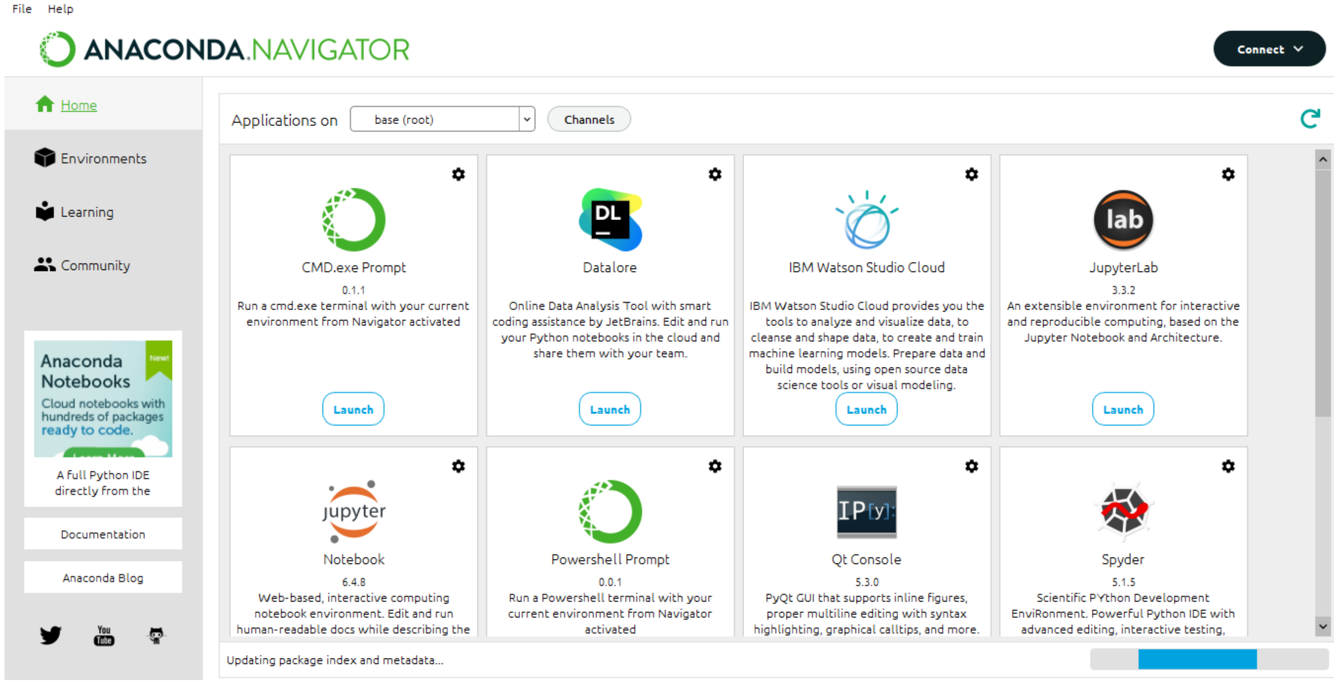
PROJECT DEVELOPMENT PHASE

DELIVERY OF SPRINT-2

DATE:	05 NOV 2022
TEAM ID:	PNT2022TMID39878
PROJECT:	A GESTURE BASED TOOL FOR STERILE BROWSING OF RADIOLOGY IMAGES
MAXIMUM MARKS:	

PREREQUISITES:

For this project we must download and install anaconda navigator, python, Jupyter notebook and pip libraries.



Cloud notebooks with hundreds of packages ready to code.

A full Python IDE directly from the

Run a cmd.exe terminal with your current environment from Navigator activated

Online Data Analysis Tool with smart coding assistance by JetBrains. Edit and run your Python notebooks in the cloud and share them with your team.

IBM Watson Studio Cloud provides you the tools to analyze and visualize data, to cleanse and shape data, to create and train machine learning models. Prepare data and build models, using open source data science tools or visual modeling.

An extensible environment for interactive and reproducible computing, based on the Jupyter Notebook and Architecture.

Web-based, interactive computing notebook environment. Edit and run human-readable docs while describing the

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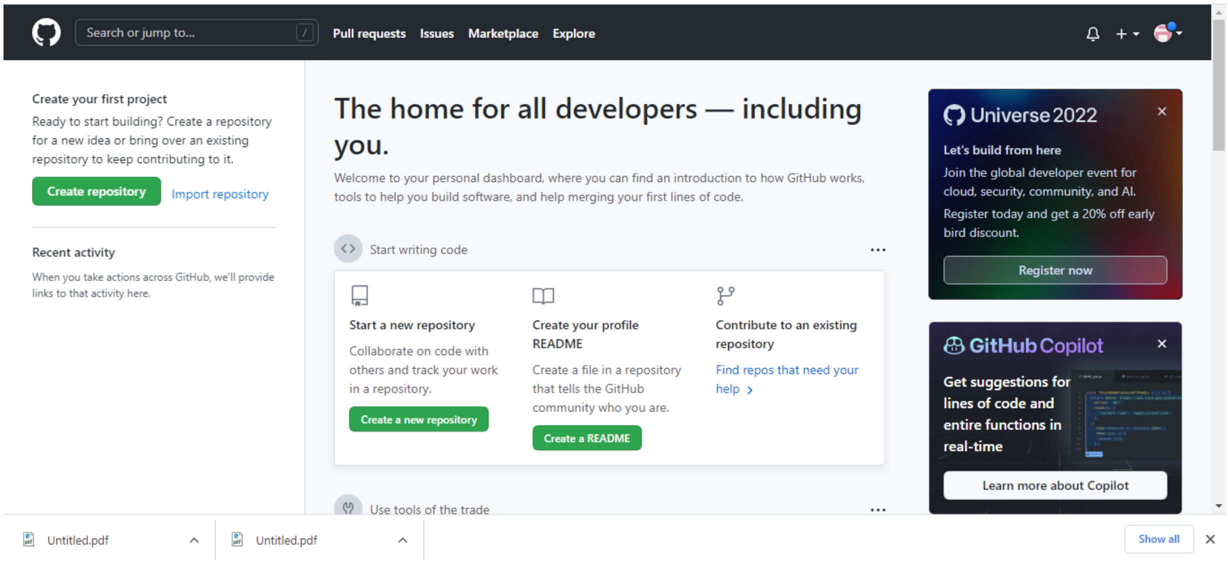
PyQt GUI that supports inline figures, proper multiline editing with syntax highlighting, graphical calltips, and more.

Scientific PYthon Development EnviRonment. Powerful Python IDE with advanced editing, interactive testing,

Updating package index and metadata...

CREATING A GIT HUB ACCOUNT:



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Collaborate on code with others and track your work in a repository.

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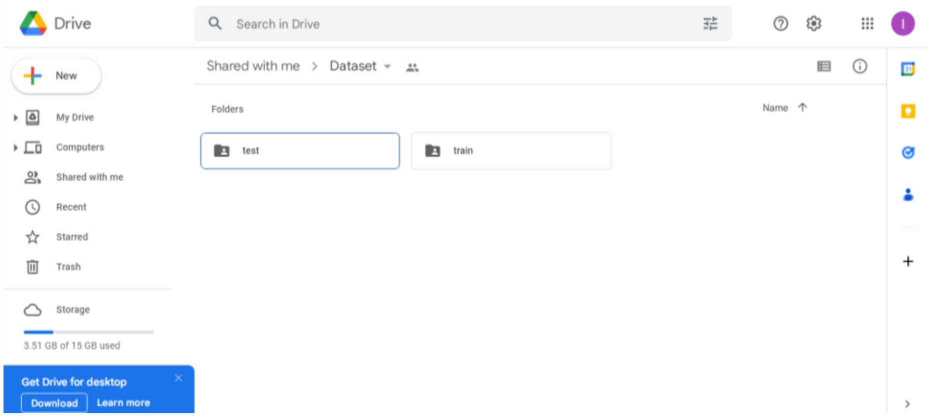
PRIOR KNOWLEDGE:

Understand and learn about the deep learning concepts such as;

