Display an image and extract feature using colour histogram

The objective of the experiments are

1. Objective 1:
2. Objective 2:

%reset

```
In [19]:   from PIL import Image
           import matplotlib.pyplot as plt
           import numpy as np
           # import torch.nn.functional as F
           # from torch import nn
           import os

           os.chdir(r'D:\1_Code\FOE\ECE3086\lab1_cbir_student')
           imgpath = r'.\images'
```

```
In [20]:   %pwd
```

```
Out[20]:   'D:\\1_Code\\FOE\\ECE3086\\lab1_cbir_student'
```

```
In [21]:   #%% Select image to preview
           filename = '215.jpg'
           filename_ = os.path.join(imgpath, filename)
           im = Image.open(filename_)
           plt.figure(figsize=(8,6))
           plt.imshow(im) , plt.axis('off')
           titleStr = " Image {}".format(filename)
           plt.title(titleStr,  fontsize=20)
```

```
Out[21]:   Text(0.5, 1.0, ' Image 215.jpg')
```


Image 215.jpg

In [22]:

```python
# Extract RGB colour histogram
im = np.array( Image.open(filename_) )

# create the histogram plot, with three lines, one for
# each color
colors = ("r", "g", "b")
channel_ids = (0, 1, 2)
plt.figure()
plt.xlim([0, 256])

histL = []
for channel_id, c in zip(channel_ids, colors):
    histogram, bin_edges = np.histogram(
        im[:, :, channel_id], bins=256, range=(0, 256)
    )

    plt.plot(bin_edges[0:-1], histogram, color=c)
    histogram_n = histogram / np.sum(histogram)
    histL.extend(histogram_n)

hist_feat = np.array(histL)  # hist is the histogram vector that represent the image

plt.xlabel("Color value")
plt.ylabel("Pixels")

plt.show()

#%%

print("Histogram feature vector has dimension ", hist_feat.shape)
```
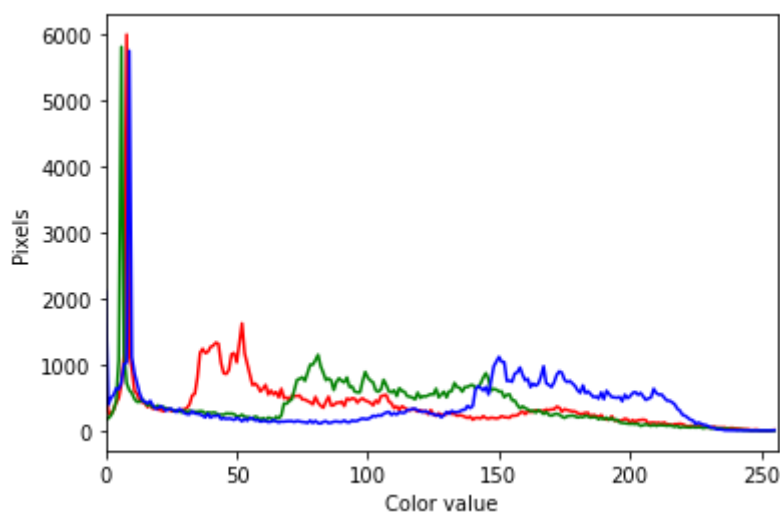


```
 Histogram feature vector has dimension  (768,)
```

Question 1 : Write a short Python code to count the number of jpeg images in the \images folder

In [23]:

```python
# Your answer to Q1 (Insert your code )

fileList=[]
#your code

print("\n The number of images in the folder used for image database = " , len(fileL
```

```
 The number of images in the folder used for image database =  1000
```

Question 2 : Compare the difference between retrieval in traditional database with content based image retrieval (CBIR). What is the benefit of CBIR.

In [24]:
```python
# Your answer to Q2 (Insert your answer in this cell)
```

In [ ]: