






CSC 3141

IMAGE PROCESSING LABORATORY

04 – Operations on Images

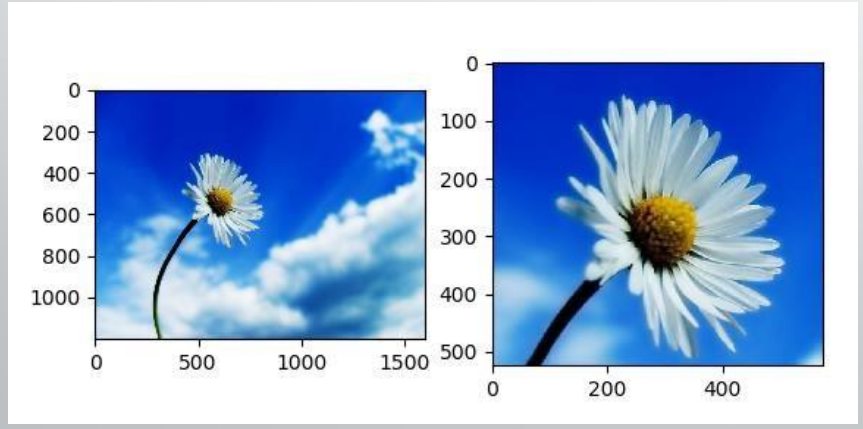
Image Region Extraction

Syntax:

```
cropped_img_array = image_array[rows,columns,channel]
```

Ex :

```
#flower 3.jpg
img = cv2.imread('images//3.jpg',cv2.IMREAD_COLOR)
cropped = img[250:775,310:885] #rows,cols
```



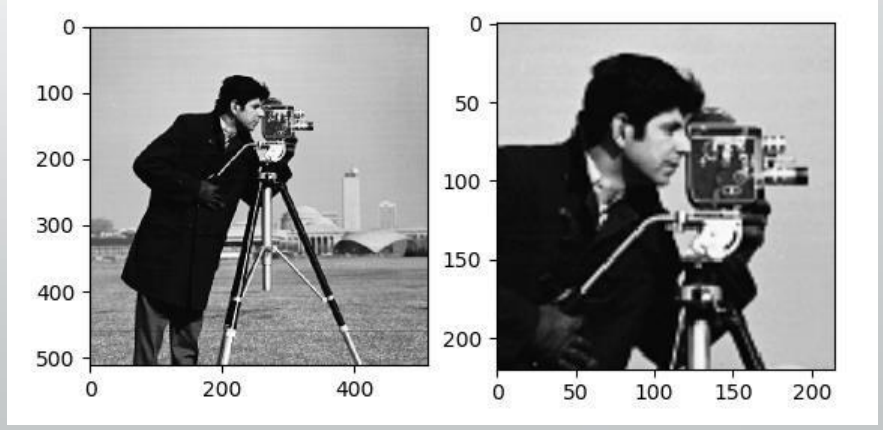


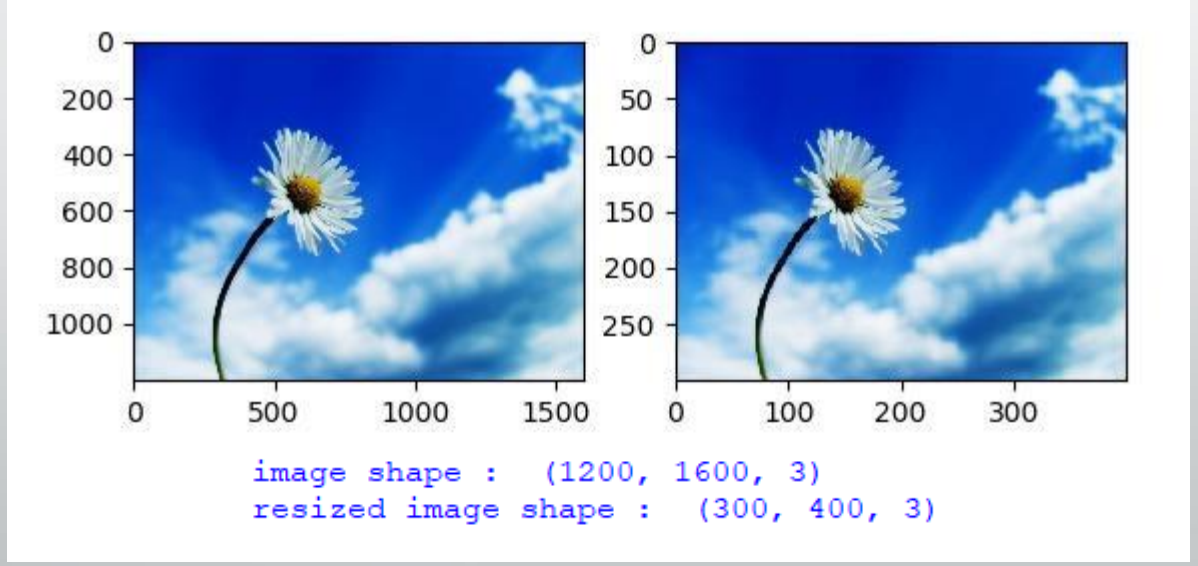
Image Resizing

Syntax:

```
resized_img = cv2.resize(image, dsize=(width,height))
```

Ex :

```
img = cv2.imread('images//cameraman.tif',cv2.IMREAD_GRAYSCALE)
resized = cv2.resize(img,dsize=(new_width,new_height))
```



