Assignment_6

November 7, 2023

[1]:
```
from tensorflow.keras.utils import load_img
from tensorflow.keras.utils import img_to_array
from keras.applications.vgg16 import preprocess_input
from keras.applications.vgg16 import decode_predictions
from keras.applications.vgg16 import VGG16
```

[2]:
```
image = load_img('/home/rmdstic/Desktop/Avadhut Tehare/tajmahal.jpg',␣
↪target_size=(224, 224))
```

[3]:
```
image = img_to_array(image)
```

[4]:
```
print(image)
```

```
[[[ 0.  5. 11.]
  [ 1.  6. 12.]
  [ 1.  8. 18.]
  …
  [ 6. 28. 75.]
  [ 6. 28. 75.]
  [ 6. 28. 75.]]

 [[ 0.  5. 11.]
  [ 1.  6. 12.]
  [ 1.  8. 18.]
  …
  [ 6. 28. 75.]
  [ 6. 28. 75.]
  [ 6. 28. 75.]]

 [[ 0.  5. 11.]
  [ 1.  6. 12.]
  [ 1.  8. 18.]
  …
  [ 6. 28. 75.]
  [ 6. 28. 75.]
  [ 6. 28. 75.]]

 …
```

```
[[ 0.  5.  9.]
 [ 1.  5. 14.]
 [ 0.  7. 17.]
 …
 [ 3. 21. 67.]
 [ 5. 22. 68.]
 [ 5. 22. 68.]]

[[ 1.  6. 12.]
 [ 1.  6. 12.]
 [ 0.  7. 17.]
 …
 [ 3. 20. 64.]
 [ 0. 18. 64.]
 [ 3. 21. 67.]]

[[ 1.  6. 12.]
 [ 1.  6. 12.]
 [ 0.  7. 17.]
 …
 [ 1. 18. 62.]
 [ 3. 21. 67.]
 [ 5. 23. 69.]]]
```

[5]:
```
image = image.reshape((1, image.shape[0], image.shape[1], image.shape[2]))
```

[6]:
```
print(image)
```

```
[[[[ 0.  5. 11.]
   [ 1.  6. 12.]
   [ 1.  8. 18.]
   …
   [ 6. 28. 75.]
   [ 6. 28. 75.]
   [ 6. 28. 75.]]

  [[ 0.  5. 11.]
   [ 1.  6. 12.]
   [ 1.  8. 18.]
   …
   [ 6. 28. 75.]
   [ 6. 28. 75.]
   [ 6. 28. 75.]]

  [[ 0.  5. 11.]
   [ 1.  6. 12.]
   [ 1.  8. 18.]
```

```
 …
  [ 6. 28. 75.]
  [ 6. 28. 75.]
  [ 6. 28. 75.]]

…

 [[ 0.  5.  9.]
  [ 1.  5. 14.]
  [ 0.  7. 17.]
  …
  [ 3. 21. 67.]
  [ 5. 22. 68.]
  [ 5. 22. 68.]]

 [[ 1.  6. 12.]
  [ 1.  6. 12.]
  [ 0.  7. 17.]
  …
  [ 3. 20. 64.]
  [ 0. 18. 64.]
  [ 3. 21. 67.]]

 [[ 1.  6. 12.]
  [ 1.  6. 12.]
  [ 0.  7. 17.]
  …
  [ 1. 18. 62.]
  [ 3. 21. 67.]
  [ 5. 23. 69.]]]]
```

