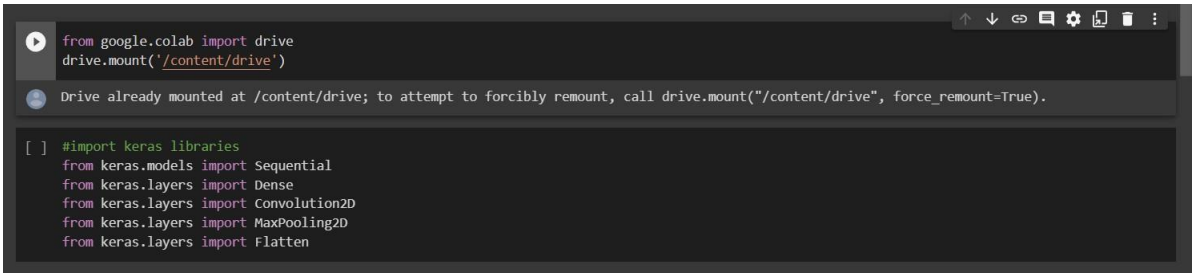
Project Development Phase

Sprint – 3

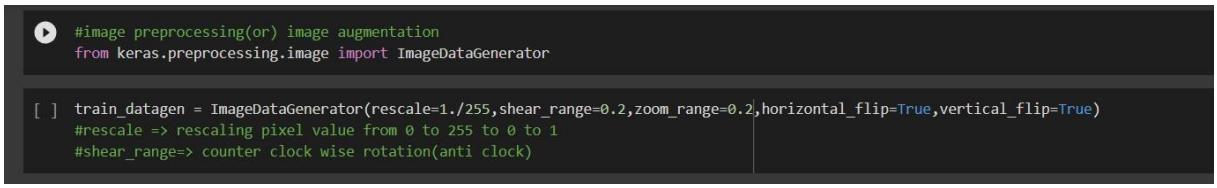
Date	11 November 2022
Team ID	PNT2022TMID13978
Project Name	AI-powered Nutrition Analyzer for Fitness Enthusiasts



```
from google.colab import drive
drive.mount('/content/drive')
```

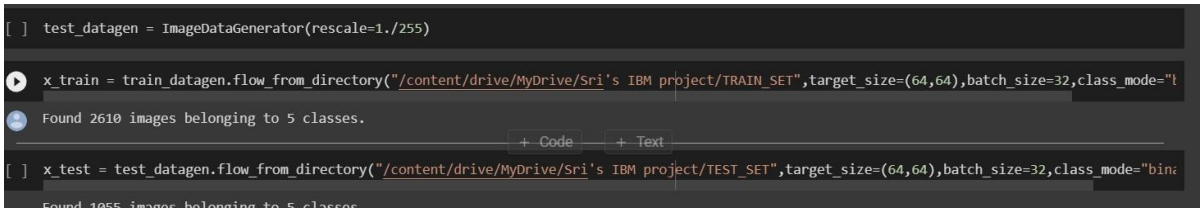
```
Drive already mounted at /content/drive; to attempt to forcibly remount, call drive.mount("/content/drive", force_remount=True).
```

```
[ ] #import keras libraries
    from keras.models import Sequential
    from keras.layers import Dense
    from keras.layers import Convolution2D
    from keras.layers import MaxPooling2D
    from keras.layers import Flatten
```



```
#image preprocessing(or) image augmentation
from keras.preprocessing.image import ImageDataGenerator
```

```
[ ] train_datagen = ImageDataGenerator(rescale=1./255,shear_range=0.2,zoom_range=0.2,horizontal_flip=True,vertical_flip=True)
    #rescale => rescaling pixel value from 0 to 255 to 0 to 1
    #shear_range=> counter clock wise rotation(anti clock)
```



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

```
x_train = train_datagen.flow_from_directory("/content/drive/MyDrive/Sri's IBM project/TRAIN_SET",target_size=(64,64),batch_size=32,class_mode="b
```

```
Found 2610 images belonging to 5 classes.
```

```
+ Code  + Text
```

```
[ ] x_test = test_datagen.flow_from_directory("/content/drive/MyDrive/Sri's IBM project/TEST_SET",target_size=(64,64),batch_size=32,class_mode="bina
```

