電機三 410587040 詹閎棋

CH2

5.

```
>> imfinfo('wombats.jpg')

ans =

  struct with fields:

          Filename: 'D:\PROGRAM\wombats.jpg'
       FileModDate: '14-Mar-2019 11:16:37'
          FileSize: 17883
            Format: 'jpg'
     FormatVersion: ''
             Width: 256
            Height: 256
          BitDepth: 8
         ColorType: 'grayscale'
   FormatSignature: ''
   NumberOfSamples: 1
      CodingMethod: 'Huffman'
     CodingProcess: 'Sequential'
           Comment: {}
```

JPEG (FileSize:17883)

(實驗)

```
>> imread('wombats.png');
>> imshow('wombats.png')
>> imfinfo('wombats.png')

ans =

  struct with fields:

                Filename: 'D:\PROGRAM\wombats.png'
             FileModDate: '26-Jun-2015 15:19:10'
                FileSize: 60918
                  Format: 'png'
           FormatVersion: []
                   Width: 256
                  Height: 256
                BitDepth: 8
               ColorType: 'grayscale'
         FormatSignature: [137 80 78 71 13 10 26 10]
                Colormap: []
               Histogram: []
           InterlaceType: 'none'
            Transparency: 'none'
   SimpleTransparencyData: []
         BackgroundColor: 1
         RenderingIntent: []
          Chromaticities: []
                   Gamma: 1
```

PNG (FileSize:60918)

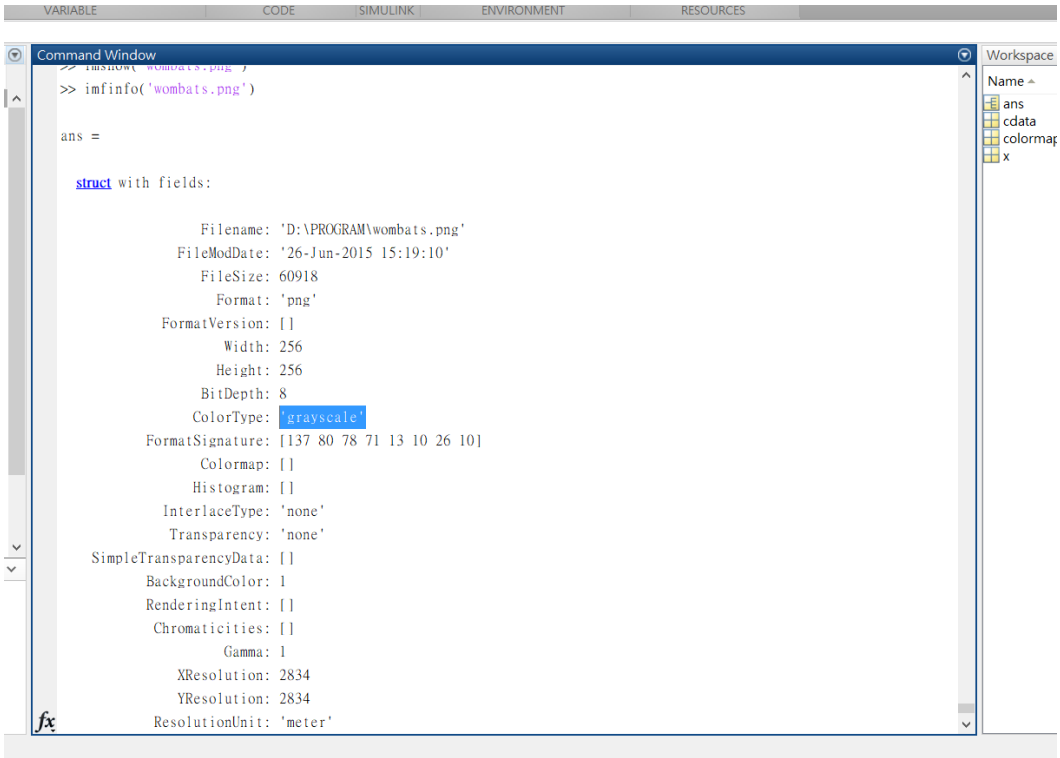
(實驗)

```
          Comment: {}

>> imwrite(x,'wombats.bmp')
>> imfinfo('wombats.bmp')

ans =

  struct with fields:

            Filename: 'D:\PROGRAM\wombats.bmp'
         FileModDate: '14-Mar-2019 11:27:31'
            FileSize: 66614
              Format: 'bmp'
       FormatVersion: 'Version 3 (Microsoft Windows 3.x)'
               Width: 256
              Height: 256
            BitDepth: 8
           ColorType: 'indexed'
     FormatSignature: 'BM'
   NumColormapEntries: 256
            Colormap: [256x3 double]
             RedMask: []
           GreenMask: []
            BlueMask: []
     ImageDataOffset: 1078
    BitmapHeaderSize: 40
```