[7]:
```
image = preprocess_input(image)
```

[8]:
```
model = VGG16()
```

[9]:
```
print(image)
```

```
[[[[ -92.939    -111.779    -123.68    ]
   [ -91.939    -110.779    -122.68    ]
   [ -85.939    -108.779    -122.68    ]
   …
   [ -28.939003  -88.779    -117.68    ]
   [ -28.939003  -88.779    -117.68    ]
   [ -28.939003  -88.779    -117.68    ]]

  [[ -92.939    -111.779    -123.68    ]
   [ -91.939    -110.779    -122.68    ]
   [ -85.939    -108.779    -122.68    ]
```

```
  …
   [ -28.939003  -88.779    -117.68    ]
   [ -28.939003  -88.779    -117.68    ]
   [ -28.939003  -88.779    -117.68    ]]

  [[ -92.939    -111.779    -123.68    ]
   [ -91.939    -110.779    -122.68    ]
   [ -85.939    -108.779    -122.68    ]
   …
   [ -28.939003  -88.779    -117.68    ]
   [ -28.939003  -88.779    -117.68    ]
   [ -28.939003  -88.779    -117.68    ]]

  …

  [[ -94.939    -111.779    -123.68    ]
   [ -89.939    -111.779    -122.68    ]
   [ -86.939    -109.779    -123.68    ]
   …
   [ -36.939003  -95.779    -120.68    ]
   [ -35.939003  -94.779    -118.68    ]
   [ -35.939003  -94.779    -118.68    ]]

  [[ -91.939    -110.779    -122.68    ]
   [ -91.939    -110.779    -122.68    ]
   [ -86.939    -109.779    -123.68    ]
   …
   [ -39.939003  -96.779    -120.68    ]
   [ -39.939003  -98.779    -123.68    ]
   [ -36.939003  -95.779    -120.68    ]]

  [[ -91.939    -110.779    -122.68    ]
   [ -91.939    -110.779    -122.68    ]
   [ -86.939    -109.779    -123.68    ]
   …
   [ -41.939003  -98.779    -122.68    ]
   [ -36.939003  -95.779    -120.68    ]
   [ -34.939003  -93.779    -118.68    ]]]]
```

[10]:
```
yhat =model.predict(image)
```

```
1/1 [==============================] - 9s 9s/step
```

[11]:
```
label=decode_predictions(yhat)
```

[12]:
```
label=label[0][0]
```

[13]:
```
print('%s (%.2f%%)' % (label[1], label[2]*100))
```

```
church (86.41%)
```

[14]:
```
image=load_img('/home/rmdstic/Downloads/cat.jpeg', target_size=(224, 224))
```

[15]:
```
print(image)
```

```
<PIL.Image.Image image mode=RGB size=224x224 at 0x7F5DD84A4400>
```

[16]:
```
image = img_to_array(image)
```

[17]:
```
print(image)
```

```
[[[  1.   1.   1.]
  [  1.   1.   1.]
  [  1.   1.   1.]
  …
  [  1.   1.   1.]
  [  1.   1.   1.]
  [  1.   1.   1.]]

 [[  1.   1.   1.]
  [  1.   1.   1.]
  [  1.   1.   1.]
  …
  [  1.   1.   1.]
  [  1.   1.   1.]
  [  1.   1.   1.]]

 [[  1.   1.   1.]
  [  1.   1.   1.]
  [  1.   1.   1.]
  …
  [  1.   1.   1.]
  [  1.   1.   1.]
  [  1.   1.   1.]]

 …

 [[ 89.  70.  56.]
  [103.  84.  70.]
  [120. 101.  87.]
  …
  [  1.   1.   1.]
  [  1.   1.   1.]
  [  1.   1.   1.]]

 [[ 93.  74.  60.]
  [100.  81.  67.]
  [130. 111.  97.]
```

```
 …
 [  1.   1.   1.]
 [  1.   1.   1.]
 [  1.   1.   1.]]

[[ 83.  64.  50.]
 [105.  86.  72.]
 [ 93.  74.  60.]
 …
 [  1.   1.   1.]
 [  1.   1.   1.]
 [  1.   1.   1.]]]
```

[18]:
```
image = image.reshape((1, image.shape[0], image.shape[1], image.shape[2]))
```

