 - ETA: 9s - loss: 0.5431 - accuracy: 0.821 - E
TA: 9s - loss: 0.5437 - accuracy: 0.82 - ETA: 9s - loss: 0.5448 - accuracy: 0.8
1 - ETA: 9s - loss: 0.5457 - accuracy: 0.81 - ETA: 8s - loss: 0.5470 - accurac
y: 0.81 - ETA: 8s - loss: 0.5485 - accuracy: 0.81 - ETA: 8s - loss: 0.5499 - ac
curacy: 0.81 - ETA: 8s - loss: 0.5510 - accuracy: 0.81 - ETA: 7s - loss: 0.5519
 - accuracy: 0.81 - ETA: 7s - loss: 0.5527 - accuracy: 0.81 - ETA: 7s - loss: 0.
5535 - accuracy: 0.81 - ETA: 7s - loss: 0.5541 - accuracy: 0.81 - ETA: 6s - los
s: 0.5547 - accuracy: 0.81 - ETA: 6s - loss: 0.5551 - accuracy: 0.81 - ETA: 6s
 - loss: 0.5555 - accuracy: 0.81 - ETA: 6s - loss: 0.5560 - accuracy: 0.81 - ET
A: 5s - loss: 0.5569 - accuracy: 0.81 - ETA: 5s - loss: 0.5576 - accuracy: 0.81
 - ETA: 5s - loss: 0.5583 - accuracy: 0.81 - ETA: 5s - loss: 0.5590 - accuracy:
 0.81 - ETA: 4s - loss: 0.5596 - accuracy: 0.81 - ETA: 4s - loss: 0.5601 - accu
racy: 0.81 - ETA: 4s - loss: 0.5605 - accuracy: 0.81 - ETA: 4s - loss: 0.5608 -
accuracy: 0.81 - ETA: 3s - loss: 0.5612 - accuracy: 0.81 - ETA: 3s - loss: 0.56
18 - accuracy: 0.81 - ETA: 3s - loss: 0.5623 - accuracy: 0.80 - ETA: 3s - loss:
0.5627 - accuracy: 0.80 - ETA: 2s - loss: 0.5631 - accuracy: 0.80 - ETA: 2s - l
oss: 0.5636 - accuracy: 0.80 - ETA: 2s - loss: 0.5642 - accuracy: 0.80 - ETA: 2
s - loss: 0.5647 - accuracy: 0.80 - ETA: 1s - loss: 0.5652 - accuracy: 0.80 - E
TA: 1s - loss: 0.5658 - accuracy: 0.80 - ETA: 1s - loss: 0.5664 - accuracy: 0.8
0 - ETA: 1s - loss: 0.5670 - accuracy: 0.80 - ETA: 0s - loss: 0.5676 - accurac
y: 0.80 - ETA: 0s - loss: 0.5683 - accuracy: 0.80 - ETA: 0s - loss: 0.5688 - ac
curacy: 0.80 - ETA: 0s - loss: 0.5694 - accuracy: 0.80 - ETA: 0s - loss: 0.5700
 - accuracy: 0.80 - 15s 256ms/step - loss: 0.5706 - accuracy: 0.8061 - val_loss:
0.5480 - val_accuracy: 0.8256
Epoch 55/100
57/57 [==============================] - ETA: 14s - loss: 0.6634 - accuracy: 0.
796 - ETA: 14s - loss: 0.7184 - accuracy: 0.757 - ETA: 13s - loss: 0.7078 - acc
uracy: 0.758 - ETA: 13s - loss: 0.6933 - accuracy: 0.765 - ETA: 12s - loss: 0.6
811 - accuracy: 0.769 - ETA: 11s - loss: 0.6702 - accuracy: 0.773 - ETA: 12s -
 loss: 0.6593 - accuracy: 0.777 - ETA: 11s - loss: 0.6508 - accuracy: 0.780 - E
TA: 11s - loss: 0.6422 - accuracy: 0.783 - ETA: 11s - loss: 0.6354 - accuracy:
 0.786 - ETA: 10s - loss: 0.6287 - accuracy: 0.788 - ETA: 10s - loss: 0.6220 -
 accuracy: 0.791 - ETA: 10s - loss: 0.6157 - accuracy: 0.793 - ETA: 10s - loss:
0.6100 - accuracy: 0.795 - ETA: 10s - loss: 0.6053 - accuracy: 0.797 - ETA: 9s
 - loss: 0.6014 - accuracy: 0.798 - ETA: 9s - loss: 0.5980 - accuracy: 0.79 - E
TA: 9s - loss: 0.5945 - accuracy: 0.80 - ETA: 9s - loss: 0.5912 - accuracy: 0.8
0 - ETA: 9s - loss: 0.5881 - accuracy: 0.80 - ETA: 8s - loss: 0.5852 - accurac
y: 0.80 - ETA: 8s - loss: 0.5822 - accuracy: 0.80 - ETA: 8s - loss: 0.5799 - ac
curacy: 0.80 - ETA: 7s - loss: 0.5779 - accuracy: 0.80 - ETA: 7s - loss: 0.5763
 - accuracy: 0.80 - ETA: 7s - loss: 0.5749 - accuracy: 0.80 - ETA: 7s - loss: 0.
5733 - accuracy: 0.80 - ETA: 6s - loss: 0.5721 - accuracy: 0.80 - ETA: 6s - los
s: 0.5713 - accuracy: 0.80 - ETA: 6s - loss: 0.5705 - accuracy: 0.80 - ETA: 6s
 - loss: 0.5698 - accuracy: 0.80 - ETA: 5s - loss: 0.5691 - accuracy: 0.80 - ET
A: 5s - loss: 0.5683 - accuracy: 0.80 - ETA: 5s - loss: 0.5673 - accuracy: 0.80
 - ETA: 5s - loss: 0.5667 - accuracy: 0.80 - ETA: 4s - loss: 0.5662 - accuracy:
 0.80 - ETA: 4s - loss: 0.5660 - accuracy: 0.80 - ETA: 4s - loss: 0.5656 - accu
racy: 0.80 - ETA: 4s - loss: 0.5654 - accuracy: 0.80 - ETA: 3s - loss: 0.5653 -
accuracy: 0.80 - ETA: 3s - loss: 0.5652 - accuracy: 0.80 - ETA: 3s - loss: 0.56
```

51 - accuracy: 0.80 - ETA: 3s - loss: 0.5651 - accuracy: 0.80 - ETA: 2s - loss: 0.5649 - accuracy: 0.80 - ETA: 2s - loss: 0.5648 - accuracy: 0.80 - ETA: 2s - loss: 0.5646 - accuracy: 0.80 - ETA: 2s - loss: 0.5646 - accuracy: 0.80 - ETA: 2s - loss: 0.5646 - accuracy: 0.80 - ETA: 1s - loss: 0.5645 - accuracy: 0.80 - ETA: 1s - loss: 0.5645 - accuracy: 0.80 - ETA: 1s - loss: 0.5645 - accuracy: 0.80 - ETA: 1s - loss: 0.5645 - accuracy: 0.80 - ETA: 0s - loss: 0.5645 - accuracy: 0.80 - ETA: 0s - loss: 0.5646 - accuracy: 0.80 - ETA: 0s - loss: 0.5647 - accuracy: 0.80 - ETA: 0s - loss: 0.5647 - accuracy: 0.80 - ETA: 0s - loss: 0.5648 - accuracy: 0.80 - 14s 243ms/step - loss: 0.5648 - accuracy: 0.8055 - val_loss: 0.4926 - val_accuracy: 0.8339
Epoch 56/100
57/57 [==============================] - ETA: 16s - loss: 0.6122 - accuracy: 0.765 - ETA: 15s - loss: 0.6066 - accuracy: 0.773 - ETA: 14s - loss: 0.5927 - accuracy: 0.784 - ETA: 14s - loss: 0.5878 - accuracy: 0.787 - ETA: 14s - loss: 0.5794 - accuracy: 0.792 - ETA: 14s - loss: 0.5720 - accuracy: 0.797 - ETA: 13s - loss: 0.5679 - accuracy: 0.798 - ETA: 13s - loss: 0.5647 - accuracy: 0.799 - ETA: 13s - loss: 0.5625 - accuracy: 0.799 - ETA: 12s - loss: 0.5594 - accuracy: 0.800 - ETA: 12s - loss: 0.5577 - accuracy: 0.801 - ETA: 11s - loss: 0.5559 - accuracy: 0.802 - ETA: 11s - loss: 0.5540 - accuracy: 0.803 - ETA: 11s - loss: 0.5526 - accuracy: 0.804 - ETA: 11s - loss: 0.5517 - accuracy: 0.804 - ETA: 10s - loss: 0.5510 - accuracy: 0.804 - ETA: 10s - loss: 0.5504 - accuracy: 0.804 - ETA: 10s - loss: 0.5501 - accuracy: 0.804 - ETA: 9s - loss: 0.5494 - accuracy: 0.804 - ETA: 9s - loss: 0.5487 - accuracy: 0.80 - ETA: 9s - loss: 0.5482 - accuracy: 0.80 - ETA: 8s - loss: 0.5478 - accuracy: 0.80 - ETA: 8s - loss: 0.5472 - accuracy: 0.80 - ETA: 8s - loss: 0.5469 - accuracy: 0.80 - ETA: 8s - loss: 0.5467 - accuracy: 0.80 - ETA: 7s - loss: 0.5466 - accuracy: 0.80 - ETA: 7s - loss: 0.5464 - accuracy: 0.80 - ETA: 7s - loss: 0.5463 - accuracy: 0.80 - ETA: 6s - loss: 0.5462 - accuracy: 0.80 - ETA: 6s - loss: 0.5460 - accuracy: 0.80 - ETA: 6s - loss: 0.5460 - accuracy: 0.80 - ETA: 6s - loss: 0.5460 - accuracy: 0.80 - ETA: 5s - loss: 0.5459 - accuracy: 0.80 - ETA: 5s - loss: 0.5457 - accuracy: 0.80 - ETA: 5s - loss: 0.5456 - accuracy: 0.80 - ETA: 5s - loss: 0.5455 - accuracy: 0.80 - ETA: 4s - loss: 0.5455 - accuracy: 0.80 - ETA: 4s - loss: 0.5454 - accuracy: 0.80 - ETA: 4s - loss: 0.5454 - accuracy: 0.80 - ETA: 4s - loss: 0.5454 - accuracy: 0.80 - ETA: 3s - loss: 0.5453 - accuracy: 0.80 - ETA: 3s - loss: 0.5452 - accuracy: 0.80 - ETA: 3s - loss: 0.5451 - accuracy: 0.80 - ETA: 3s - loss: 0.5452 - accuracy: 0.80 - ETA: 2s - loss: 0.5452 - accuracy: 0.80 - ETA: 2s - loss: 0.5453 - accuracy: 0.80 - ETA: 2s - loss: 0.5453 - accuracy: 0.80 - ETA: 2s - loss: 0.5454 - accuracy: 0.80 - ETA: 1s - loss: 0.5455 - accuracy: 0.80 - ETA: 1s - loss: 0.5456 - accuracy: 0.80 - ETA: 1s - loss: 0.5457 - accuracy: 0.80 - ETA: 1s - loss: 0.5458 - accuracy: 0.80 - ETA: 0s - loss: 0.5459 - accuracy: 0.80 - ETA: 0s - loss: 0.5459 - accuracy: 0.80 - ETA: 0s - loss: 0.5458 - accuracy: 0.80 - ETA: 0s - loss: 0.5459 - accuracy: 0.80 - ETA: 0s - loss: 0.5460 - accuracy: 0.80 - 14s 239ms/step - loss: 0.5460 - accuracy: 0.8071 - val_loss: 0.4831 - val_accuracy: 0.8256
Epoch 57/100
57/57 [==============================] - ETA: 12s - loss: 0.5001 - accuracy: 0.812 - ETA: 12s - loss: 0.4752 - accuracy: 0.835 - ETA: 11s - loss: 0.4755 - accuracy: 0.840 - ETA: 11s - loss: 0.4715 - accuracy: 0.843 - ETA: 10s - loss: 0.4721 - accuracy: 0.841 - ETA: 10s - loss: 0.4705 - accuracy: 0.840 - ETA: 10s - loss: 0.4709 - accuracy: 0.840 - ETA: 10s - loss: 0.4730 - accuracy: 0.838 - ETA: 10s - loss: 0.4754 - accuracy: 0.837 - ETA: 9s - loss: 0.4776 - accuracy: 0.836 - ETA: 9s - loss: 0.4792 - accuracy: 0.83 - ETA: 9s - loss: 0.4798 - accuracy: 0.83 - ETA: 9s - loss: 0.4818 - accuracy: 0.83 - ETA: 9s - loss: 0.4839 - accuracy: 0.83 - ETA: 8s - loss: 0.4858 - accuracy: 0.83 - ETA: 8s - loss: 0.4874 - accuracy: 0.83 - ETA: 8s - loss: 0.4883 - accuracy: 0.83 - ETA: 8s - loss: 0.4896 - accuracy: 0.83 - ETA: 7s - loss: 0.4906 - accuracy: 0.83 - ETA: 7s - loss: 0.4916 - accuracy: 0.83 - ETA: 7s - loss: 0.4929 - accuracy: 0.83 - ETA: 7s - loss: 0.4943 - accuracy: 0.83 - ETA: 7s - loss: 0.4954 - accuracy: 0.83 - ETA: 6s - loss: 0.4964 - accuracy: 0.83 - ETA: 6s - loss: 0.4973 - accuracy: 0.83 - ETA: 6s - loss: 0.4985 - accuracy: 0.82 - ETA: 6s - loss: 0.4995 -

accuracy: 0.82 - ETA: 6s - loss: 0.5009 - accuracy: 0.82 - ETA: 5s - loss: 0.50
21 - accuracy: 0.82 - ETA: 5s - loss: 0.5038 - accuracy: 0.82 - ETA: 5s - loss:
0.5054 - accuracy: 0.82 - ETA: 5s - loss: 0.5070 - accuracy: 0.82 - ETA: 4s - l
oss: 0.5084 - accuracy: 0.82 - ETA: 4s - loss: 0.5098 - accuracy: 0.82 - ETA: 4
s - loss: 0.5111 - accuracy: 0.82 - ETA: 4s - loss: 0.5124 - accuracy: 0.82 - E
TA: 4s - loss: 0.5135 - accuracy: 0.82 - ETA: 3s - loss: 0.5146 - accuracy: 0.8