BMP (FileSize:66614)

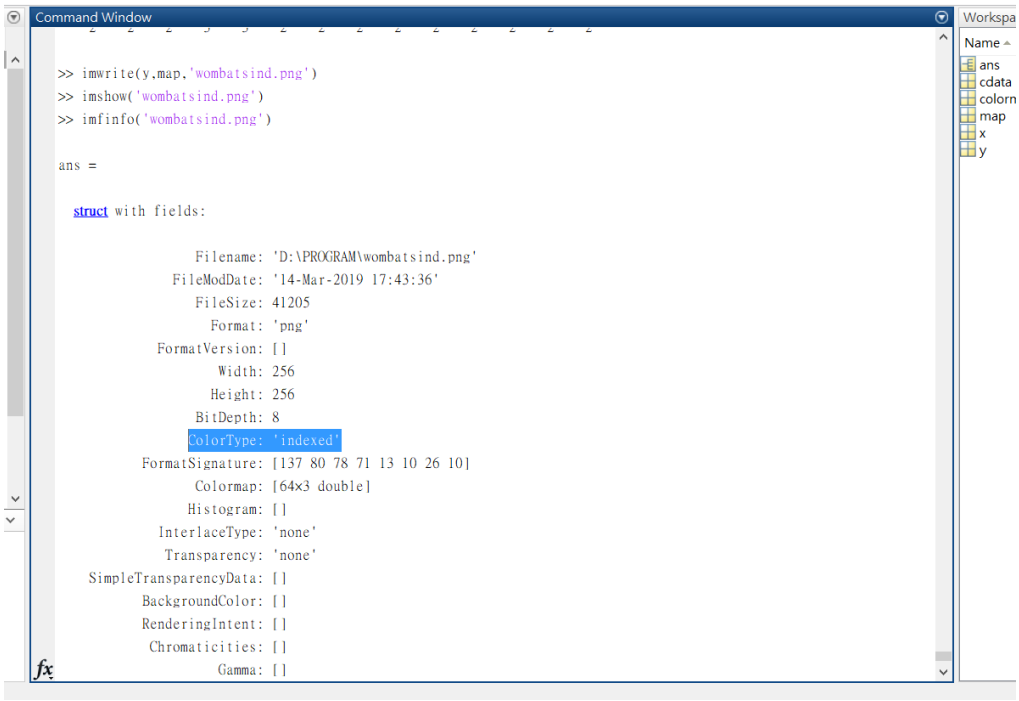
(實驗)

6.



