

```
from google.colab import drive
drive.mount('/content/drive')
```

Mounted at /content/drive

```
! unzip '/content/drive/MyDrive/datasets/archive.zip'
```

```

inflating: dataset/cloudy/cloudy22.jpg
inflating: dataset/cloudy/cloudy220.jpg
inflating: dataset/cloudy/cloudy221.jpg
inflating: dataset/cloudy/cloudy222.jpg
inflating: dataset/cloudy/cloudy223.jpg
inflating: dataset/cloudy/cloudy224.jpg
inflating: dataset/cloudy/cloudy225.jpg
inflating: dataset/cloudy/cloudy226.jpg
inflating: dataset/cloudy/cloudy227.jpg
inflating: dataset/cloudy/cloudy228.jpg
inflating: dataset/cloudy/cloudy229.jpg
inflating: dataset/cloudy/cloudy23.jpg
inflating: dataset/cloudy/cloudy230.jpg
inflating: dataset/cloudy/cloudy231.jpg
inflating: dataset/cloudy/cloudy232.jpg
inflating: dataset/cloudy/cloudy233.jpg
inflating: dataset/cloudy/cloudy234.jpg
inflating: dataset/cloudy/cloudy235.jpg
inflating: dataset/cloudy/cloudy236.jpg
inflating: dataset/cloudy/cloudy237.jpg
inflating: dataset/cloudy/cloudy238.jpg
inflating: dataset/cloudy/cloudy239.jpg
inflating: dataset/cloudy/cloudy24.jpg
inflating: dataset/cloudy/cloudy240.jpg
inflating: dataset/cloudy/cloudy241.jpg
inflating: dataset/cloudy/cloudy242.jpg
inflating: dataset/cloudy/cloudy243.jpg
inflating: dataset/cloudy/cloudy244.jpg
inflating: dataset/cloudy/cloudy245.jpg
inflating: dataset/cloudy/cloudy246.jpg
inflating: dataset/cloudy/cloudy247.jpg
inflating: dataset/cloudy/cloudy248.jpg
inflating: dataset/cloudy/cloudy249.jpg
inflating: dataset/cloudy/cloudy25.jpg
inflating: dataset/cloudy/cloudy250.jpg
inflating: dataset/cloudy/cloudy251.jpg
inflating: dataset/cloudy/cloudy252.jpg
inflating: dataset/cloudy/cloudy253.jpg
inflating: dataset/cloudy/cloudy254.jpg
inflating: dataset/cloudy/cloudy255.jpg
inflating: dataset/cloudy/cloudy256.jpg
inflating: dataset/cloudy/cloudy257.jpg
inflating: dataset/cloudy/cloudy258.jpg
inflating: dataset/cloudy/cloudy259.jpg
inflating: dataset/cloudy/cloudy26.jpg
inflating: dataset/cloudy/cloudy260.jpg
inflating: dataset/cloudy/cloudy261.jpg
inflating: dataset/cloudy/cloudy262.jpg
inflating: dataset/cloudy/cloudy263.jpg
inflating: dataset/cloudy/cloudy264.jpg
inflating: dataset/cloudy/cloudy265.jpg
inflating: dataset/cloudy/cloudy266.jpg
inflating: dataset/cloudy/cloudy267.jpg
inflating: dataset/cloudy/cloudy268.jpg
inflating: dataset/cloudy/cloudy269.jpg
inflating: dataset/cloudy/cloudy27.jpg
inflating: dataset/cloudy/cloudy270.jpg
inflating: dataset/cloudy/cloudy271.jpg
inflating: dataset/cloudy/cloudy272.jpg

