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

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

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

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"x\_train = train\_datagen.flow\_from\_directory('/content/Dataset/training\_set',target\_size=(64,64),batch\_size=300,class\_mode='categorical',color\_mode=\"grayscale\")"

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"Found 15750 images belonging to 9 classes.\n"

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"from keras.models import Sequential\n",

"from keras.layers import Dense\n",

"from keras.layers import Convolution2D\n",

"from keras.layers import MaxPooling2D\n",

"from keras.layers import Dropout\n",

"from keras.layers import Flatten"

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"model = Sequential()"

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"model.add(Convolution2D(32,(3,3),input\_shape=(64,64,1), activation='relu'))\n",

"#no. of feature detectors, size of feature detector, image size, activation function"

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

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"model.add(Flatten())"

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"model.fit\_generator(x\_train,steps\_per\_epoch=24,epochs=10,validation\_data = x\_test, validation\_steps= 40)\n",

"#steps\_per\_epoch = no. of train images//batch size"

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"/usr/local/lib/python3.7/dist-packages/ipykernel\_launcher.py:1: UserWarning: `Model.fit\_generator` is deprecated and will be removed in a future version. Please use `Model.fit`, which supports generators.\n",

" \"\"\"Entry point for launching an IPython kernel.\n"

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"Epoch 1/10\n",

"24/24 [==============================] - ETA: 0s - loss: 1.2714 - accuracy: 0.6219"

]

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"WARNING:tensorflow:Your input ran out of data; interrupting training. Make sure that your dataset or generator can generate at least `steps\_per\_epoch \* epochs` batches (in this case, 40 batches). You may need to use the repeat() function when building your dataset.\n"

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"Epoch 2/10\n",

"24/24 [==============================] - 33s 1s/step - loss: 0.2827 - accuracy: 0.9211\n",

"Epoch 3/10\n",

"24/24 [==============================] - 34s 1s/step - loss: 0.1448 - accuracy: 0.9615\n",

"Epoch 4/10\n",

"24/24 [==============================] - 32s 1s/step - loss: 0.0958 - accuracy: 0.9746\n",

"Epoch 5/10\n",

"24/24 [==============================] - 34s 1s/step - loss: 0.0679 - accuracy: 0.9826\n",

"Epoch 6/10\n",

"24/24 [==============================] - 32s 1s/step - loss: 0.0424 - accuracy: 0.9909\n",

"Epoch 7/10\n",

"24/24 [==============================] - 32s 1s/step - loss: 0.0373 - accuracy: 0.9908\n",

"Epoch 8/10\n",

"24/24 [==============================] - 33s 1s/step - loss: 0.0319 - accuracy: 0.9915\n",

"Epoch 9/10\n",

"24/24 [==============================] - 32s 1s/step - loss: 0.0235 - accuracy: 0.9940\n",

"Epoch 10/10\n",

"24/24 [==============================] - 32s 1s/step - loss: 0.0170 - accuracy: 0.9972\n"

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"import numpy as np\n",

"import cv2"

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