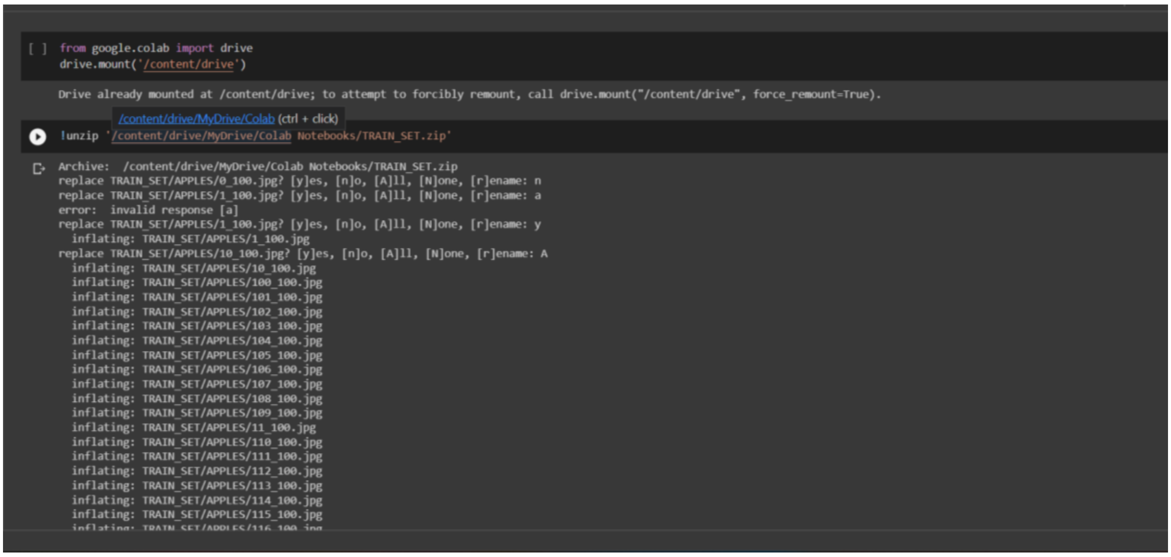
UNZIP THE FILE

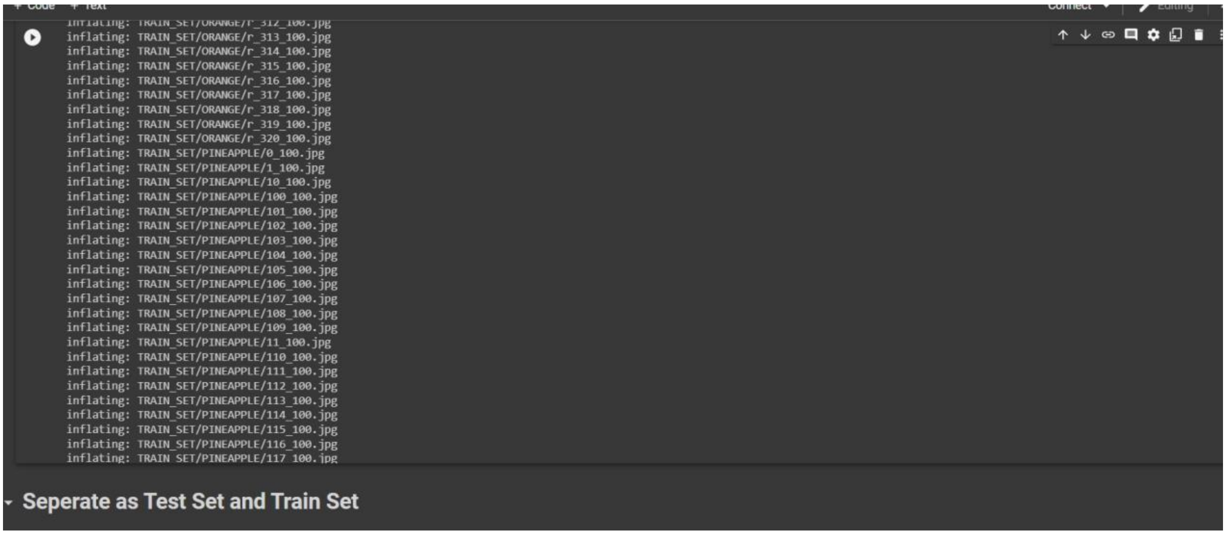


```
from google.colab import drive
drive.mount('/content/drive')
```