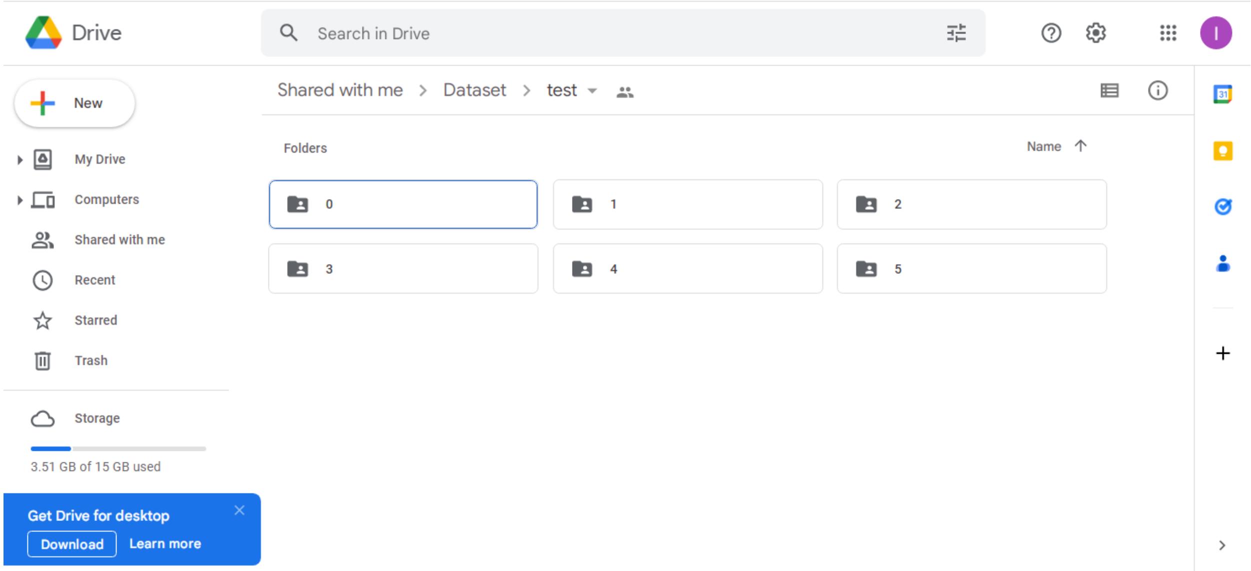
1. CNN
2. OpenCV
3. Flask

DATA COLLECTION:

Collect the data sets required. Create two different folders for test data and train data.



