{

"nbformat": 4,

"nbformat\_minor": 0,

"metadata": {

"colab": {

"provenance": [],

"collapsed\_sections": []

},

"kernelspec": {

"name": "python3",

"display\_name": "Python 3"

},

"language\_info": {

"name": "python"

},

"accelerator": "GPU",

"gpuClass": "standard"

},

"cells": [

{

"cell\_type": "code",

"source": [

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

],

"metadata": {

"id": "xn0DsnMBqbAk"

},

"execution\_count": 9,

"outputs": []

},

{

"cell\_type": "code",

"source": [

"train\_datagen = ImageDataGenerator(rescale=1./255,shear\_range=0.1,zoom\_range=0.1,horizontal\_flip=True)\n",

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

],

"metadata": {

"id": "NMNrvYyhq5\_x"

},

"execution\_count": 10,

"outputs": []

},

{

"cell\_type": "code",

"source": [

"training\_set = train\_datagen.flow\_from\_directory('/content/drive/MyDrive/Car Damage Dataset/level/training',\n",

"target\_size = (256, 256),\n",

"batch\_size = 10,\n",

"class\_mode = 'categorical')\n",

"\n",

"test\_set = test\_datagen.flow\_from\_directory('/content/drive/MyDrive/Car Damage Dataset/level/validation',\n",

"target\_size = (256, 256),\n",

"batch\_size = 10,\n",

"class\_mode = 'categorical')"

],

"metadata": {

"colab": {

"base\_uri": "https://localhost:8080/"

},

"id": "fsyCPIqZq-cU",

"outputId": "37c077c1-4126-49da-af3e-5ae84b9ee507"

},

"execution\_count": 11,

"outputs": [

{

"output\_type": "stream",

"name": "stdout",

"text": [

"Found 979 images belonging to 3 classes.\n",

"Found 171 images belonging to 3 classes.\n"

]

}

]

},

{

"cell\_type": "code",

"source": [

"from tensorflow.keras.layers import Dense, Flatten, Input\n",

"from tensorflow.keras.models import Model\n",

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

"from tensorflow.keras.preprocessing.image import ImageDataGenerator, load\_img\n",

"from tensorflow.keras.applications.vgg16 import VGG16, preprocess\_input\n",

"from glob import glob\n",

"import numpy as np\n",

"import matplotlib.pyplot as plt"

],

"metadata": {

"id": "fNlaQ5DnunO\_"

},

"execution\_count": 12,

"outputs": []

},

{

"cell\_type": "code",

"source": [

"vgg = VGG16(input\_shape=[256,256] + [3], weights='imagenet',include\_top=False)"

],

"metadata": {

"id": "bgT3cfaTuqOF",

"colab": {

"base\_uri": "https://localhost:8080/"

},

"outputId": "2a81dc74-8b8c-41c4-bf0c-da26560fa71e"

},

"execution\_count": 13,

"outputs": [

{

"output\_type": "stream",

"name": "stdout",

"text": [

"Downloading data from https://storage.googleapis.com/tensorflow/keras-applications/vgg16/vgg16\_weights\_tf\_dim\_ordering\_tf\_kernels\_notop.h5\n",

"58889256/58889256 [==============================] - 3s 0us/step\n"

]

}

]

},

{

"cell\_type": "code",

"source": [

"# don't train existing weights\n",

"for layer in vgg.layers:\n",

" layer.trainable = False"

],

"metadata": {

"id": "FMmDb\_Mxuswt"

},

"execution\_count": 14,

"outputs": []

},

{

"cell\_type": "code",

"source": [

"# our Layers - you can add more if you want\n",

"x = Flatten()(vgg.output)"

],

"metadata": {

"id": "vP-SPW8cuvJ1"

},

"execution\_count": 15,

"outputs": []

},

{

"cell\_type": "code",

"source": [

"prediction = Dense(3,activation='softmax')(x)"

],

"metadata": {

"id": "qeNVB\_tcuwlv"

},

"execution\_count": 16,

"outputs": []

},

{

"cell\_type": "code",

"source": [

"model2= Model(inputs=vgg.input, outputs=prediction)"

