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Model Building

Adding The Dense Layers

In []:

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

In []:

```
model.add(Dense(units=512, activation='relu')) model.add(Dense(units=9,  
activation='softmax'))
```

In []:

```
print("Adding dense layer on top")  
model.add(layers.Flatten()) model.add(layers.Dense(64, activation='relu'))  
model.add(layers.Dense(10))
```

In []:

```
print("Complete architecture of the model") model.summary()
```

In []:

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

In []:

```
# Training Dataset  
x_train=train_datagen.flow_from_directory(r'/content/drive/MyDrive/Dataset/t  
raining_set', target_size=(64,64), class_mode='categorical', batch_size=900)  
# Testing Dataset  
x_test=test_datagen.flow_from_directory(r'/content/drive/MyDrive/Dataset/tes  
t_set', target_size=(64,64), class_mode='categorical', batch_size=900)
```

```
Found 15760 images belonging to 9 classes. Found  
2250 images belonging to 9 classes.
```

In []:

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

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

In []:

```
# The Class Indices in Training Dataset x_train.class_indices
```

Out[]:

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

Model Creation

In []:

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

In []:

```
# Creating Model model=Sequential()
```

In []:

```
# Adding Layers
model.add(Convolution2D(32,(3,3),activation='relu',input_shape=(64,64,3)))
```

In []:

```
model.add(MaxPooling2D(pool_size=(2,2)))
```

In []:

```
# Adding Dense Layers model.add(Dense(300,activation='relu'))
model.add(Dense(150,activation='relu'))
model.add(Dense(9,activation='softmax'))
```

In []:

```
# Compiling the Model model.compile(loss='
```