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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, vertical_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/train_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/test_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='
```