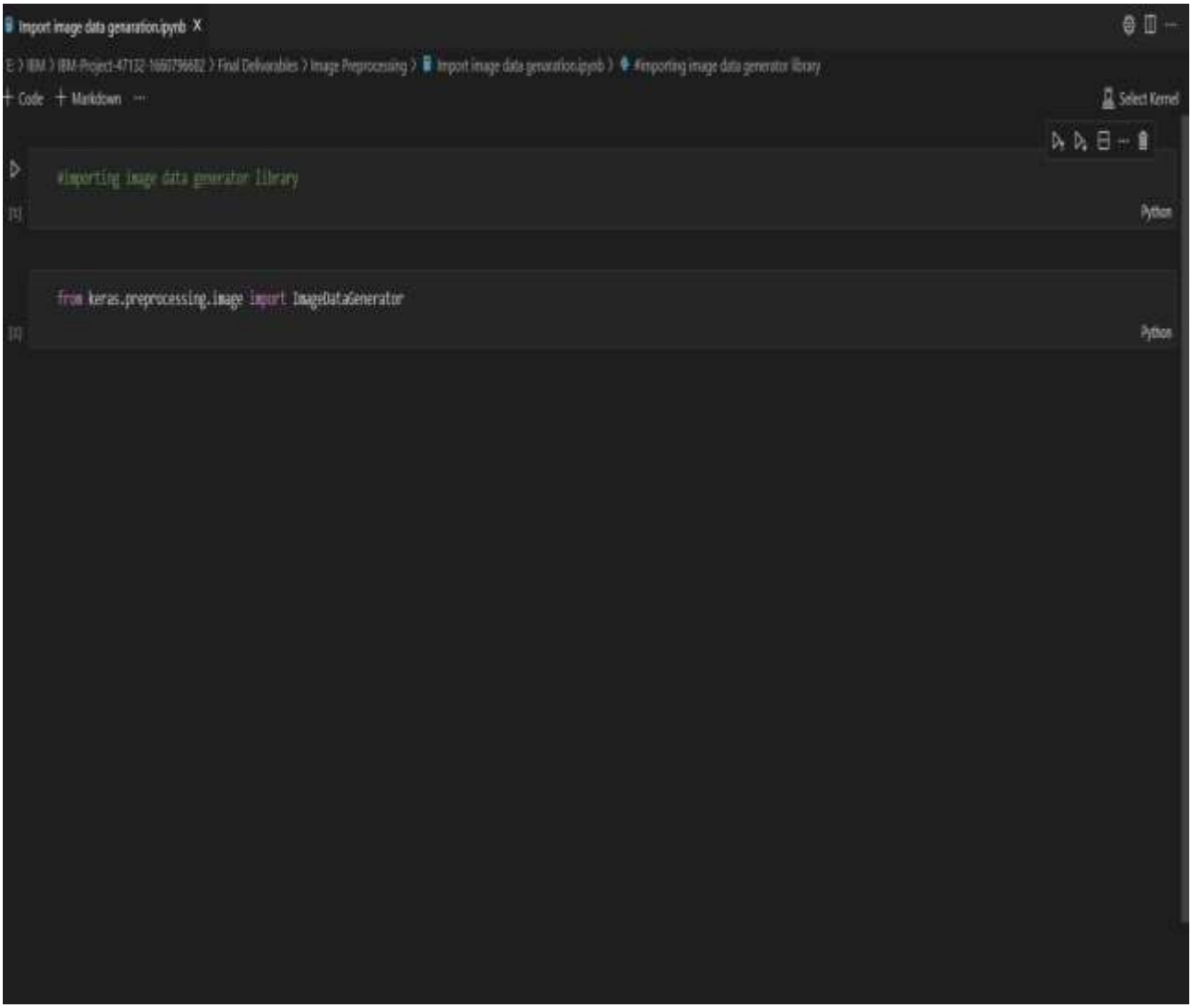
Sprint 2

Team ID	PNT2022TMID47240
Project Name	Natural Disasters Intensity Analysis and Classification using Artificial Intelligence
Maximum Marks	20 Marks

Image Processing:

Image data augmentation is a technique that can be used to artificially expand the size of a training dataset by creating modified versions of images in the dataset.

