## **TEAM ID:PNT2022TMID41505**

## MODEL BUILDING

from keras. preprocessing. image import ImageDataGeneratortrain\_datagen=ImageDataGenerator(rescale=1./255, s hear range=0.2, zoom range=0.2, horizontal flip=True) test datagen=Ima geDataGenerator (rescale=1./255) In [3]: x train = train datagen. flow from directory ('/content/Dataset/training set', t arget size=(64,64), batch size=300, class mode='categorical', color mo de="grayscale") Found 15750 images belonging to 9 classes. In [4]: x test =test datagen. flow from directory ('/content/Dataset/test set', target size=(64,64), batch size=300, class mode='categorical', color mode="g rayscale") Found 2250 images belonging to 9 classes. In [5]: from keras. models import Sequentialfrom keras. layers import Densefrom keras. layers import Convolution2Dfrom keras. layers import MaxPooling2Dfrom keras. layers import Dropoutfrom keras. layers import Flatten In [6]: model = Sequential() In [7]: model.add(Convolution2D(32, (3, 3), input shape=(64, 64, 1), activation='relu'))#no. of feature detectors, size of feature detector, image size, activation function In [8]: model.add(MaxPooling2D(pool size=(2,2))) In [9]: model.add(Flatten())

In [10]:

```
model.add(Dense(units=512, activation = 'relu'))
                                                     In [11]:
model.add(Dense(units=9, activation = 'softmax'))
                                                     In [12]:
model.compile(loss='categorical crossentropy', optimizer = 'adam',
metrics = ['accuracy'])
                                                     In [13]:
model. fit generator (x train, steps per epoch=24, epochs=10, validation
data = x test, validation steps= 40) #steps per epoch = no. of
train images//batch size
/usr/local/lib/python3.7/dist-packages/ipykernel launcher.py:1: UserW
arning: `Model.fit_generator` is deprecated and will be removed in a
future version. Please use `Model.fit`, which supports generators.
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Epoch 1/10
24/24 [==============] - ETA: Os - loss: 1.2714 - acc
uracy: 0.6219
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Make sure that your dataset or generator can generate at least 'step
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24/24 [======] - 41s 2s/step - loss: 1.2714 -
accuracy: 0.6219 - val loss: 0.4031 - val accuracy: 0.8982
Epoch 2/10
24/24 [=========== ] - 33s 1s/step - loss: 0.2827 -
accuracy: 0.9211
Epoch 3/10
accuracy: 0.9615
Epoch 4/10
24/24 [===========] - 32s 1s/step - loss: 0.0958 -
accuracy: 0.9746
Epoch 5/10
24/24 [=======
                    ========] - 34s 1s/step - loss: 0.0679 -
accuracy: 0.9826
Epoch 6/10
accuracy: 0.9909
```

```
Epoch 7/10
24/24 [======
                          =======] - 32s 1s/step - 1oss: 0.0373 -
accuracy: 0.9908
Epoch 8/10
accuracy: 0.9915
Epoch 9/10
                    ========= ] - 32s 1s/step - loss: 0.0235 -
accuracy: 0.9940
Epoch 10/10
24/24 [========
                     ======== ] - 32s 1s/step - 1oss: 0.0170 -
accuracy: 0.9972
                                                          Out[13]:
                                                           In [14]:
model. save ('aslpng1. h5')
                                                           In [17]:
from keras. models import load modelimport numpy as npimport cv2
                                                           In [187:
model=load model('aslpng1.h5')
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from keras. preprocessing. image import
ImageDataGeneratortrain_datagen=ImageDataGenerator(rescale=1./255, s
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x train =
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rayscale")
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Found 2250 images belonging to 9 classes.

In [5]:

from keras.models import Sequentialfrom keras.layers import
Densefrom keras.layers import Convolution2Dfrom keras.layers import
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model.fit\_generator(x\_train, steps\_per\_epoch=24, epochs=10, validation
\_data = x\_test, validation\_steps= 40) #steps\_per\_epoch = no. of
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