# Tugas Morfologi Pengukuran Berbasis Citra

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https://github.com/ronggurmahendra/TF4012-Morphology.git (https://github.com/ronggurmahendra/TF4012-Morphology.git)

In [60]:

```python
import cv2
import numpy as np
import matplotlib.pyplot as plt
from math import sqrt,exp
```

In [61]:

```python
# load image sebagai grayscale
img = cv2.imread("./coin.png")
gray = cv2.cvtColor(img, cv2.COLOR_BGR2GRAY)
```

In [62]:

```python
#threshold input imahe menggunakan otsu thresholding sebagai mask dan refine pake morpology

blur = cv2.GaussianBlur(gray,(5,5),0)
ret, mask = cv2.threshold(blur, 0, 255, cv2.THRESH_BINARY+cv2.THRESH_OTSU)
kernel = np.ones((5,5), np.uint8)
plt.subplot(1,4,1),
plt.imshow(mask)
mask = cv2.morphologyEx(mask, cv2.MORPH_CLOSE, kernel) #dilation -> errosion
plt.subplot(1,4,2)
plt.imshow(mask)
# mask = cv2.morphologyEx(mask, cv2.MORPH_OPEN, kernel) #errosion -> dilation
# plt.subplot(1,4,3)
# plt.imshow(mask)
# mask = cv2.morphologyEx(mask, cv2.MORPH_CROSS, kernel) #errosion -> dilation
# plt.subplot(1,4,4)
# plt.imshow(mask)
```
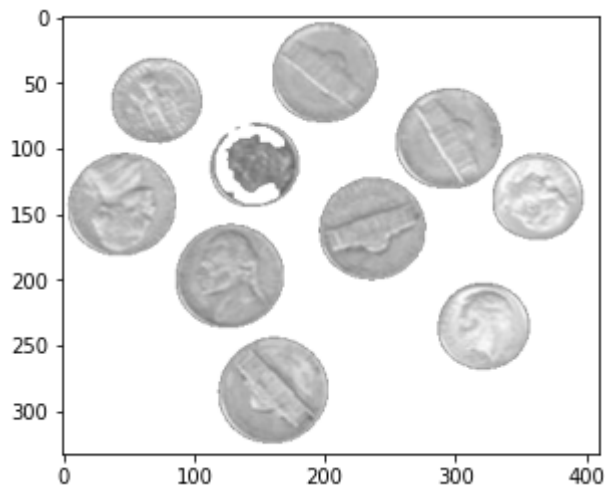
Out[62]:

<matplotlib.image.AxesImage at 0x236bb9cef10>
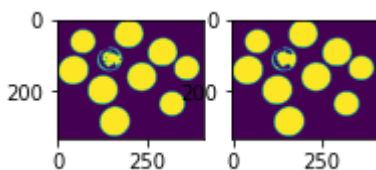
In [63]:

```python
# mask -> channel baru -> result
result = img.copy()
result = cv2.cvtColor(result, cv2.COLOR_BGR2BGRA)
result[:, :, 3] = mask

plt.imshow(result)
```

Out[63]:

<matplotlib.image.AxesImage at 0x236bbae0100>

In [64]:

```python
#extract coin yang diinginkan

(cnt, hierarchy) = cv2.findContours(mask.copy(), cv2.RETR_EXTERNAL, cv2.CHAIN_APPROX_NO
NE)

print("coins in the image : ", len(cnt))
colourTemp = img.copy()
idx = 0
cv2.drawContours(colourTemp, cnt[idx], -1, (0, 255, 0), 2)
plt.subplot(1,1,1),plt.imshow(colourTemp)
```
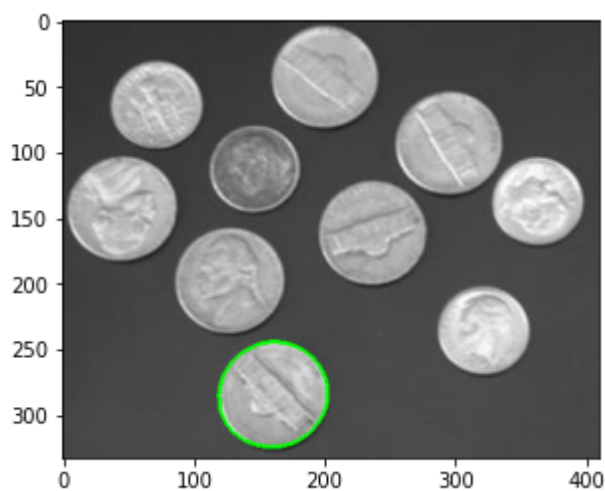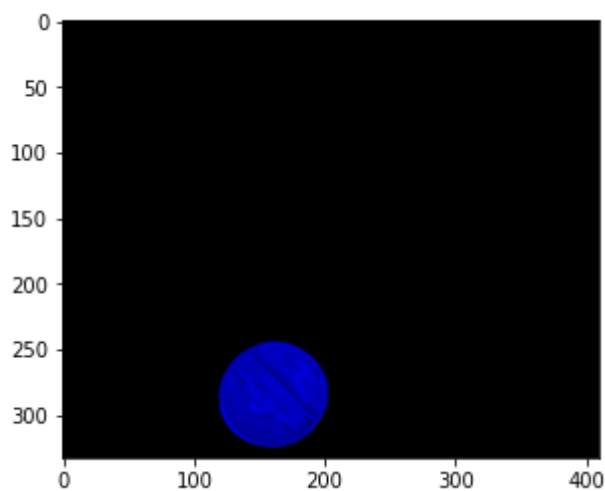
coins in the image :   11

Out[64]:

(<AxesSubplot:>, <matplotlib.image.AxesImage at 0x236bbb17070>)

In [70]:

```python
mask = np.zeros_like(result)
cv2.drawContours(mask, cnt, idx, 255, -1)
out = np.zeros_like(result)
out[mask == 255] = result[mask == 255]

plt.subplot(1,1,1),plt.imshow(cv2.cvtColor(out, cv2.COLOR_BGRA2RGB))
```

Out[70]:

(<AxesSubplot:>, <matplotlib.image.AxesImage at 0x236bcd03850>)



In [ ]: