# Assignment -3

# Convolution Neural Network

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| Assignment Date | 6 October 2022 |
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| Student Roll Number | 9517201906029 |
| Maximum Marks | 2 Marks |

**#Import necessary libraries**

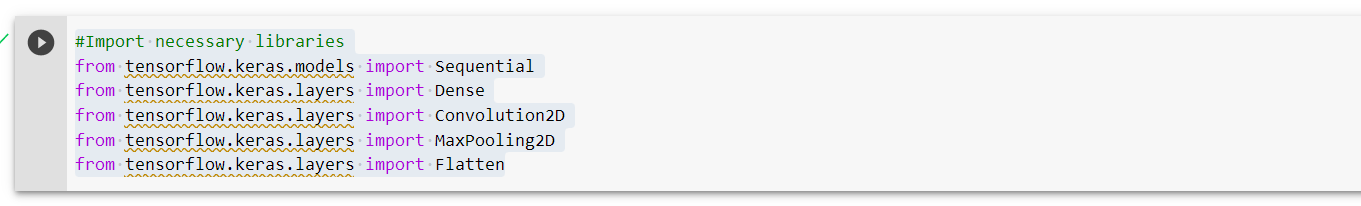
from tensorflow.keras.models import Sequential

from tensorflow.keras.layers import Dense

from tensorflow.keras.layers import Convolution2D

from tensorflow.keras.layers import MaxPooling2D

from tensorflow.keras.layers import Flatten

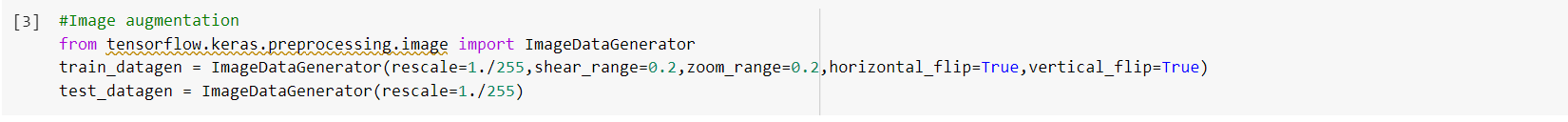


**#Image augmentation**

from tensorflow.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)

test\_datagen = ImageDataGenerator(rescale=1./255)

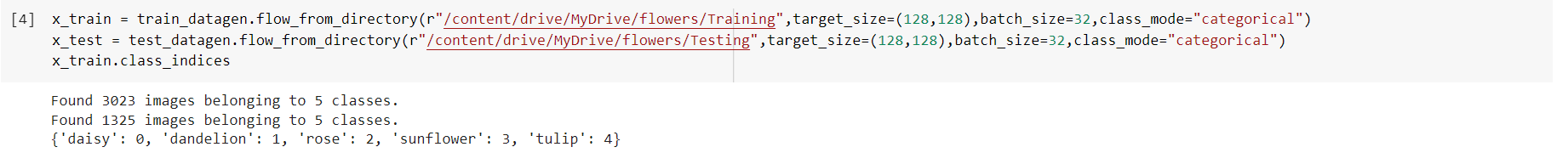


**#Dataset**

x\_train=train\_datagen.flow\_from\_directory(r"E:\Flowers\Training",target\_size=(128,128),batch\_size=32,class\_mode="categorical")

x\_test=test\_datagen.flow\_from\_directory(r"E:\Flowers\Testing",target\_size=(128,128),batch\_size=32,class\_mode="categorical")

x\_train.class\_indices



**#Add layers**

model = Sequential()

**#Convolution layer**

model.add(Convolution2D(32,(3,3),input\_shape=(128,128,3),activation='relu'))

**#Maxpooling layer**

model.add(MaxPooling2D(pool\_size=(2,2)))

**#Flatten layer**

model.add(Flatten())

**#Hidden layer**

model.add(Dense(units=300,kernel\_initializer="random\_uniform",activation="relu"))

model.add(Dense(units=200,kernel\_initializer="random\_uniform",activation="relu"))

model.add(Dense(units=5,kernel\_initializer="random\_uniform",activation="softmax"))

model.summary()