TEST DATA: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New
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Storage
3.51 GB of 15 GB used
Get Drive for desktop
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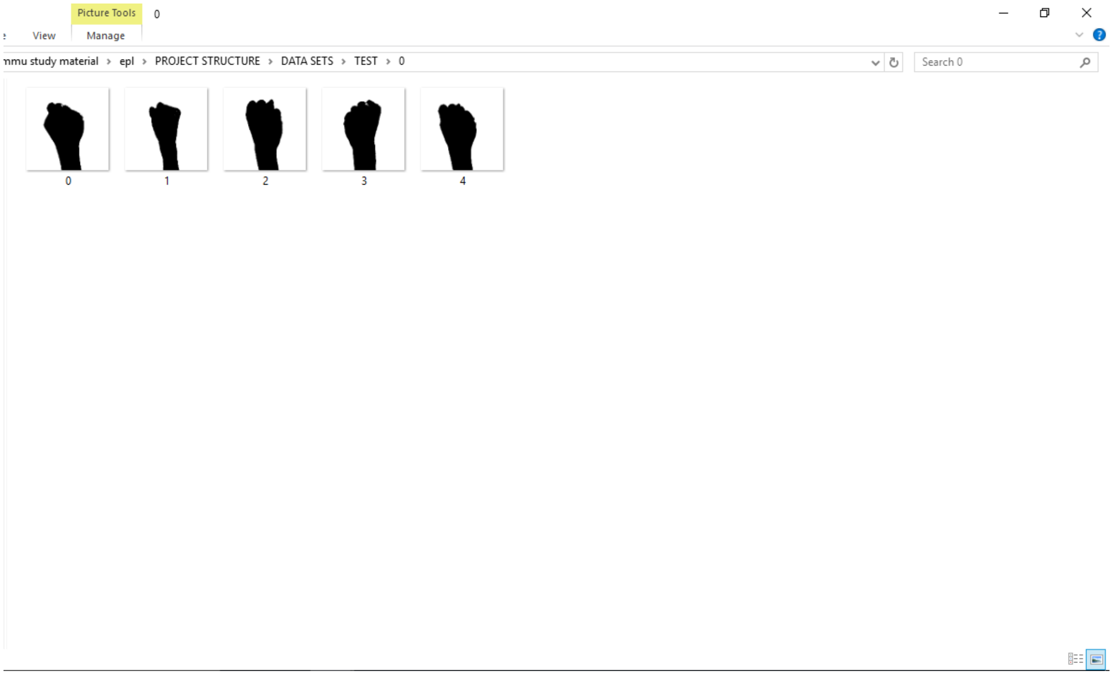
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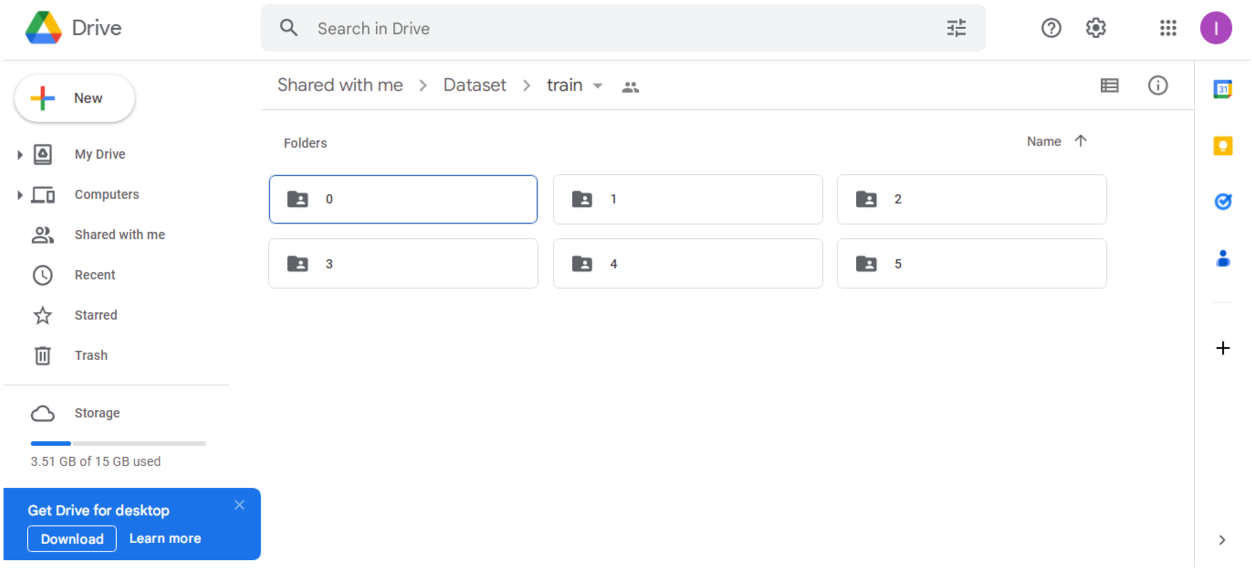
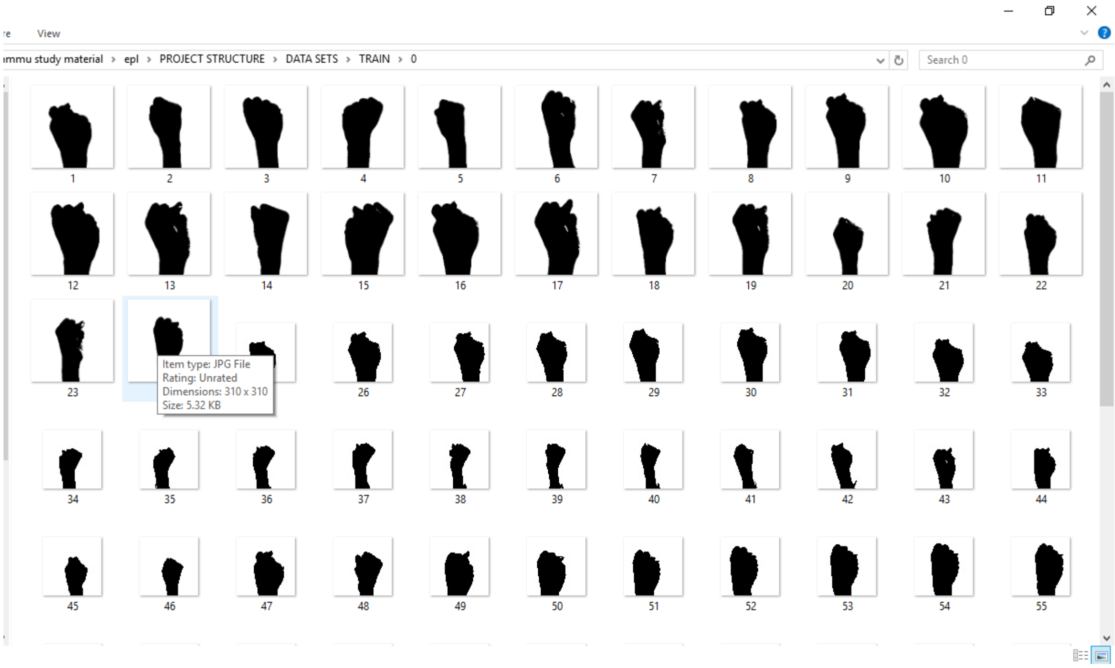
TRAIN DATA:



