

# DATA COLLECTION AND PREPROCESSING

## ▼ Nutrition Image Analysis using CNN

```
!unzip '/content/Dataset-Fruit.zip'
```

inflatng: Dataset/TEST\_SET/APPLES/n07740461\_12841.jpg  
inflatng: Dataset/TEST\_SET/APPLES/n07740461\_12010.jpg  
inflatng: Dataset/TEST\_SET/APPLES/n07740461\_14600.jpg  
inflatng: Dataset/TRAIN\_SET/APPLES/n07740461\_9294.jpg  
inflatng: Dataset/TEST\_SET/APPLES/n07740461\_13931.jpg  
inflatng: Dataset/TEST\_SET/APPLES/n07740461\_12071.jpg  
inflatng: Dataset/TRAIN\_SET/APPLES/n07740461\_9816.jpg  
inflatng: Dataset/TRAIN\_SET/APPLES/n07740461\_9813.jpg  
inflatng: Dataset/TRAIN\_SET/APPLES/n07740461\_9636.jpg  
inflatng: Dataset/TEST\_SET/APPLES/n07740461\_13800.jpg  
inflatng: Dataset/TRAIN\_SET/APPLES/n07740461\_9756.jpg  
inflatng: Dataset/TEST\_SET/APPLES/n07740461\_14211.jpg  
inflatng: Dataset/TRAIN\_SET/APPLES/n07740461\_9582.jpg  
inflatng: Dataset/TEST\_SET/APPLES/n07740461\_12121.jpg  
inflatng: Dataset/TRAIN\_SET/APPLES/n07740461\_958.jpg  
inflatng: Dataset/TEST\_SET/APPLES/n07740461\_12990.jpg  
inflatng: Dataset/TRAIN\_SET/APPLES/n07740461\_9268.jpg  
inflatng: Dataset/TEST\_SET/APPLES/n07740461\_12930.jpg  
inflatng: Dataset/TRAIN\_SET/APPLES/n07740461\_9172.jpg  
inflatng: Dataset/TRAIN\_SET/APPLES/n07740461\_8842.jpg  
inflatng: Dataset/TEST\_SET/APPLES/n07740461\_12101.jpg  
inflatng: Dataset/TRAIN\_SET/APPLES/n07740461\_8689.jpg  
inflatng: Dataset/TEST\_SET/APPLES/n07740461\_14501.jpg  
inflatng: Dataset/TRAIN\_SET/APPLES/n07740461\_9944.jpg  
inflatng: Dataset/TEST\_SET/APPLES/n07740461\_14300.jpg  
inflatng: Dataset/TEST\_SET/APPLES/n07740461\_14721.jpg  
inflatng: Dataset/TEST\_SET/APPLES/n07740461\_14450.jpg  
inflatng: Dataset/TRAIN\_SET/APPLES/n07740461\_9067.jpg  
inflatng: Dataset/TEST\_SET/APPLES/n07740461\_13950.jpg  
inflatng: Dataset/TEST\_SET/APPLES/n07740461\_11910.jpg  
inflatng: Dataset/TRAIN\_SET/APPLES/n07740461\_9.jpg  
inflatng: Dataset/TRAIN\_SET/APPLES/n07740461\_8774.jpg  
inflatng: Dataset/TRAIN\_SET/APPLES/n07740461\_9026.jpg  
inflatng: Dataset/TEST\_SET/APPLES/n07740461\_13171.jpg  
inflatng: Dataset/TEST\_SET/APPLES/n07740461\_14570.jpg  
inflatng: Dataset/TEST\_SET/APPLES/n07740461\_1261.jpg  
inflatng: Dataset/TRAIN\_SET/APPLES/n07740461\_9157.jpg  
inflatng: Dataset/TEST\_SET/APPLES/n07740461\_13580.jpg  
inflatng: Dataset/TEST\_SET/APPLES/n07740461\_12300.jpg  
inflatng: Dataset/TRAIN\_SET/APPLES/n07740461\_8649.jpg  
inflatng: Dataset/TEST\_SET/APPLES/n07740461\_12350.jpg  
inflatng: Dataset/TRAIN\_SET/APPLES/n07740461\_8617.jpg  
inflatng: Dataset/TRAIN\_SET/APPLES/n07740461\_904.jpg  
inflatng: Dataset/TEST\_SET/APPLES/n07740461\_14510.jpg  
inflatng: Dataset/TRAIN\_SET/APPLES/n07740461\_8764.jpg  
inflatng: Dataset/TEST\_SET/APPLES/n07740461\_13030.jpg  
inflatng: Dataset/TRAIN\_SET/APPLES/n07740461\_862.jpg  
inflatng: Dataset/TEST SET/APPLES/n07740461\_1191.png

```

inflatng: Dataset/TEST_SET/APPLES/n07740461_13390.jpg
inflatng: Dataset/TEST_SET/APPLES/n07740461_11871.jpg
inflatng: Dataset/TRAIN_SET/APPLES/n07740461_9129.jpg
inflatng: Dataset/TEST_SET/APPLES/n07740461_111.jpg
inflatng: Dataset/TRAIN_SET/APPLES/n07740461_8834.jpg
inflatng: Dataset/TRAIN_SET/APPLES/n07740461_9074.jpg
inflatng: Dataset/TRAIN_SET/APPLES/n07740461_8915.jpg
inflatng: Dataset/TEST_SET/APPLES/n07740461_12360.jpg
inflatng: Dataset/TRAIN_SET/APPLES/n07740461_9092.jpg
inflatng: Dataset/TRAIN_SET/APPLES/n07740461_9023.jpg

```

## ▼ 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
#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,Dropout #Convolutional layer
#MaxPooling2D-for downsampling the image
from keras.preprocessing.image import ImageDataGenerator

```

## ▼ Image Data Agumentation

```

#setting parameter for Image Data agumentation to the training data
train_datagen = ImageDataGenerator(rescale=1./255,shear_range=0.2,zoom_range=0.2,horizontal_
#Image Data agumentation to the testing data
test_datagen=ImageDataGenerator(rescale=1./255)

```

## ▼ Loading our data and performing data agumentation

```

#performing data agumentation to train data
x_train = train_datagen.flow_from_directory(
    r'/content/Dataset/TRAIN_SET',
    target_size=(64, 64),batch_size=5,color_mode='rgb',class_mode='sparse')
#performing data agumentation to test data
x_test = test_datagen.flow_from_directory(
    r'/content/Dataset/TEST_SET',
    target_size=(64, 64),batch_size=5,color_mode='rgb',class_mode='sparse')

```

```

Found 4118 images belonging to 5 classes.
Found 1500 images belonging to 5 classes.

```

```

print(x_train.class_indices)#checking the number of classes

```

```
{'APPLES': 0, 'BANANA': 1, 'ORANGE': 2, 'PINEAPPLE': 3, 'WATERMELON': 4}
```

```
print(x_test.class_indices)#checking the number of classes
```

```
{'APPLES': 0, 'BANANA': 1, 'ORANGE': 2, 'PINEAPPLE': 3, 'WATERMELON': 4}
```

```
from collections import Counter as c  
c(x_train .labels)
```

```
Counter({0: 995, 1: 1354, 2: 1019, 3: 275, 4: 475})
```

```
from collections import Counter as c  
c(x_test .labels)
```

```
Counter({0: 266, 1: 415, 2: 248, 3: 224, 4: 347})
```

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