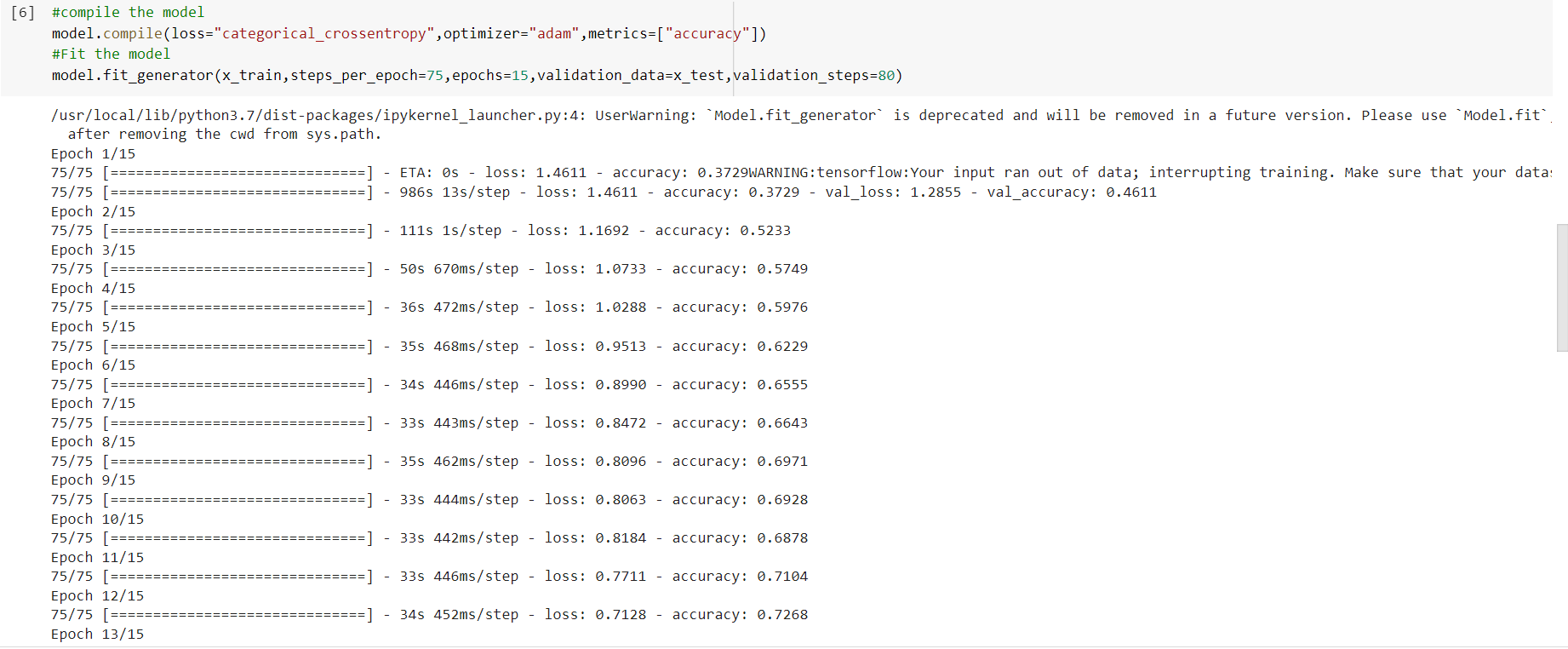


**#Compile the model**

model.compile(loss="categorical\_crossentropy",optimizer="adam",metrics=["accuracy"])

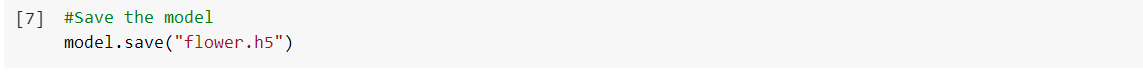
**#Fit the model**

model.fit\_generator(x\_train,steps\_per\_epoch=75,epochs=15,validation\_data=x\_test,validation\_steps=80)



**#Save the model**

model.save("flower.h5")

