```
1  import numpy as np
2  import cv2 as cv
3  from google.colab.patches import cv2_imshow
```

```
1  img = cv.imread('/content/messi15.png')
2  cv2_imshow(img)
```



```
1 img.shape
```
```
  (1200, 992, 3)
```

```
1 px = img[500, 232]
2 print(px)
```

[167 158 214]

```
1 blue = img[500, 232, 0]
2 print(blue)
```

167

```
1 reg = img[500, 232, 2]
2 print(reg)
```

214

```
1 green = img[500, 232, 2]
2 print(green)
```

214

```
1 img[500, 232] = [255, 255, 255]
2 print(img[500, 232])
```

[255 255 255]

```
1 img.shape
```

(1200, 992, 3)

```
1 img.size
```

3571200

```
1 img.dtype #kieu du lieu anh
```

dtype('uint8')

**Image Roi**

```
1 img1 = cv.imread('/content/messi.jpg')
2 cv2_imshow(img1)
```



```
1 img1.shape
```

(355, 474, 3)

```
1 img1.size
```

504810

```
1 ball = img1[285:340, 315:370]
2 cv2_imshow(ball)
```

**Splitting and Merging Image Channels**

```
1 b, g, r = cv.split(img1)
2 img1 = cv.merge((b, g, r))
```

**Making Borders for Images(Padding)**

```
1 from matplotlib import pyplot as plt
```

```
 1 BLUE = [255, 0, 0]
 2 img1 = cv.imread('/content/opencv_logo.jpg')
 3 replicate = cv.copyMakeBorder(img1, 10, 10, 10, 10, cv.BORDER_REPLICATE)#Sao chep cac px o bien cua hinh anh
 4 reflect = cv.copyMakeBorder(img1, 10, 10, 10, 10, cv.BORDER_REFLECT)#phan chieu hinh anh, khong bao gom px o bien
 5 reflect101 = cv.copyMakeBorder(img1, 10, 10, 10, 10, cv.BORDER_REFLECT_101)#phan chieu hinh anh, bao gom px o bien
 6 wrap = cv.copyMakeBorder(img1, 10, 10, 10, 10, cv.BORDER_WRAP)#lap lai hinh anh tu bien nay sang bien kia
 7 constant = cv.copyMakeBorder(img1, 10, 10, 10, 10, cv.BORDER_CONSTANT, value = BLUE)#them vien voi mau sac co dinh
 8
 9 plt.figure(figsize = (12, 12))
10 plt.subplot(231), plt.imshow(img1, 'gray'), plt.title('ORIGINAL')
11 plt.subplot(232), plt.imshow(replicate, 'gray'), plt.title('REPLICATE')
12 plt.subplot(233), plt.imshow(reflect, 'gray'), plt.title('REFLECT')
13 plt.subplot(234), plt.imshow(reflect101, 'gray'), plt.title('REFLECT_101')
14 plt.subplot(235), plt.imshow(wrap, 'gray'), plt.title('WRAP')
15 plt.subplot(236), plt.imshow(constant, 'gray'), plt.title('CONSTANT')
16
17 plt.show()
18
```