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

The Required ModelBuilding 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
  inflating: Dataset/training_set/I/951.png
  inflating: Dataset/training_set/I/952.png
  inflating: Dataset/training_set/I/953.png
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  inflating: Dataset/training_set/I/960.png
  inflating: Dataset/training_set/I/961.png
  inflating: Dataset/training_set/I/962.png
  inflating: Dataset/training_set/I/963.png
  inflating: Dataset/training_set/I/964.png
  inflating: Dataset/training_set/I/965.png
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  inflating: Dataset/training_set/I/967.png
  inflating: Dataset/training_set/I/968.png
  inflating: Dataset/training_set/I/969.png
  inflating: Dataset/training_set/I/97.png
  inflating: Dataset/training_set/I/970.png
  inflating: Dataset/training_set/I/971.png
  inflating: Dataset/training_set/I/972.png
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  inflating: Dataset/training_set/I/974.png
  inflating: Dataset/training_set/I/975.png
  inflating: Dataset/training_set/I/976.png
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  inflating: Dataset/training_set/I/978.png
  inflating: Dataset/training_set/I/979.png
  inflating: Dataset/training_set/I/98.png
  inflating: Dataset/training_set/I/980.png
  inflating: Dataset/training_set/I/981.png
  inflating: Dataset/training_set/I/982.png
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  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
  inflating: Dataset/training_set/I/988.png
  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,
                                          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),ba
                                          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'])
```

✓ completed at 10/11/22 ● ×