],

"metadata": {

"id": "ofUzNYWVuyde"

},

"execution\_count": 17,

"outputs": []

},

{

"cell\_type": "code",

"source": [

"model2.compile(loss='categorical\_crossentropy', optimizer='adam', metrics=['acc'])"

],

"metadata": {

"id": "b156soZSu2W0"

},

"execution\_count": 18,

"outputs": []

},

{

"cell\_type": "code",

"source": [

"import sys\n",

"r=model2.fit\_generator(\n",

"training\_set,\n",

"validation\_data=test\_set,\n",

"epochs=100,\n",

"steps\_per\_epoch=979//10,\n",

"validation\_steps=171//10)"

],

"metadata": {

"colab": {

"base\_uri": "https://localhost:8080/"

},

"id": "7WqpQGWFu5nc",

"outputId": "b255cb25-7d8b-4619-bee9-bc7a6e605f67"

},

"execution\_count": null,

"outputs": [

{

"output\_type": "stream",

"name": "stderr",

"text": [

"/usr/local/lib/python3.7/dist-packages/ipykernel\_launcher.py:7: UserWarning: `Model.fit\_generator` is deprecated and will be removed in a future version. Please use `Model.fit`, which supports generators.\n",

" import sys\n"

]

},

{

"output\_type": "stream",

"name": "stdout",

"text": [

"Epoch 1/100\n",

"97/97 [==============================] - 20s 203ms/step - loss: 1.2468 - acc: 0.5418 - val\_loss: 1.0699 - val\_acc: 0.6412\n",

"Epoch 2/100\n",

"97/97 [==============================] - 19s 193ms/step - loss: 0.7592 - acc: 0.7441 - val\_loss: 1.6222 - val\_acc: 0.5765\n",

"Epoch 3/100\n",

"97/97 [==============================] - 19s 193ms/step - loss: 0.6435 - acc: 0.7946 - val\_loss: 1.6233 - val\_acc: 0.6059\n",

"Epoch 4/100\n",

"97/97 [==============================] - 19s 192ms/step - loss: 0.4110 - acc: 0.8524 - val\_loss: 1.0407 - val\_acc: 0.6412\n",

"Epoch 5/100\n",

"97/97 [==============================] - 19s 193ms/step - loss: 0.3594 - acc: 0.8679 - val\_loss: 1.1046 - val\_acc: 0.6412\n",

"Epoch 6/100\n",

"97/97 [==============================] - 19s 192ms/step - loss: 0.2769 - acc: 0.8999 - val\_loss: 1.2588 - val\_acc: 0.6353\n",

"Epoch 7/100\n",

"97/97 [==============================] - 19s 192ms/step - loss: 0.2382 - acc: 0.9226 - val\_loss: 1.3195 - val\_acc: 0.6941\n",

"Epoch 8/100\n",

"97/97 [==============================] - 19s 194ms/step - loss: 0.1269 - acc: 0.9587 - val\_loss: 1.0245 - val\_acc: 0.7059\n",

"Epoch 9/100\n",

"97/97 [==============================] - 21s 216ms/step - loss: 0.1309 - acc: 0.9670 - val\_loss: 1.2817 - val\_acc: 0.7059\n",

"Epoch 10/100\n",

"97/97 [==============================] - 19s 197ms/step - loss: 0.1725 - acc: 0.9401 - val\_loss: 1.1065 - val\_acc: 0.7059\n",

"Epoch 11/100\n",

"97/97 [==============================] - 19s 198ms/step - loss: 0.0719 - acc: 0.9845 - val\_loss: 1.2679 - val\_acc: 0.7235\n",

"Epoch 12/100\n",

"97/97 [==============================] - 19s 195ms/step - loss: 0.0950 - acc: 0.9752 - val\_loss: 1.0734 - val\_acc: 0.7294\n",

"Epoch 13/100\n",

"97/97 [==============================] - 19s 192ms/step - loss: 0.0865 - acc: 0.9783 - val\_loss: 1.2916 - val\_acc: 0.7176\n",

