Project Development Phase

Delivery of Sprint 1

Date	11 November 2022
Team ID	PNT2022TMID16980
Project Name	Classification of Arrhythmia by Using Deep Learning with 2-D ECG Spectral Image Representation

Task 1:

Download the dataset:

The dataset has been downloaded and the drive link is given

https://drive.google.com/drive/folders/1h_v0ja8sMe4FbeYO85fGH7Zgsa2UTOHG?usp=share_link

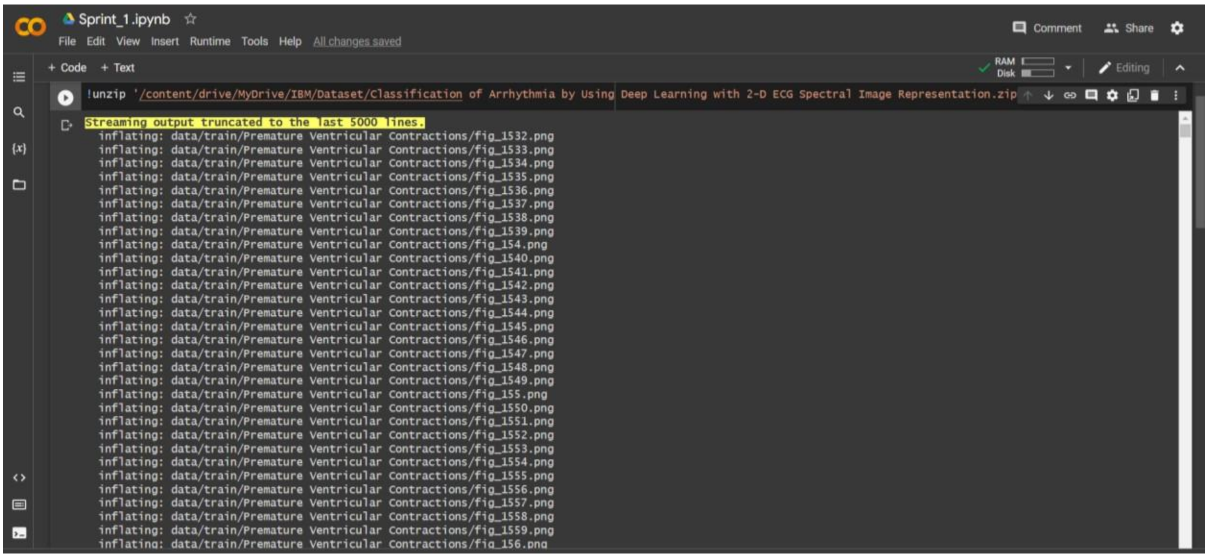
Run the dataset (Unzipping the dataset):

Code:

```
#UNZIPPING THE DATASET

!unzip '/content/drive/MyDrive/IBM/Dataset/Classification of Arrhythmia
 by Using Deep Learning with 2-D ECG Spectral Image Representation.zip'
```

Output:



```
!unzip '/content/drive/MyDrive/IBM/Dataset/Classification of Arrhythmia by Using Deep Learning with 2-D ECG Spectral Image Representation.zip
```

```
Streaming output truncated to the last 5000 lines.
  inflating: data/train/Premature Ventricular Contractions/fig_1532.png
  inflating: data/train/Premature Ventricular Contractions/fig_1533.png
  inflating: data/train/Premature Ventricular Contractions/fig_1534.png
  inflating: data/train/Premature Ventricular Contractions/fig_1535.png
  inflating: data/train/Premature Ventricular Contractions/fig_1536.png
  inflating: data/train/Premature Ventricular Contractions/fig_1537.png
  inflating: data/train/Premature Ventricular Contractions/fig_1538.png
  inflating: data/train/Premature Ventricular Contractions/fig_1539.png
  inflating: data/train/Premature Ventricular Contractions/fig_154.png
  inflating: data/train/Premature Ventricular Contractions/fig_1540.png
  inflating: data/train/Premature Ventricular Contractions/fig_1541.png
  inflating: data/train/Premature Ventricular Contractions/fig_1542.png
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  inflating: data/train/Premature Ventricular Contractions/fig_1550.png
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  inflating: data/train/Premature Ventricular Contractions/fig_1557.png
  inflating: data/train/Premature Ventricular Contractions/fig_1558.png
  inflating: data/train/Premature Ventricular Contractions/fig_1559.png
  inflating: data/train/Premature Ventricular Contractions/fig_156.png
```