[19]:
```
image = preprocess_input(image)
```

[20]:
```
print(image)
```

```
[[[[-102.939     -115.779     -122.68     ]
   [-102.939     -115.779     -122.68     ]
   [-102.939     -115.779     -122.68     ]
   …
   [-102.939     -115.779     -122.68     ]
   [-102.939     -115.779     -122.68     ]
   [-102.939     -115.779     -122.68     ]]

  [[-102.939     -115.779     -122.68     ]
   [-102.939     -115.779     -122.68     ]
   [-102.939     -115.779     -122.68     ]
   …
   [-102.939     -115.779     -122.68     ]
   [-102.939     -115.779     -122.68     ]
   [-102.939     -115.779     -122.68     ]]

  [[-102.939     -115.779     -122.68     ]
   [-102.939     -115.779     -122.68     ]
   [-102.939     -115.779     -122.68     ]
   …
   [-102.939     -115.779     -122.68     ]
   [-102.939     -115.779     -122.68     ]
   [-102.939     -115.779     -122.68     ]]


  …

  [[ -47.939003   -46.779      -34.68     ]
   [ -33.939003   -32.779      -20.68     ]
   [ -16.939003   -15.778999    -3.6800003]
```

```
  …
   [-102.939     -115.779     -122.68     ]
   [-102.939     -115.779     -122.68     ]
   [-102.939     -115.779     -122.68     ]]

  [[ -43.939003   -42.779      -30.68     ]
   [ -36.939003   -35.779      -23.68     ]
   [  -6.939003    -5.7789993    6.3199997]
   …
   [-102.939     -115.779     -122.68     ]
   [-102.939     -115.779     -122.68     ]
   [-102.939     -115.779     -122.68     ]]

  [[ -53.939003   -52.779      -40.68     ]
   [ -31.939003   -30.779      -18.68     ]
   [ -43.939003   -42.779      -30.68     ]
   …
   [-102.939     -115.779     -122.68     ]
   [-102.939     -115.779     -122.68     ]
   [-102.939     -115.779     -122.68     ]]]]
```

[21]:
```
model = VGG16()
```

[22]:
```
yhat = model.predict(image)
```

```
1/1 [==============================] - 2s 2s/step
```

[23]:
```
label = decode_predictions(yhat)
```

[24]:
```
label = label[0][0]

print('%s (%.2f%%)' % (label[1], label[2]*100))
```

```
Egyptian_cat (56.31%)
```

[25]:
```
print(image)
```

```
[[[[-102.939     -115.779     -122.68     ]
   [-102.939     -115.779     -122.68     ]
   [-102.939     -115.779     -122.68     ]
   …
   [-102.939     -115.779     -122.68     ]
   [-102.939     -115.779     -122.68     ]
   [-102.939     -115.779     -122.68     ]]

  [[-102.939     -115.779     -122.68     ]
   [-102.939     -115.779     -122.68     ]
   [-102.939     -115.779     -122.68     ]
   …
```

```
 [-102.939     -115.779     -122.68     ]
 [-102.939     -115.779     -122.68     ]
 [-102.939     -115.779     -122.68     ]]

[[-102.939     -115.779     -122.68     ]
 [-102.939     -115.779     -122.68     ]
 [-102.939     -115.779     -122.68     ]
 …
 [-102.939     -115.779     -122.68     ]
 [-102.939     -115.779     -122.68     ]
 [-102.939     -115.779     -122.68     ]]

…

[[ -47.939003   -46.779      -34.68     ]
 [ -33.939003   -32.779      -20.68     ]
 [ -16.939003   -15.778999    -3.6800003]
 …
 [-102.939     -115.779     -122.68     ]
 [-102.939     -115.779     -122.68     ]
 [-102.939     -115.779     -122.68     ]]

[[ -43.939003   -42.779      -30.68     ]
 [ -36.939003   -35.779      -23.68     ]
 [  -6.939003    -5.7789993    6.3199997]
 …
 [-102.939     -115.779     -122.68     ]
 [-102.939     -115.779     -122.68     ]
 [-102.939     -115.779     -122.68     ]]

[[ -53.939003   -52.779      -40.68     ]
 [ -31.939003   -30.779      -18.68     ]
 [ -43.939003   -42.779      -30.68     ]
 …
 [-102.939     -115.779     -122.68     ]
 [-102.939     -115.779     -122.68     ]
 [-102.939     -115.779     -122.68     ]]]]
```

[26]:
```
image = load_img('/home/rmdstic/Downloads/dog.jpeg', target_size=(224, 224))
```