```

```
IMAGE_SIZE=[180,180]
```

```
! pip install tensorflow
```

```

Requirement already satisfied: tensorflow in /usr/local/lib/python3.10/dist-packages (2.12.0)
Requirement already satisfied: absl-py>=1.0.0 in /usr/local/lib/python3.10/dist-packages (from tensorflow) (1.4.0)
Requirement already satisfied: astunparse>=1.6.0 in /usr/local/lib/python3.10/dist-packages (from tensorflow) (1.6.3)
Requirement already satisfied: flatbuffers>=2.0 in /usr/local/lib/python3.10/dist-packages (from tensorflow) (23.5.26)
Requirement already satisfied: gast<=0.4.0,>=0.2.1 in /usr/local/lib/python3.10/dist-packages (from tensorflow) (0.4.0)
Requirement already satisfied: google-pasta>=0.1.1 in /usr/local/lib/python3.10/dist-packages (from tensorflow) (0.2.0)
Requirement already satisfied: grpcio<2.0,>=1.24.3 in /usr/local/lib/python3.10/dist-packages (from tensorflow) (1.56.0)
Requirement already satisfied: h5py>=2.9.0 in /usr/local/lib/python3.10/dist-packages (from tensorflow) (3.8.0)
Requirement already satisfied: jax>=0.3.15 in /usr/local/lib/python3.10/dist-packages (from tensorflow) (0.4.10)
Requirement already satisfied: keras<2.13,>=2.12.0 in /usr/local/lib/python3.10/dist-packages (from tensorflow) (2.12.0)

```

```

Requirement already satisfied: libclang>=13.0.0 in /usr/local/lib/python3.10/dist-packages (from tensorflow) (16.0.0)
Requirement already satisfied: numpy<1.24,>=1.22 in /usr/local/lib/python3.10/dist-packages (from tensorflow) (1.22.4)
Requirement already satisfied: opt-einsum>=2.3.2 in /usr/local/lib/python3.10/dist-packages (from tensorflow) (3.3.0)
Requirement already satisfied: packaging in /usr/local/lib/python3.10/dist-packages (from tensorflow) (23.1)
Requirement already satisfied: protobuf!=4.21.0,!<4.21.1,!<4.21.2,!<4.21.3,!<4.21.4,!<4.21.5,<5.0.0dev,>=3.20.3 in /usr/local/lib/python3.10/dist-packages (from tensorflow) (4.21.0)
Requirement already satisfied: setuptools in /usr/local/lib/python3.10/dist-packages (from tensorflow) (67.7.2)
Requirement already satisfied: six>=1.12.0 in /usr/local/lib/python3.10/dist-packages (from tensorflow) (1.16.0)
Requirement already satisfied: tensorboard<2.13,>=2.12 in /usr/local/lib/python3.10/dist-packages (from tensorflow) (2.12.3)
Requirement already satisfied: tensorflow-estimator<2.13,>=2.12.0 in /usr/local/lib/python3.10/dist-packages (from tensorflow) (2.12.0)
Requirement already satisfied: termcolor>=1.1.0 in /usr/local/lib/python3.10/dist-packages (from tensorflow) (2.3.0)
Requirement already satisfied: typing-extensions>=3.6.6 in /usr/local/lib/python3.10/dist-packages (from tensorflow) (4.6.3)
Requirement already satisfied: wrapt<1.15,>=1.11.0 in /usr/local/lib/python3.10/dist-packages (from tensorflow) (1.14.1)
Requirement already satisfied: tensorflow-io-gcs-filesystem>=0.23.1 in /usr/local/lib/python3.10/dist-packages (from tensorflow) (0.32.6)
Requirement already satisfied: wheel<1.0,>=0.23.0 in /usr/local/lib/python3.10/dist-packages (from astunparse>=1.6.0->tensorflow) (0.40.0)
