Assignment -3

**CONVOLUTIONAL NEURAL NETWORKS**

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| Assignment Date | 5 October 2022 |
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| Student Roll Number | 9517201903007 |
| 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

from google.colab import drive

drive.mount('/content/drive')

#Image augmentation

from tensorflow.keras.preprocessing.image import ImageDataGenerator

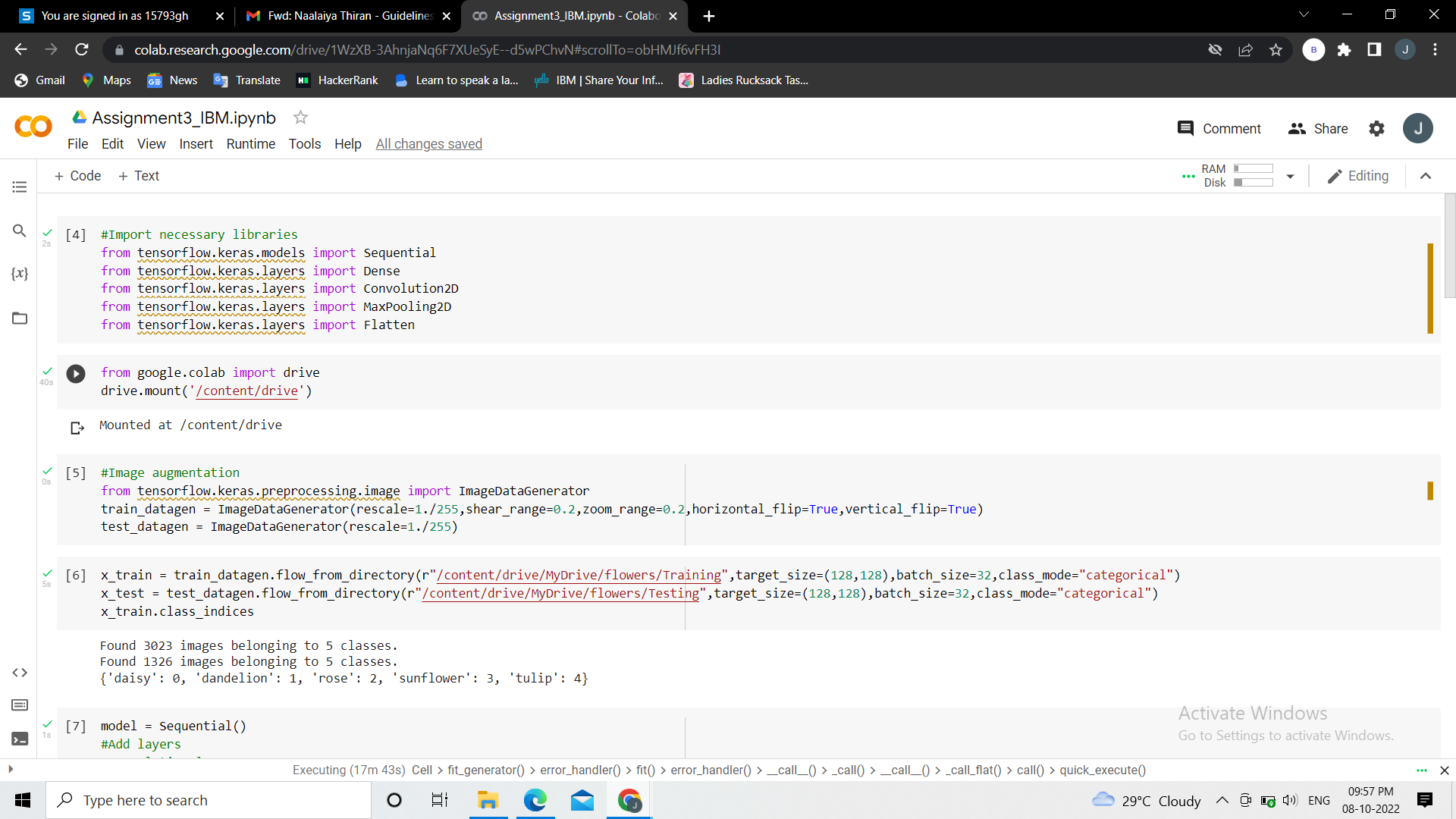
train\_datagen = ImageDataGenerator(rescale=1./255,shear\_range=0.2,zoom\_range=0.2,horizontal\_flip=True,vertical\_flip=True)