Task 2:

Image Preprocessing:

Import ImageDataGenerator Library:

Code:

```
#IMPORTING THE IMAGEDATAGENERATOR LIBRARY

from keras.preprocessing.image import ImageDataGenerator
```

Configure ImageDataGenerator class:

Code:

```
#SETTING PARAMETER FOR IMAGE DATA AUGMENTATION TO THE TRAINING DATA

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

#IMAGE DATA AUGMENTATION TO THE TESTING DATA

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

Apply ImageDataGenerator Functionality to Trainset and Testset:

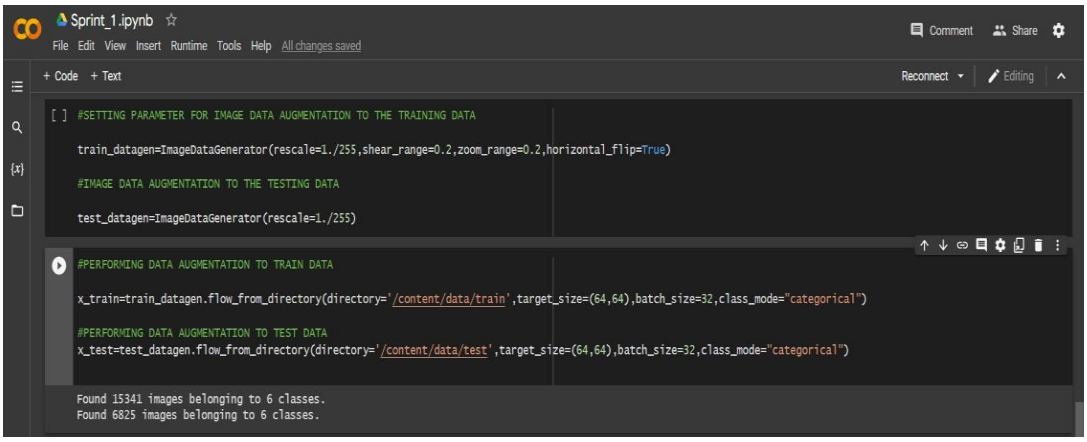
Code:

```
#PERFORMING DATA AUGMENTATION TO TRAIN DATA

x_train=train_datagen.flow_from_directory(directory='/content/data/train',target_size=(64,64),batch_size=32,class_mode="categorical")

#PERFORMING DATA AUGMENTATION TO TEST DATA
x_test=test_datagen.flow_from_directory(directory='/content/data/test',target_size=(64,64),batch_size=32,class_mode="categorical")
```

Output:



```
[ ] #SETTING PARAMETER FOR IMAGE DATA AUGMENTATION TO THE TRAINING DATA

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

    #IMAGE DATA AUGMENTATION TO THE TESTING DATA

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

```
#PERFORMING DATA AUGMENTATION TO TRAIN DATA

x_train=train_datagen.flow_from_directory(directory='/content/data/train',target_size=(64,64),batch_size=32,class_mode="categorical")

#PERFORMING DATA AUGMENTATION TO TEST DATA
x_test=test_datagen.flow_from_directory(directory='/content/data/test',target_size=(64,64),batch_size=32,class_mode="categorical")
```

```
Found 15341 images belonging to 6 classes.
Found 6825 images belonging to 6 classes.
```

Task 3:

Model Building:

Import Libraries:

Code:

```
#IMPORTING 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 Tensor-in Tensor-out computation function

#DENSE LAYER IS THE REGULAR DEEPLY CONNECTED NURAL NETWORK LAYER

from tensorflow.keras.layers import Dense,Flatten

# FLATTEN-USED FOR FLATTENING THE INPUT OR CHANGE THE DIRECTION

from tensorflow.keras.layers import Conv2D,MaxPooling2D #convolution Layer
```

Initialize Model:

Code:

```
#INITIALIZING MODEL

model=Sequential()
```