```
pwd
```

```
'C:\\Users\\prasa\\OneDrive\\Desktop\\IBM Project'
```

```
!pip install tensorflow==2.7.1
!pip install keras==2.2.4
```

```
from tensorflow.keras.preprocessing.image import ImageDataGenerator
```

```
# Training Datagen
train_datagen =
ImageDataGenerator(rescale=1/255,zoom_range=0.2,horizontal_flip=True,v
ertical_flip=False)
# Testing Datagen
test_datagen = ImageDataGenerator(rescale=1/255)
```

```
import os, types
import pandas as pd
from botocore.client import Config
import ibm_boto3
```

```
def __iter__(self): return 0
```

```
# @hidden_cell
# The following code accesses a file in your IBM Cloud Object Storage.
It includes your credentials.
# You might want to remove those credentials before you share the
notebook.
cos_client = ibm_boto3.client(service_name='s3',
    ibm_api_key_id='cMbxf8UO34fapSRVfoMX0zJbaLb5pHpHi-HRESsGKPng',
    ibm_auth_endpoint="https://iam.cloud.ibm.com/oidc/token",
    config=Config(signature_version='oauth'),
    endpoint_url='https://s3.private.ap.cloud-object-
storage.appdomain.cloud')

bucket = 'realtimecommunicationsystempowere-donotdelete-pr-
be0yo09hakvd76'
object_key = 'conversation engine for deaf and dumb.zip'

streaming_body_1 = cos_client.get_object(Bucket=bucket,
Key=object_key)['Body']

# Your data file was loaded into a botocore.response.StreamingBody
object.
# Please read the documentation of ibm_boto3 and pandas to learn more
about the possibilities to load the data.
# ibm_boto3 documentation: https://ibm.github.io/ibm-cos-sdk-python/
# pandas documentation: http://pandas.pydata.org/

# Unzip the Dataset Zip File
from io import BytesIO
```

```
import zipfile
unzip = zipfile.ZipFile(BytesIO(streaming_body_1.read()), 'r')
file_paths = unzip.namelist()
for path in file_paths:
    unzip.extract(path)

%%bash
ls Communication_Dataset

x_train =
train_datagen.flow_from_directory('dataset/training_set',target_size=(
64,64),batch_size=900, class_mode='categorical',
color_mode='grayscale')
x_test =
test_datagen.flow_from_directory('dataset/test_set',target_size=(64,64
),batch_size=900, class_mode='categorical', color_mode='grayscale')

print("Len x-train : ", len(x_train))
print("Len x-test : ", len(x_test))

# The Class Indices in Training Dataset
x_train.class_indices

# Importing Libraries
from tensorflow.keras.models import Sequential
from tensorflow.keras.layers import
Convolution2D,MaxPooling2D,Flatten,Dense

# Creating Model
model=Sequential()

# Adding Layers
model.add(Convolution2D(32,
(3,3),activation='relu',input_shape=(64,64,3)))
model.add(MaxPooling2D(pool_size=(2,2)))
model.add(Flatten())

# Adding Hidden Layers
model.add(Dense(300,activation='relu'))
model.add(Dense(150,activation='relu'))

# Adding Output Layer
model.add(Dense(9,activation='softmax'))

# Compiling the Model
model.compile(loss='categorical_crossentropy',optimizer='adam',metrics
=['accuracy'])

# Fitting the Model Generator
model.fit_generator(x_train,steps_per_epoch=len(x_train),epochs=10,val
idation_data=x_test,validation_steps=len(x_test))
```

```
model.save('aslpng1.h5')
# Current accuracy is 0.9994

# Convert the Saved Model to a Tar Compressed Format
!tar -zcvf IBM_TrainedModel.tgz IBM_Communication_Model.h5

%%bash
ls -ll

!pip install watson-machine-learning-client --upgrade

from ibm_watson_machine_learning import APIClient
wml_credentials = {
    "url":"https://eu-gb.ml.cloud.ibm.com",
     "apikey":"EVt1zVq7kc8EBdZixNmtljy66pVQF4Fe8JLPJl-yMUKB",
}

client = APIClient(wml_credentials)

def guid_from_space_name(client, space_name):
    space = client.spaces.get_details()
    return (next(item for item in space['resources'] if item['entity']
["name"] == space_name)['metadata']['id'])
```