```
!unzip "/content/Flowers-Dataset.zip"
```

```
Archive:  /content/Flowers-Dataset.zip
  inflating: flowers/daisy/100080576_f52e8ee070_n.jpg
  inflating: flowers/daisy/10140303196_b88d3d6cec.jpg
  inflating: flowers/daisy/10172379554_b296050f82_n.jpg
  inflating: flowers/daisy/10172567486_2748826a8b.jpg
  inflating: flowers/daisy/10172636503_21bededa75_n.jpg
  inflating: flowers/daisy/102841525_bd6628ae3c.jpg
  inflating: flowers/daisy/10300722094_28fa978807_n.jpg
  inflating: flowers/daisy/1031799732_e7f4008c03.jpg
  inflating: flowers/daisy/10391248763_1d16681106_n.jpg
  inflating: flowers/daisy/10437754174_22ec990b77_m.jpg
  inflating: flowers/daisy/10437770546_8bb6f7bdd3_m.jpg
  inflating: flowers/daisy/10437929963_bc13eebe0c.jpg
  inflating: flowers/daisy/10466290366_cc72e33532.jpg
  inflating: flowers/daisy/10466558316_a7198b87e2.jpg
  inflating: flowers/daisy/10555749515_13a12a026e.jpg
  inflating: flowers/daisy/10555815624_dc211569b0.jpg
  inflating: flowers/daisy/10555826524_423eb8bf71_n.jpg
  inflating: flowers/daisy/10559679065_50d2b16f6d.jpg
  inflating: flowers/daisy/105806915_a9c13e2106_n.jpg
  inflating: flowers/daisy/10712722853_5632165b04.jpg
  inflating: flowers/daisy/107592979_aaa9cdfe78_m.jpg
  inflating: flowers/daisy/10770585085_4742b9dac3_n.jpg
  inflating: flowers/daisy/10841136265_af473efc60.jpg
  inflating: flowers/daisy/10993710036_2033222c91.jpg
  inflating: flowers/daisy/10993818044_4c19b86c82.jpg
  inflating: flowers/daisy/10994032453_ac7f8d9e2e.jpg
  inflating: flowers/daisy/11023214096_b5b39fab08.jpg
  inflating: flowers/daisy/11023272144_fce94401f2_m.jpg
  inflating: flowers/daisy/11023277956_8980d53169_m.jpg
  inflating: flowers/daisy/11124324295_503f3a0804.jpg
  inflating: flowers/daisy/1140299375_3aa7024466.jpg
  inflating: flowers/daisy/11439894966_dca877f0cd.jpg
  inflating: flowers/daisy/1150395827_6f94a5c6e4_n.jpg
  inflating: flowers/daisy/11642632_1e7627a2cc.jpg
  inflating: flowers/daisy/11834945233_a53b7a92ac_m.jpg
  inflating: flowers/daisy/11870378973_2ec1919f12.jpg
  inflating: flowers/daisy/11891885265_ccefec7284_n.jpg
  inflating: flowers/daisy/12193032636_b50ae7db35_n.jpg
  inflating: flowers/daisy/12348343085_d4c396e5b5_m.jpg
  inflating: flowers/daisy/12585131704_0f64b17059_m.jpg
  inflating: flowers/daisy/12601254324_3cb62c254a_m.jpg
  inflating: flowers/daisy/1265350143_6e2b276ec9.jpg
  inflating: flowers/daisy/12701063955_4840594ea6_n.jpg
  inflating: flowers/daisy/1285423653_18926dc2c8_n.jpg
  inflating: flowers/daisy/1286274236_1d7ac84efb_n.jpg
  inflating: flowers/daisy/12891819633_e4c82b51e8.jpg
  inflating: flowers/daisy/1299501272_59d9da5510_n.jpg
  inflating: flowers/daisy/1306119996_ab8ae14d72_n.jpg
  inflating: flowers/daisy/1314069875_da8dc023c6_m.jpg
  inflating: flowers/daisy/1342002397_9503c97b49.jpg
  inflating: flowers/Daisy/134409839_71069a95d1_m.jpg
  inflating: flowers/daisy/1344985627_c3115e2d71_n.jpg
  inflating: flowers/Daisy/13491959645_2cd9df44d6_n.jpg
  inflating: flowers/daisy/1354396826_2868631432_m.jpg
  inflating: flowers/daisy/1355787476_32e9f2a30b.jpg
```

```
      inflating: flowers/daisy/13583238844_573df2de8e_m.jpg
      inflating: flowers/daisy/1374193928_a5222noafa_ing
```