Splitting and Merging

Splitting Syntax:

```
r, g, b    = cv2.split(color_image)
```

Ex :

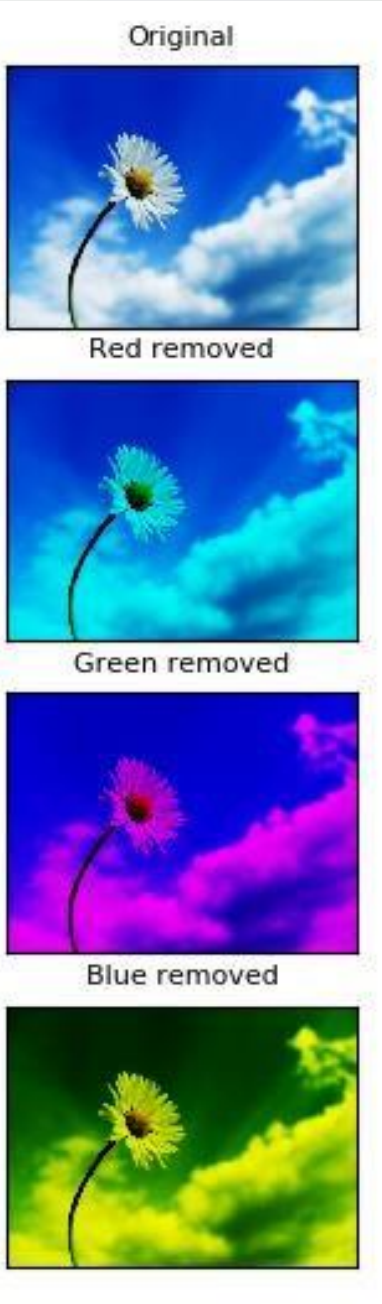
```
img = cv2.imread('images//3_.jpg',cv2.IMREAD_COLOR)
b,g,r = cv2.split(img)
```

Merging Syntax:

```
merged_img = cv2.merge((b,g,r))
```

Ex :

```
img = cv2.imread('images//3_.jpg',cv2.IMREAD_COLOR)
b_ = b.copy()
b_[ :,: ] = 0 # or b[ : ] = 0
m_img_blue_removed = cv2.merge((b_,g,r))
```



Arithmetic Operations

Arithmetic Operations

- **Addition**

```
cv2.add(img_1, img_2)
cv2.addWeighted(img_1, img1_wgt, img_2, img2_wgt, gamma_val)
```

- **Subtraction**

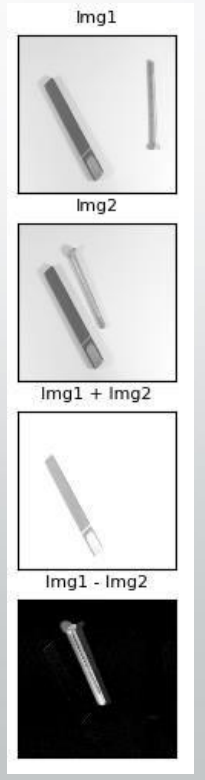
```
cv2.subtract(img_1, img_2)
```

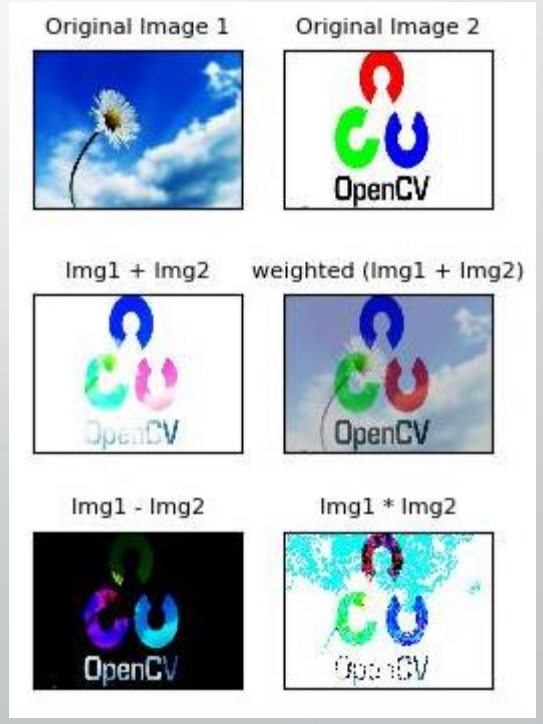
- **Multiplication**

```
cv2.multiply(img_1, img_2)
```