The Keras deep learning neural network library provides the capability to fit models using image data augmentation via the Image Data Generator class .Let us import the Image Data Generator class from Keras.



□ Configure image Data Generator class□

Image Data Generator class is instantiated and the configuration for the types of data augmentation

There are five main types of data augmentation techniques for image data; specifically:

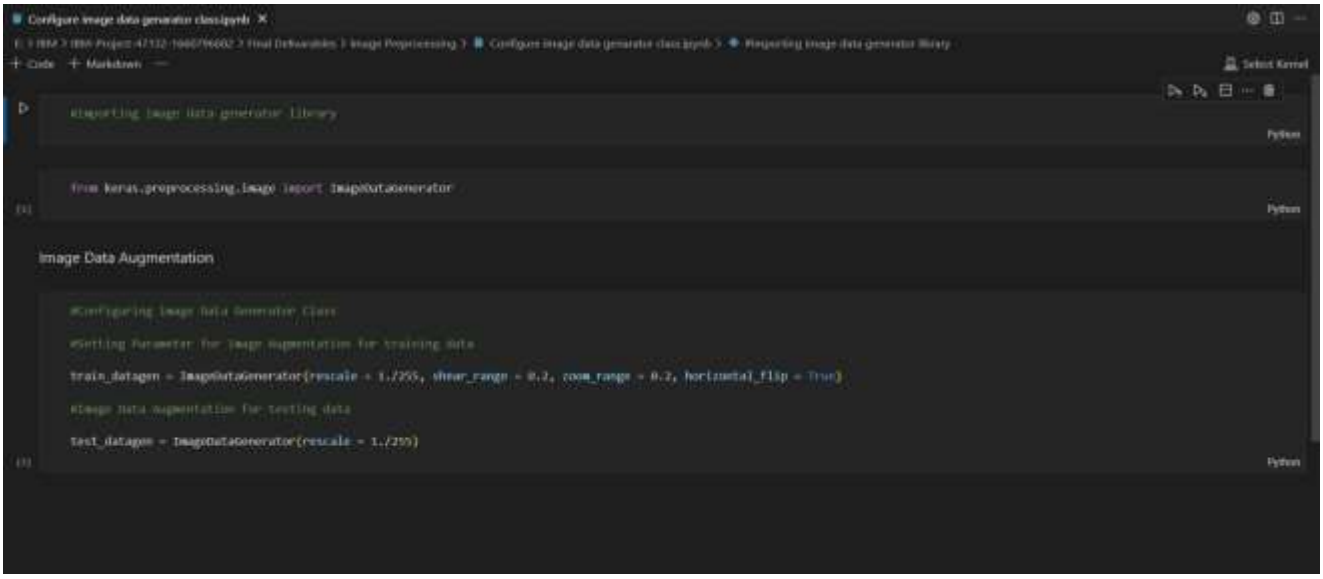
Image shifts via the width shift range and height shift range arguments.

The image flips via the horizontal flip and vertical flip arguments.

Image rotations via the rotation range argument

Image brightness via the brightness range argument.

An instance of the Image Data Generator class can be constructed for train and test.



✅ Apply Image Data Generator Functionality to Trainset and Test set✅

Let us apply Image Data Generator functionality to Trainset and Test set by using the following code

For Training set using flow from directory function.

This function will return batches of images from the subdirectories Cyclone, Earthquake, Flood, Wildfire together with labels 0 to 3{Cyclone: 0, Earthquake: 1, Flood: 2, Wildfire: 3}

