

Team Id: PNT2022TMID22447

Project: Real-Time Communication system powered by AI for specially abled

Import The Required Model Building Libraries

```
#import imagedatagenerator
from keras.preprocessing.image import ImageDataGenerator

#training datagen
train_datagen=ImageDataGenerator(rescale=1./255, shear_range=0.2, zoom_range=0.2, horizontal_

#testing datagen
test_datagen=ImageDataGenerator(rescale=1./255)
```

IMPORTING tensorflow

```
import tensorflow as tf
import os
```

IMPORTING LIBRARIES TO INITIALIZE NEURAL NETWORK LAYER

```
from keras.models import Sequential
from keras.layers import Dense
from keras.layers import Convolution2D
from keras.layers import MaxPooling2D
from keras.layers import Dropout
from keras.layers import Flatten
from tensorflow.keras.preprocessing.image import ImageDataGenerator
```

```
import numpy as np
import matplotlib.pyplot as plt #to view graph in colab itself
import IPython.display as display
from PIL import Image
import pathlib
```

Unzipping the dataset

```
!unzip '/content/conversation engine for deaf and dumb.zip'

inflating: Dataset/training_set/I/947.png
inflating: Dataset/training_set/I/948.png
inflating: Dataset/training_set/I/949.png
inflating: Dataset/training_set/I/95.png
```

```
inflating: Dataset/training_set/I/950.png
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inflating: Dataset/training_set/I/980.png
inflating: Dataset/training_set/I/981.png
inflating: Dataset/training_set/I/982.png
extracting: Dataset/training_set/I/983.png
inflating: Dataset/training_set/I/984.png
inflating: Dataset/training_set/I/985.png
inflating: Dataset/training_set/I/986.png
inflating: Dataset/training_set/I/987.png
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inflating: Dataset/training_set/I/989.png
inflating: Dataset/training_set/I/99.png
inflating: Dataset/training_set/I/990.png
inflating: Dataset/training_set/I/991.png
inflating: Dataset/training_set/I/992.png
extracting: Dataset/training_set/I/993.png
inflating: Dataset/training_set/I/994.png
inflating: Dataset/training_set/I/995.png
extracting: Dataset/training_set/I/996.png
inflating: Dataset/training_set/I/997.png
inflating: Dataset/training_set/I/998.png
inflating: Dataset/training_set/I/999.png
```

Applying ImageDataGenerator to training set

```
x_train=train_datagen.flow_from_directory('/content/Dataset/training_set',target_size=(64,64),
                                          class_mode='categorical',color_mode="grayscale")
```

Found 15750 images belonging to 9 classes.

Applying ImageDataGenerator to test set

```
x_test=test_datagen.flow_from_directory('/content/Dataset/test_set',target_size=(64,64),batch_size=32,
                                         class_mode='categorical',color_mode="grayscale")
```

Found 2250 images belonging to 9 classes.

```
a=len(x_train)
b=len(x_test)
```

Length of training set

```
print(a)
```

79

Length of test set

```
print(b)
```

12

Add Layers

```
#create model
model=Sequential()
```

Add The Convolution Layer

```
model.add(Convolution2D(32,(3,3),input_shape=(64,64,1),activation='relu'))
```

Add Pooling Layer

```
model.add(MaxPooling2D(pool_size=(2,2)))
```

Add The Flatten Layer

```
model.add(Flatten())
```

Adding The Dense Layers

```
#1st hidden layer
model.add(Dense(units=512,activation='relu'))
#2nd hidden layer
model.add(Dense(units=261,activation='relu'))

#output layer
model.add(Dense(units=9,activation='softmax'))
```

Compile The Model

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

Fit The Model

```
model.fit_generator(x_train,steps_per_epoch=len(x_train),epochs=10,validation_data=x_test,
```

```
/usr/local/lib/python3.7/dist-packages/ipykernel_launcher.py:1: UserWarning: `Model.
    """Entry point for launching an IPython kernel.
Epoch 1/10
79/79 [=====] - 87s 1s/step - loss: 0.4944 - accuracy: 0.84
Epoch 2/10
79/79 [=====] - 87s 1s/step - loss: 0.0536 - accuracy: 0.98
Epoch 3/10
79/79 [=====] - 85s 1s/step - loss: 0.0236 - accuracy: 0.99
Epoch 4/10
79/79 [=====] - 83s 1s/step - loss: 0.0094 - accuracy: 0.99
Epoch 5/10
79/79 [=====] - 82s 1s/step - loss: 0.0086 - accuracy: 0.99
Epoch 6/10
79/79 [=====] - 80s 1s/step - loss: 0.0122 - accuracy: 0.99
Epoch 7/10
79/79 [=====] - 78s 988ms/step - loss: 0.0055 - accuracy: 0
Epoch 8/10
79/79 [=====] - 78s 988ms/step - loss: 0.0052 - accuracy: 0
Epoch 9/10
79/79 [=====] - 78s 990ms/step - loss: 0.0019 - accuracy: 0
Epoch 10/10
79/79 [=====] - 78s 992ms/step - loss: 0.0032 - accuracy: 0
<keras.callbacks.History at 0x7f59aab99510>
```

Save The Model

```
model.save('as1png2.h5')
```

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