"Epoch 14/100\n",

"97/97 [==============================] - 19s 193ms/step - loss: 0.0644 - acc: 0.9814 - val\_loss: 1.0785 - val\_acc: 0.7000\n",

"Epoch 15/100\n",

"97/97 [==============================] - 19s 191ms/step - loss: 0.1450 - acc: 0.9577 - val\_loss: 1.1610 - val\_acc: 0.7235\n",

"Epoch 16/100\n",

"97/97 [==============================] - 19s 191ms/step - loss: 0.1006 - acc: 0.9732 - val\_loss: 1.3060 - val\_acc: 0.6882\n",

"Epoch 17/100\n",

"97/97 [==============================] - 19s 192ms/step - loss: 0.1555 - acc: 0.9598 - val\_loss: 1.7975 - val\_acc: 0.6059\n",

"Epoch 18/100\n",

"97/97 [==============================] - 18s 189ms/step - loss: 0.0906 - acc: 0.9701 - val\_loss: 1.3778 - val\_acc: 0.7235\n",

"Epoch 19/100\n",

"97/97 [==============================] - 22s 223ms/step - loss: 0.0757 - acc: 0.9794 - val\_loss: 1.2139 - val\_acc: 0.7059\n",

"Epoch 20/100\n",

"97/97 [==============================] - 18s 189ms/step - loss: 0.0918 - acc: 0.9701 - val\_loss: 2.1055 - val\_acc: 0.6176\n",

"Epoch 21/100\n",

"97/97 [==============================] - 18s 189ms/step - loss: 0.1204 - acc: 0.9639 - val\_loss: 1.6772 - val\_acc: 0.7059\n",

"Epoch 22/100\n",

"97/97 [==============================] - 19s 191ms/step - loss: 0.0689 - acc: 0.9814 - val\_loss: 1.5560 - val\_acc: 0.7118\n",

"Epoch 23/100\n",

"97/97 [==============================] - 18s 189ms/step - loss: 0.0934 - acc: 0.9825 - val\_loss: 1.8560 - val\_acc: 0.6706\n",

"Epoch 24/100\n",

"97/97 [==============================] - 19s 192ms/step - loss: 0.0812 - acc: 0.9752 - val\_loss: 2.2182 - val\_acc: 0.6588\n",

"Epoch 25/100\n",

"97/97 [==============================] - 19s 193ms/step - loss: 0.1323 - acc: 0.9577 - val\_loss: 1.8525 - val\_acc: 0.6765\n",

"Epoch 26/100\n",

"97/97 [==============================] - 19s 191ms/step - loss: 0.1065 - acc: 0.9670 - val\_loss: 1.8559 - val\_acc: 0.6588\n",

"Epoch 27/100\n",

"97/97 [==============================] - 19s 193ms/step - loss: 0.0936 - acc: 0.9701 - val\_loss: 2.1968 - val\_acc: 0.6647\n",

"Epoch 28/100\n",

"97/97 [==============================] - 19s 191ms/step - loss: 0.0916 - acc: 0.9794 - val\_loss: 2.0881 - val\_acc: 0.6824\n",

"Epoch 29/100\n",

"97/97 [==============================] - 23s 236ms/step - loss: 0.0872 - acc: 0.9814 - val\_loss: 1.7974 - val\_acc: 0.6412\n",

"Epoch 30/100\n",

"97/97 [==============================] - 19s 194ms/step - loss: 0.0682 - acc: 0.9825 - val\_loss: 1.8247 - val\_acc: 0.6765\n",

"Epoch 31/100\n",

"97/97 [==============================] - 19s 191ms/step - loss: 0.0886 - acc: 0.9711 - val\_loss: 1.8823 - val\_acc: 0.6647\n",

"Epoch 32/100\n",

"97/97 [==============================] - 18s 188ms/step - loss: 0.1008 - acc: 0.9701 - val\_loss: 2.0062 - val\_acc: 0.6353\n",

"Epoch 33/100\n",

"97/97 [==============================] - 19s 193ms/step - loss: 0.0754 - acc: 0.9825 - val\_loss: 1.9013 - val\_acc: 0.6824\n",