In [11]:

```
#extract zip file

!unzip '/content/drive/MyDrive/dataset.zip'
```

```
Archive:  /content/drive/MyDrive/dataset.zip
  inflating: dataset/readme.txt
   creating: dataset/test_set/
   creating: dataset/test_set/Cyclone/
  inflating: dataset/test_set/Cyclone/867.jpg
  inflating: dataset/test_set/Cyclone/868.jpg
  inflating: dataset/test_set/Cyclone/869.jpg
  inflating: dataset/test_set/Cyclone/870.jpg
  inflating: dataset/test_set/Cyclone/871.jpg
  inflating: dataset/test_set/Cyclone/872.jpg
  inflating: dataset/test_set/Cyclone/873.jpg
  inflating: dataset/test_set/Cyclone/874.jpg
  inflating: dataset/test_set/Cyclone/875.jpg
  inflating: dataset/test_set/Cyclone/876.jpg
  inflating: dataset/test_set/Cyclone/877.jpg
  inflating: dataset/test_set/Cyclone/878.jpg
  inflating: dataset/test_set/Cyclone/879.jpg
  inflating: dataset/test_set/Cyclone/880.jpg
  inflating: dataset/test_set/Cyclone/881.jpg
  inflating: dataset/test_set/Cyclone/882.jpg
  inflating: dataset/test_set/Cyclone/883.jpg
  inflating: dataset/test_set/Cyclone/884.jpg
  inflating: dataset/test_set/Cyclone/885.jpg
  inflating: dataset/test_set/Cyclone/886.jpg
  inflating: dataset/test_set/Cyclone/887.jpg
  inflating: dataset/test_set/Cyclone/888.jpg
  inflating: dataset/test_set/Cyclone/889.jpg
  inflating: dataset/test_set/Cyclone/890.jpg
  inflating: dataset/test_set/Cyclone/891.jpg
  inflating: dataset/test_set/Cyclone/892.jpg
  inflating: dataset/test_set/Cyclone/893.jpg
  inflating: dataset/test_set/Cyclone/894.jpg
  inflating: dataset/test_set/Cyclone/895.jpg
  inflating: dataset/test_set/Cyclone/896.jpg
  inflating: dataset/test_set/Cyclone/897.jpg
  inflating: dataset/test_set/Cyclone/898.jpg
  inflating: dataset/test_set/Cyclone/899.jpg
  inflating: dataset/test_set/Cyclone/900.jpg
  inflating: dataset/train_set/Cyclone/216.jpg
  inflating: dataset/train_set/Cyclone/217.jpg
  inflating: dataset/train_set/Cyclone/218.jpg
  inflating: dataset/train_set/Cyclone/219.jpg
  inflating: dataset/train_set/Cyclone/22.jpg
  inflating: dataset/train_set/Cyclone/220.jpg
  inflating: dataset/train_set/Cyclone/221.jpg
  inflating: dataset/train_set/Cyclone/222.jpg
  inflating: dataset/train_set/Cyclone/223.jpg
  inflating: dataset/train_set/Cyclone/224.jpg
  inflating: dataset/train_set/Cyclone/225.jpg
  inflating: dataset/train_set/Cyclone/226.jpg
  inflating: dataset/train_set/Cyclone/227.jpg
  inflating: dataset/train_set/Cyclone/228.jpg
  inflating: dataset/train_set/Cyclone/229.jpg
  inflating: dataset/train_set/Cyclone/23.jpg
  inflating: dataset/train_set/Cyclone/230.jpg
  inflating: dataset/train_set/Cyclone/231.jpg
  inflating: dataset/train_set/Cyclone/232.jpg
  inflating: dataset/train_set/Cyclone/24.jpg
  inflating: dataset/train_set/Cyclone/25.jpg
  inflating: dataset/train_set/Cyclone/26.jpg
  inflating: dataset/train_set/Cyclone/27.jpg
  inflating: dataset/train_set/Cyclone/28.jpg
  inflating: dataset/train_set/Cyclone/29.jpg
  inflating: dataset/train_set/Cyclone/3.jpg
  inflating: dataset/train_set/Cyclone/30.jpg
  inflating: dataset/train_set/Cyclone/31.jpg
  inflating: dataset/train_set/Cyclone/32.jpg
  inflating: dataset/train_set/Cyclone/33.jpg
  inflating: dataset/train_set/Cyclone/34.jpg
  inflating: dataset/train_set/Cyclone/35.jpg
  inflating: dataset/train_set/Cyclone/36.jpg
  inflating: dataset/train_set/Cyclone/37.jpg
  inflating: dataset/train_set/Cyclone/38.jpg
  inflating: dataset/train_set/Cyclone/39.jpg
  inflating: dataset/train_set/Cyclone/4.jpg
