ASSIGNMENT-3

{

"cells": [

{

"cell\_type": "markdown",

"id": "406ab8ce",

"metadata": {},

"source": [

" ASSIGNMENT - 3 \n",

" "

]

},

{

"cell\_type": "markdown",

"id": "d2fa8506",

"metadata": {},

"source": [

"1.Download the dataset: Dataset"

]

},

{

"cell\_type": "markdown",

"id": "6156459c",

"metadata": {},

"source": [

"2.IMAGE AUGMENTATION"

]

},

{

"cell\_type": "code",

"execution\_count": 2,

"id": "fc34cad1",

"metadata": {},

"outputs": [],

"source": [

"from tensorflow.keras.preprocessing.image import ImageDataGenerator"

]

},

{

"cell\_type": "code",

"execution\_count": 3,

"id": "a4b14680",

"metadata": {},

"outputs": [],

"source": [

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

]

},

{

"cell\_type": "code",

"execution\_count": 4,

"id": "b22d69f3",

"metadata": {},

"outputs": [],

"source": [

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

]

},

{

"cell\_type": "code",

"execution\_count": 5,

"id": "eb38a22a",

"metadata": {},

"outputs": [

{

"name": "stdout",

"output\_type": "stream",

"text": [

"Found 4317 images belonging to 5 classes.\n"

]

}

],

"source": [

"x\_train=train\_datagen.flow\_from\_directory(r\"C:\\Users\\Acer\\Downloads\\Flowers-Dataset\\flowers\",target\_size=(64,64),\n",

" class\_mode=\"categorical\",batch\_size=24)"

]

},

{

"cell\_type": "code",

"execution\_count": 6,

"id": "b1c1813c",

"metadata": {},

"outputs": [

{

"name": "stdout",

"output\_type": "stream",

"text": [

"Found 4317 images belonging to 5 classes.\n"

]

}

],

"source": [

"x\_test=test\_datagen.flow\_from\_directory(r\"C:\\Users\\Acer\\Downloads\\Flowers-Dataset\\flowers\",target\_size=(64,64),\n",

" class\_mode=\"categorical\",batch\_size=24)"

]

},

{

"cell\_type": "markdown",

"id": "3a7798c3",

"metadata": {},

"source": [

"3,4. CREATE MODEL: Add Layers (Convolution,MaxPooling,Flatten,Dense-(Hidden Layers),Output)"

]

},

{

"cell\_type": "code",

"execution\_count": 7,

"id": "5251a5d6",

"metadata": {},

"outputs": [],

"source": [

"from tensorflow.keras.models import Sequential"

]

},

{

"cell\_type": "code",

"execution\_count": 8,

"id": "44e578dd",

"metadata": {},

"outputs": [],

"source": [

"from tensorflow.keras.layers import Convolution2D,MaxPooling2D,Flatten,Dense"

]

},

{

"cell\_type": "code",

"execution\_count": 9,

"id": "e16cbe29",

"metadata": {},

"outputs": [],

"source": [

"model=Sequential()"

]

},

{

"cell\_type": "code",

"execution\_count": 10,

"id": "b08a8bd0",

"metadata": {},

"outputs": [],

"source": [

"model.add(Convolution2D(32,(3,3),activation=\"relu\",input\_shape=(64,64,3)))"

]

},

{

"cell\_type": "code",

"execution\_count": 11,

"id": "7e80e337",

"metadata": {},

"outputs": [],

"source": [

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

]

},

{

"cell\_type": "code",

"execution\_count": 12,

"id": "3f5d5d36",

"metadata": {},

"outputs": [],

"source": [

"model.add(Flatten())"

]

},

{

"cell\_type": "code",

"execution\_count": 13,

"id": "94501b37",

"metadata": {},

"outputs": [],

"source": [

"model.add(Dense(300,activation='relu'))"

]

},

{

"cell\_type": "code",

"execution\_count": 14,

"id": "6255d4a7",

"metadata": {},

"outputs": [],

"source": [

"model.add(Dense(300,activation='relu'))"

]

},

{

"cell\_type": "code",

"execution\_count": 15,

"id": "f24ccfa0",

"metadata": {},

"outputs": [],

"source": [

"model.add(Dense(5,activation=\"softmax\"))"

]

},

{

"cell\_type": "markdown",

"id": "ffd5ff6d",

"metadata": {},

"source": [

"5.COMPILE THE MODEL"

]

},

{

"cell\_type": "code",

"execution\_count": 16,

"id": "f04b25ce",

"metadata": {},

"outputs": [],

"source": [

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

]

},

{

"cell\_type": "code",

"execution\_count": 17,

"id": "7c087a88",

"metadata": {},

"outputs": [

{

"data": {

"text/plain": [

"180"

]

