In [ ]:

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

In [ ]:

```python
src = cv2.imread('./data/circles.jpg')
gray = cv2.cvtColor(src,cv2.COLOR_BGR2GRAY)
ret, res = cv2.threshold(gray, 128, 255, cv2.THRESH_BINARY_INV)
cv2.imshow('src',  src)
cv2.imshow('res',  res)
cv2.waitKey()
cv2.destroyAllWindows()
```

In [ ]:

```python
ret, labels = cv2.connectedComponents(res)
print('ret=', ret)
```

In [ ]:

```python
dst = np.zeros(src.shape, dtype=src.dtype)
for i in range(1, ret): # 분할영역 표시
    r = np.random.randint(256)
    g = np.random.randint(256)
    b = np.random.randint(256)
    dst[labels == i] = [b, g, r]

cv2.imshow('src',  src)
cv2.imshow('res',  res)
cv2.imshow('dst',  dst)
cv2.waitKey()
cv2.destroyAllWindows()
```

In [ ]:

```python
ret, labels, stats, centroids = cv2.connectedComponentsWithStats(res)
print('ret =', ret)
print('stats =', stats)
print('centroids =', centroids)
```

In [ ]:

```python
dst  = np.zeros(src.shape, dtype=src.dtype)
for i in range(1, int(ret)): # 분할영역 표시
    r = np.random.randint(256)
    g = np.random.randint(256)
    b = np.random.randint(256)
    dst[labels == i] = [b, g, r]
```

In [ ]:

```python
for i in range(1, int(ret)):
    x, y, width, height, area = stats[i]
    cv2.rectangle(dst, (x,y), (x+width, y+height), (0, 0, 255), 2)
    cx, cy = centroids[i]
    cv2.circle(dst, (int(cx), int(cy)), 5, (255,0,0), -1)

cv2.imshow('src',  src)
cv2.imshow('dst',  dst)
cv2.waitKey()
cv2.destroyAllWindows()
```

In [ ]: