

▼ Model Building

Loading the Dataset & Image Data Generation

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

# Training Datagen
train_datagen = ImageDataGenerator(rescale=1/255, zoom_range=0.2, horizontal_flip=True, verti
# Testing Datagen
test_datagen = ImageDataGenerator(rescale=1/255)

# Training Dataset
x_train=train_datagen.flow_from_directory(r'.\Dataset\train_set', target_size=(64,64), clas
# Testing Dataset
x_test=test_datagen.flow_from_directory(r'.\Dataset\test_set', target_size=(64,64), class_m

    Found 15750 images belonging to 9 classes.
    Found 2250 images belonging to 9 classes.

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

    Len x-train :  18
    Len x-test :   3

# The Class Indices in Training Dataset
x_train.class_indices

    {'A': 0, 'B': 1, 'C': 2, 'D': 3, 'E': 4, 'F': 5, 'G': 6, 'H': 7, 'I': 8}
```

▼ Model Generation

```
# Importing Libraries
from tensorflow.keras.models import Sequential
from tensorflow.keras.layers import Convolution2D, MaxPooling2D,
from tensorflow.keras.layers import 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'))

model.summary()
```

Model: "sequential"

Layer (type)	Output Shape	Param #
conv2d (Conv2D)	(None, 62, 62, 32)	896
max_pooling2d (MaxPooling2D)	(None, 31, 31, 32)	0
flatten (Flatten)	(None, 30752)	0
dense (Dense)	(None, 300)	9225900
dense_1 (Dense)	(None, 150)	45150
dense_2 (Dense)	(None, 9)	1359
Total params: 9,273,305		
Trainable params: 9,273,305		
Non-trainable params: 0		

```
# 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,validation_data=x_test,
```

```
C:\Users\snavel\AppData\Local\Temp\ipykernel_3100\1042518445.py:2: UserWarning: `Model
model.fit_generator(x_train,steps_per_epoch=len(x_train),epochs=10,validation_data=
Epoch 1/10
18/18 [=====] - 29s 1s/step - loss: 0.9233 - accuracy: 0.687
Epoch 2/10
18/18 [=====] - 17s 914ms/step - loss: 0.1772 - accuracy: 0
Epoch 3/10
18/18 [=====] - 17s 923ms/step - loss: 0.0780 - accuracy: 0
Epoch 4/10
18/18 [=====] - 17s 929ms/step - loss: 0.0404 - accuracy: 0
Epoch 5/10
18/18 [=====] - 17s 930ms/step - loss: 0.0249 - accuracy: 0
Epoch 6/10
18/18 [=====] - 17s 909ms/step - loss: 0.0177 - accuracy: 0
Epoch 7/10
18/18 [=====] - 17s 920ms/step - loss: 0.0109 - accuracy: 0
Epoch 8/10
18/18 [=====] - 17s 912ms/step - loss: 0.0100 - accuracy: 0
```

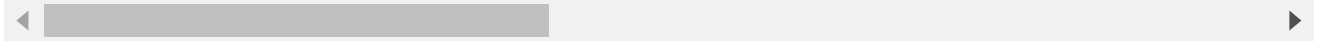
Epoch 9/10

18/18 [=====] - 16s 907ms/step - loss: 0.0058 - accuracy: 0

Epoch 10/10

18/18 [=====] - 16s 913ms/step - loss: 0.0041 - accuracy: 0

<keras.callbacks.History at 0x263af9f6b50>



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Save the Model

Save the Model

```
model.save('ASL_Model.h5')
```

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