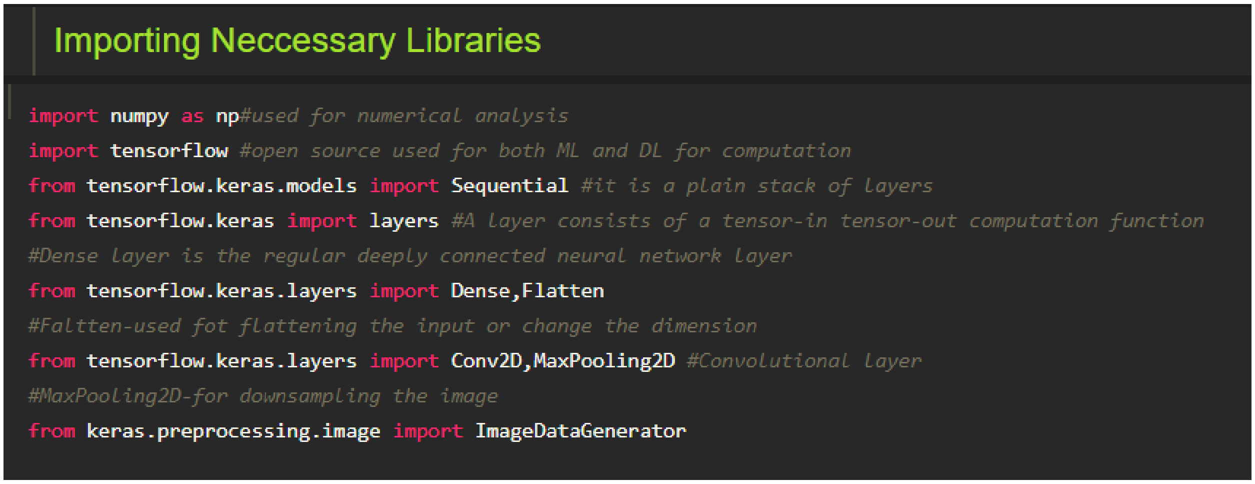


Item type: JPG File
Rating: Unrated
Dimensions: 310 x 310
Size: 5.32 KB

MODEL BUILDING:

