

# TEAM ID:PNT2022TMID41505

```
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'))
```

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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: UserWarning: `Model.fit\_generator` is deprecated and will be removed in a future version. Please use `Model.fit`, which supports generators.

"""Entry point for launching an IPython kernel.

Epoch 1/10

24/24 [=====] - ETA: 0s - loss: 1.2714 - accuracy: 0.6219

WARNING:tensorflow:Your input ran out of data; interrupting training.

Make sure that your dataset or generator can generate at least `steps\_per\_epoch \* epochs` batches (in this case, 40 batches). You may need to use the repeat() function when building your dataset.

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

24/24 [=====] - 34s 1s/step - loss: 0.1448 - 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

24/24 [=====] - 32s 1s/step - loss: 0.0424 - accuracy: 0.9909

Epoch 7/10

24/24 [=====] - 32s 1s/step - loss: 0.0373 - accuracy: 0.9908

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Epoch 8/10

24/24 [=====] - 33s 1s/step - loss: 0.0319 - accuracy: 0.9915

Epoch 9/10

24/24 [=====] - 32s 1s/step - loss: 0.0235 - accuracy: 0.9940

Epoch 10/10

24/24 [=====] - 32s 1s/step - loss: 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 [18]:

```
model=load_model('aslpng1.h5')
```

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