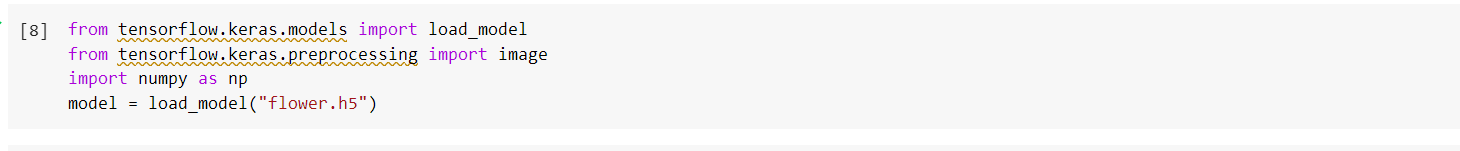


from tensorflow.keras.models import load\_model

from tensorflow.keras.preprocessing import image

import numpy as np

model = load\_model("Flower.h5")

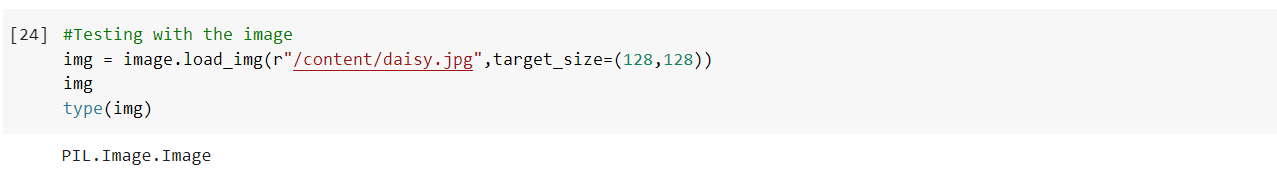


**#Test the model**

img = image.load\_img(r"C:\Users\hp\Downloads\rose.jpg",target\_size=(128,128))

img

type(img)



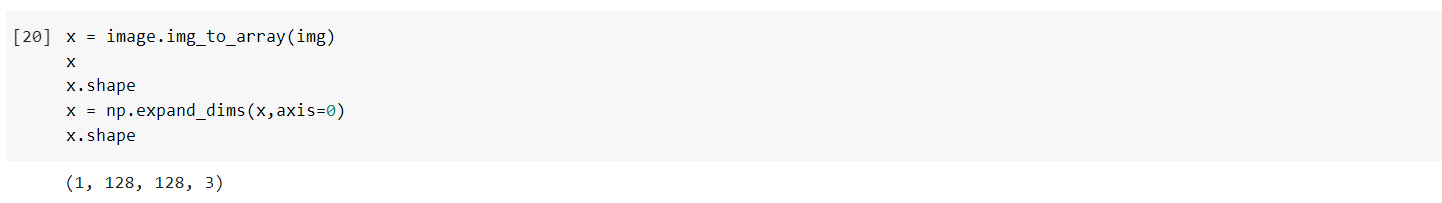
x = image.img\_to\_array(img)

x

x.shape

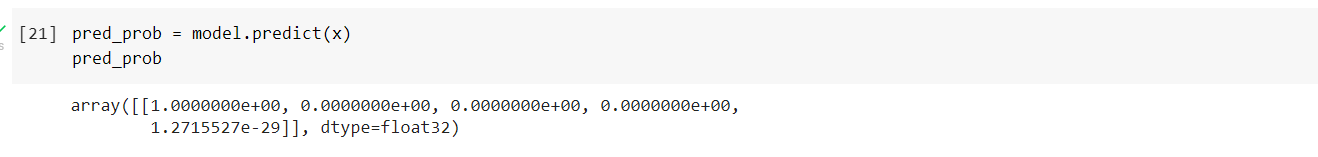
x = np.expand\_dims(x,axis=0)

x.shape



pred\_prob = model.predict(x)

pred\_prob



class\_name = ["daisy","dandelion","rose","sunfower","tulip"]



pred\_id = pred\_prob.argmax(axis=1)[0]

pred\_id

print("Predicted flower is",str(class\_name[pred\_id]))