[27]:
```
image = img_to_array(image)
```

[28]:
```
print(image)
```

```
[[[ 24.  17.  11.]
  [ 24.  17.  11.]
  [ 24.  17.  11.]
  …
```

```
 [168. 111.  58.]
 [163. 106.  53.]
 [161. 103.  53.]]

[[ 24.  17.  11.]
 [ 24.  17.  11.]
 [ 24.  17.  11.]
 …
 [168. 111.  58.]
 [163. 106.  53.]
 [161. 103.  53.]]

[[ 24.  17.  11.]
 [ 24.  17.  11.]
 [ 24.  17.  11.]
 …
 [164. 107.  54.]
 [160. 102.  52.]
 [157.  99.  49.]]

…

[[ 89.  97. 116.]
 [ 89.  97. 116.]
 [ 89.  97. 116.]
 …
 [ 47.  68.  89.]
 [ 49.  70.  91.]
 [ 49.  70.  91.]]

[[ 81.  89. 108.]
 [ 81.  89. 108.]
 [ 82.  90. 109.]
 …
 [ 41.  63.  86.]
 [ 43.  65.  88.]
 [ 43.  65.  88.]]

[[ 81.  89. 108.]
 [ 81.  89. 108.]
 [ 82.  90. 109.]
 …
 [ 41.  63.  86.]
 [ 43.  65.  88.]
 [ 43.  65.  88.]]]
```

[29]:
```
image = image.reshape((1, image.shape[0], image.shape[1], image.shape[2]))
```

[30]:
```
image = preprocess_input(image)
```

[31]:
```
print(image)
```

```
[[[[-92.939     -99.779     -99.68     ]
   [-92.939     -99.779     -99.68     ]
   [-92.939     -99.779     -99.68     ]
   …
   [-45.939003   -5.7789993  44.32     ]
   [-50.939003  -10.778999   39.32     ]
   [-50.939003  -13.778999   37.32     ]]

  [[-92.939     -99.779     -99.68     ]
   [-92.939     -99.779     -99.68     ]
   [-92.939     -99.779     -99.68     ]
   …
   [-45.939003   -5.7789993  44.32     ]
   [-50.939003  -10.778999   39.32     ]
   [-50.939003  -13.778999   37.32     ]]

  [[-92.939     -99.779     -99.68     ]
   [-92.939     -99.779     -99.68     ]
   [-92.939     -99.779     -99.68     ]
   …
   [-49.939003   -9.778999   40.32     ]
   [-51.939003  -14.778999   36.32     ]
   [-54.939003  -17.779      33.32     ]]

  …

  [[ 12.060997  -19.779     -34.68     ]
   [ 12.060997  -19.779     -34.68     ]
   [ 12.060997  -19.779     -34.68     ]
   …
   [-14.939003  -48.779     -76.68     ]
   [-12.939003  -46.779     -74.68     ]
   [-12.939003  -46.779     -74.68     ]]

  [[  4.060997  -27.779     -42.68     ]
   [  4.060997  -27.779     -42.68     ]
   [  5.060997  -26.779     -41.68     ]
   …
   [-17.939003  -53.779     -82.68     ]
   [-15.939003  -51.779     -80.68     ]
   [-15.939003  -51.779     -80.68     ]]

  [[  4.060997  -27.779     -42.68     ]
   [  4.060997  -27.779     -42.68     ]
```

```
  [  5.060997  -26.779     -41.68     ]
  …
  [-17.939003  -53.779     -82.68     ]
  [-15.939003  -51.779     -80.68     ]
  [-15.939003  -51.779     -80.68     ]]]]
```

[32]:
```
model = VGG16()
```

[33]:
```
yhat = model.predict(image)
```

```
1/1 [==============================] - 4s 4s/step
```

[35]:
```
label = decode_predictions(yhat)
```

[36]:
```
label = label[0][0]
```

[37]:
```
print('%s (%.2f%%)' % (label[1], label[2]*100))
```

```
Pekinese (70.83%)
```

[ ]:
```

```