Model building involves a chain of tasks to be completed like

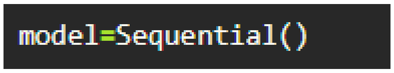
1. Importing model building libraries



Importing Neccessary Libraries

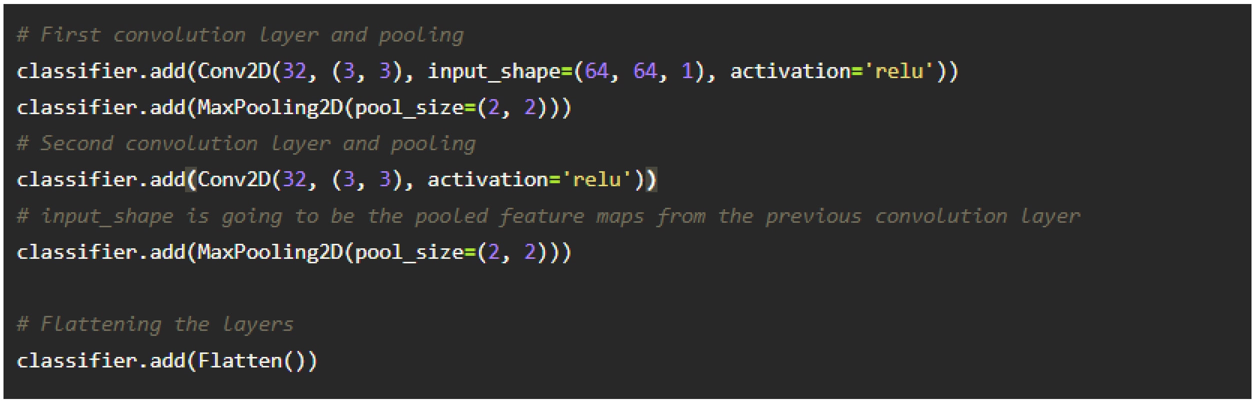
```
import numpy as np#used for numerical analysis
import tensorflow #open source used for both ML and DL for computation
from tensorflow.keras.models import Sequential #it is a plain stack of layers
from tensorflow.keras import layers #A layer consists of a tensor-in tensor-out computation function
#Dense layer is the regular deeply connected neural network layer
from tensorflow.keras.layers import Dense,Flatten
#Faltten-used fot flattening the input or change the dimension
from tensorflow.keras.layers import Conv2D,MaxPooling2D #Convolutional layer
#MaxPooling2D-for downsampling the image
from keras.preprocessing.image import ImageDataGenerator
```

2. Initializing the model



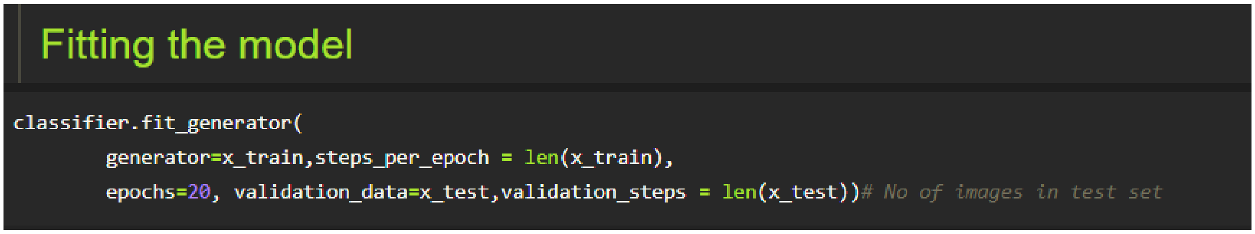
```
model=Sequential()
```

3. Adding CNN layers



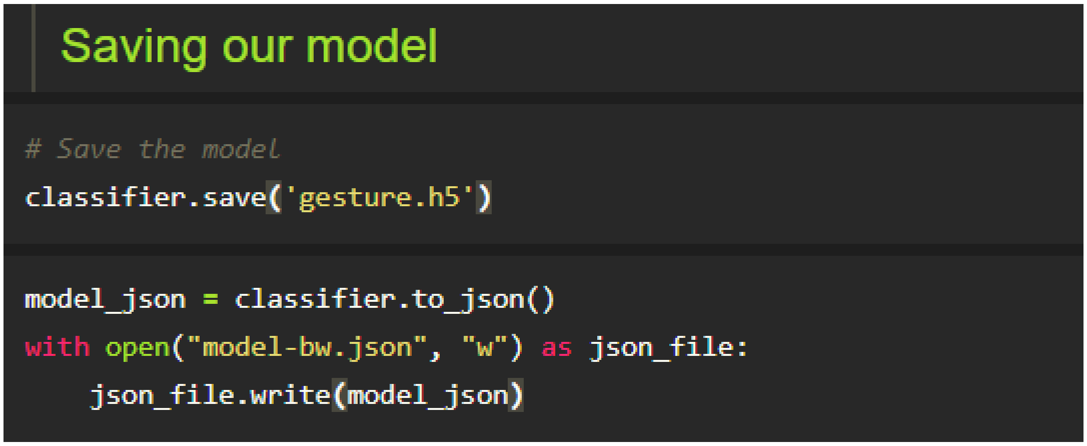
```
# First convolution layer and pooling
classifier.add(Conv2D(32, (3, 3), input_shape=(64, 64, 1), activation='relu'))
classifier.add(MaxPooling2D(pool_size=(2, 2)))
# Second convolution layer and pooling
classifier.add(Conv2D(32, (3, 3), activation='relu'))
# input_shape is going to be the pooled feature maps from the previous convolution layer
classifier.add(MaxPooling2D(pool_size=(2, 2)))

# Flattening the layers
classifier.add(Flatten())
```