"Epoch 34/100\n",

"97/97 [==============================] - 19s 191ms/step - loss: 0.0499 - acc: 0.9886 - val\_loss: 2.1477 - val\_acc: 0.6471\n",

"Epoch 35/100\n",

"97/97 [==============================] - 18s 190ms/step - loss: 0.0887 - acc: 0.9825 - val\_loss: 2.1067 - val\_acc: 0.7059\n",

"Epoch 36/100\n",

"97/97 [==============================] - 19s 190ms/step - loss: 0.0941 - acc: 0.9783 - val\_loss: 1.9811 - val\_acc: 0.6824\n",

"Epoch 37/100\n",

"97/97 [==============================] - 18s 189ms/step - loss: 0.1336 - acc: 0.9690 - val\_loss: 2.2101 - val\_acc: 0.6647\n",

"Epoch 38/100\n",

"97/97 [==============================] - 18s 190ms/step - loss: 0.1517 - acc: 0.9680 - val\_loss: 2.2843 - val\_acc: 0.6824\n",

"Epoch 39/100\n",

"97/97 [==============================] - 18s 189ms/step - loss: 0.1581 - acc: 0.9587 - val\_loss: 2.1658 - val\_acc: 0.6471\n",

"Epoch 40/100\n",

"97/97 [==============================] - 21s 212ms/step - loss: 0.1824 - acc: 0.9536 - val\_loss: 2.5084 - val\_acc: 0.6647\n",

"Epoch 41/100\n",

"97/97 [==============================] - 19s 192ms/step - loss: 0.1702 - acc: 0.9546 - val\_loss: 4.1952 - val\_acc: 0.6176\n",

"Epoch 42/100\n",

"97/97 [==============================] - 19s 191ms/step - loss: 0.2197 - acc: 0.9412 - val\_loss: 2.9636 - val\_acc: 0.5706\n",

"Epoch 43/100\n",

"97/97 [==============================] - 19s 192ms/step - loss: 0.1581 - acc: 0.9546 - val\_loss: 2.1069 - val\_acc: 0.6824\n",

"Epoch 44/100\n",

"97/97 [==============================] - 19s 193ms/step - loss: 0.0817 - acc: 0.9763 - val\_loss: 2.1963 - val\_acc: 0.6941\n",

"Epoch 45/100\n",

"97/97 [==============================] - 19s 191ms/step - loss: 0.0500 - acc: 0.9907 - val\_loss: 2.8681 - val\_acc: 0.6765\n",

"Epoch 46/100\n",

"97/97 [==============================] - 19s 191ms/step - loss: 0.0889 - acc: 0.9773 - val\_loss: 2.3192 - val\_acc: 0.7059\n",

"Epoch 47/100\n",

"97/97 [==============================] - 18s 190ms/step - loss: 0.0775 - acc: 0.9876 - val\_loss: 3.1451 - val\_acc: 0.6941\n",

"Epoch 48/100\n",

"97/97 [==============================] - 18s 189ms/step - loss: 0.1376 - acc: 0.9690 - val\_loss: 2.2887 - val\_acc: 0.6941\n",

"Epoch 49/100\n",

"97/97 [==============================] - 18s 189ms/step - loss: 0.0500 - acc: 0.9907 - val\_loss: 3.1124 - val\_acc: 0.7000\n",

"Epoch 50/100\n",

"97/97 [==============================] - 18s 190ms/step - loss: 0.1055 - acc: 0.9804 - val\_loss: 2.2108 - val\_acc: 0.6824\n",

"Epoch 51/100\n",

"97/97 [==============================] - 21s 212ms/step - loss: 0.0349 - acc: 0.9886 - val\_loss: 2.7751 - val\_acc: 0.6412\n",

"Epoch 52/100\n",

"97/97 [==============================] - 18s 189ms/step - loss: 0.0960 - acc: 0.9773 - val\_loss: 2.5336 - val\_acc: 0.6882\n",

"Epoch 53/100\n",

"97/97 [==============================] - 18s 188ms/step - loss: 0.1277 - acc: 0.9742 - val\_loss: 2.7289 - val\_acc: 0.6647\n",