2 - ETA: 3s - loss: 0.5156 - accuracy: 0.82 - ETA: 3s - loss: 0.5165 - accurac
y: 0.82 - ETA: 3s - loss: 0.5173 - accuracy: 0.82 - ETA: 3s - loss: 0.5181 - ac
curacy: 0.82 - ETA: 2s - loss: 0.5189 - accuracy: 0.82 - ETA: 2s - loss: 0.5197
- accuracy: 0.82 - ETA: 2s - loss: 0.5205 - accuracy: 0.82 - ETA: 2s - loss: 0.
5213 - accuracy: 0.82 - ETA: 2s - loss: 0.5221 - accuracy: 0.82 - ETA: 1s - los
s: 0.5228 - accuracy: 0.82 - ETA: 1s - loss: 0.5234 - accuracy: 0.82 - ETA: 1s
 - loss: 0.5241 - accuracy: 0.82 - ETA: 1s - loss: 0.5247 - accuracy: 0.82 - ET
A: 1s - loss: 0.5254 - accuracy: 0.82 - ETA: 0s - loss: 0.5260 - accuracy: 0.81
- ETA: 0s - loss: 0.5266 - accuracy: 0.81 - ETA: 0s - loss: 0.5272 - accuracy:
 0.81 - ETA: 0s - loss: 0.5277 - accuracy: 0.81 - ETA: 0s - loss: 0.5281 - accu
racy: 0.81 - 12s 219ms/step - loss: 0.5286 - accuracy: 0.8186 - val_loss: 0.457
4 - val_accuracy: 0.8504
Epoch 58/100
57/57 [==============================] - ETA: 10s - loss: 0.2371 - accuracy: 0.
937 - ETA: 11s - loss: 0.3192 - accuracy: 0.906 - ETA: 11s - loss: 0.3602 - acc
uracy: 0.887 - ETA: 10s - loss: 0.3925 - accuracy: 0.870 - ETA: 10s - loss: 0.4
116 - accuracy: 0.860 - ETA: 10s - loss: 0.4298 - accuracy: 0.853 - ETA: 10s -
 loss: 0.4400 - accuracy: 0.849 - ETA: 10s - loss: 0.4462 - accuracy: 0.847 - E
TA: 9s - loss: 0.4506 - accuracy: 0.845 - ETA: 9s - loss: 0.4533 - accuracy: 0.
84 - ETA: 9s - loss: 0.4548 - accuracy: 0.84 - ETA: 9s - loss: 0.4562 - accurac
y: 0.84 - ETA: 8s - loss: 0.4576 - accuracy: 0.84 - ETA: 8s - loss: 0.4592 - ac
curacy: 0.84 - ETA: 8s - loss: 0.4617 - accuracy: 0.84 - ETA: 8s - loss: 0.4636
- accuracy: 0.84 - ETA: 8s - loss: 0.4648 - accuracy: 0.84 - ETA: 7s - loss: 0.
4663 - accuracy: 0.84 - ETA: 7s - loss: 0.4678 - accuracy: 0.83 - ETA: 7s - los
s: 0.4687 - accuracy: 0.83 - ETA: 7s - loss: 0.4698 - accuracy: 0.83 - ETA: 7s
 - loss: 0.4709 - accuracy: 0.83 - ETA: 6s - loss: 0.4720 - accuracy: 0.83 - ET
A: 6s - loss: 0.4728 - accuracy: 0.83 - ETA: 6s - loss: 0.4735 - accuracy: 0.83
- ETA: 6s - loss: 0.4742 - accuracy: 0.83 - ETA: 6s - loss: 0.4748 - accuracy:
 0.83 - ETA: 5s - loss: 0.4753 - accuracy: 0.83 - ETA: 5s - loss: 0.4758 - accu
racy: 0.83 - ETA: 5s - loss: 0.4762 - accuracy: 0.83 - ETA: 5s - loss: 0.4766 -
accuracy: 0.83 - ETA: 4s - loss: 0.4769 - accuracy: 0.83 - ETA: 4s - loss: 0.47
76 - accuracy: 0.83 - ETA: 4s - loss: 0.4781 - accuracy: 0.83 - ETA: 4s - loss:
0.4788 - accuracy: 0.83 - ETA: 4s - loss: 0.4793 - accuracy: 0.83 - ETA: 3s - l
oss: 0.4798 - accuracy: 0.83 - ETA: 3s - loss: 0.4803 - accuracy: 0.83 - ETA: 3
s - loss: 0.4808 - accuracy: 0.83 - ETA: 3s - loss: 0.4813 - accuracy: 0.83 - E
TA: 3s - loss: 0.4818 - accuracy: 0.83 - ETA: 2s - loss: 0.4822 - accuracy: 0.8
3 - ETA: 2s - loss: 0.4827 - accuracy: 0.83 - ETA: 2s - loss: 0.4833 - accurac
y: 0.83 - ETA: 2s - loss: 0.4839 - accuracy: 0.83 - ETA: 2s - loss: 0.4845 - ac
curacy: 0.83 - ETA: 1s - loss: 0.4851 - accuracy: 0.83 - ETA: 1s - loss: 0.4857
- accuracy: 0.83 - ETA: 1s - loss: 0.4863 - accuracy: 0.83 - ETA: 1s - loss: 0.
4870 - accuracy: 0.83 - ETA: 1s - loss: 0.4876 - accuracy: 0.83 - ETA: 0s - los
s: 0.4882 - accuracy: 0.83 - ETA: 0s - loss: 0.4889 - accuracy: 0.83 - ETA: 0s
 - loss: 0.4896 - accuracy: 0.83 - ETA: 0s - loss: 0.4903 - accuracy: 0.83 - ET
A: 0s - loss: 0.4910 - accuracy: 0.83 - ETA: 0s - loss: 0.4916 - accuracy: 0.83
- 12s 210ms/step - loss: 0.4922 - accuracy: 0.8301 - val_loss: 0.4979 - val_acc
uracy: 0.8149
Epoch 59/100
57/57 [==============================] - ETA: 11s - loss: 0.6700 - accuracy: 0.
734 - ETA: 11s - loss: 0.6699 - accuracy: 0.746 - ETA: 10s - loss: 0.6552 - acc
uracy: 0.756 - ETA: 10s - loss: 0.6398 - accuracy: 0.762 - ETA: 10s - loss: 0.6
287 - accuracy: 0.769 - ETA: 10s - loss: 0.6209 - accuracy: 0.773 - ETA: 9s - l
oss: 0.6112 - accuracy: 0.776 - ETA: 9s - loss: 0.6021 - accuracy: 0.77 - ETA:
 9s - loss: 0.5962 - accuracy: 0.78 - ETA: 9s - loss: 0.5917 - accuracy: 0.78 -
ETA: 9s - loss: 0.5877 - accuracy: 0.78 - ETA: 8s - loss: 0.5822 - accuracy: 0.

78 - ETA: 8s - loss: 0.5764 - accuracy: 0.78 - ETA: 8s - loss: 0.5709 - accurac
y: 0.79 - ETA: 8s - loss: 0.5666 - accuracy: 0.79 - ETA: 8s - loss: 0.5625 - ac
curacy: 0.79 - ETA: 7s - loss: 0.5587 - accuracy: 0.79 - ETA: 7s - loss: 0.5558
- accuracy: 0.79 - ETA: 7s - loss: 0.5538 - accuracy: 0.79 - ETA: 7s - loss: 0.
5518 - accuracy: 0.79 - ETA: 7s - loss: 0.5501 - accuracy: 0.79 - ETA: 6s - los
s: 0.5484 - accuracy: 0.80 - ETA: 6s - loss: 0.5470 - accuracy: 0.80 - ETA: 6s
- loss: 0.5459 - accuracy: 0.80 - ETA: 6s - loss: 0.5447 - accuracy: 0.80 - ET
A: 6s - loss: 0.5435 - accuracy: 0.80 - ETA: 5s - loss: 0.5424 - accuracy: 0.80
- ETA: 5s - loss: 0.5413 - accuracy: 0.80 - ETA: 5s - loss: 0.5403 - accuracy:
0.80 - ETA: 5s - loss: 0.5398 - accuracy: 0.80 - ETA: 5s - loss: 0.5392 - accu
racy: 0.80 - ETA: 4s - loss: 0.5387 - accuracy: 0.80 - ETA: 4s - loss: 0.5382 -
accuracy: 0.80 - ETA: 4s - loss: 0.5376 - accuracy: 0.80 - ETA: 4s - loss: 0.53
71 - accuracy: 0.80 - ETA: 4s - loss: 0.5368 - accuracy: 0.80 - ETA: 3s - loss:
0.5363 - accuracy: 0.80 - ETA: 3s - loss: 0.5357 - accuracy: 0.80 - ETA: 3s - l
oss: 0.5351 - accuracy: 0.81 - ETA: 3s - loss: 0.5345 - accuracy: 0.81 - ETA: 3
s - loss: 0.5340 - accuracy: 0.81 - ETA: 2s - loss: 0.5336 - accuracy: 0.81 - E
TA: 2s - loss: 0.5331 - accuracy: 0.81 - ETA: 2s - loss: 0.5326 - accuracy: 0.8
1 - ETA: 2s - loss: 0.5320 - accuracy: 0.81 - ETA: 2s - loss: 0.5315 - accurac
y: 0.81 - ETA: 1s - loss: 0.5309 - accuracy: 0.81 - ETA: 1s - loss: 0.5303 - ac
curacy: 0.81 - ETA: 1s - loss: 0.5297 - accuracy: 0.81 - ETA: 1s - loss: 0.5291
- accuracy: 0.81 - ETA: 1s - loss: 0.5286 - accuracy: 0.81 - ETA: 0s - loss: 0.
5282 - accuracy: 0.81 - ETA: 0s - loss: 0.5277 - accuracy: 0.81 - ETA: 0s - los
s: 0.5273 - accuracy: 0.81 - ETA: 0s - loss: 0.5268 - accuracy: 0.81 - ETA: 0s
- loss: 0.5264 - accuracy: 0.81 - ETA: 0s - loss: 0.5259 - accuracy: 0.81 - 12
s 210ms/step - loss: 0.5255 - accuracy: 0.8154 - val_loss: 0.4670 - val_accurac
y: 0.8537
Epoch 60/100
57/57 [==============================] - ETA: 11s - loss: 0.5943 - accuracy: 0.
750 - ETA: 11s - loss: 0.5781 - accuracy: 0.753 - ETA: 10s - loss: 0.5632 - acc
uracy: 0.764 - ETA: 10s - loss: 0.5465 - accuracy: 0.775 - ETA: 10s - loss: 0.5
317 - accuracy: 0.783 - ETA: 10s - loss: 0.5190 - accuracy: 0.791 - ETA: 9s - l
oss: 0.5101 - accuracy: 0.797 - ETA: 9s - loss: 0.5013 - accuracy: 0.80 - ETA:
9s - loss: 0.4954 - accuracy: 0.80 - ETA: 9s - loss: 0.4894 - accuracy: 0.81 -
ETA: 9s - loss: 0.4848 - accuracy: 0.81 - ETA: 8s - loss: 0.4810 - accuracy: 0.
81 - ETA: 8s - loss: 0.4780 - accuracy: 0.81 - ETA: 8s - loss: 0.4762 - accurac
y: 0.81 - ETA: 8s - loss: 0.4753 - accuracy: 0.81 - ETA: 8s - loss: 0.4753 - ac
curacy: 0.81 - ETA: 7s - loss: 0.4758 - accuracy: 0.81 - ETA: 7s - loss: 0.4760
- accuracy: 0.82 - ETA: 7s - loss: 0.4762 - accuracy: 0.82 - ETA: 7s - loss: 0.
4769 - accuracy: 0.82 - ETA: 7s - loss: 0.4777 - accuracy: 0.82 - ETA: 6s - los
s: 0.4785 - accuracy: 0.82 - ETA: 6s - loss: 0.4790 - accuracy: 0.82 - ETA: 6s
- loss: 0.4796 - accuracy: 0.81 - ETA: 6s - loss: 0.4801 - accuracy: 0.82 - ET
A: 6s - loss: 0.4808 - accuracy: 0.81 - ETA: 6s - loss: 0.4815 - accuracy: 0.81
- ETA: 5s - loss: 0.4823 - accuracy: 0.81 - ETA: 5s - loss: 0.4829 - accuracy:
0.81 - ETA: 5s - loss: 0.4838 - accuracy: 0.81 - ETA: 5s - loss: 0.4845 - accu
racy: 0.81 - ETA: 5s - loss: 0.4854 - accuracy: 0.81 - ETA: 4s - loss: 0.4864 -
accuracy: 0.81 - ETA: 4s - loss: 0.4872 - accuracy: 0.81 - ETA: 4s - loss: 0.48
82 - accuracy: 0.81 - ETA: 4s - loss: 0.4890 - accuracy: 0.81 - ETA: 4s - loss:
0.4898 - accuracy: 0.81 - ETA: 3s - loss: 0.4904 - accuracy: 0.81 - ETA: 3s - l
oss: 0.4910 - accuracy: 0.81 - ETA: 3s - loss: 0.4916 - accuracy: 0.81 - ETA: 3
s - loss: 0.4921 - accuracy: 0.81 - ETA: 3s - loss: 0.4925 - accuracy: 0.81 - E
TA: 2s - loss: 0.4929 - accuracy: 0.81 - ETA: 2s - loss: 0.4933 - accuracy: 0.8
1 - ETA: 2s - loss: 0.4936 - accuracy: 0.81 - ETA: 2s - loss: 0.4939 - accurac
y: 0.81 - ETA: 2s - loss: 0.4941 - accuracy: 0.81 - ETA: 1s - loss: 0.4944 - ac
curacy: 0.81 - ETA: 1s - loss: 0.4946 - accuracy: 0.81 - ETA: 1s - loss: 0.4949
- accuracy: 0.81 - ETA: 1s - loss: 0.4951 - accuracy: 0.81 - ETA: 1s - loss: 0.
4952 - accuracy: 0.81 - ETA: 0s - loss: 0.4954 - accuracy: 0.81 - ETA: 0s - los
s: 0.4955 - accuracy: 0.81 - ETA: 0s - loss: 0.4956 - accuracy: 0.82 - ETA: 0s
- loss: 0.4957 - accuracy: 0.82 - ETA: 0s - loss: 0.4958 - accuracy: 0.82 - 13
s 223ms/step - loss: 0.4958 - accuracy: 0.8202 - val_loss: 0.4453 - val_accurac
y: 0.8537

```
Epoch 61/100
57/57 [==============================] - ETA: 11s - loss: 0.3998 - accuracy: 0.
859 - ETA: 11s - loss: 0.3815 - accuracy: 0.871 - ETA: 11s - loss: 0.3988 - acc
uracy: 0.855 - ETA: 10s - loss: 0.4155 - accuracy: 0.843 - ETA: 10s - loss: 0.4
307 - accuracy: 0.837 - ETA: 10s - loss: 0.4452 - accuracy: 0.830 - ETA: 10s -
 loss: 0.4547 - accuracy: 0.828 - ETA: 10s - loss: 0.4612 - accuracy: 0.826 - E
TA: 9s - loss: 0.4661 - accuracy: 0.826 - ETA: 9s - loss: 0.4703 - accuracy: 0.
82 - ETA: 9s - loss: 0.4747 - accuracy: 0.82 - ETA: 9s - loss: 0.4775 - accurac
y: 0.82 - ETA: 9s - loss: 0.4802 - accuracy: 0.82 - ETA: 9s - loss: 0.4827 - ac
curacy: 0.82 - ETA: 8s - loss: 0.4839 - accuracy: 0.82 - ETA: 8s - loss: 0.4846
 - accuracy: 0.82 - ETA: 8s - loss: 0.4850 - accuracy: 0.82 - ETA: 8s - loss: 0.
4853 - accuracy: 0.82 - ETA: 7s - loss: 0.4858 - accuracy: 0.82 - ETA: 7s - los
s: 0.4859 - accuracy: 0.82 - ETA: 7s - loss: 0.4862 - accuracy: 0.82 - ETA: 7s
 - loss: 0.4864 - accuracy: 0.82 - ETA: 7s - loss: 0.4868 - accuracy: 0.82 - ET
A: 6s - loss: 0.4870 - accuracy: 0.82 - ETA: 6s - loss: 0.4873 - accuracy: 0.82
 - ETA: 6s - loss: 0.4874 - accuracy: 0.82 - ETA: 6s - loss: 0.4874 - accuracy:
 0.82 - ETA: 6s - loss: 0.4873 - accuracy: 0.82 - ETA: 5s - loss: 0.4871 - accu
racy: 0.82 - ETA: 5s - loss: 0.4866 - accuracy: 0.82 - ETA: 5s - loss: 0.4862 -
accuracy: 0.82 - ETA: 5s - loss: 0.4857 - accuracy: 0.82 - ETA: 5s - loss: 0.48
52 - accuracy: 0.82 - ETA: 5s - loss: 0.4848 - accuracy: 0.82 - ETA: 4s - loss:
0.4844 - accuracy: 0.82 - ETA: 4s - loss: 0.4840 - accuracy: 0.82 - ETA: 4s - l
oss: 0.4836 - accuracy: 0.82 - ETA: 4s - loss: 0.4831 - accuracy: 0.82 - ETA: 4
s - loss: 0.4826 - accuracy: 0.82 - ETA: 3s - loss: 0.4821 - accuracy: 0.82 - E
TA: 3s - loss: 0.4817 - accuracy: 0.82 - ETA: 3s - loss: 0.4813 - accuracy: 0.8
2 - ETA: 3s - loss: 0.4809 - accuracy: 0.82 - ETA: 3s - loss: 0.4807 - accurac
y: 0.82 - ETA: 2s - loss: 0.4804 - accuracy: 0.82 - ETA: 2s - loss: 0.4801 - ac
curacy: 0.82 - ETA: 2s - loss: 0.4798 - accuracy: 0.82 - ETA: 2s - loss: 0.4797
 - accuracy: 0.82 - ETA: 1s - loss: 0.4796 - accuracy: 0.83 - ETA: 1s - loss: 0.
4796 - accuracy: 0.83 - ETA: 1s - loss: 0.4796 - accuracy: 0.83 - ETA: 1s - los
s: 0.4796 - accuracy: 0.83 - ETA: 0s - loss: 0.4796 - accuracy: 0.83 - ETA: 0s
 - loss: 0.4796 - accuracy: 0.83 - ETA: 0s - loss: 0.4797 - accuracy: 0.83 - ET
A: 0s - loss: 0.4798 - accuracy: 0.83 - ETA: 0s - loss: 0.4799 - accuracy: 0.83
 - 14s 249ms/step - loss: 0.4800 - accuracy: 0.8308 - val_loss: 0.4534 - val_acc
uracy: 0.8512
Epoch 62/100
57/57 [==============================] - ETA: 12s - loss: 0.5051 - accuracy: 0.
812 - ETA: 12s - loss: 0.5130 - accuracy: 0.812 - ETA: 12s - loss: 0.5084 - acc
uracy: 0.817 - ETA: 12s - loss: 0.5204 - accuracy: 0.814 - ETA: 11s - loss: 0.5
213 - accuracy: 0.816 - ETA: 11s - loss: 0.5164 - accuracy: 0.819 - ETA: 11s -
 loss: 0.5145 - accuracy: 0.822 - ETA: 11s - loss: 0.5119 - accuracy: 0.824 - E
TA: 11s - loss: 0.5086 - accuracy: 0.826 - ETA: 11s - loss: 0.5059 - accuracy:
 0.827 - ETA: 11s - loss: 0.5036 - accuracy: 0.828 - ETA: 10s - loss: 0.5005 -
 accuracy: 0.830 - ETA: 10s - loss: 0.4979 - accuracy: 0.831 - ETA: 10s - loss:
0.4955 - accuracy: 0.832 - ETA: 10s - loss: 0.4934 - accuracy: 0.833 - ETA: 10s
 - loss: 0.4922 - accuracy: 0.833 - ETA: 10s - loss: 0.4912 - accuracy: 0.834 -
 ETA: 10s - loss: 0.4904 - accuracy: 0.834 - ETA: 12s - loss: 0.4893 - accurac
y: 0.834 - ETA: 12s - loss: 0.4884 - accuracy: 0.834 - ETA: 12s - loss: 0.4878
 - accuracy: 0.834 - ETA: 12s - loss: 0.4877 - accuracy: 0.834 - ETA: 11s - los
s: 0.4877 - accuracy: 0.834 - ETA: 11s - loss: 0.4877 - accuracy: 0.833 - ETA:
 10s - loss: 0.4877 - accuracy: 0.833 - ETA: 10s - loss: 0.4879 - accuracy: 0.8
33 - ETA: 9s - loss: 0.4882 - accuracy: 0.833 - ETA: 9s - loss: 0.4884 - accura
cy: 0.83 - ETA: 8s - loss: 0.4887 - accuracy: 0.83 - ETA: 8s - loss: 0.4889 - a
ccuracy: 0.83 - ETA: 8s - loss: 0.4891 - accuracy: 0.83 - ETA: 7s - loss: 0.489
1 - accuracy: 0.83 - ETA: 7s - loss: 0.4891 - accuracy: 0.83 - ETA: 7s - loss:
 0.4891 - accuracy: 0.83 - ETA: 6s - loss: 0.4891 - accuracy: 0.83 - ETA: 6s -
 loss: 0.4892 - accuracy: 0.83 - ETA: 6s - loss: 0.4892 - accuracy: 0.83 - ETA:
5s - loss: 0.4892 - accuracy: 0.83 - ETA: 5s - loss: 0.4894 - accuracy: 0.83 -
 ETA: 5s - loss: 0.4894 - accuracy: 0.83 - ETA: 4s - loss: 0.4894 - accuracy:
 0.83 - ETA: 4s - loss: 0.4894 - accuracy: 0.83 - ETA: 4s - loss: 0.4895 - accu
racy: 0.83 - ETA: 3s - loss: 0.4896 - accuracy: 0.83 - ETA: 3s - loss: 0.4897 -
```

accuracy: 0.83 - ETA: 3s - loss: 0.4897 - accuracy: 0.83 - ETA: 2s - loss: 0.48
97 - accuracy: 0.83 - ETA: 2s - loss: 0.4898 - accuracy: 0.83 - ETA: 2s - loss:
0.4898 - accuracy: 0.83 - ETA: 1s - loss: 0.4899 - accuracy: 0.83 - ETA: 1s - l
oss: 0.4899 - accuracy: 0.83 - ETA: 1s - loss: 0.4898 - accuracy: 0.83 - ETA: 1
s - loss: 0.4898 - accuracy: 0.83 - ETA: 0s - loss: 0.4898 - accuracy: 0.83 - E
TA: 0s - loss: 0.4898 - accuracy: 0.83 - ETA: 0s - loss: 0.4898 - accuracy: 0.8
3 - ETA: 0s - loss: 0.4898 - accuracy: 0.83 - 19s 333ms/step - loss: 0.4898 - a
ccuracy: 0.8307 - val_loss: 0.4100 - val_accuracy: 0.8793
Epoch 63/100
57/57 [==============================] - ETA: 19s - loss: 0.4161 - accuracy: 0.
859 - ETA: 12s - loss: 0.4211 - accuracy: 0.851 - ETA: 12s - loss: 0.4208 - acc
uracy: 0.849 - ETA: 12s - loss: 0.4194 - accuracy: 0.847 - ETA: 12s - loss: 0.4
169 - accuracy: 0.850 - ETA: 11s - loss: 0.4142 - accuracy: 0.851 - ETA: 11s -
 loss: 0.4137 - accuracy: 0.852 - ETA: 11s - loss: 0.4117 - accuracy: 0.853 - E
TA: 11s - loss: 0.4107 - accuracy: 0.854 - ETA: 10s - loss: 0.4111 - accuracy:
 0.855 - ETA: 10s - loss: 0.4115 - accuracy: 0.856 - ETA: 10s - loss: 0.4115 -
 accuracy: 0.857 - ETA: 10s - loss: 0.4126 - accuracy: 0.857 - ETA: 10s - loss:
0.4139 - accuracy: 0.858 - ETA: 9s - loss: 0.4149 - accuracy: 0.858 - ETA: 9s -
loss: 0.4159 - accuracy: 0.85 - ETA: 9s - loss: 0.4167 - accuracy: 0.85 - ETA:
 9s - loss: 0.4179 - accuracy: 0.85 - ETA: 8s - loss: 0.4187 - accuracy: 0.85 -
ETA: 8s - loss: 0.4195 - accuracy: 0.85 - ETA: 8s - loss: 0.4205 - accuracy: 0.
85 - ETA: 8s - loss: 0.4213 - accuracy: 0.85 - ETA: 8s - loss: 0.4219 - accurac
y: 0.85 - ETA: 8s - loss: 0.4227 - accuracy: 0.85 - ETA: 7s - loss: 0.4231 - ac
curacy: 0.85 - ETA: 7s - loss: 0.4235 - accuracy: 0.85 - ETA: 7s - loss: 0.4237
- accuracy: 0.85 - ETA: 7s - loss: 0.4239 - accuracy: 0.85 - ETA: 6s - loss: 0.
4240 - accuracy: 0.85 - ETA: 6s - loss: 0.4241 - accuracy: 0.85 - ETA: 6s - los
s: 0.4243 - accuracy: 0.85 - ETA: 5s - loss: 0.4244 - accuracy: 0.85 - ETA: 5s
 - loss: 0.4246 - accuracy: 0.85 - ETA: 5s - loss: 0.4248 - accuracy: 0.85 - ET
A: 5s - loss: 0.4250 - accuracy: 0.85 - ETA: 5s - loss: 0.4251 - accuracy: 0.85