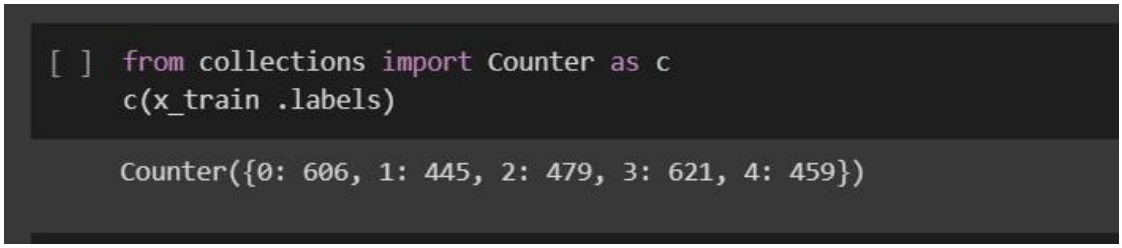
```
Found 1055 images belonging to 5 classes.
```

```
[ ] x_test = test_datagen.flow_from_directory("/content/drive/MyDrive/Sri's IBM project/TEST_SET",target_size=(64,64),batch_size=32,class_mode="bina
```

```
Found 1055 images belonging to 5 classes.
```

```
[ ] x_train.class_indices
```

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



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

```
Counter({0: 606, 1: 445, 2: 479, 3: 621, 4: 459})
```

```
[ ] #Initializing the model
    model = Sequential()
```

```
    # add First convolution layer
    model.add(Convolution2D(32,(3,3),input_shape=(64,64,3),activation="relu"))
    # 32 indicates => no of feature detectors
    #(3,3)=> kernel size (feature detector size)
```

```
[ ] # add Maxpooling layer
    model.add(MaxPooling2D(pool_size=(2,2)))
```

```
[ ] #Second convolution layer and pooling
    model.add(Convolution2D(32,(3,3),activation='relu'))
```

```
[ ] model.add(MaxPooling2D(pool_size=(2,2)))
    #Flattening the layers
    model.add(Flatten())
    model.add(Dense(units=128,activation='relu'))
    model.add(Dense(units=5,activation='softmax'))
```

```
[ ] # add flatten layer => input to your ANN
    model.add(Flatten())
    model.summary()
```

```
Model: "sequential"
```

```
# add flatten layer => input to your ANN
model.add(Flatten())
model.summary()
```

```
Model: "sequential"
_________________________________________________________________
 Layer (type)                Output Shape              Param #
=================================================================
 conv2d (Conv2D)             (None, 62, 62, 32)        896

 max_pooling2d (MaxPooling2D  (None, 31, 31, 32)       0
 )

 conv2d_1 (Conv2D)           (None, 29, 29, 32)        9248

 max_pooling2d_1 (MaxPooling  (None, 14, 14, 32)       0
 2D)

 flatten (Flatten)           (None, 6272)              0

 dense (Dense)               (None, 128)               802944

 dense_1 (Dense)             (None, 5)                 645

 flatten_1 (Flatten)         (None, 5)                 0

=================================================================
Total params: 813,733
Trainable params: 813,733
Non-trainable params: 0
_________________________________________________________________
```