▾ IMAGE AUGMENTATION

```python
from tensorflow.keras.preprocessing.image import ImageDataGenerator
train_datagen = ImageDataGenerator(rescale=1./255,
                                   zoom_range=0.2,
                                   horizontal_flip=True,vertical_flip=True)
test_datagen = ImageDataGenerator(rescale=1./255)
xtrain = train_datagen.flow_from_directory('/content/flowers',
                                            target_size=(64,64),
                                            class_mode='categorical',
                                            batch_size=24)
xtest = test_datagen.flow_from_directory('/content/flowers',
                                          target_size=(64,64),
                                          class_mode='categorical',
                                          batch_size=124)
```

```
    Found 4317 images belonging to 5 classes.
    Found 4317 images belonging to 5 classes.
```

▾ CREATE MODEL AND ADDING LAYERS

```python
from tensorflow.keras.models import Sequential

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

model = Sequential()

model.add(Convolution2D(32,(3,3),activation='relu',input_shape=(64,64,3))) # Convol

model.add(MaxPooling2D(pool_size=(2,2))) # Max pooling layer

model.add(Flatten()) # Flatten layer

model.add(Dense(300,activation='relu')) # Hidden layer 1

model.add(Dense(150,activation='relu')) # Hidden layer 2

model.add(Dense(4,activation='softmax')) # Output layer
```

▾ COMPILE MODEL

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

```python
len(xtrain)
```

```
180
```

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

```python
model.fit(xtrain,
          steps_per_epoch=len(xtrain),
          epochs=5,
          validation_data=xtest,
          validation_steps=len(xtest))
```

```
Epoch 1/5
------------------------------------------------------------------------
InvalidArgumentError                     Traceback (most recent call last)
<ipython-input-47-9a4ef8c8eb25> in <module>
      3             epochs=5,
      4             validation_data=xtest,
----> 5             validation_steps=len(xtest))

                              ‹› 1 frames

/usr/local/lib/python3.7/dist-packages/tensorflow/python/eager/execute.py
in quick_execute(op_name, num_outputs, inputs, attrs, ctx, name)
     53     ctx.ensure_initialized()
     54     tensors = pywrap_tfe.TFE_Py_Execute(ctx._handle, device_name,
op_name,
---> 55                                         inputs, attrs, num_outputs)
     56     except core._NotOkStatusException as e:
```

‣ SAVE MODEL

[ ] ↳ 1 cell hidden

```
'categorical_crossentropy/softmax_cross_entropy_with_logits' defined at
```

‣ TEST THE MODEL

[ ] ↳ 15 cells hidden

```
File "/usr/local/lib/python3.7/dist-packages/ipykernel_launcher.py",
line 16, in <module>
    app.launch_new_instance()
  File "/usr/local/lib/python3.7/dist-
packages/traitlets/config/application.py", line 846, in launch_instance
    app.start()
  File "/usr/local/lib/python3.7/dist-packages/ipykernel/kernelapp.py",
line 612, in start
    self.io_loop.start()
  File "/usr/local/lib/python3.7/dist-
packages/tornado/platform/asyncio.py", line 132, in start
    self.asyncio_loop.run_forever()
  File "/usr/lib/python3.7/asyncio/base_events.py", line 541, in
run_forever
    self._run_once()
  File "/usr/lib/python3.7/asyncio/base_events.py", line 1786, in
_run_once
    handle._run()
  File "/usr/lib/python3.7/asyncio/events.py", line 88, in _run
    self._context.run(self._callback, *self._args)
  File "/usr/local/lib/python3.7/dist-packages/tornado/ioloop.py", line
758, in _run_callback
    ret = callback()
  File "/usr/local/lib/python3.7/dist-packages/tornado/stack_context.py",
line 300, in null_wrapper
    return fn(*args, **kwargs)
  File "/usr/local/lib/python3.7/dist-packages/tornado/gen.py", line
```