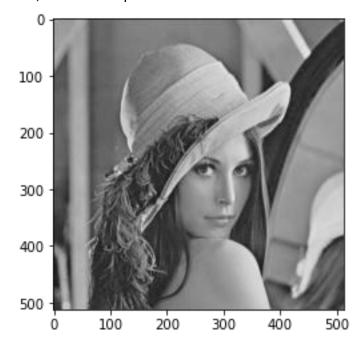
電腦視覺 hw6 資工所碩一 R09922127 林聖哲

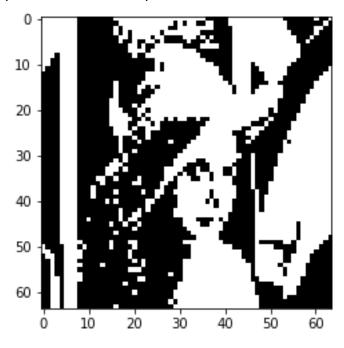
Python 版本 3.6.12 使用套件 cv2, numpy, matplotlib

First, read the bmp file



Write a program which counts the Yokoi connectivity number on a downsampled image(lena.bmp).

Step1: Binarize the benchmark image lena, then using 8x8 blocks as a unit, take the topmost-left pixel as the downsampled data.



Step2: Count the Yokoi connectivity number on a downsampled lena using 4-connected. Formula:

· for 4-connectivity

$$h(b,c,d,e) = \begin{cases} q & \text{if } b = c \text{ and } (d \neq b \ \forall e \neq b) \\ r & \text{if } b = c \text{ and } (d = b \land e = b) \\ s & \text{if } b \neq c \end{cases}$$

$$= \begin{cases} f(a_1,a_2,a_3,a_4) \\ 5 & \text{if } a_1 = a_2 = a_3 = a_4 = r \\ n & \text{where } n = number of \{a_k | a_k = q\}, \text{otherwise} \end{cases}$$

Use the right formula generating a1, a2, a3, a4, then input to the right formula Result:

| 1111111 15555551 15555551 15555551 1555555 | 1211111111122322221 |
|--|---|
| 111 1551 11 1551 21 1551 1 1551 1551 1551 1551 1551 1551 | 1 121555555511 1555555555511 21155555511 1551115555511 2 1555555511 155111555511 2 15555555555 |
| 1551 1551 1551 1551 1551 1551 1551 155 | 111 22 15555555555555555555551 1 1555551 1511 1 125112111112111555555555111 11555551 15521 1 121 1 11 1 1 |
| 1551 1551 1551 1551 1551 1551 1551 155 | 131 111 15111 2 155555555551 121 1121 1 111 1 2 115555555555 |
| 1551 1551 1551 1551 1551 1551 1551 155 | 2 1333331113311 1 133333333331 2 22 12555551 15551 1 15555555555551 1 1 1555511 11511 2 115555555555 |
| 1551 1551 1551 11521 1 151 22 1511 22 1511 2 151 | 1111111 155555551 1555551 1155551 1155551 1555511 1555511 1555511 1555511 1555511 155511 155511 155511 1555555 |
| 22 1511 2 151 2 151 2 151 2 151 2 1511 21 1511 11 151 11 151 11 151 11 151 11 151 | 121 1555555555551 155511 1551 15555555555 |