In [1]:

```
import cv2
import numpy as np
```

In [2]:

```
#1
src = cv2.imread('./data/lena.jpg', cv2.IMREAD_GRAYSCALE)
blur= cv2.GaussianBlur(src, ksize=(7, 7), sigmaX=0.0)
cv2.imshow('src',  src)
cv2.imshow('blur', blur)
cv2.waitKey()
cv2.destroyAllWindows()
```

In [3]:

```
#2
lap  = cv2.Laplacian(src, cv2.CV_32F)
minVal, maxVal, minLoc, maxLoc = cv2.minMaxLoc(lap)
print('lap:', minVal, maxVal, minLoc, maxLoc)
dst = cv2.convertScaleAbs(lap)
dst = cv2.normalize(dst, None, 0, 255, cv2.NORM_MINMAX)
cv2.imshow('lap',  lap)
cv2.imshow('dst',  dst)
cv2.waitKey()
cv2.destroyAllWindows()
```

```
lap: -239.0 189.0 (404, 181) (221, 287)
```

In [4]:

```
#3
lap2 = cv2.Laplacian(blur, cv2.CV_32F)
minVal, maxVal, minLoc, maxLoc = cv2.minMaxLoc(lap2)
print('lap2:', minVal, maxVal, minLoc, maxLoc)
dst2 = cv2.convertScaleAbs(lap2)
dst2 = cv2.normalize(dst2, None, 0, 255, cv2.NORM_MINMAX)
cv2.imshow('lap2',  lap2)
cv2.imshow('dst',  dst)
cv2.imshow('dst2', dst2)
cv2.waitKey()
cv2.destroyAllWindows()
```

```
lap2: -35.0 30.0 (180, 435) (367, 449)
```

In [ ]: