

MODEL BUILDIND

DATE	03/11/22
TEAM ID	PNT2022TMID36873
PROJEET NAME	AI-powered Nutrition Analyzer for Fitness Enthusiasts
MARK	6

Model Building

- Importing The Model Building Libraries

```
import numpy as np
import tensorflow as tf
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
classifi
er.summa
ry()
```

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
```

- Train The Model

```
#Fitting the model
classifier.fit_generator(generator=x_train,steps_per_epoch =
len(x_train),epochs=20, valid
```

```
Epoch 1/20
/usr/local/lib/python3.7/dist-packages/ipykernel_launcher.py:2:
UserWarning: `Model.
```

824/824 [=====]	- 21s	16ms/step	- loss:	0.6172	- accuracy:
Epoch 2/20					
824/824 [=====]	- 13s	15ms/step	- loss:	0.4115	- accuracy:
Epoch 3/20					
824/824 [=====]	- 13s	16ms/step	- loss:	0.3766	- accuracy:
Epoch 4/20					
824/824 [=====]	- 13s	16ms/step	- loss:	0.3484	- accuracy:
Epoch 5/20					

824/824 [=====]	- 13s	16ms/step	- loss:	0.3243	- accuracy:
Epoch 6/20					
824/824 [=====]	- 13s	16ms/step	- loss:	0.3240	- accuracy:
Epoch 7/20					
824/824 [=====]	- 13s	16ms/step	- loss:	0.2887	- accuracy:
Epoch 8/20					
824/824 [=====]	- 13s	16ms/step	- loss:	0.2728	- accuracy:
Epoch 9/20					
824/824 [=====]	- 13s	16ms/step	- loss:	0.2717	- accuracy:
Epoch 10/20					
824/824 [=====]	- 14s	17ms/step	- loss:	0.2365	- accuracy:
Epoch 11/20					
824/824 [=====]	- 13s	15ms/step	- loss:	0.2301	- accuracy:
Epoch 12/20					
824/824 [=====]	- 13s	15ms/step	- loss:	0.2083	- accuracy:
Epoch 13/20					
824/824 [=====]	- 13s	15ms/step	- loss:	0.2049	- accuracy:
Epoch 14/20					


```

#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 18ms/step
array([0])

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

'APPLES'

```

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