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In [ ]: #####IMPORTING LIBRARIES

In [ ]: import os  
import cv2  
import numpy as np  
import matplotlib.pyplot as plt  
from keras.preprocessing.image import ImageDataGenerator

Define DATA FILES

In [ ]: def rename\_imgs(file\_name):  
folder\_path = r'test\_dataset/'+file\_name  
  
num = 0  
for file in os.listdir(folder\_path):  
# if num%10 == 0:  
# print(f'Renamed {num} files...')  
# os.rename(folder\_path+'\\'+file, folder\_path+'\\'+file\_name+'\_'+str(num)+'.jpeg')  
num += 1

In [ ]: fn = 'Space'  
rename\_imgs(fn)

In [ ]: # ...

```
for file in os.listdir(folder_path):
    # if num%10 == 0:
    #     print(f'Renamed {num} files...')
    # os.rename(folder_path+'\\'+file, folder_path+'\\'+file_name+'_'+str(num)+'.jpeg')
    num += 1
```

```
In [ ]: fn = 'Space'
         rename_imgs(fn)
```

```
In [ ]: file_names = '0123456789'+ 'ABCDEFGHIJKLMN OPQRSTUVWXYZ'
for fn in file_names:
    rename_imgs(fn)
```

### SAMPLE IMAGES FROM DATASET

```
In [ ]: train_data_path = 'train_dataset/'
        test_data_path = 'test_dataset/'
```

```
In [ ]: def display(img,sign=None):  
  
    img = cv2.cvtColor(img,cv2.COLOR_BGR2RGB)  
    fig = plt.figure(figsize=(7,7))  
    ax = fig.add_subplot(111)  
    plt.title(sign)  
    ax.imshow(img)
```

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Run


Format

Code

Training Data Set

```
In [ ]: sign_img = cv2.imread(train_data_path+'A/A_204.jpeg')
display(sign_img,'A')
```

A



A low-resolution, pixelated image of a hand showing the number 3. The hand is dark, and the background is a light, textured gray. The image is labeled with a '3' at the top center and a vertical axis on the left with values 0, 10, 20, 30, and 40.

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Train Data Generator

In [ ]: train\_data\_gen = image\_gen.flow\_from\_directory(train\_data\_path, target\_size=(250,250), batch\_size=16, shuffle=True, class\_mode='binary', subset='training')

Found 41625 images belonging to 37 classes.

Validation Data Generator

In [ ]: validation\_data\_gen = image\_gen.flow\_from\_directory(train\_data\_path, target\_size=(250,250), batch\_size=16, shuffle=True, class\_mode='binary', subset='validation')

Found 13875 images belonging to 37 classes.

Test Data Generator

In [ ]: test\_data\_gen = image\_gen.flow\_from\_directory(test\_data\_path