- ETA: 4s - loss: 0.4253 - accuracy: 0.85 - ETA: 4s - loss: 0.4254 - accuracy:
 0.85 - ETA: 4s - loss: 0.4256 - accuracy: 0.85 - ETA: 4s - loss: 0.4259 - accu
racy: 0.85 - ETA: 3s - loss: 0.4261 - accuracy: 0.85 - ETA: 3s - loss: 0.4262 -
accuracy: 0.85 - ETA: 3s - loss: 0.4265 - accuracy: 0.85 - ETA: 3s - loss: 0.42
67 - accuracy: 0.85 - ETA: 2s - loss: 0.4268 - accuracy: 0.85 - ETA: 2s - loss:
0.4269 - accuracy: 0.85 - ETA: 2s - loss: 0.4271 - accuracy: 0.85 - ETA: 2s - l
oss: 0.4273 - accuracy: 0.85 - ETA: 1s - loss: 0.4275 - accuracy: 0.85 - ETA: 1
s - loss: 0.4277 - accuracy: 0.85 - ETA: 1s - loss: 0.4278 - accuracy: 0.85 - E
TA: 1s - loss: 0.4280 - accuracy: 0.85 - ETA: 0s - loss: 0.4281 - accuracy: 0.8
5 - ETA: 0s - loss: 0.4283 - accuracy: 0.85 - ETA: 0s - loss: 0.4285 - accurac
y: 0.85 - ETA: 0s - loss: 0.4288 - accuracy: 0.85 - ETA: 0s - loss: 0.4292 - ac
curacy: 0.85 - 15s 262ms/step - loss: 0.4295 - accuracy: 0.8521 - val_loss: 0.3
918 - val_accuracy: 0.8843
Epoch 64/100
57/57 [==============================] - ETA: 11s - loss: 0.4634 - accuracy: 0.
843 - ETA: 10s - loss: 0.4528 - accuracy: 0.855 - ETA: 14s - loss: 0.4363 - acc
uracy: 0.860 - ETA: 13s - loss: 0.4260 - accuracy: 0.863 - ETA: 12s - loss: 0.4
222 - accuracy: 0.865 - ETA: 12s - loss: 0.4184 - accuracy: 0.866 - ETA: 12s -
 loss: 0.4176 - accuracy: 0.867 - ETA: 11s - loss: 0.4175 - accuracy: 0.866 - E
TA: 11s - loss: 0.4180 - accuracy: 0.865 - ETA: 11s - loss: 0.4188 - accuracy:
 0.864 - ETA: 11s - loss: 0.4206 - accuracy: 0.863 - ETA: 10s - loss: 0.4231 -
 accuracy: 0.861 - ETA: 10s - loss: 0.4253 - accuracy: 0.860 - ETA: 10s - loss:
0.4273 - accuracy: 0.859 - ETA: 9s - loss: 0.4291 - accuracy: 0.858 - ETA: 9s -
loss: 0.4301 - accuracy: 0.85 - ETA: 9s - loss: 0.4308 - accuracy: 0.85 - ETA:
 8s - loss: 0.4315 - accuracy: 0.85 - ETA: 8s - loss: 0.4317 - accuracy: 0.85 -
ETA: 8s - loss: 0.4322 - accuracy: 0.85 - ETA: 8s - loss: 0.4326 - accuracy: 0.
85 - ETA: 7s - loss: 0.4328 - accuracy: 0.85 - ETA: 7s - loss: 0.4333 - accurac
y: 0.85 - ETA: 7s - loss: 0.4334 - accuracy: 0.85 - ETA: 7s - loss: 0.4335 - ac
curacy: 0.85 - ETA: 6s - loss: 0.4335 - accuracy: 0.85 - ETA: 6s - loss: 0.4334
- accuracy: 0.85 - ETA: 6s - loss: 0.4332 - accuracy: 0.85 - ETA: 6s - loss: 0.
4331 - accuracy: 0.85 - ETA: 5s - loss: 0.4329 - accuracy: 0.85 - ETA: 5s - los

s: 0.4327 - accuracy: 0.85 - ETA: 5s - loss: 0.4324 - accuracy: 0.85 - ETA: 5s - loss: 0.4321 - accuracy: 0.85 - ETA: 5s - loss: 0.4317 - accuracy: 0.85 - ETA: 4s - loss: 0.4314 - accuracy: 0.85 - ETA: 4s - loss: 0.4312 - accuracy: 0.85 - ETA: 4s - loss: 0.4311 - accuracy: 0.85 - ETA: 4s - loss: 0.4310 - accuracy: 0.85 - ETA: 3s - loss: 0.4310 - accuracy: 0.85 - ETA: 3s - loss: 0.4310 - accuracy: 0.85 - ETA: 3s - loss: 0.4309 - accuracy: 0.85 - ETA: 3s - loss: 0.4309 - accuracy: 0.85 - ETA: 3s - loss: 0.4308 - accuracy: 0.85 - ETA: 2s - loss: 0.4308 - accuracy: 0.85 - ETA: 2s - loss: 0.4308 - accuracy: 0.85 - ETA: 2s - loss: 0.4309 - accuracy: 0.85 - ETA: 2s - loss: 0.4310 - accuracy: 0.85 - ETA: 1s - loss: 0.4311 - accuracy: 0.85 - ETA: 1s - loss: 0.4312 - accuracy: 0.85 - ETA: 1s - loss: 0.4312 - accuracy: 0.85 - ETA: 1s - loss: 0.4312 - accuracy: 0.85 - ETA: 1s - loss: 0.4312 - accuracy: 0.85 - ETA: 0s - loss: 0.4312 - accuracy: 0.85 - ETA: 0s - loss: 0.4313 - accuracy: 0.85 - ETA: 0s - loss: 0.4313 - accuracy: 0.85 - ETA: 0s - loss: 0.4313 - accuracy: 0.85 - ETA: 0s - loss: 0.4313 - accuracy: 0.85 - 13s 225ms/step - loss: 0.4313 - accuracy: 0.8535 - val_loss: 0.4150 - val_accuracy: 0.8760
Epoch 65/100
57/57 [==============================] - ETA: 10s - loss: 0.3874 - accuracy: 0.843 - ETA: 13s - loss: 0.4635 - accuracy: 0.824 - ETA: 12s - loss: 0.4674 - accuracy: 0.830 - ETA: 12s - loss: 0.4618 - accuracy: 0.835 - ETA: 11s - loss: 0.4532 - accuracy: 0.839 - ETA: 11s - loss: 0.4466 - accuracy: 0.843 - ETA: 10s - loss: 0.4396 - accuracy: 0.845 - ETA: 10s - loss: 0.4362 - accuracy: 0.847 - ETA: 10s - loss: 0.4345 - accuracy: 0.848 - ETA: 9s - loss: 0.4325 - accuracy: 0.850 - ETA: 9s - loss: 0.4300 - accuracy: 0.85 - ETA: 9s - loss: 0.4279 - accuracy: 0.85 - ETA: 9s - loss: 0.4259 - accuracy: 0.85 - ETA: 8s - loss: 0.4235 - accuracy: 0.85 - ETA: 8s - loss: 0.4220 - accuracy: 0.85 - ETA: 8s - loss: 0.4213 - accuracy: 0.85 - ETA: 8s - loss: 0.4209 - accuracy: 0.85 - ETA: 8s - loss: 0.4209 - accuracy: 0.85 - ETA: 7s - loss: 0.4207 - accuracy: 0.85 - ETA: 7s - loss: 0.4207 - accuracy: 0.85 - ETA: 7s - loss: 0.4208 - accuracy: 0.85 - ETA: 7s - loss: 0.4207 - accuracy: 0.85 - ETA: 6s - loss: 0.4208 - accuracy: 0.85 - ETA: 6s - loss: 0.4211 - accuracy: 0.85 - ETA: 6s - loss: 0.4216 - accuracy: 0.85 - ETA: 6s - loss: 0.4219 - accuracy: 0.85 - ETA: 6s - loss: 0.4225 - accuracy: 0.85 - ETA: 5s - loss: 0.4231 - accuracy: 0.85 - ETA: 5s - loss: 0.4239 - accuracy: 0.85 - ETA: 5s - loss: 0.4243 - accuracy: 0.85 - ETA: 5s - loss: 0.4246 - accuracy: 0.85 - ETA: 5s - loss: 0.4249 - accuracy: 0.85 - ETA: 4s - loss: 0.4252 - accuracy: 0.85 - ETA: 4s - loss: 0.4253 - accuracy: 0.85 - ETA: 4s - loss: 0.4254 - accuracy: 0.85 - ETA: 4s - loss: 0.4255 - accuracy: 0.85 - ETA: 4s - loss: 0.4256 - accuracy: 0.85 - ETA: 3s - loss: 0.4258 - accuracy: 0.85 - ETA: 3s - loss: 0.4261 - accuracy: 0.85 - ETA: 3s - loss: 0.4264 - accuracy: 0.85 - ETA: 3s - loss: 0.4265 - accuracy: 0.85 - ETA: 3s - loss: 0.4267 - accuracy: 0.85 - ETA: 2s - loss: 0.4269 - accuracy: 0.85 - ETA: 2s - loss: 0.4271 - accuracy: 0.85 - ETA: 2s - loss: 0.4272 - accuracy: 0.85 - ETA: 2s - loss: 0.4274 - accuracy: 0.85 - ETA: 2s - loss: 0.4275 - accuracy: 0.85 - ETA: 1s - loss: 0.4276 - accuracy: 0.85 - ETA: 1s - loss: 0.4276 - accuracy: 0.85 - ETA: 1s - loss: 0.4277 - accuracy: 0.85 - ETA: 1s - loss: 0.4278 - accuracy: 0.85 - ETA: 1s - loss: 0.4279 - accuracy: 0.85 - ETA: 0s - loss: 0.4280 - accuracy: 0.85 - ETA: 0s - loss: 0.4282 - accuracy: 0.85 - ETA: 0s - loss: 0.4284 - accuracy: 0.85 - ETA: 0s - loss: 0.4286 - accuracy: 0.85 - ETA: 0s - loss: 0.4288 - accuracy: 0.85 - 13s 221ms/step - loss: 0.4289 - accuracy: 0.8560 - val_loss: 0.4219 - val_accuracy: 0.8719
Epoch 66/100
57/57 [==============================] - ETA: 12s - loss: 0.4604 - accuracy: 0.812 - ETA: 12s - loss: 0.4959 - accuracy: 0.796 - ETA: 11s - loss: 0.5126 - accuracy: 0.800 - ETA: 11s - loss: 0.5149 - accuracy: 0.807 - ETA: 11s - loss: 0.5093 - accuracy: 0.812 - ETA: 11s - loss: 0.5006 - accuracy: 0.818 - ETA: 10s - loss: 0.4930 - accuracy: 0.822 - ETA: 10s - loss: 0.4866 - accuracy: 0.826 - ETA: 10s - loss: 0.4826 - accuracy: 0.829 - ETA: 10s - loss: 0.4790 - accuracy: 0.831 - ETA: 10s - loss: 0.4764 - accuracy: 0.833 - ETA: 9s - loss: 0.4737 - accuracy: 0.835 - ETA: 9s - loss: 0.4714 - accuracy: 0.83 - ETA: 9s - loss: 0.4695 - accuracy: 0.83 - ETA: 8s - loss: 0.4681 - accuracy: 0.83 - ETA: 8s - loss:

