MODEL BUILDING

ADDING THE DENSE LAYER

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=Fa
# Testing Datagen
test_datagen = ImageDataGenerator(rescale=1/255)
```

In [ ]:
```
# Training Dataset
x_train=train_datagen.flow_from_directory(r'/content/drive/MyDrive/Dataset/training_set',target_size=
# Testing Dataset
x_test=test_datagen.flow_from_directory(r'/content/drive/MyDrive/Dataset/test_set',target_size=(64,64
```

```
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='categorical_crossentropy',optimizer='adam',metrics=['accuracy'])
```