- **Division**

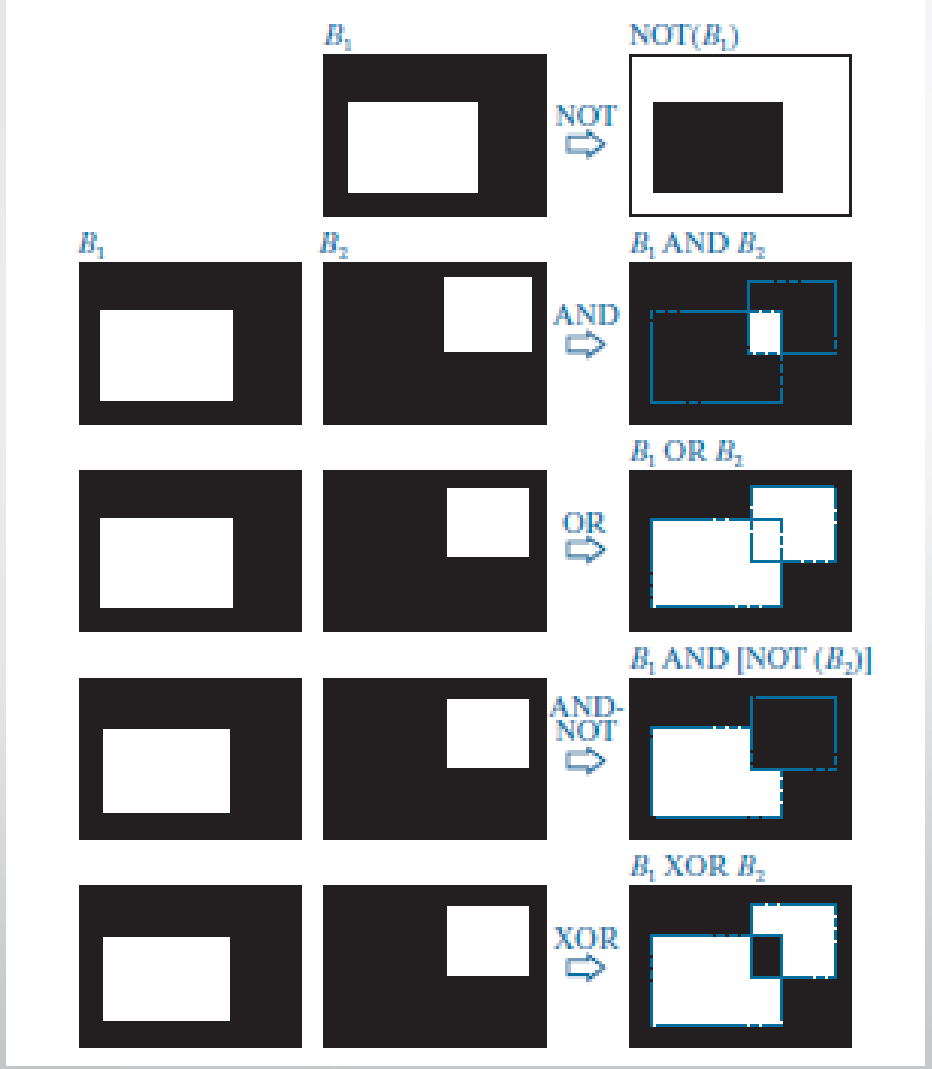
```
cv2.divide(img_1, img_2)
```



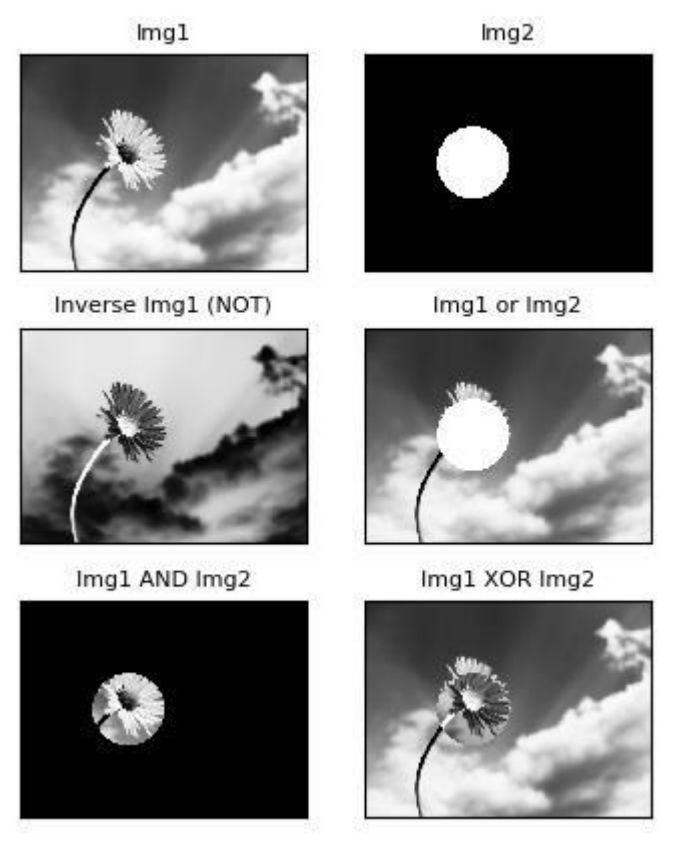


Logical Operations

Logical Operations



Logical Operations



- **AND**

  ```
  cv2.bitwise_and(img_1, img_2)
  ```

- **OR**

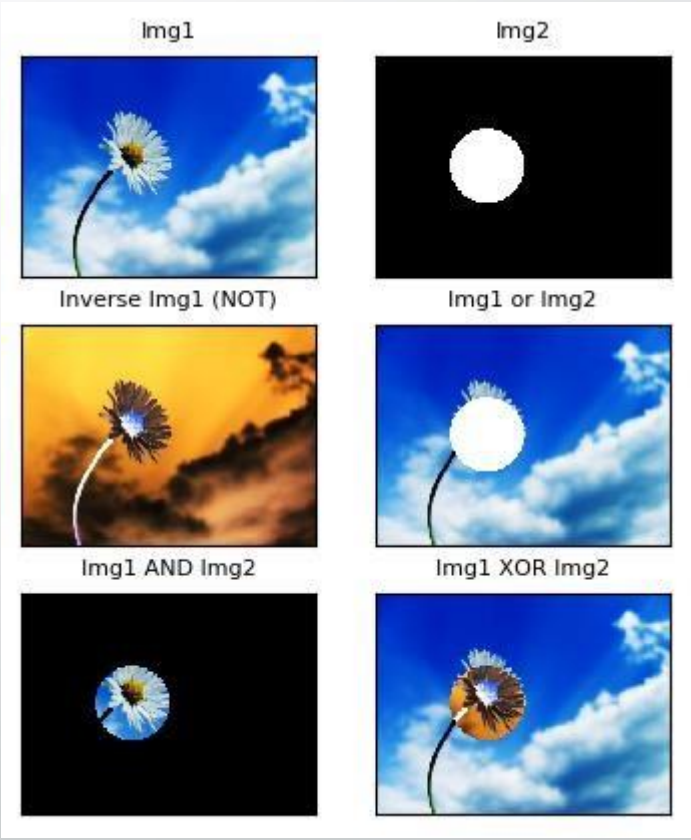
  ```
  cv2.bitwise_or(img_1, img_2)
  ```

- **NOT**

  ```
  cv2.bitwise_not(img_1)
  ```

- **XOR**

  ```
