

Sprint-1 Model

Building

Date	15 November 20 22
Team ID	PNT2022TMID21094
Project Name	AI-powered Nutrition Analyzer for Fitness Enthusiasts
Maximum Marks	

Dataset:

- In our dataset we have collected images of the five variety of fruits.
 - Apple
 - Orange
 - Pineapple
 - Watermelon
 - Banana

Image Pre-processing:

- Import The ImageDataGenerator Library
- Configure ImageDataGenerator Class
- Apply Image DataGenerator Functionality To Trainset And Testset

Model Building:

- Importing The Model Building Libraries
- Initializing The Model
- Adding CNN Layers
- Adding Dense Layers
- Configure The Learning Process

Data Collection

Unzipping the dataset

```
!unzip '/content/Dataset.zip' inflating: Dataset/TRAIN_SET/WATERMELON/r_288_100.jpg
inflating: Dataset/TRAIN_SET/WATERMELON/r_289_100.jpg inflating:
Dataset/TRAIN_SET/WATERMELON/r_28_100.jpg inflating:
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Dataset/TRAIN_SET/WATERMELON/r_43_100.jpg inflating:
Dataset/TRAIN_SET/WATERMELON/r_44_100.jpg inflating:
Dataset/TRAIN_SET/WATERMELON/r_45_100.jpg inflating:
```

Dataset/TRAIN_SET/WATERMELON/r_46_100.jpg	inflating:
Dataset/TRAIN_SET/WATERMELON/r_4_100.jpg	inflating:
Dataset/TRAIN_SET/WATERMELON/r_50_100.jpg	inflating:
Dataset/TRAIN_SET/WATERMELON/r_57_100.jpg	inflating:
Dataset/TRAIN_SET/WATERMELON/r_5_100.jpg	inflating:
Dataset/TRAIN_SET/WATERMELON/r_6_100.jpg	inflating:
Dataset/TRAIN_SET/WATERMELON/r_7_100.jpg	inflating:
Dataset/TRAIN_SET/WATERMELON/r_81_100.jpg	inflating:
Dataset/TRAIN_SET/WATERMELON/r_8_100.jpg	inflating:
Dataset/TRAIN_SET/WATERMELON/r_9_100.jpg	

▼ Image Preprocessing

```
#Importing The ImageDataGenerator Library
from keras.preprocessing.image import ImageDataGenerator
```

▼ Image Data Augmentation

```
#Configure ImageDataGenerator Class train_datagen =
ImageDataGenerator(rescale=1./255,shear_range=0.2,zoom_range=0.2,horizontal
test_datagen=ImageDataGenerator(rescale=1./255))
```

Applying Image DataGenerator Functionality To TrainsetAnd

▼ Testset

```
#Applying Image DataGenerator Functionality To Trainset And Testset
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')
#Applying Image DataGenerator Functionality To Testset
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
929 images belonging to 5 classes.

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

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

#checking the number of classes
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: 995, 1: 1354, 2: 1019, 3: 275, 4: 475})
```

Model Building



1. Importing The Model Building 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
```

2. Initializing The Model

```
model = Sequential()
```

3. Adding CNN Layers

```
# Initializing the CNN classifier
= Sequential()

# First convolution layer and pooling classifier.add(Conv2D(32, (3, 3),
input_shape=(64, 64, 3), activation='relu'))
classifier.add(MaxPooling2D(pool_size=(2, 2)))
# Second convolution layer and pooling
classifier.add(Conv2D(32, (3, 3), activation='relu'))
# input_shape is going to be the pooled feature maps from the previous convolution layer
classifier.add(MaxPooling2D(pool_size=(2, 2)))
# Flattening the layers classifier.add(Flatten())
```

4. Adding Dense Layers

```
classifier.add(Dense(units=128, activation='relu'))
classifier.add(Dense(units=5, activation='softmax'))
#summary of our model 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) 2D)		0
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

5. Configure The Learning Process

```
# Compiling the CNN
# categorical_crossentropy for more than 2 classifier.compile(optimizer='adam',
loss='sparse_categorical_crossentropy', metrics=['acc
```