4. Train, save and test the model



Fitting the model

```
classifier.fit_generator(
        generator=x_train,steps_per_epoch = len(x_train),
        epochs=20, validation_data=x_test,validation_steps = len(x_test))# No of images in test set
```

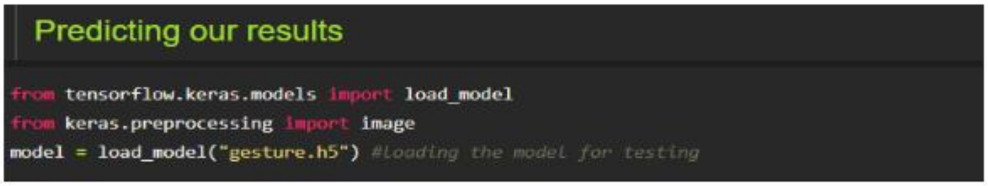


Saving our model

```
# Save the model
classifier.save('gesture.h5')
```

```
model_json = classifier.to_json()
with open("model-bw.json", "w") as json_file:
    json_file.write(model_json)
```

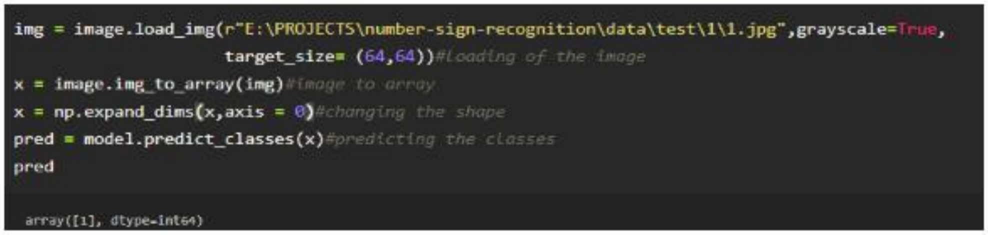
Load the saved model using load_model



Predicting our results

```
from tensorflow.keras.models import load_model
from keras.preprocessing import image
model = load_model("gesture.h5") #Loading the model for testing
```

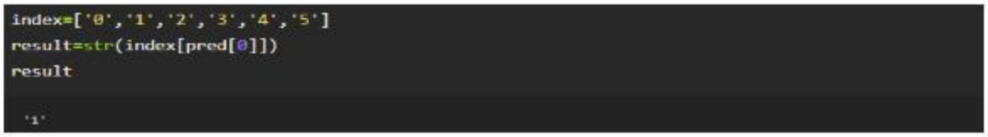
Taking an image as input and checking the results



```
img = image.load_img(r"E:\PROJECTS\number-sign-recognition\data\test\1\1.jpg",grayscale=True,
                     target_size= (64,64))#Loading of the image
x = image.img_to_array(img)#image to array
x = np.expand_dims(x,axis = 0)#changing the shape
pred = model.predict_classes(x)#predicting the classes
pred
```

```
array([1], dtype=int64)
```

By using the model we are predicting the output for the given input image



```
index=['0','1','2','3','4','5']
result=str(index[pred[0]])
result
```

```
'1'
```

The predicted class index name will be printed here.