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

```
!unzip '/content/drive/MyDrive/Colab Notebooks/TRAIN_SET.zip'
```

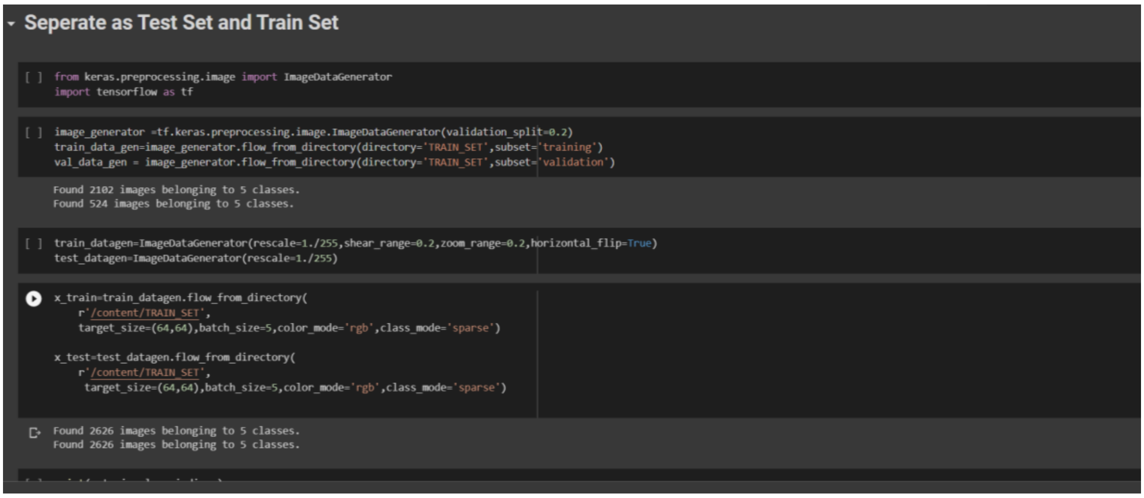
```
Archive:  /content/drive/MyDrive/Colab Notebooks/TRAIN_SET.zip
replace TRAIN_SET/APPLES/0_100.jpg? [y]es, [n]o, [A]ll, [N]one, [r]ename: n
replace TRAIN_SET/APPLES/1_100.jpg? [y]es, [n]o, [A]ll, [N]one, [r]ename: a
error:  invalid response [a]
replace TRAIN_SET/APPLES/1_100.jpg? [y]es, [n]o, [A]ll, [N]one, [r]ename: y
  inflating: TRAIN_SET/APPLES/1_100.jpg
replace TRAIN_SET/APPLES/10_100.jpg? [y]es, [n]o, [A]ll, [N]one, [r]ename: A
  inflating: TRAIN_SET/APPLES/10_100.jpg
  inflating: TRAIN_SET/APPLES/100_100.jpg
  inflating: TRAIN_SET/APPLES/101_100.jpg
  inflating: TRAIN_SET/APPLES/102_100.jpg
  inflating: TRAIN_SET/APPLES/103_100.jpg
  inflating: TRAIN_SET/APPLES/104_100.jpg
  inflating: TRAIN_SET/APPLES/105_100.jpg
  inflating: TRAIN_SET/APPLES/106_100.jpg
  inflating: TRAIN_SET/APPLES/107_100.jpg
  inflating: TRAIN_SET/APPLES/108_100.jpg
  inflating: TRAIN_SET/APPLES/109_100.jpg
  inflating: TRAIN_SET/APPLES/11_100.jpg
  inflating: TRAIN_SET/APPLES/110_100.jpg
  inflating: TRAIN_SET/APPLES/111_100.jpg
  inflating: TRAIN_SET/APPLES/112_100.jpg
  inflating: TRAIN_SET/APPLES/113_100.jpg
  inflating: TRAIN_SET/APPLES/114_100.jpg
  inflating: TRAIN_SET/APPLES/115_100.jpg
  inflating: TRAIN_SET/APPLES/116_100.jpg
```



```
  inflating: TRAIN_SET/ORANGE/r_312_100.jpg
  inflating: TRAIN_SET/ORANGE/r_313_100.jpg
  inflating: TRAIN_SET/ORANGE/r_314_100.jpg
  inflating: TRAIN_SET/ORANGE/r_315_100.jpg
  inflating: TRAIN_SET/ORANGE/r_316_100.jpg
  inflating: TRAIN_SET/ORANGE/r_317_100.jpg
  inflating: TRAIN_SET/ORANGE/r_318_100.jpg
  inflating: TRAIN_SET/ORANGE/r_319_100.jpg
  inflating: TRAIN_SET/ORANGE/r_320_100.jpg
  inflating: TRAIN_SET/PINEAPPLE/0_100.jpg
  inflating: TRAIN_SET/PINEAPPLE/1_100.jpg
  inflating: TRAIN_SET/PINEAPPLE/10_100.jpg
  inflating: TRAIN_SET/PINEAPPLE/100_100.jpg
  inflating: TRAIN_SET/PINEAPPLE/101_100.jpg
  inflating: TRAIN_SET/PINEAPPLE/102_100.jpg
  inflating: TRAIN_SET/PINEAPPLE/103_100.jpg
  inflating: TRAIN_SET/PINEAPPLE/104_100.jpg
  inflating: TRAIN_SET/PINEAPPLE/105_100.jpg
  inflating: TRAIN_SET/PINEAPPLE/106_100.jpg
  inflating: TRAIN_SET/PINEAPPLE/107_100.jpg
  inflating: TRAIN_SET/PINEAPPLE/108_100.jpg
  inflating: TRAIN_SET/PINEAPPLE/109_100.jpg
  inflating: TRAIN_SET/PINEAPPLE/11_100.jpg
  inflating: TRAIN_SET/PINEAPPLE/110_100.jpg
  inflating: TRAIN_SET/PINEAPPLE/111_100.jpg
  inflating: TRAIN_SET/PINEAPPLE/112_100.jpg
  inflating: TRAIN_SET/PINEAPPLE/113_100.jpg
  inflating: TRAIN_SET/PINEAPPLE/114_100.jpg
  inflating: TRAIN_SET/PINEAPPLE/115_100.jpg
  inflating: TRAIN_SET/PINEAPPLE/116_100.jpg
  inflating: TRAIN_SET/PINEAPPLE/117_100.jpg
```