Requirement already satisfied: ml-dtypes>=0.1.0 in /usr/local/lib/python3.10/dist-packages (from jax>=0.3.15->tensorflow) (0.2.0)
Requirement already satisfied: scipy>=1.7 in /usr/local/lib/python3.10/dist-packages (from jax>=0.3.15->tensorflow) (1.10.1)
Requirement already satisfied: google-auth<3,>=1.6.3 in /usr/local/lib/python3.10/dist-packages (from tensorboard<2.13,>=2.12->tensorflow) (2.21.0)
Requirement already satisfied: google-auth-oauthlib<1.1,>=0.5 in /usr/local/lib/python3.10/dist-packages (from tensorboard<2.13,>=2.12->tensorflow) (0.5.0)
Requirement already satisfied: markdown>=2.6.8 in /usr/local/lib/python3.10/dist-packages (from tensorboard<2.13,>=2.12->tensorflow) (3.4.1)
Requirement already satisfied: requests<3,>=2.21.0 in /usr/local/lib/python3.10/dist-packages (from tensorboard<2.13,>=2.12->tensorflow) (2.28.1)
Requirement already satisfied: tensorboard-data-server<0.8.0,>=0.7.0 in /usr/local/lib/python3.10/dist-packages (from tensorboard<2.13,>=2.12->tensorflow) (0.7.0)
Requirement already satisfied: werkzeug>=1.0.1 in /usr/local/lib/python3.10/dist-packages (from tensorboard<2.13,>=2.12->tensorflow) (2.3.7)
Requirement already satisfied: cachetools<6.0,>=2.0.0 in /usr/local/lib/python3.10/dist-packages (from google-auth<3,>=1.6.3->tensorboard<2.13,>=2.12->tensorflow) (5.3.0)
Requirement already satisfied: pyasn1-modules>=0.2.1 in /usr/local/lib/python3.10/dist-packages (from google-auth<3,>=1.6.3->tensorboard<2.13,>=2.12->tensorflow) (0.3.1)
Requirement already satisfied: rsa<5,>=3.1.4 in /usr/local/lib/python3.10/dist-packages (from google-auth<3,>=1.6.3->tensorboard<2.13,>=2.12->tensorflow) (4.9)
Requirement already satisfied: requests-oauthlib>=0.7.0 in /usr/local/lib/python3.10/dist-packages (from google-auth-oauthlib<1.1,>=0.5->tensorboard<2.13,>=2.12->tensorflow) (1.3.1)
Requirement already satisfied: urllib3<1.27,>=1.21.1 in /usr/local/lib/python3.10/dist-packages (from requests<3,>=2.21.0->tensorboard<2.13,>=2.12->tensorflow) (2.0.4)
Requirement already satisfied: certifi>=2017.4.17 in /usr/local/lib/python3.10/dist-packages (from requests<3,>=2.21.0->tensorboard<2.13,>=2.12->tensorflow) (2023.7.22)
Requirement already satisfied: charset-normalizer~>2.0.0 in /usr/local/lib/python3.10/dist-packages (from requests<3,>=2.21.0->tensorboard<2.13,>=2.12->tensorflow) (3.2.0)
Requirement already satisfied: idna<4,>=2.5 in /usr/local/lib/python3.10/dist-packages (from requests<3,>=2.21.0->tensorboard<2.13,>=2.12->tensorflow) (3.4)
Requirement already satisfied: MarkupSafe>=2.1.1 in /usr/local/lib/python3.10/dist-packages (from werkzeug>=1.0.1->tensorboard<2.13,>=2.12->tensorflow) (2.1.3)
Requirement already satisfied: pyasn1<0.6.0,>=0.4.6 in /usr/local/lib/python3.10/dist-packages (from pyasn1-modules>=0.2.1->google-auth<3,>=1.6.3->tensorboard<2.13,>=2.12->tensorflow) (0.5.1)
Requirement already satisfied: oauthlib>=3.0.0 in /usr/local/lib/python3.10/dist-packages (from requests-oauthlib>=0.7.0->google-auth-oauthlib<1.1,>=0.5->tensorboard<2.13,>=2.12->tensorflow) (3.2.2)