  cv2.bitwise_xor(img_1, img_2)
  ```



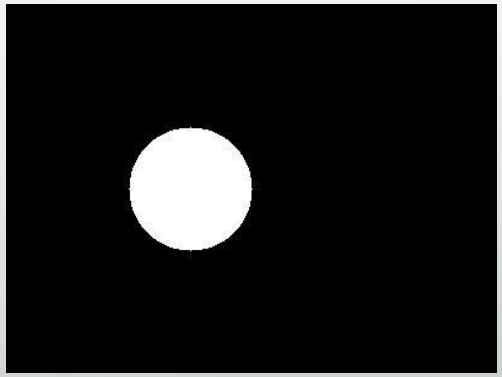
Masking

A **mask image** is simply an **image** where some of the pixel intensity values are zero, and others are non-zero.

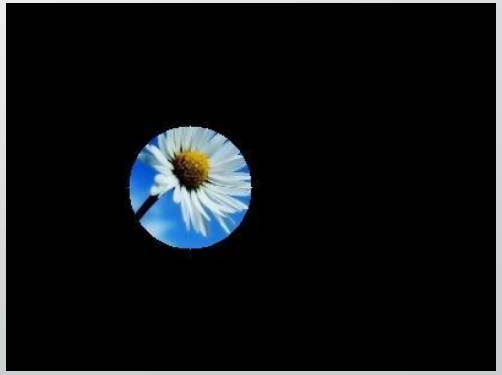
The key point of **masks** is that they allow us to focus our computation only on regions of the **image** that interest us.

Image

Bitwise Operation (AND)



Mask



Output Image

– END –