Seperate as Test Set and Train Set

SEPARATE THE TEST AND TRAIN SET



Seperate as Test Set and Train Set

```
from keras.preprocessing.image import ImageDataGenerator
import tensorflow as tf
```

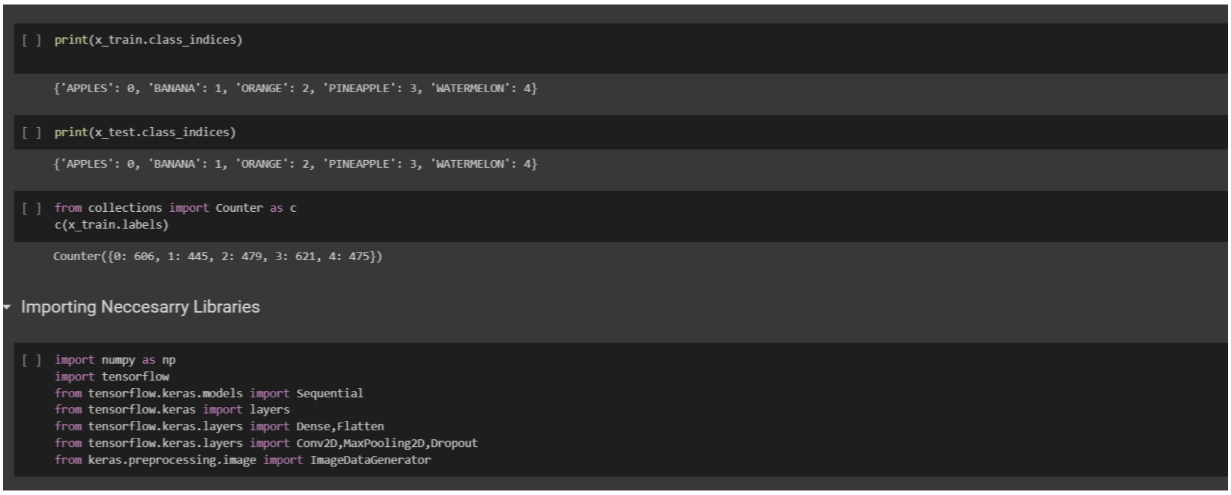
```
image_generator =tf.keras.preprocessing.image.ImageDataGenerator(validation_split=0.2)
train_data_gen=image_generator.flow_from_directory(directory='TRAIN_SET',subset='training')
val_data_gen = image_generator.flow_from_directory(directory='TRAIN_SET',subset='validation')
```

```
Found 2102 images belonging to 5 classes.
Found 524 images belonging to 5 classes.
```

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

```
x_train=train_datagen.flow_from_directory(
    r'/content/TRAIN_SET',
    target_size=(64,64),batch_size=5,color_mode='rgb',class_mode='sparse')

x_test=test_datagen.flow_from_directory(
    r'/content/TRAIN_SET',
     target_size=(64,64),batch_size=5,color_mode='rgb',class_mode='sparse')
```

```
Found 2626 images belonging to 5 classes.
Found 2626 images belonging to 5 classes.
```



```
print(x_train.class_indices)
```

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

```
print(x_test.class_indices)
```

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

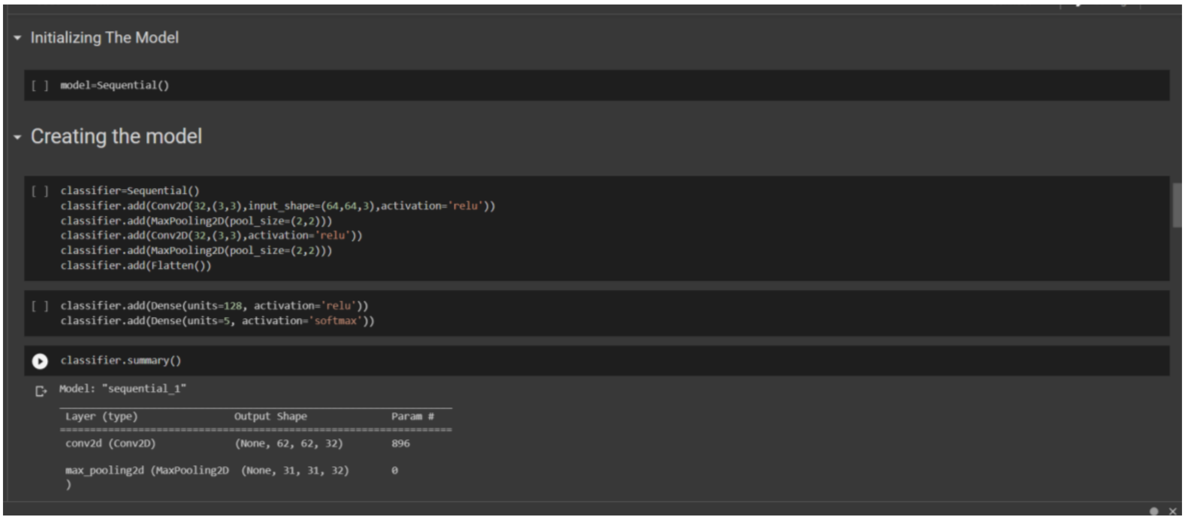
```
from collections import Counter as c
c(x_train.labels)
```

```
Counter({0: 606, 1: 445, 2: 479, 3: 621, 4: 475})
```

Importing Neccesarry Libraries

```
import numpy as np
import tensorflow
from tensorflow.keras.models import Sequential
from tensorflow.keras import layers
from tensorflow.keras.layers import Dense,Flatten
from tensorflow.keras.layers import Conv2D,MaxPooling2D,Dropout
from keras.preprocessing.image import ImageDataGenerator
```

INITIALIZING & CREATING THE MODEL



Initializing The Model

```
model=Sequential()
```

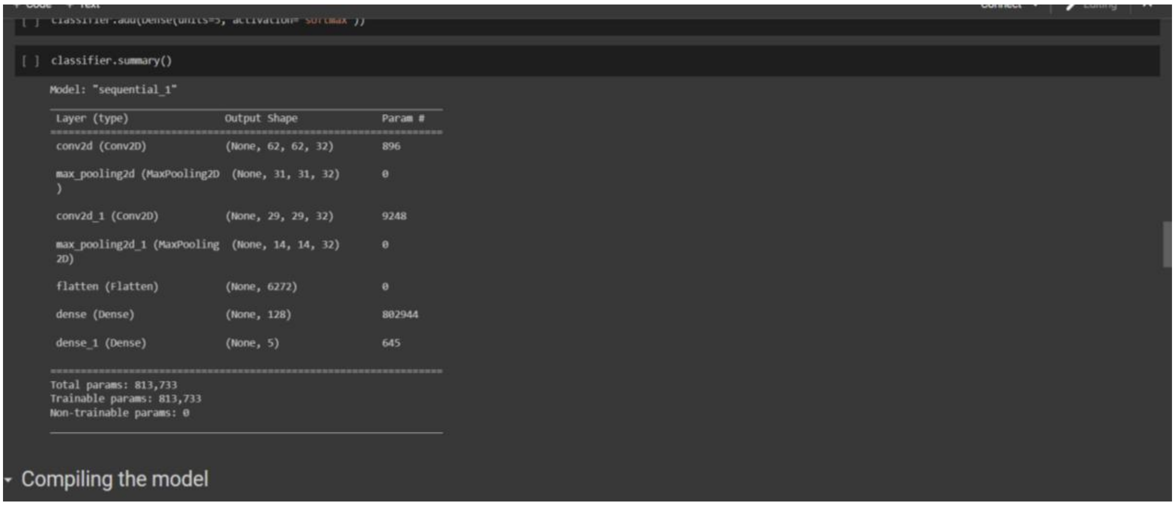
Creating the model

```
classifier=Sequential()
classifier.add(Conv2D(32,(3,3),input_shape=(64,64,3),activation='relu'))
classifier.add(MaxPooling2D(pool_size=(2,2)))
classifier.add(Conv2D(32,(3,3),activation='relu'))
classifier.add(MaxPooling2D(pool_size=(2,2)))
classifier.add(Flatten())
```

```
classifier.add(Dense(units=128, activation='relu'))
classifier.add(Dense(units=5, activation='softmax'))
```

```
classifier.summary()
```

```
Model: "sequential_1"
_________________________________________________________________
 Layer (type)                Output Shape              Param #
=================================================================
 conv2d (Conv2D)             (None, 62, 62, 32)        896

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



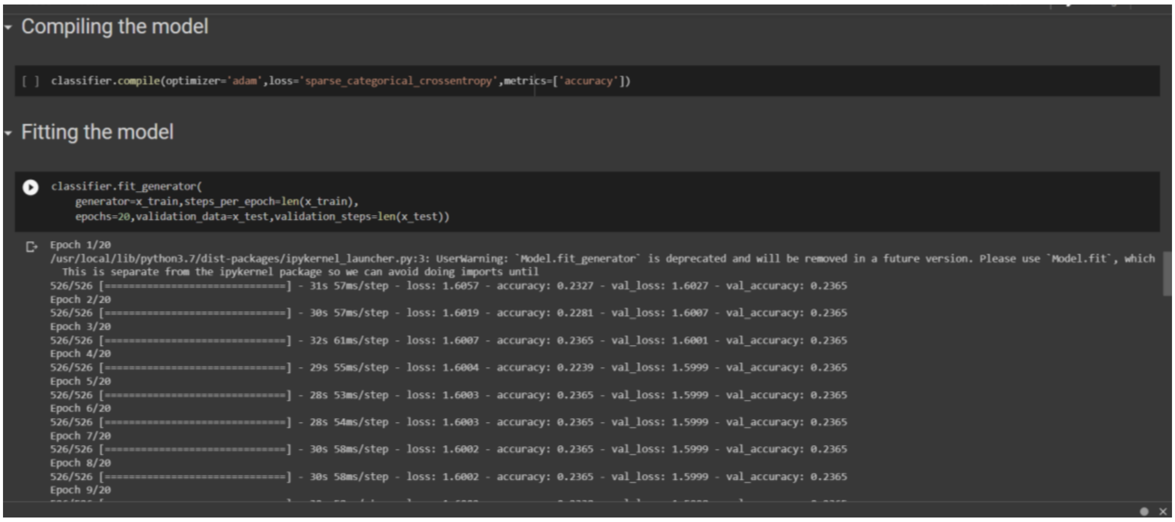
```
classifier.add(Dense(units=5, activation='softmax'))
```

```
classifier.summary()
```

```
Model: "sequential_1"
_________________________________________________________________
 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