},

"execution\_count": 17,

"metadata": {},

"output\_type": "execute\_result"

}

],

"source": [

"len(x\_train)"

]

},

{

"cell\_type": "code",

"execution\_count": 18,

"id": "927c72cb",

"metadata": {},

"outputs": [

{

"data": {

"text/plain": [

"180"

]

},

"execution\_count": 18,

"metadata": {},

"output\_type": "execute\_result"

}

],

"source": [

"len(x\_test)"

]

},

{

"cell\_type": "markdown",

"id": "a202252b",

"metadata": {},

"source": [

"6.FIT THE MODEL"

]

},

{

"cell\_type": "code",

"execution\_count": 19,

"id": "bf8c1e65",

"metadata": {},

"outputs": [

{

"name": "stdout",

"output\_type": "stream",

"text": [

"Epoch 1/5\n",

"180/180 [==============================] - 379s 2s/step - loss: 1.2657 - accuracy: 0.4681 - val\_loss: 1.0761 - val\_accuracy: 0.5798\n",

"Epoch 2/5\n",

"180/180 [==============================] - 138s 767ms/step - loss: 1.0503 - accuracy: 0.5784 - val\_loss: 0.9687 - val\_accuracy: 0.6115\n",

"Epoch 3/5\n",

"180/180 [==============================] - 128s 711ms/step - loss: 0.9889 - accuracy: 0.6092 - val\_loss: 0.8925 - val\_accuracy: 0.6461\n",

"Epoch 4/5\n",

"180/180 [==============================] - 123s 683ms/step - loss: 0.9120 - accuracy: 0.6426 - val\_loss: 0.8636 - val\_accuracy: 0.6720\n",

"Epoch 5/5\n",

"180/180 [==============================] - 123s 684ms/step - loss: 0.8624 - accuracy: 0.6613 - val\_loss: 0.8027 - val\_accuracy: 0.6933\n"

]

},

{

"data": {

"text/plain": [

"<keras.callbacks.History at 0x2187cc81a30>"

]

},

"execution\_count": 19,

"metadata": {},

"output\_type": "execute\_result"

}

],

"source": [

"model.fit(x\_train,epochs=5,validation\_data=x\_test,steps\_per\_epoch=len(x\_train),validation\_steps=len(x\_test))"

]

},

{

"cell\_type": "markdown",

"id": "bf83cff5",

"metadata": {},

"source": [

"7.SAVE THE MODEL"

]

},

{

"cell\_type": "code",

"execution\_count": 20,

"id": "3c55940a",

"metadata": {},

"outputs": [],

"source": [

"model.save(\"flower1.h5\")"

]

},

{

"cell\_type": "markdown",

"id": "3a478ace",

"metadata": {},

"source": [

"8.TEST THE MODEL"

]

},

{

"cell\_type": "code",

"execution\_count": 2,

"id": "e2f576b2",

"metadata": {},

"outputs": [],

"source": [

"from tensorflow.keras.models import load\_model\n",

"from tensorflow.keras.preprocessing import image \n",

"import numpy as np"

]

},

{

"cell\_type": "code",

"execution\_count": 3,

"id": "baf88da1",

"metadata": {},

"outputs": [],

"source": [

"model=load\_model(\"flower1.h5\")"

]

},

{

"cell\_type": "code",

"execution\_count": 4,

"id": "e6d6c223",

"metadata": {},

"outputs": [],

"source": [

"img=image.load\_img(\"5794835\_d15905c7c8\_n.jpg\",target\_size=(64,64))"

]

},

{

"cell\_type": "code",

"execution\_count": 5,

"id": "2f6b5026",

"metadata": {},

"outputs": [

{

"data": {

"image/png": "",

"text/plain": [

"<PIL.Image.Image image mode=RGB size=64x64 at 0x168B8727D00>"

]

},

"execution\_count": 5,

"metadata": {},

"output\_type": "execute\_result"

}

],

"source": [

"img"

]

},

{

"cell\_type": "code",

"execution\_count": 6,

"id": "2a80ace5",

"metadata": {},

"outputs": [

{

"data": {

"text/plain": [

"PIL.Image.Image"

]

},

"execution\_count": 6,

"metadata": {},

"output\_type": "execute\_result"

}

],

"source": [

"type(img)"

]

},

{

"cell\_type": "code",

"execution\_count": 7,

"id": "558ee8ca",

"metadata": {},

"outputs": [],

"source": [

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

]

},

{

"cell\_type": "code",

"execution\_count": 8,

"id": "1f27cca9",

"metadata": {},

"outputs": [

{

"data": {

"text/plain": [

"array([[[ 75., 89., 36.],\n",

" [ 78., 93., 38.],\n",

" [ 77., 92., 35.],\n",

" ...,\n",

" [ 94., 95., 53.],\n",

" [ 93., 91., 52.],\n",

" [ 80., 91., 48.]],\n",

"\n",

" [[ 76., 91., 36.],\n",

" [ 80., 95., 36.],\n",

" [ 78., 93., 34.],\n",

" ...,\n",

" [112., 105., 63.],\n",

" [104., 99., 57.],\n",

" [ 91., 92., 52.]],\n",

"\n",

" [[ 79., 94., 39.],\n",

" [ 82., 97., 38.],\n",

" [ 81., 97., 34.],\n",

" ...,\n",

" [122., 110., 70.],\n",

" [114., 106., 67.],\n",

" [101., 99., 58.]],\n",

"\n",

" ...,\n",

"\n",

" [[118., 119., 105.],\n",

" [127., 121., 109.],\n",

" [134., 128., 116.],\n",

" ...,\n",

" [109., 129., 68.],\n",

" [110., 127., 72.],\n",

" [111., 123., 73.]],\n",

"\n",

" [[133., 127., 115.],\n",

" [133., 131., 116.],\n",

" [142., 136., 124.],\n",

" ...,\n",

" [ 83., 104., 47.],\n",

" [ 80., 104., 46.],\n",

" [ 91., 103., 55.]],\n",

"\n",

" [[142., 133., 124.],\n",

" [144., 136., 125.],\n",

" [144., 138., 126.],\n",

" ...,\n",

" [ 72., 93., 37.],\n",

" [ 72., 94., 47.],\n",

" [ 77., 90., 47.]]], dtype=float32)"

]

},

"execution\_count": 8,

"metadata": {},

"output\_type": "execute\_result"

}

],

"source": [

"x"

]

},

{

"cell\_type": "code",

"execution\_count": 9,

"id": "82ef450e",

"metadata": {},

"outputs": [

{

"data": {

"text/plain": [

"(64, 64, 3)"

]

},

"execution\_count": 9,

"metadata": {},

"output\_type": "execute\_result"

}

],

"source": [

"x.shape"

]

},

{

"cell\_type": "code",

"execution\_count": 10,

"id": "d1391355",

"metadata": {},

"outputs": [],

"source": [

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

]

},

{

"cell\_type": "code",

"execution\_count": 11,

"id": "33d21c7d",

"metadata": {},

"outputs": [

{

"data": {

"text/plain": [

"(1, 64, 64, 3)"

]

},

"execution\_count": 11,

"metadata": {},

"output\_type": "execute\_result"

}

],

"source": [

"x.shape"

]

},

{

"cell\_type": "code",

"execution\_count": 12,

"id": "a5df1a13",

"metadata": {},

"outputs": [

{

"name": "stdout",

"output\_type": "stream",

"text": [

"1/1 [==============================] - 1s 595ms/step\n"

]

}

],

"source": [

"pred\_prob = model.predict(x)"

]

},

{

"cell\_type": "code",

"execution\_count": 13,

"id": "971f4fb1",

"metadata": {},

"outputs": [

{

"data": {

"text/plain": [

"array([[1., 0., 0., 0., 0.]], dtype=float32)"

]

},

"execution\_count": 13,

"metadata": {},

"output\_type": "execute\_result"

}

],

"source": [

"pred\_prob"

]

},

{

"cell\_type": "code",

"execution\_count": 14,

"id": "33562758",

"metadata": {},

"outputs": [],

"source": [

"class\_name=[\"daisy\",\"dandelio\",\"rose\",\"sunflower\",\"tulip\"]\n",

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

]

},

{

"cell\_type": "code",

"execution\_count": 15,

"id": "066314ba",

"metadata": {},

"outputs": [

{

"data": {

"text/plain": [

"0"

]

},

"execution\_count": 15,

"metadata": {},

"output\_type": "execute\_result"

}

],

"source": [

"pred\_id"

]

},

{

"cell\_type": "code",

"execution\_count": 16,

"id": "35458b39",

"metadata": {},

"outputs": [

{

"name": "stdout",

"output\_type": "stream",

"text": [

"predicted animal is daisy\n"

]

}

],

"source": [

"print(\"predicted animal is \",str(class\_name[pred\_id]))"

]

},

{

"cell\_type": "code",

"execution\_count": null,

"id": "1328746f",

"metadata": {},

"outputs": [],

"source": []

}

],

"metadata": {

"kernelspec": {

"display\_name": "Python 3 (ipykernel)",

"language": "python",

"name": "python3"

},

"language\_info": {

"codemirror\_mode": {

"name": "ipython",

"version": 3

},

"file\_extension": ".py",

"mimetype": "text/x-python",

"name": "python",

"nbconvert\_exporter": "python",

"pygments\_lexer": "ipython3",

"version": "3.9.12"

}

},

"nbformat": 4,

"nbformat\_minor": 5

}