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

x\_train = train\_datagen.flow\_from\_directory(r"/content/drive/MyDrive/flowers/Training",target\_size=(128,128),batch\_size=32,class\_mode="categorical")

x\_test = test\_datagen.flow\_from\_directory(r"/content/drive/MyDrive/flowers/Testing",target\_size=(128,128),batch\_size=32,class\_mode="categorical")

x\_train.class\_indices



model = Sequential()

#Add layers

#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())

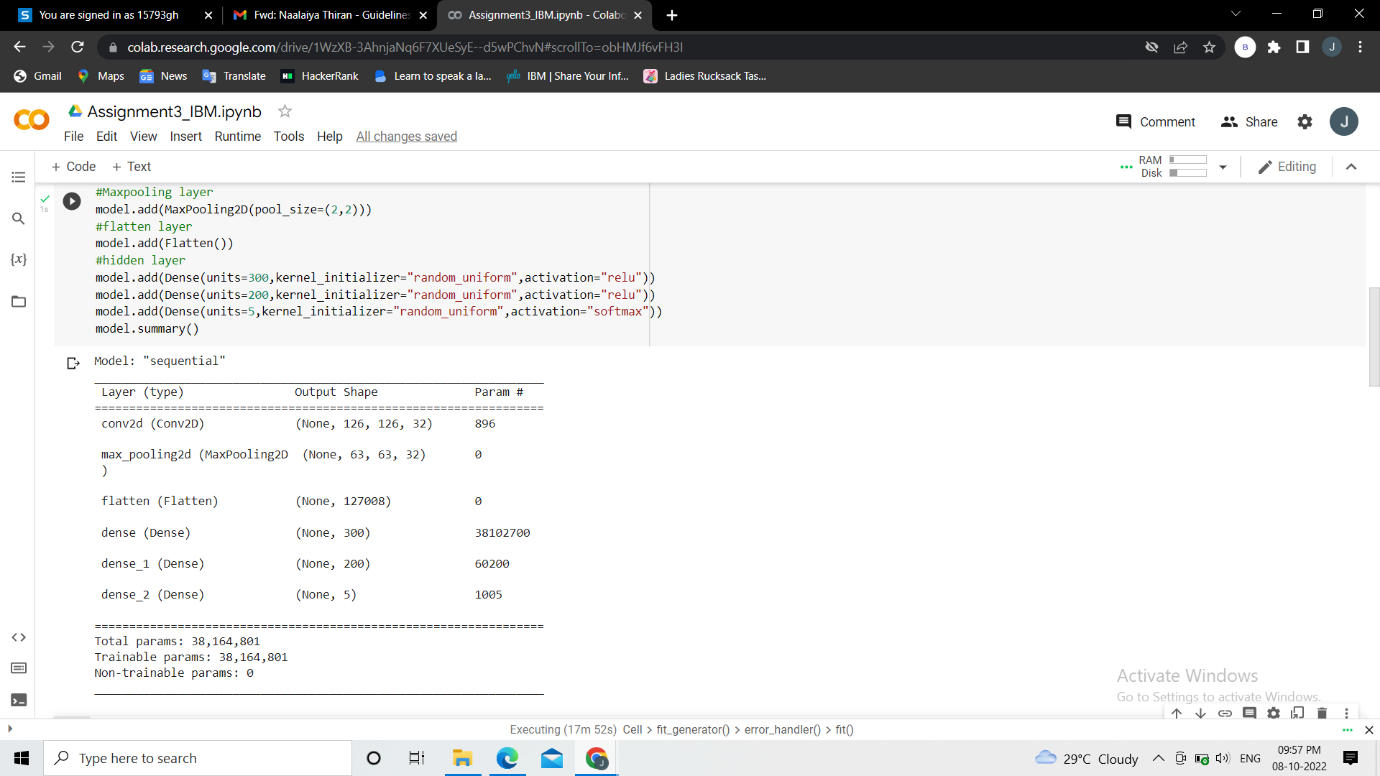
#hidden layer

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()