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

Compiling the model

COMPILING & FITTING THE MODEL



Compiling the model

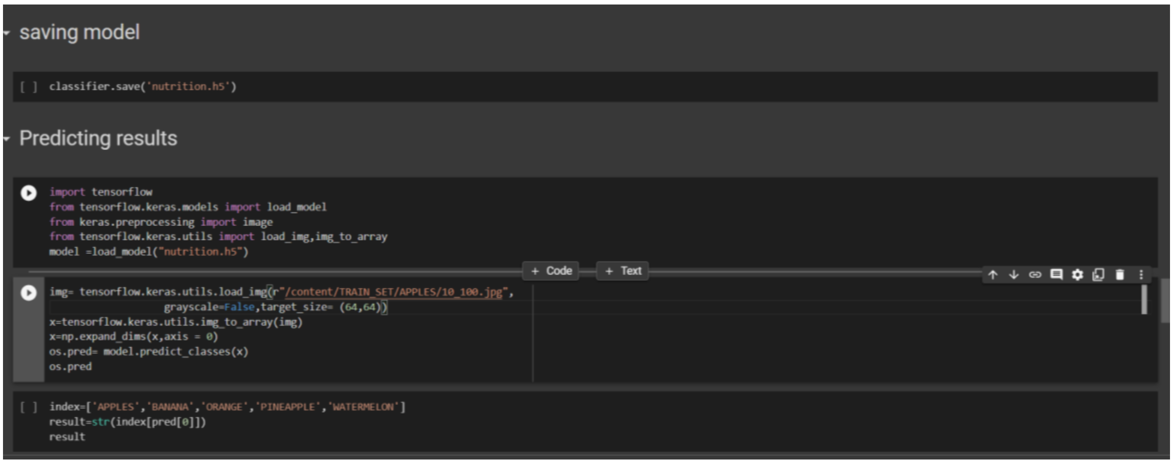
```
[ ] classifier.compile(optimizer='adam',loss='sparse_categorical_crossentropy',metrics=['accuracy'])
```

Fitting the model

```
classifier.fit_generator(
    generator=x_train,steps_per_epoch=len(x_train),
    epochs=20,validation_data=x_test,validation_steps=len(x_test))
```

```
Epoch 1/20
/usr/local/lib/python3.7/dist-packages/ipykernel_launcher.py:3: UserWarning: `Model.fit_generator` is deprecated and will be removed in a future version. Please use `Model.fit`, which
  This is separate from the ipykernel package so we can avoid doing imports until
526/526 [==============================] - 31s 57ms/step - loss: 1.6057 - accuracy: 0.2327 - val_loss: 1.6027 - val_accuracy: 0.2365
Epoch 2/20
526/526 [==============================] - 30s 57ms/step - loss: 1.6019 - accuracy: 0.2281 - val_loss: 1.6007 - val_accuracy: 0.2365
Epoch 3/20
526/526 [==============================] - 32s 61ms/step - loss: 1.6007 - accuracy: 0.2365 - val_loss: 1.6001 - val_accuracy: 0.2365
Epoch 4/20
526/526 [==============================] - 29s 55ms/step - loss: 1.6004 - accuracy: 0.2239 - val_loss: 1.5999 - val_accuracy: 0.2365
Epoch 5/20
526/526 [==============================] - 28s 53ms/step - loss: 1.6003 - accuracy: 0.2365 - val_loss: 1.5999 - val_accuracy: 0.2365
Epoch 6/20
526/526 [==============================] - 28s 54ms/step - loss: 1.6003 - accuracy: 0.2365 - val_loss: 1.5999 - val_accuracy: 0.2365
Epoch 7/20
526/526 [==============================] - 30s 58ms/step - loss: 1.6002 - accuracy: 0.2365 - val_loss: 1.5999 - val_accuracy: 0.2365
Epoch 8/20
526/526 [==============================] - 30s 58ms/step - loss: 1.6002 - accuracy: 0.2365 - val_loss: 1.5999 - val_accuracy: 0.2365
Epoch 9/20
```

SAVING THE MODEL & PREDICTING THE RESULTS



saving model

```
[ ] classifier.save('nutrition.h5')
```

Predicting results

```
import tensorflow
from tensorflow.keras.models import load_model
from keras.preprocessing import image
from tensorflow.keras.utils import load_img,img_to_array
model =load_model("nutrition.h5")
```

```
img= tensorflow.keras.utils.load_img(r"/content/TRAIN_SET/APPLES/10_100.jpg",
                    grayscale=False,target_size= (64,64))
x=tensorflow.keras.utils.img_to_array(img)
x=np.expand_dims(x,axis = 0)
os.pred= model.predict_classes(x)
os.pred
```

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