

Sprint-1

Model

Building

Date	29 October 2022
	PNT2022PMID16515
Project Name	AI-powered Nutrition Analyzer for Fitness Enthusiasts
Maximum Marks	

Dataset:

- ⑩ In our dataset we have collected images of the five variety of fruits.
 - Apple
 - Orange
 - Pineapple
 - Watermelon
 - Banana

Drive link : https://drive.google.com/file/d/1jzDjV7jYclzllieagaJdubMJ3YeLsry1/view?usp=share_link

Image Pre-processing:

- ⑩ Import The ImageDataGenerator Library
- ⑩ Configure ImageDataGenerator Class
- ⑩ Apply Image DataGenerator Functionality To Trainset And Testset

Model Building:

- ⑩ Importing The Model Building Libraries
- ⑩ Initializing The Model
- ⑩ Adding CNN Layers
- ⑩ Adding Dense Layers
- ⑩ Configure The Learning Process

Data Collection

Download the dataset [here](#)

```
# 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
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Dataset/TRAIN_SET/WATERMELON/r_44_100.jpg

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Dataset/TRAIN_SET/WATERMELON/r_45_100.jpg
```

```
inflating:
Dataset/TRAIN_SET/WATERMELON/r_46_100.jpg
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Dataset/TRAIN_SET/WATERMELON/r_4_100.jpg
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Dataset/TRAIN_SET/WATERMELON/r_50_100.jpg
inflating:
Dataset/TRAIN_SET/WATERMELON/r_57_100.jpg
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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, horizontala
test_datagen=ImageDataGenerator(rescale=1./255)
```

Applying Image DataGenerator Functionality To TrainsetAndTestset

```

#Applying Image DataGenerator Functionality To Trainset
And Testsetx_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 cc(x_train
.labels)

    Counter({0: 995, 1: 1354, 2: 1019, 3: 275, 4: 475})

```

Model Building

- Importing The Model Building Libraries

```

import numpy
as npimport
tensorflow
from tensorflow.keras.models import
Sequentialfrom tensorflow.keras
import layers
from tensorflow.keras.layers import Dense,Flatten
from tensorflow.keras.layers import Conv2D,MaxPooling2D,Dropout

```

- Initializing The Model

```

model = Sequential()

```

- 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 layerclassifier.add(MaxPooling2D(pool_size=(2, 2)))

# Flattening the layers
classifier.add(Flatten())

```

- 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 (MaxPooling2D)	(None, 14, 14, 32)	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

- Configure The Learning Process

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