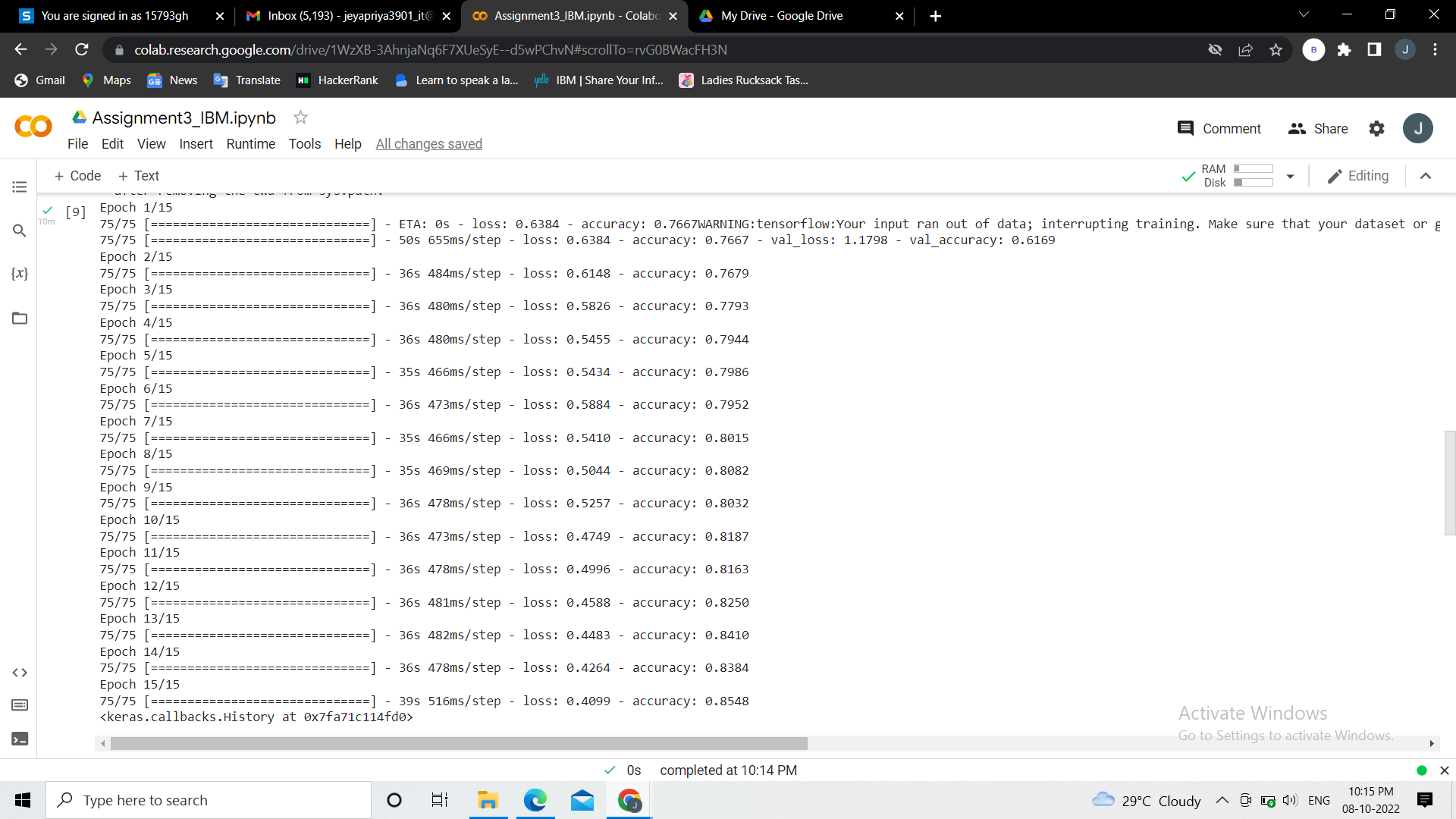


#compile the model

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

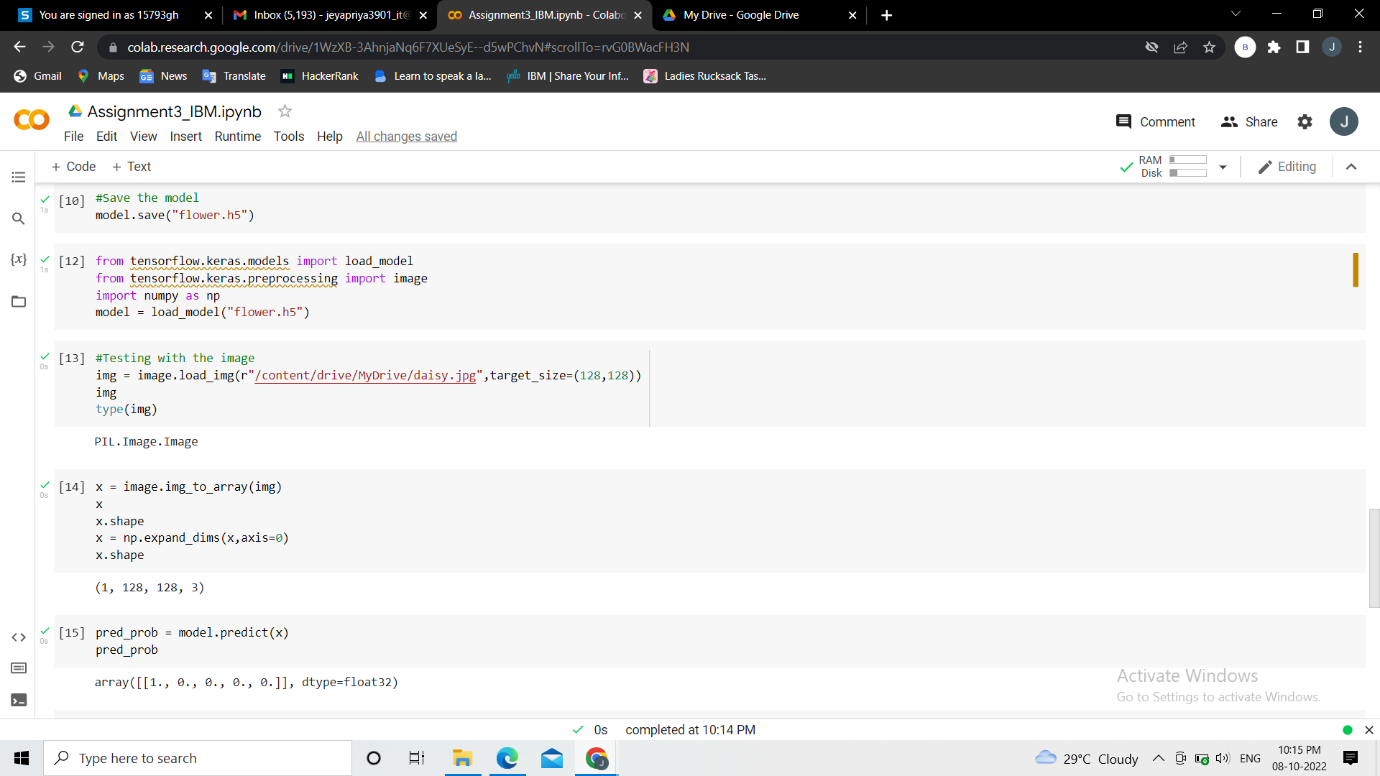
model = load\_model("flower.h5")

#Testing with the image

img = image.load\_img(r"/content/drive/MyDrive/daisy.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]))