```

```

from tensorflow.keras.applications.vgg19 import VGG19,preprocess_input
from tensorflow.keras.layers import Flatten,Dense
from tensorflow.keras.models import Model
from tensorflow.keras.preprocessing.image import ImageDataGenerator
from PIL import ImageFile
from tensorflow.keras.models import load_model
from tensorflow.keras.preprocessing import image
import numpy as np

```

```

train_datagen = ImageDataGenerator(rescale=1./255,
    shear_range=0.2,
    zoom_range=[.99,1.01],
    brightness_range=[0.8,1.2],
    data_format="channels_last",
    fill_mode="constant",
    horizontal_flip=True)
test_datagen = ImageDataGenerator(rescale=1./255)

```

```

training_set=train_datagen.flow_from_directory('/content/drive/MyDrive/train',
    target_size=(180,180),
    batch_size=64,
    class_mode='categorical')
test_set=train_datagen.flow_from_directory('/content/drive/MyDrive/test',
    target_size=(180,180),
    batch_size=64,
    class_mode='categorical')

```

```

Found 1500 images belonging to 5 classes.
Found 930 images belonging to 5 classes.

```

```

from tensorflow.keras.applications.vgg16 import VGG16, preprocess_input

```

```

# Adding the preprocessing layer to the front of vgg

```

```

VGG19 = VGG19(input_shape=IMAGE_SIZE + [3],weights='imagenet',include_top=False)

```

```

Downloading data from https://storage.googleapis.com/tensorflow/keras-applications/vgg19/weights\_tf\_dim\_ordering\_tf\_kernels\_notop.80134624/80134624 [=====] - 0s 0us/step

```

```
# Train model with existing weights

for layer in VGG19.layers:
    layer.trainable=False

x = Flatten()(VGG19.output)

# output layer

prediction = Dense(5,activation='softmax')(x)

# Create Vgg16 model

model = Model(inputs=VGG19.input,outputs=prediction)

model.summary()
```

Model: "model"

Layer (type)	Output Shape	Param #
input_1 (InputLayer)	[(None, 180, 180, 3)]	0
block1_conv1 (Conv2D)	(None, 180, 180, 64)	1792
block1_conv2 (Conv2D)	(None, 180, 180, 64)	36928
block1_pool (MaxPooling2D)	(None, 90, 90, 64)	0
block2_conv1 (Conv2D)	(None, 90, 90, 128)	73856
block2_conv2 (Conv2D)	(None, 90, 90, 128)	147584
block2_pool (MaxPooling2D)	(None, 45, 45, 128)	0
block3_conv1 (Conv2D)	(None, 45, 45, 256)	295168
block3_conv2 (Conv2D)	(None, 45, 45, 256)	590080
block3_conv3 (Conv2D)	(None, 45, 45, 256)	590080
block3_conv4 (Conv2D)	(None, 45, 45, 256)	590080
block3_pool (MaxPooling2D)	(None, 22, 22, 256)	0
block4_conv1 (Conv2D)	(None, 22, 22, 512)	1180160
block4_conv2 (Conv2D)	(None, 22, 22, 512)	2359808
block4_conv3 (Conv2D)	(None, 22, 22, 512)	2359808
block4_conv4 (Conv2D)	(None, 22, 22, 512)	2359808
block4_pool (MaxPooling2D)	(None, 11, 11, 512)	0
block5_conv1 (Conv2D)	(None, 11, 11, 512)	2359808
block5_conv2 (Conv2D)	(None, 11, 11, 512)	2359808
block5_conv3 (Conv2D)	(None, 11, 11, 512)	2359808
block5_conv4 (Conv2D)	(None, 11, 11, 512)	2359808
block5_pool (MaxPooling2D)	(None, 5, 5, 512)	0
flatten (Flatten)	(None, 12800)	0
dense (Dense)	(None, 5)	64005

```
=====
Total params: 20,088,389
Trainable params: 64,005
Non-trainable params: 20,024,384
```

```
model.compile(loss='categorical_crossentropy',optimizer='adam',metrics=['accuracy'])
```

```

model.fit_generator(training_set,
                    validation_data=test_set,
                    epochs=1,
                    steps_per_epoch=len(training_set),
                    validation_steps=len(test_set)
                    )

```

<ipython-input-14-4e3d432559d5>:1: UserWarning: `Model.fit_generator` is deprecated and will be removed in a future version. Please use
 model.fit_generator(training_set,
 24/24 [=====] - 1400s 59s/step - loss: 1.1750 - accuracy: 0.5327 - val_loss: 0.6866 - val_accuracy: 0.7527
 <keras.callbacks.History at 0x7fef45e6ddb0>

```

model.save('kanekanti.h5')

```

```

import numpy as np
import os
from tensorflow.keras.models import load_model
from tensorflow.keras.preprocessing import image
from flask import Flask, render_template, request
app=Flask(__name__)
model=load_model("/content/drive/MyDrive/kanekanti.h5")
loss, accuracy=model.evaluate(test_set,
                              steps=11,
                              verbose=2,
                              use_multiprocessing=True,
                              workers=2)
print(f"Model performance on test images:\n accuracy = {accuracy}\nLoss={loss}")

```

11/11 - 394s - loss: 0.1254 - accuracy: 0.9759 - 394s/epoch - 36s/step
 Model performance on test images:
 accuracy = 0.9758522510528564
 Loss=0.1253613829612732

[Colab paid products](#) - [Cancel contracts here](#)