  inflating: dataset/train_set/Cyclone/40.jpg
  inflating: dataset/train_set/Cyclone/41.jpg
  inflating: dataset/train_set/Cyclone/42.jpg
  inflating: dataset/train_set/Cyclone/43.jpg
  inflating: dataset/train_set/Cyclone/44.jpg
  inflating: dataset/train_set/Cyclone/45.jpg
  inflating: dataset/train_set/Cyclone/46.jpg
  inflating: dataset/train_set/Cyclone/47.jpg
  inflating: dataset/train_set/Cyclone/48.jpg
```

```
inflating: dataset/train_set/Flood/4.jpg
inflating: dataset/train_set/Flood/40.jpg
inflating: dataset/train_set/Flood/41.jpg
inflating: dataset/train_set/Flood/42.jpg
inflating: dataset/train_set/Flood/43.jpg
inflating: dataset/train_set/Flood/44.jpg
inflating: dataset/train_set/Flood/45.jpg
inflating: dataset/train_set/Flood/46.jpg
inflating: dataset/train_set/Flood/47.jpg
inflating: dataset/train_set/Flood/48.jpg
inflating: dataset/train_set/Flood/49.jpg
inflating: dataset/train_set/Flood/5.jpg
inflating: dataset/train_set/Flood/50.jpg
inflating: dataset/train_set/Flood/51.jpg
inflating: dataset/train_set/Flood/52.jpg
inflating: dataset/train_set/Flood/53.jpg
inflating: dataset/train_set/Flood/54.jpg
inflating: dataset/train_set/Flood/55.jpg
inflating: dataset/train_set/Flood/56.jpg
inflating: dataset/train_set/Flood/57.jpg
inflating: dataset/train_set/Flood/58.jpg
inflating: dataset/train_set/Flood/59.jpg
inflating: dataset/train_set/Flood/6.jpg
inflating: dataset/train_set/Flood/60.jpg
inflating: dataset/train_set/Flood/61.jpg
inflating: dataset/train_set/Flood/62.jpg
inflating: dataset/train_set/Flood/63.jpg
inflating: dataset/train_set/Flood/64.jpg
inflating: dataset/train_set/Flood/65.jpg
inflating: dataset/train_set/Flood/66.jpg
inflating: dataset/train_set/Flood/67.jpg
inflating: dataset/train_set/Flood/68.jpg
inflating: dataset/train_set/Flood/69.jpg
inflating: dataset/train_set/Flood/7.jpg
inflating: dataset/train_set/Flood/70.jpg
inflating: dataset/train_set/Flood/71.jpg
inflating: dataset/train_set/Flood/72.jpg
inflating: dataset/train_set/Flood/73.jpg
inflating: dataset/train_set/Flood/74.jpg
inflating: dataset/train_set/Flood/75.jpg
inflating: dataset/train_set/Flood/76.jpg
inflating: dataset/train_set/Flood/77.jpg
inflating: dataset/train_set/Flood/78.jpg
inflating: dataset/train_set/Flood/79.jpg
inflating: dataset/train_set/Flood/8.jpg
inflating: dataset/train_set/Flood/80.jpg
```

```
inflating: dataset/train_set/Wildfire/97.jpg
inflating: dataset/train_set/Wildfire/98.jpg
inflating: dataset/train_set/Wildfire/99.jpg
```

In [16]:
```
#importing image data generator library
```

In [17]:
```
from keras.preprocessing.image import ImageDataGenerator
```

Image Data Augmentation

In [18]:
```
#Configuring Image Data Generator Class

#Setting Parameter for Image Augmentation for training data

train_datagen = ImageDataGenerator(rescale = 1./255, shear_range = 0.2, zoom_range = 0.2, horizontal_flip = True)

#Image Data Augmentation for testing data

test_datagen = ImageDataGenerator(rescale = 1./255)
```

Apply ImageDataGenerator Functionality To Trainset And Testset

In [19]:
```
#Performing data augmentation to train data

x_train = train_datagen.flow_from_directory('/content/drive/MyDrive/dataset/dataset/train_set', target_size = (64,64), batch_size = 5, color_mode = 'r

#performing data augmentation to test data

x_test = test_datagen.flow_from_directory('/content/drive/MyDrive/dataset/dataset/test_set', target_size = (64,64), batch_size = 5, color_mode = 'rgb'
```

```
Found 742 images belonging to 4 classes.
Found 198 images belonging to 4 classes.
```