

IBM Project Name: Real-Time Communication System Powered by AI for Specially Abled

TEAM ID: PNT2022TMID46015

TEAM Lead: Akash S

Model Building

Import The Required Model Building Libraries

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

In [1]:

```
#training datagen  
train_datagen=ImageDataGenerator(rescale=1./255, shear_range=0.2, zoom_range=  
0.2, horizontal_flip=True)
```

In [2]:

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

In [3]:

IMPORTING tensorflow

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

In [4]:

Initialize The Model

```
#create model  
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
```

In [13]:

```
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
```

In [6]:

Unzipping the dataset

In [7]:

```
!unzip '/content/conversation engine for deaf and dumb (1).zip'
```

Streaming output truncated to the last 5000 lines.

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extracting: Dataset/training_set/I/1425.png
extracting: Dataset/training_set/I/1426.png
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inflating: Dataset/training_set/I/1428.png
inflating: Dataset/training_set/I/1429.png
inflating: Dataset/training_set/I/143.png
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extracting: Dataset/training_set/I/1431.png
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inflating: Dataset/training_set/I/144.png
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extracting: Dataset/training_set/I/1456.png

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inflating: Dataset/training_set/I/1459.png
inflating: Dataset/training_set/I/146.png
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inflating: Dataset/training_set/I/1461.png
inflating: Dataset/training_set/I/1462.png
inflating: Dataset/training_set/I/1463.png
inflating: Dataset/training_set/I/1464.png
inflating: Dataset/training_set/I/1465.png
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inflating: Dataset/training_set/I/148.png
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extracting: Dataset/training_set/I/1487.png
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inflating: Dataset/training_set/I/1489.png
inflating: Dataset/training_set/I/149.png
inflating: Dataset/training_set/I/1490.png
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extracting: Dataset/training_set/I/1494.png
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extracting: Dataset/training_set/I/1499.png
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inflating: Dataset/training_set/I/150.png
inflating: Dataset/training_set/I/1500.png
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extracting: Dataset/training_set/I/1502.png
inflating: Dataset/training_set/I/1503.png
inflating: Dataset/training_set/I/1504.png
extracting: Dataset/training_set/I/1505.png
extracting: Dataset/training_set/I/1506.png
inflating: Dataset/training_set/I/1507.png

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inflating: Dataset/training_set/I/1562.png
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inflating: Dataset/training_set/I/157.png
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inflating: Dataset/training_set/I/158.png
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inflating: Dataset/training_set/I/159.png
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inflating: Dataset/training_set/I/161.png

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inflating: Dataset/training_set/I/167.png
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inflating: Dataset/training_set/I/189.png

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inflating: Dataset/training_set/I/395.png
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inflating: Dataset/training_set/I/548.png

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extracting: Dataset/training_set/I/700.png
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extracting: Dataset/training_set/I/863.png
inflating: Dataset/training_set/I/864.png
inflating: Dataset/training_set/I/865.png
inflating: Dataset/training_set/I/866.png
inflating: Dataset/training_set/I/867.png
extracting: Dataset/training_set/I/868.png
inflating: Dataset/training_set/I/869.png
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inflating: Dataset/training_set/I/904.png
extracting: Dataset/training_set/I/905.png
inflating: Dataset/training_set/I/906.png
inflating: Dataset/training_set/I/907.png

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```
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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

In [8]:

```
x_train=train_datagen.flow_from_directory('/content/Dataset/training_set',target_size=(64,64),batch_size=200,
```

```
class_mode='categorical',color_mode="grayscale")
```

Found 15750 images belonging to 9 classes.

Applying ImageDataGenerator to test set

In [9]:

```
x_test=test_datagen.flow_from_directory('/content/Dataset/test_set',target_size=(64,64),batch_size=200,
```

```
class_mode='categorical',color_mode="grayscale")
Found 2250 images belonging to 9 classes.
```

In [10]:

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

Length of training set

In [11]:

```
print(a)
79
```

Length of test set

In [12]:

```
print(b)
12
```

Add Layers

In [15]:

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

Add The Convolution Layer

In [16]:

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

Add Pooling Layer

In [17]:

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

Add The Flatten Layer

In [18]:

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

Adding The Dense Layers

In [19]:

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

In [20]:

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

Compile The Model

In [22]:

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