"Epoch 54/100\n",

"97/97 [==============================] - 18s 189ms/step - loss: 0.0894 - acc: 0.9752 - val\_loss: 2.4635 - val\_acc: 0.6706\n",

"Epoch 55/100\n",

"97/97 [==============================] - 18s 189ms/step - loss: 0.1060 - acc: 0.9814 - val\_loss: 3.5136 - val\_acc: 0.6588\n",

"Epoch 56/100\n",

"97/97 [==============================] - 18s 187ms/step - loss: 0.0849 - acc: 0.9804 - val\_loss: 2.6414 - val\_acc: 0.6824\n",

"Epoch 57/100\n",

"97/97 [==============================] - 18s 188ms/step - loss: 0.0740 - acc: 0.9856 - val\_loss: 2.6839 - val\_acc: 0.7176\n",

"Epoch 58/100\n",

"97/97 [==============================] - 18s 188ms/step - loss: 0.1404 - acc: 0.9742 - val\_loss: 2.9829 - val\_acc: 0.7000\n",

"Epoch 59/100\n",

"97/97 [==============================] - 19s 190ms/step - loss: 0.1319 - acc: 0.9752 - val\_loss: 2.5947 - val\_acc: 0.6882\n",

"Epoch 60/100\n",

"97/97 [==============================] - 21s 213ms/step - loss: 0.1002 - acc: 0.9814 - val\_loss: 2.8899 - val\_acc: 0.6647\n",

"Epoch 61/100\n",

"97/97 [==============================] - 18s 188ms/step - loss: 0.1632 - acc: 0.9649 - val\_loss: 2.6314 - val\_acc: 0.6941\n",

"Epoch 62/100\n",

"97/97 [==============================] - 20s 208ms/step - loss: 0.0996 - acc: 0.9835 - val\_loss: 3.5069 - val\_acc: 0.6471\n",

"Epoch 63/100\n",

"97/97 [==============================] - 20s 209ms/step - loss: 0.1543 - acc: 0.9546 - val\_loss: 3.4140 - val\_acc: 0.6647\n",

"Epoch 64/100\n",

"97/97 [==============================] - 18s 188ms/step - loss: 0.1603 - acc: 0.9608 - val\_loss: 2.8006 - val\_acc: 0.6824\n",

"Epoch 65/100\n",

"97/97 [==============================] - 18s 185ms/step - loss: 0.0470 - acc: 0.9917 - val\_loss: 2.9281 - val\_acc: 0.6706\n",

"Epoch 66/100\n",

"97/97 [==============================] - 18s 188ms/step - loss: 0.0547 - acc: 0.9856 - val\_loss: 2.6578 - val\_acc: 0.7000\n",

"Epoch 67/100\n",

"97/97 [==============================] - 18s 188ms/step - loss: 0.0424 - acc: 0.9866 - val\_loss: 2.9958 - val\_acc: 0.6412\n",

"Epoch 68/100\n",

"97/97 [==============================] - 18s 188ms/step - loss: 0.1062 - acc: 0.9752 - val\_loss: 3.5791 - val\_acc: 0.6176\n",

"Epoch 69/100\n",

"97/97 [==============================] - 18s 186ms/step - loss: 0.0648 - acc: 0.9876 - val\_loss: 2.7452 - val\_acc: 0.7000\n",

"Epoch 70/100\n",

"97/97 [==============================] - 18s 188ms/step - loss: 0.0520 - acc: 0.9845 - val\_loss: 2.5709 - val\_acc: 0.7353\n",

"Epoch 71/100\n",

"97/97 [==============================] - 18s 187ms/step - loss: 0.0823 - acc: 0.9886 - val\_loss: 4.1480 - val\_acc: 0.6882\n",

"Epoch 72/100\n",

"97/97 [==============================] - 18s 189ms/step - loss: 0.0479 - acc: 0.9928 - val\_loss: 2.7652 - val\_acc: 0.6882\n",

"Epoch 73/100\n",

"97/97 [==============================] - 20s 207ms/step - loss: 0.0992 - acc: 0.9835 - val\_loss: 2.7451 - val\_acc: 0.6882\n",