```
0.4668 - accuracy: 0.83 - ETA: 8s - loss: 0.4658 - accuracy: 0.83 - ETA: 8s - l
oss: 0.4654 - accuracy: 0.84 - ETA: 8s - loss: 0.4653 - accuracy: 0.84 - ETA: 7
s - loss: 0.4650 - accuracy: 0.84 - ETA: 7s - loss: 0.4646 - accuracy: 0.84 - E
TA: 7s - loss: 0.4642 - accuracy: 0.84 - ETA: 7s - loss: 0.4642 - accuracy: 0.8
4 - ETA: 6s - loss: 0.4642 - accuracy: 0.84 - ETA: 6s - loss: 0.4641 - accurac
y: 0.84 - ETA: 6s - loss: 0.4637 - accuracy: 0.84 - ETA: 6s - loss: 0.4634 - ac
curacy: 0.84 - ETA: 6s - loss: 0.4631 - accuracy: 0.84 - ETA: 5s - loss: 0.4627
- accuracy: 0.84 - ETA: 5s - loss: 0.4622 - accuracy: 0.84 - ETA: 5s - loss: 0.
4615 - accuracy: 0.84 - ETA: 5s - loss: 0.4613 - accuracy: 0.84 - ETA: 5s - los
s: 0.4612 - accuracy: 0.84 - ETA: 4s - loss: 0.4612 - accuracy: 0.84 - ETA: 4s
 - loss: 0.4612 - accuracy: 0.84 - ETA: 4s - loss: 0.4611 - accuracy: 0.84 - ET
A: 4s - loss: 0.4610 - accuracy: 0.84 - ETA: 3s - loss: 0.4609 - accuracy: 0.84
- ETA: 3s - loss: 0.4608 - accuracy: 0.84 - ETA: 3s - loss: 0.4607 - accuracy:
 0.84 - ETA: 3s - loss: 0.4605 - accuracy: 0.84 - ETA: 3s - loss: 0.4605 - accu
racy: 0.84 - ETA: 2s - loss: 0.4606 - accuracy: 0.84 - ETA: 2s - loss: 0.4606 -
accuracy: 0.84 - ETA: 2s - loss: 0.4608 - accuracy: 0.84 - ETA: 2s - loss: 0.46
09 - accuracy: 0.84 - ETA: 2s - loss: 0.4610 - accuracy: 0.84 - ETA: 1s - loss:
0.4611 - accuracy: 0.84 - ETA: 1s - loss: 0.4612 - accuracy: 0.84 - ETA: 1s - l
oss: 0.4613 - accuracy: 0.84 - ETA: 1s - loss: 0.4614 - accuracy: 0.84 - ETA: 1
s - loss: 0.4617 - accuracy: 0.84 - ETA: 0s - loss: 0.4619 - accuracy: 0.84 - E
TA: 0s - loss: 0.4620 - accuracy: 0.84 - ETA: 0s - loss: 0.4622 - accuracy: 0.8
4 - ETA: 0s - loss: 0.4622 - accuracy: 0.84 - ETA: 0s - loss: 0.4623 - accurac
y: 0.84 - 13s 221ms/step - loss: 0.4624 - accuracy: 0.8433 - val_loss: 0.4233 -
val_accuracy: 0.8694
Epoch 67/100
57/57 [==============================] - ETA: 11s - loss: 0.2781 - accuracy: 0.
890 - ETA: 11s - loss: 0.3533 - accuracy: 0.878 - ETA: 11s - loss: 0.3555 - acc
uracy: 0.884 - ETA: 11s - loss: 0.3742 - accuracy: 0.887 - ETA: 11s - loss: 0.3
793 - accuracy: 0.889 - ETA: 11s - loss: 0.3870 - accuracy: 0.888 - ETA: 11s -
 loss: 0.3921 - accuracy: 0.888 - ETA: 10s - loss: 0.3990 - accuracy: 0.886 - E
TA: 10s - loss: 0.4043 - accuracy: 0.883 - ETA: 10s - loss: 0.4072 - accuracy:
 0.882 - ETA: 9s - loss: 0.4107 - accuracy: 0.880 - ETA: 9s - loss: 0.4206 - ac
curacy: 0.87 - ETA: 9s - loss: 0.4284 - accuracy: 0.87 - ETA: 9s - loss: 0.4361
- accuracy: 0.87 - ETA: 9s - loss: 0.4424 - accuracy: 0.87 - ETA: 8s - loss: 0.
4481 - accuracy: 0.87 - ETA: 8s - loss: 0.4528 - accuracy: 0.87 - ETA: 8s - los
s: 0.4570 - accuracy: 0.86 - ETA: 8s - loss: 0.4601 - accuracy: 0.86 - ETA: 8s
 - loss: 0.4630 - accuracy: 0.86 - ETA: 8s - loss: 0.4658 - accuracy: 0.86 - ET
A: 7s - loss: 0.4686 - accuracy: 0.86 - ETA: 7s - loss: 0.4713 - accuracy: 0.86
- ETA: 7s - loss: 0.4737 - accuracy: 0.86 - ETA: 7s - loss: 0.4755 - accuracy:
 0.86 - ETA: 6s - loss: 0.4772 - accuracy: 0.86 - ETA: 6s - loss: 0.4786 - accu
racy: 0.86 - ETA: 6s - loss: 0.4800 - accuracy: 0.85 - ETA: 6s - loss: 0.4812 -
accuracy: 0.85 - ETA: 5s - loss: 0.4824 - accuracy: 0.85 - ETA: 5s - loss: 0.48
33 - accuracy: 0.85 - ETA: 5s - loss: 0.4840 - accuracy: 0.85 - ETA: 5s - loss:
0.4846 - accuracy: 0.85 - ETA: 4s - loss: 0.4851 - accuracy: 0.85 - ETA: 4s - l
oss: 0.4855 - accuracy: 0.85 - ETA: 4s - loss: 0.4860 - accuracy: 0.85 - ETA: 4
s - loss: 0.4865 - accuracy: 0.85 - ETA: 4s - loss: 0.4867 - accuracy: 0.85 - E
TA: 3s - loss: 0.4870 - accuracy: 0.85 - ETA: 3s - loss: 0.4871 - accuracy: 0.8
5 - ETA: 3s - loss: 0.4873 - accuracy: 0.85 - ETA: 3s - loss: 0.4875 - accurac
y: 0.85 - ETA: 2s - loss: 0.4876 - accuracy: 0.85 - ETA: 2s - loss: 0.4876 - ac
curacy: 0.85 - ETA: 2s - loss: 0.4878 - accuracy: 0.85 - ETA: 2s - loss: 0.4880
- accuracy: 0.84 - ETA: 2s - loss: 0.4882 - accuracy: 0.84 - ETA: 1s - loss: 0.
4884 - accuracy: 0.84 - ETA: 1s - loss: 0.4885 - accuracy: 0.84 - ETA: 1s - los
s: 0.4887 - accuracy: 0.84 - ETA: 1s - loss: 0.4888 - accuracy: 0.84 - ETA: 1s
 - loss: 0.4889 - accuracy: 0.84 - ETA: 0s - loss: 0.4890 - accuracy: 0.84 - ET
A: 0s - loss: 0.4891 - accuracy: 0.84 - ETA: 0s - loss: 0.4892 - accuracy: 0.84
- ETA: 0s - loss: 0.4892 - accuracy: 0.84 - ETA: 0s - loss: 0.4893 - accuracy:
 0.84 - 14s 240ms/step - loss: 0.4893 - accuracy: 0.8462 - val_loss: 0.4467 - v
al_accuracy: 0.8802
Epoch 68/100
57/57 [==============================] - ETA: 15s - loss: 0.6414 - accuracy: 0.
```

828 - ETA: 14s - loss: 0.5790 - accuracy: 0.847 - ETA: 14s - loss: 0.5376 - acc
uracy: 0.855 - ETA: 15s - loss: 0.5178 - accuracy: 0.852 - ETA: 15s - loss: 0.5
014 - accuracy: 0.851 - ETA: 14s - loss: 0.4855 - accuracy: 0.853 - ETA: 13s -
 loss: 0.4733 - accuracy: 0.854 - ETA: 13s - loss: 0.4617 - accuracy: 0.855 - E
TA: 13s - loss: 0.4541 - accuracy: 0.855 - ETA: 12s - loss: 0.4458 - accuracy:
 0.856 - ETA: 12s - loss: 0.4401 - accuracy: 0.856 - ETA: 11s - loss: 0.4350 -
 accuracy: 0.857 - ETA: 11s - loss: 0.4298 - accuracy: 0.858 - ETA: 11s - loss:
0.4261 - accuracy: 0.858 - ETA: 10s - loss: 0.4232 - accuracy: 0.858 - ETA: 10s
- loss: 0.4215 - accuracy: 0.858 - ETA: 9s - loss: 0.4195 - accuracy: 0.858 - E
TA: 9s - loss: 0.4183 - accuracy: 0.85 - ETA: 9s - loss: 0.4175 - accuracy: 0.8
5 - ETA: 8s - loss: 0.4170 - accuracy: 0.85 - ETA: 8s - loss: 0.4164 - accurac
y: 0.85 - ETA: 8s - loss: 0.4157 - accuracy: 0.85 - ETA: 8s - loss: 0.4153 - ac
curacy: 0.85 - ETA: 7s - loss: 0.4152 - accuracy: 0.85 - ETA: 7s - loss: 0.4150
- accuracy: 0.85 - ETA: 7s - loss: 0.4148 - accuracy: 0.85 - ETA: 6s - loss: 0.
4149 - accuracy: 0.85 - ETA: 6s - loss: 0.4153 - accuracy: 0.85 - ETA: 6s - los
s: 0.4159 - accuracy: 0.85 - ETA: 6s - loss: 0.4165 - accuracy: 0.85 - ETA: 5s
 - loss: 0.4170 - accuracy: 0.85 - ETA: 5s - loss: 0.4174 - accuracy: 0.85 - ET
A: 5s - loss: 0.4178 - accuracy: 0.85 - ETA: 5s - loss: 0.4183 - accuracy: 0.85
- ETA: 4s - loss: 0.4190 - accuracy: 0.85 - ETA: 4s - loss: 0.4197 - accuracy:
 0.85 - ETA: 4s - loss: 0.4204 - accuracy: 0.85 - ETA: 4s - loss: 0.4212 - accu
racy: 0.85 - ETA: 4s - loss: 0.4219 - accuracy: 0.85 - ETA: 3s - loss: 0.4225 -
accuracy: 0.85 - ETA: 3s - loss: 0.4232 - accuracy: 0.85 - ETA: 3s - loss: 0.42
37 - accuracy: 0.85 - ETA: 3s - loss: 0.4243 - accuracy: 0.85 - ETA: 2s - loss:
0.4249 - accuracy: 0.85 - ETA: 2s - loss: 0.4255 - accuracy: 0.85 - ETA: 2s - l
oss: 0.4259 - accuracy: 0.85 - ETA: 2s - loss: 0.4263 - accuracy: 0.85 - ETA: 1
s - loss: 0.4266 - accuracy: 0.85 - ETA: 1s - loss: 0.4269 - accuracy: 0.85 - E
TA: 1s - loss: 0.4272 - accuracy: 0.85 - ETA: 1s - loss: 0.4275 - accuracy: 0.8
5 - ETA: 1s - loss: 0.4279 - accuracy: 0.85 - ETA: 0s - loss: 0.4282 - accurac
y: 0.85 - ETA: 0s - loss: 0.4286 - accuracy: 0.85 - ETA: 0s - loss: 0.4289 - ac
curacy: 0.85 - ETA: 0s - loss: 0.4292 - accuracy: 0.85 - ETA: 0s - loss: 0.4296
- accuracy: 0.85 - 14s 251ms/step - loss: 0.4300 - accuracy: 0.8519 - val_loss:
0.3931 - val_accuracy: 0.8752
Restoring model weights from the end of the best epoch.
Epoch 00068: early stopping

Loss and Accuracy Curve

In [43]:
```python
epochs = [i for i in range(68)]
fig , ax = plt.subplots(1,2)
train_acc = history.history['accuracy']
train_loss = history.history['loss']
test_acc = history.history['val_accuracy']
test_loss = history.history['val_loss']

