Open in Colab

In [1]:
```
import numpy as np
```

In [2]:
```
np.random.seed(10)
image = np.random.randint(0, 256, size=(3, 3, 3))
print("Original RGB Image Matrix:\n", image)
```

```
Original RGB Image Matrix:
 [[[  9 125 228]
  [ 15  64 113]
  [123 156 217]]

 [[221 240 157]
  [113 250   8]
  [ 73   0 234]]

 [[ 40 246 164]
  [115  16 100]
  [239 139  54]]]
```

In [3]:
```
red_channel = image[:, :, 0]
green_channel = image[:, :, 1]
blue_channel = image[:, :, 2]

print("\nRed Channel:\n", red_channel)
print("\nGreen Channel:\n", green_channel)
print("\nBlue Channel:\n", blue_channel)
```

```
Red Channel:
 [[  9  15 123]
 [221 113  73]
 [ 40 115 239]]

Green Channel:
 [[125  64 156]
 [240 250   0]
 [246  16 139]]

Blue Channel:
 [[228 113 217]
 [157   8 234]
 [164 100  54]]
```

In [4]:
```
avg_red = np.mean(red_channel)
avg_green = np.mean(green_channel)
avg_blue = np.mean(blue_channel)

print("\nAverage Intensities → Red:", avg_red, "Green:", avg_green, "Blue:",
```

```
Average Intensities → Red: 105.33333333333333 Green: 137.33333333333334 Blue: 1
41.66666666666666
```

In [5]:
```
brightened_image = np.clip(image + 50, 0, 255)
print("\nBrightened Image Matrix:\n", brightened_image)
```

```
Brightened Image Matrix:
 [[[ 59 175 255]
  [ 65 114 163]
  [173 206 255]]

 [[255 255 207]
  [163 255  58]
  [123  50 255]]

 [[ 90 255 214]
  [165  66 150]
  [255 189 104]]]
```

In [6]:
```
print("\nPixel Difference After Brightness Increase:\n", brightened_image -
```

```
Pixel Difference After Brightness Increase:
 [[[50 50 27]
  [50 50 50]
  [50 50 38]]

 [[34 15 50]
  [50  5 50]
  [50 50 21]]

 [[50  0 50]
```