"Epoch 74/100\n",

"97/97 [==============================] - 18s 189ms/step - loss: 0.1334 - acc: 0.9794 - val\_loss: 2.7716 - val\_acc: 0.7059\n",

"Epoch 75/100\n",

"97/97 [==============================] - 18s 190ms/step - loss: 0.0919 - acc: 0.9794 - val\_loss: 3.2767 - val\_acc: 0.7000\n",

"Epoch 76/100\n",

"97/97 [==============================] - 18s 190ms/step - loss: 0.1113 - acc: 0.9814 - val\_loss: 3.7251 - val\_acc: 0.7176\n",

"Epoch 77/100\n",

"97/97 [==============================] - 18s 188ms/step - loss: 0.1221 - acc: 0.9794 - val\_loss: 3.3398 - val\_acc: 0.6588\n",

"Epoch 78/100\n",

"97/97 [==============================] - 18s 187ms/step - loss: 0.1681 - acc: 0.9628 - val\_loss: 4.2207 - val\_acc: 0.6529\n",

"Epoch 79/100\n",

"97/97 [==============================] - 18s 186ms/step - loss: 0.1083 - acc: 0.9814 - val\_loss: 3.4916 - val\_acc: 0.6882\n",

"Epoch 80/100\n",

"97/97 [==============================] - 18s 187ms/step - loss: 0.0869 - acc: 0.9845 - val\_loss: 3.4377 - val\_acc: 0.6706\n",

"Epoch 81/100\n",

"97/97 [==============================] - 18s 186ms/step - loss: 0.1078 - acc: 0.9814 - val\_loss: 4.9982 - val\_acc: 0.6118\n",

"Epoch 82/100\n",

"97/97 [==============================] - 18s 185ms/step - loss: 0.1785 - acc: 0.9690 - val\_loss: 3.0411 - val\_acc: 0.6824\n",

"Epoch 83/100\n",

"97/97 [==============================] - 18s 186ms/step - loss: 0.1026 - acc: 0.9835 - val\_loss: 3.1353 - val\_acc: 0.6941\n",

"Epoch 84/100\n",

"97/97 [==============================] - 18s 187ms/step - loss: 0.0951 - acc: 0.9876 - val\_loss: 3.3077 - val\_acc: 0.7118\n",

"Epoch 85/100\n",

"97/97 [==============================] - 19s 190ms/step - loss: 0.0125 - acc: 0.9959 - val\_loss: 3.0417 - val\_acc: 0.7176\n",

"Epoch 86/100\n",

"97/97 [==============================] - 18s 188ms/step - loss: 0.0652 - acc: 0.9928 - val\_loss: 3.9668 - val\_acc: 0.6765\n",

"Epoch 87/100\n",

"97/97 [==============================] - 18s 187ms/step - loss: 0.1323 - acc: 0.9783 - val\_loss: 3.5612 - val\_acc: 0.6765\n",

"Epoch 88/100\n",

"97/97 [==============================] - 18s 188ms/step - loss: 0.0403 - acc: 0.9928 - val\_loss: 3.2598 - val\_acc: 0.7000\n",

"Epoch 89/100\n",

"97/97 [==============================] - 18s 187ms/step - loss: 0.0986 - acc: 0.9856 - val\_loss: 4.1915 - val\_acc: 0.6059\n",

"Epoch 90/100\n",

"97/97 [==============================] - 18s 185ms/step - loss: 0.1586 - acc: 0.9804 - val\_loss: 3.3004 - val\_acc: 0.6706\n",

"Epoch 91/100\n",

"97/97 [==============================] - 18s 188ms/step - loss: 0.0673 - acc: 0.9897 - val\_loss: 3.2391 - val\_acc: 0.6824\n",

"Epoch 92/100\n",

"97/97 [==============================] - 19s 190ms/step - loss: 0.0828 - acc: 0.9856 - val\_loss: 3.4563 - val\_acc: 0.6588\n",

"Epoch 93/100\n",

"97/97 [==============================] - 18s 187ms/step - loss: 0.0761 - acc: 0.9866 - val\_loss: 3.3207 - val\_acc: 0.7118\n",