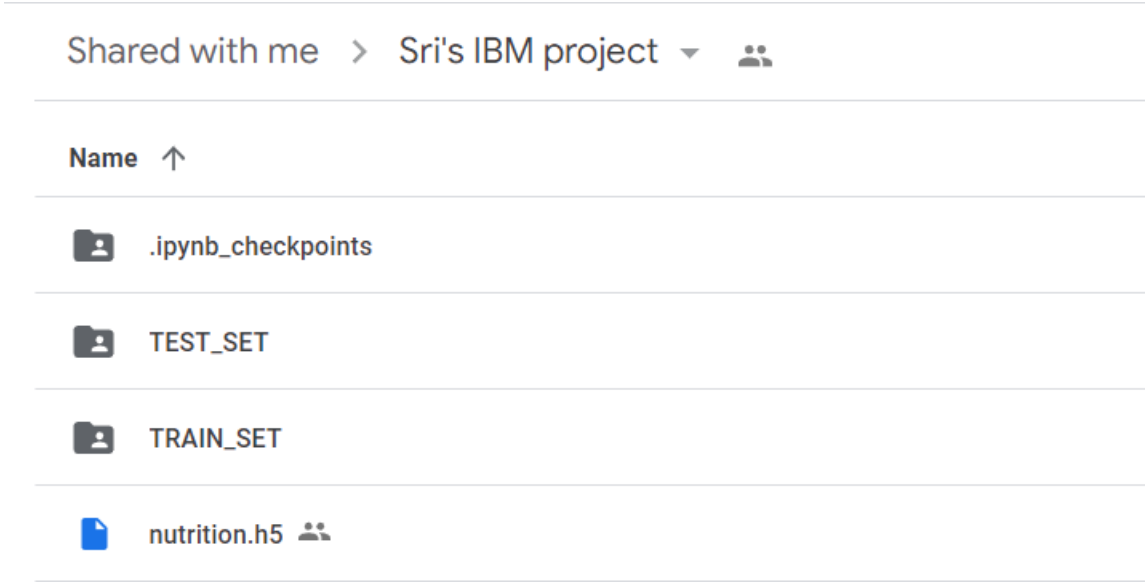
```
[ ]  # adding dense layer
     model.add(Dense(units=300,kernel_initializer="random_uniform",activation="relu"))
     model.add(Dense(units=200,kernel_initializer="random_uniform",activation="relu"))
```

```
[ ]  #output layer
     model.add(Dense(units=4,kernel_initializer="random_uniform",activation="softmax"))
     len(x_train)

     82
```

```
     #Ann starts so need to add dense layers
     model.add(Dense(units=128,activation="relu",kernel_initializer="random_uniform"))
     model.add(Dense(units=1,activation="sigmoid",kernel_initializer="random_uniform"))

     #Compile the model
     model.compile(loss="binary_crossentropy",optimizer="adam",metrics=['accuracy'])
```

```
#Train the model
model.fit_generator(x_train,steps_per_epoch=len(x_train), validation_data=x_test, validation_steps=len(x_test), epochs= 20)

/usr/local/lib/python3.7/dist-packages/ipykernel_launcher.py:2: UserWarning: `Model.fit_generator` is deprecated and will be removed in a future

Epoch 1/20
82/82 [==============================] - 709s 9s/step - loss: 0.1100 - accuracy: 0.1736 - val_loss: -1.0631 - val_accuracy: 0.2720
Epoch 2/20
82/82 [==============================] - 24s 291ms/step - loss: -2.8702 - accuracy: 0.1705 - val_loss: -5.4632 - val_accuracy: 0.2720
Epoch 3/20
82/82 [==============================] - 22s 263ms/step - loss: -8.3526 - accuracy: 0.1705 - val_loss: -12.8106 - val_accuracy: 0.2720
Epoch 4/20
82/82 [==============================] - 24s 288ms/step - loss: -16.9286 - accuracy: 0.1705 - val_loss: -23.7377 - val_accuracy: 0.2720
Epoch 5/20
82/82 [==============================] - 22s 263ms/step - loss: -28.8029 - accuracy: 0.1705 - val_loss: -37.9295 - val_accuracy: 0.2720
Epoch 6/20
82/82 [==============================] - 23s 283ms/step - loss: -44.0002 - accuracy: 0.1705 - val_loss: -55.4858 - val_accuracy: 0.2720
Epoch 7/20
82/82 [==============================] - 22s 264ms/step - loss: -62.2679 - accuracy: 0.1705 - val_loss: -76.4685 - val_accuracy: 0.2720
Epoch 8/20
82/82 [==============================] - 24s 286ms/step - loss: -83.5602 - accuracy: 0.1705 - val_loss: -100.6702 - val_accuracy: 0.2720
Epoch 9/20
82/82 [==============================] - 22s 263ms/step - loss: -107.7657 - accuracy: 0.1705 - val_loss: -127.5378 - val_accuracy: 0.2720
Epoch 10/20
82/82 [==============================] - 21s 256ms/step - loss: -134.6819 - accuracy: 0.1705 - val_loss: -157.5612 - val_accuracy: 0.2720
Epoch 11/20
82/82 [==============================] - 21s 259ms/step - loss: -164.3762 - accuracy: 0.1705 - val_loss: -189.9892 - val_accuracy: 0.2720
Epoch 12/20
82/82 [==============================] - 24s 292ms/step - loss: -196.3868 - accuracy: 0.1705 - val_loss: -225.3566 - val_accuracy: 0.2720
Epoch 13/20
82/82 [==============================] - 22s 265ms/step - loss: -231.1082 - accuracy: 0.1705 - val_loss: -263.1507 - val_accuracy: 0.2720
```

```
[ ]  model.save("/content/drive/MyDrive/Sri's IBM project/nutrition.h5")
```




```
[ ]  #Prediction the result
     from tensorflow.keras.models import load_model
     from keras.preprocessing  import image
     # model =load_model("/content/drive/MyDrive/Sri's IBM project/nutrition.h5")
```

```
import numpy as np
from tensorflow.keras.utils import load_img
from tensorflow.keras.utils import img_to_array
#loading of the image
img = load_img(r'/content/drive/MyDrive/Apple.jpg', grayscale=False,target_size=(64,64))
#image to array
x = img_to_array(img)
#changing the shape
x= np.expand_dims(x,axis = 0)
predict_x=model.predict(x)
classes_x=np.argmax(predict_x,axis = -1)
classes_x
```

```
1/1 [==============================] - 0s 19ms/step
array([0])
```

```
[ ] index=['APPLES', 'BANANA', 'ORANGE', 'PINEAPPLE', 'WATERMELON']
    result=str(index[classes_x[0]])
    result
```

```
'APPLES'
```

sri's_image_classify.ipynb

The output file:

nutrition.h5