

## Hands on Lab Practice Sheet 1

1. Step 1: In the browser, open googlecolab site:  
<https://colab.research.google.com/> and sign in using gmail.
2. Open the python notebook.



3. Wait for the connection shown on the rightmost tab.
4. Install opencv python using the first command.

```
! pip install opencv-python
```

5. Insert the cell below and import the libraries

```
import numpy as np
import pandas as pd
import cv2 as cv
from google.colab.patches import cv2_imshow
from skimage import io
from PIL import Image
import matplotlib.pyplot as plt
```

6. Add the following function in the next cell:

```
▶ def computeNegativeImage(img):
    """
    Computes the negative pixel values of an image.

    Parameters
    -----
    img : ndarray
        Input array that stores the image pixel values.

    Returns
    -----
    negImg : ndarray
        The negative pixel values of the original image.
    """

    # Compute the absolute of the resulting values
    negImg = np.abs(img - 255)

    # Return the final result
    return negImg
```

## 7. Read the image

```
[7] #Read an image file
url="https://iiif.lib.ncsu.edu/iiif/0052574/full/800,/0/default.jpg"

imge = io.imread(url) # open an image

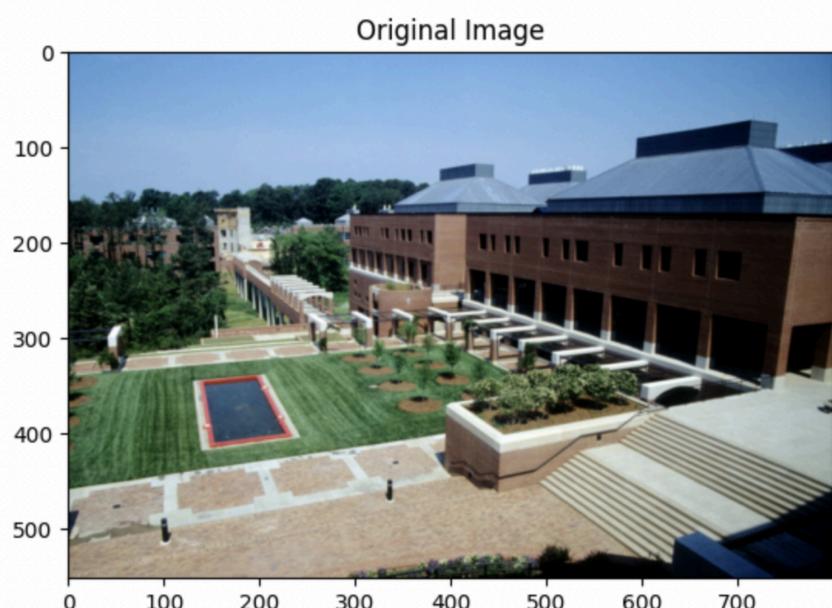
#Convert the image file to a matrix
imge = np.array(imge)

#Convert the uint datatype of the matrix values into 'int' for using the negative val
imge = imge.astype('int')

##Note: If the image is RGB colored, we can convert to grayscale image as follows
#imge = imge.convert(mode='L')
```

## 8.

```
▶ plt.imshow(imge, cmap=plt.get_cmap('gray'))
plt.title('Original Image')
plt.show()
```



```
plt.hist(image.ravel(),bins = 256, range = [0,256])
plt.show()
```

## 9.

```
color = ('b','g','r')
for i, col in enumerate(color):
    histr = cv.calcHist([image],[i],None,[256],[0,256])
    plt.plot(histr,color = col)
plt.xlim([0,256])
plt.show()
```