"Epoch 94/100\n",

"97/97 [==============================] - 18s 189ms/step - loss: 0.0960 - acc: 0.9897 - val\_loss: 3.5292 - val\_acc: 0.6765\n",

"Epoch 95/100\n",

"97/97 [==============================] - 18s 190ms/step - loss: 0.0750 - acc: 0.9866 - val\_loss: 4.4016 - val\_acc: 0.5941\n",

"Epoch 96/100\n",

"97/97 [==============================] - 20s 201ms/step - loss: 0.0825 - acc: 0.9866 - val\_loss: 4.3764 - val\_acc: 0.6765\n",

"Epoch 97/100\n",

"97/97 [==============================] - 18s 188ms/step - loss: 0.1185 - acc: 0.9856 - val\_loss: 4.6414 - val\_acc: 0.6294\n",

"Epoch 98/100\n",

"97/97 [==============================] - 18s 188ms/step - loss: 0.0617 - acc: 0.9917 - val\_loss: 4.3458 - val\_acc: 0.6176\n",

"Epoch 99/100\n",

"97/97 [==============================] - 18s 189ms/step - loss: 0.0824 - acc: 0.9917 - val\_loss: 3.8459 - val\_acc: 0.7059\n",

"Epoch 100/100\n",

"97/97 [==============================] - 18s 189ms/step - loss: 0.0458 - acc: 0.9897 - val\_loss: 3.8171 - val\_acc: 0.6941\n"

]

}

]

},

{

"cell\_type": "code",

"source": [

"model1.save('body.h5')"

],

"metadata": {

"id": "hboHxB6NvBEq"

},

"execution\_count": null,

"outputs": []

},

{

"cell\_type": "code",

"source": [

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

"import cv2\n",

"from skimage.transform import resize"

],

"metadata": {

"id": "ee84mpvk3b-d"

},

"execution\_count": 19,

"outputs": []

},

{

"cell\_type": "code",

"source": [

"model=load\_model('/content/drive/MyDrive/level.h5/')"

],

"metadata": {

"id": "OfFdfXNh3qUi"

},

"execution\_count": 20,

"outputs": []

},

{

"cell\_type": "code",

"source": [

"def detect(frame):\n",

" img = cv2.resize(frame,(256,256)) #resizing the image to model trained image size\n",

" img = cv2.cvtColor(img,cv2.COLOR\_BGR2RGB) # uploaded image is in the form of BGR,so convert to RGB\n",

" # scaling need to be done\n",

" if(np.max(img)>1):\n",

" img = img/255.0\n",

" img = np.array([img]) #then to array fpormat\n",

" prediction = model. predict (img)\n",

" print(prediction)\n",

" label = [\"minor\",\"moderate\",\"severe\"]\n",

" preds = label[np.argmax(prediction)]\n",

" return preds"

],

"metadata": {

"id": "nE2h2L933xXH"

},

"execution\_count": 21,

"outputs": []

},

{

"cell\_type": "code",

"source": [

"import numpy as np"

],

"metadata": {

"id": "uchb9joQ4PuG"

},

"execution\_count": 22,

"outputs": []

},

{

"cell\_type": "code",

"source": [

"data = '/content/drive/MyDrive/Colab Notebooks/moderate-car-damage-300x263.jpg'\n",

"image = cv2.imread(data)\n",

"print (detect(image))"

],

"metadata": {

"colab": {

"base\_uri": "https://localhost:8080/"

},

"id": "A-ywd7Uf4YB8",

"outputId": "c0ffa996-d1af-4941-e02e-85c35bea221b"

},

"execution\_count": 23,

"outputs": [

{

"output\_type": "stream",

"name": "stdout",

"text": [

"1/1 [==============================] - 0s 126ms/step\n",

"[[3.9014634e-05 9.9909949e-01 8.6151168e-04]]\n",

"moderate\n"

]

}

]

},

{

"cell\_type": "code",

"source": [],

"metadata": {

"id": "S3z1\_2nM45Nu"

},

"execution\_count": null,

"outputs": []

}

]

}