fig.set_size_inches(20,6)
ax[0].plot(epochs , train_loss , label = 'Training Loss')
ax[0].plot(epochs , test_loss , label = 'Testing Loss')
ax[0].set_title('Training & Testing Loss')
ax[0].legend()
ax[0].set_xlabel("Epochs")

ax[1].plot(epochs , train_acc , label = 'Training Accuracy')
ax[1].plot(epochs , test_acc , label = 'Testing Accuracy')
ax[1].set_title('Training & Testing Accuracy')
ax[1].legend()
ax[1].set_xlabel("Epochs")
plt.show()
```
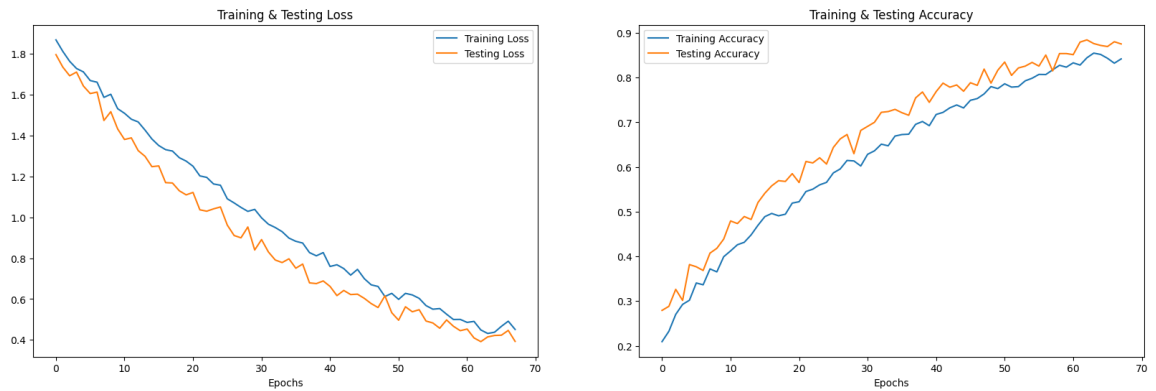
```
In [44]: print("Accuracy of our model on test data : " , model.evaluate(x_test,y_test)[1]
         print("Accuracy of our model on test data : " , model.evaluate(x_train,y_train)[
```

```
38/38 [==============================] - ETA: 1s - loss: 0.9362 - accuracy: 0.7
8 - ETA: 0s - loss: 0.8962 - accuracy: 0.75 - ETA: 0s - loss: 0.7838 - accurac
y: 0.76 - ETA: 0s - loss: 0.7746 - accuracy: 0.75 - ETA: 0s - loss: 0.7879 - ac
curacy: 0.75 - ETA: 0s - loss: 0.7046 - accuracy: 0.77 - ETA: 0s - loss: 0.6161
 - accuracy: 0.80 - ETA: 0s - loss: 0.5518 - accuracy: 0.83 - ETA: 0s - loss: 0.
5022 - accuracy: 0.84 - ETA: 0s - loss: 0.4709 - accuracy: 0.85 - ETA: 0s - los
s: 0.4388 - accuracy: 0.86 - ETA: 0s - loss: 0.4228 - accuracy: 0.87 - ETA: 0s
 - loss: 0.4020 - accuracy: 0.88 - 1s 22ms/step - loss: 0.3918 - accuracy: 0.884
3
Accuracy of our model on test data :  88.42975497245789 %
114/114 [==============================] - ETA: 3s - loss: 0.1940 - accuracy:
0.93 - ETA: 2s - loss: 0.1994 - accuracy: 0.93 - ETA: 2s - loss: 0.1748 - accur
acy: 0.95 - ETA: 2s - loss: 0.1667 - accuracy: 0.96 - ETA: 2s - loss: 0.1690 -
accuracy: 0.96 - ETA: 2s - loss: 0.1742 - accuracy: 0.95 - ETA: 2s - loss: 0.17
09 - accuracy: 0.96 - ETA: 2s - loss: 0.1870 - accuracy: 0.95 - ETA: 2s - loss:
0.1842 - accuracy: 0.95 - ETA: 1s - loss: 0.1836 - accuracy: 0.95 - ETA: 1s - l
oss: 0.1750 - accuracy: 0.95 - ETA: 1s - loss: 0.1768 - accuracy: 0.95 - ETA: 1
s - loss: 0.1764 - accuracy: 0.95 - ETA: 1s - loss: 0.1775 - accuracy: 0.95 - E
TA: 1s - loss: 0.1866 - accuracy: 0.95 - ETA: 1s - loss: 0.1866 - accuracy: 0.9
5 - ETA: 1s - loss: 0.1903 - accuracy: 0.94 - ETA: 1s - loss: 0.1899 - accurac
y: 0.94 - ETA: 1s - loss: 0.1929 - accuracy: 0.94 - ETA: 1s - loss: 0.1923 - ac
curacy: 0.94 - ETA: 1s - loss: 0.1922 - accuracy: 0.94 - ETA: 1s - loss: 0.1941
 - accuracy: 0.94 - ETA: 1s - loss: 0.1941 - accuracy: 0.94 - ETA: 0s - loss: 0.
1938 - accuracy: 0.94 - ETA: 0s - loss: 0.1917 - accuracy: 0.94 - ETA: 0s - los
s: 0.1915 - accuracy: 0.94 - ETA: 0s - loss: 0.1922 - accuracy: 0.94 - ETA: 0s
 - loss: 0.1932 - accuracy: 0.94 - ETA: 0s - loss: 0.1950 - accuracy: 0.94 - ET
A: 0s - loss: 0.1943 - accuracy: 0.94 - ETA: 0s - loss: 0.1932 - accuracy: 0.94
 - ETA: 0s - loss: 0.1936 - accuracy: 0.94 - ETA: 0s - loss: 0.1935 - accuracy:
0.94 - ETA: 0s - loss: 0.1944 - accuracy: 0.94 - ETA: 0s - loss: 0.1932 - accur
acy: 0.94 - ETA: 0s - loss: 0.1929 - accuracy: 0.94 - ETA: 0s - loss: 0.1928 -
accuracy: 0.94 - ETA: 0s - loss: 0.1910 - accuracy: 0.94 - ETA: 0s - loss: 0.18
99 - accuracy: 0.94 - ETA: 0s - loss: 0.1899 - accuracy: 0.94 - ETA: 0s - loss:
0.1894 - accuracy: 0.94 - 3s 22ms/step - loss: 0.1890 - accuracy: 0.9487
Accuracy of our model on test data :  94.8732078075409 %
```

```
In [45]: # predicting on test data.
         pred_test = model.predict(x_test)
         y_pred = encoder.inverse_transform(pred_test)

         y_test = encoder.inverse_transform(y_test)
```

Comparison between Actual and

Predicted

```
In [46]: df = pd.DataFrame(columns=['Predicted Labels', 'Actual Labels'])
         df['Predicted Labels'] = y_pred.flatten()
         df['Actual Labels'] = y_test.flatten()
         df.head(10)
```

Out[46]:

	Predicted Labels	Actual Labels
0	disgust	disgust
1	happy	fear
2	calm	calm
3	angry	angry
4	calm	fear
5	sad	sad
6	surprise	surprise
7	surprise	surprise
8	disgust	disgust
9	angry	angry

Confusion Matrix

```
In [47]: cm = confusion_matrix(y_test, y_pred)
         plt.figure(figsize = (12, 10))
         cm = pd.DataFrame(cm , index = [i for i in encoder.categories_] , columns = [i f
         sns.heatmap(cm, linecolor='white', cmap='Blues', linewidth=1, annot=True, fmt=''
         plt.title('Confusion Matrix', size=20)
         plt.xlabel('Predicted Labels', size=14)
         plt.ylabel('Actual Labels', size=14)
         plt.show()
```

Confusion Matrix
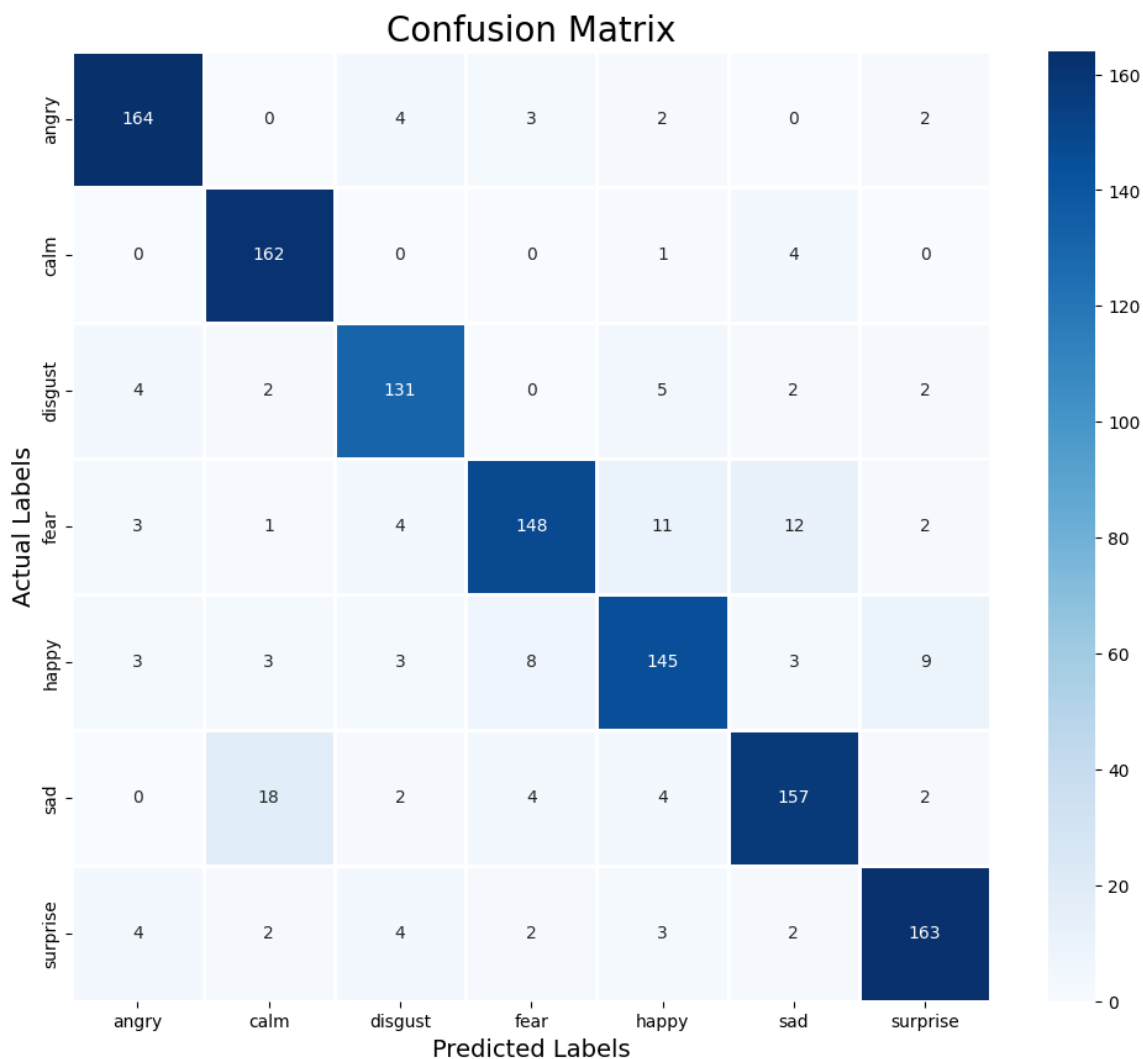
Classification Matrix

```
In [48]: print(classification_report(y_test, y_pred))
```

```
              precision    recall  f1-score   support

       angry       0.92      0.94      0.93       175
        calm       0.86      0.97      0.91       167
     disgust       0.89      0.90      0.89       146
        fear       0.90      0.82      0.86       181
       happy       0.85      0.83      0.84       174
         sad       0.87      0.84      0.86       187
    surprise       0.91      0.91      0.91       180

    accuracy                           0.88      1210
   macro avg       0.88      0.89      0.88      1210
weighted avg       0.88      0.88      0.88      1210
```

SVM Model

```
In [54]: from sklearn.svm import SVC
```

```
In [83]: X_train, X_test, y_train, y_test = train_test_split(X, Y,test_size = 0.1, random
```

```
In [127… from sklearn.model_selection import GridSearchCV
         params = {
             'C': [0.1, 1, 10, 100, 1000,10000,10000],
             'gamma': [1, 0.1, 0.01, 0.001, 0.0001,0.00001],
             'kernel': ['rbf']
         }

         clf = GridSearchCV(
             estimator=SVC(),
             param_grid=params,
             cv=5,
             n_jobs=5,
             verbose=1
         )

         clf.fit(X_train, y_train)
         print(clf.best_params_)
```

```
Fitting 5 folds for each of 42 candidates, totalling 210 fits
{'C': 1000, 'gamma': 0.0001, 'kernel': 'rbf'}
```

```
In [84]: clf = SVC(kernel='rbf', gamma=0.0001, C=1000)
         clf.fit(X_train, y_train)
```
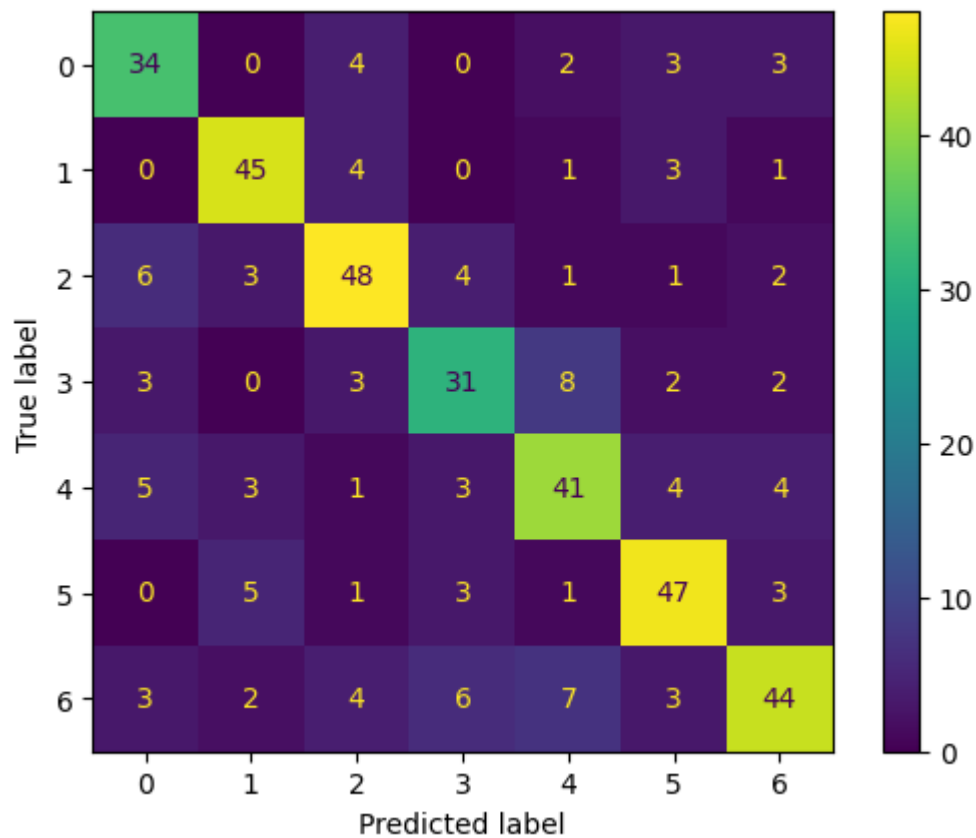
```
Out[84]: SVC(C=1000, gamma=0.0001)
```

```
In [85]: svm_predictions = clf.predict(X_test)

         # model accuracy for X_test
         accuracy = clf.score(X_test, y_test)

         # creating a confusion matrix
         cm = confusion_matrix(y_test, svm_predictions)
```

```
In [86]: from sklearn import metrics
         cm_display = metrics.ConfusionMatrixDisplay(confusion_matrix = cm)
         cm_display.plot()
         plt.show()
```

`accuracy`

0.7178217821782178

`print(classification_report(y_test, svm_predictions))`

```
              precision    recall  f1-score   support

       angry       0.67      0.74      0.70        46
        calm       0.78      0.83      0.80        54
     disgust       0.74      0.74      0.74        65
        fear       0.66      0.63      0.65        49
       happy       0.67      0.67      0.67        61
         sad       0.75      0.78      0.76        60
    surprise       0.75      0.64      0.69        69

    accuracy                           0.72       404
   macro avg       0.71      0.72      0.72       404
weighted avg       0.72      0.72      0.72       404
```