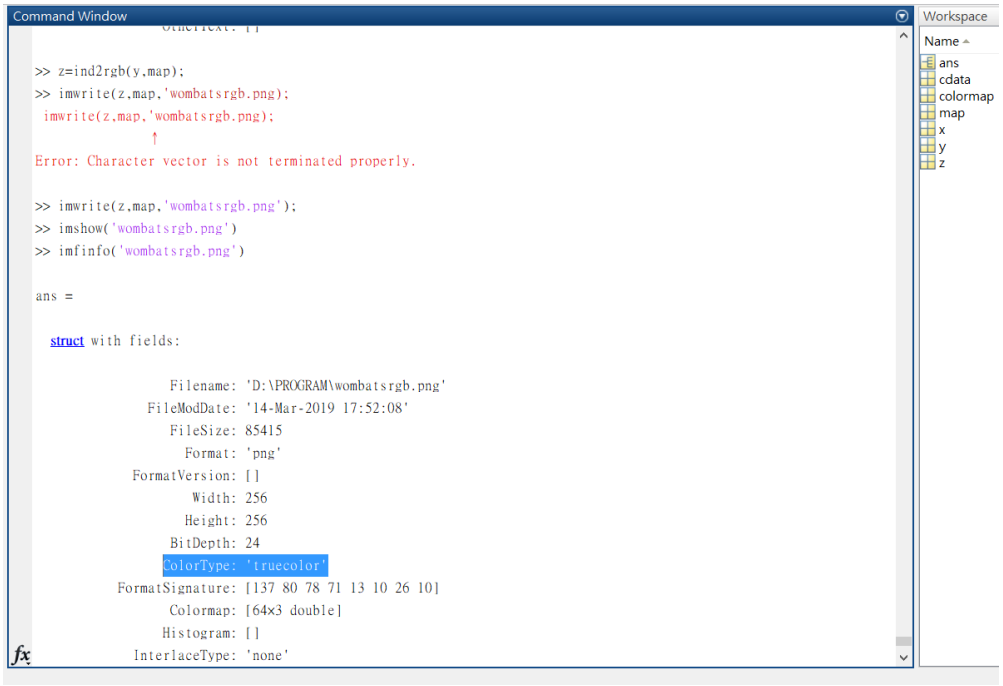
二元影像檔案。

(實驗)



索引彩色檔案。

(實驗)



全彩檔案。

(實驗)

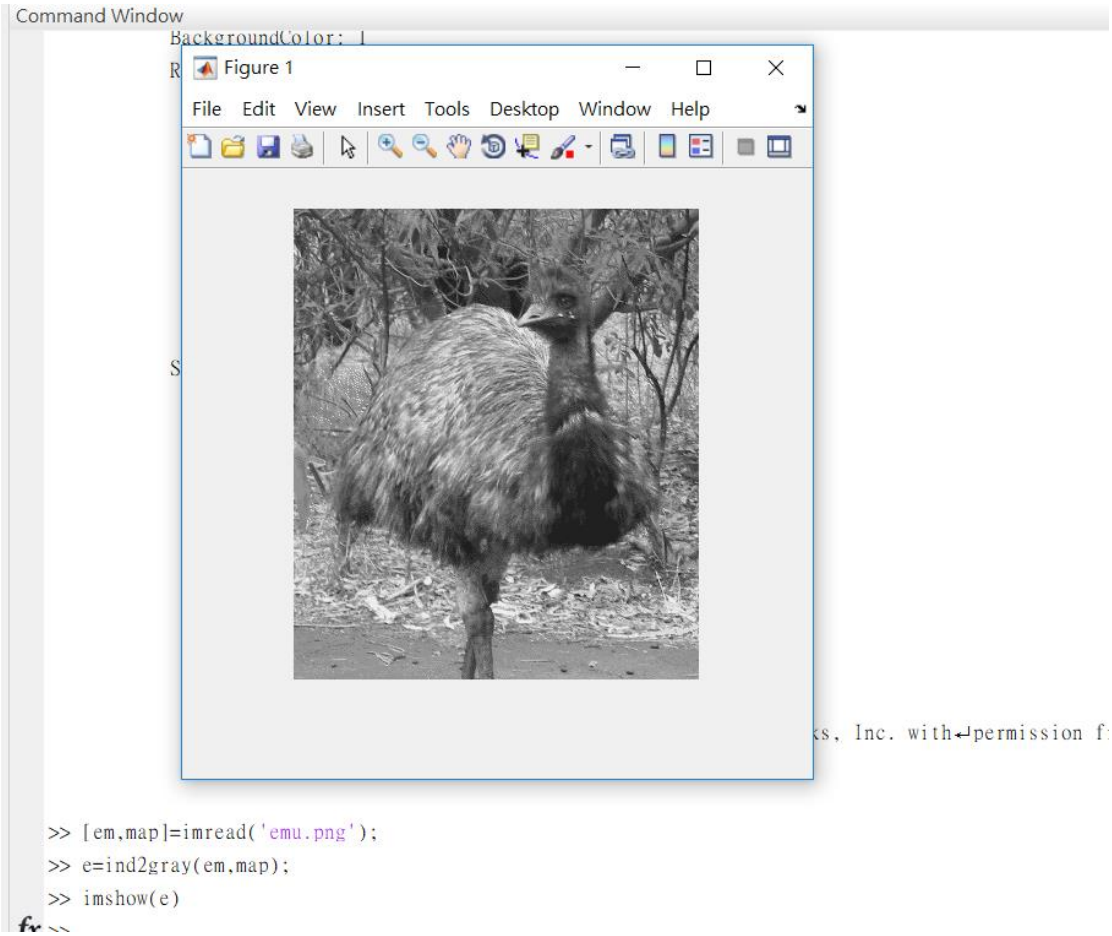
CH3

1.

```
>> d=imread('cameraman.png');
>> whos d
  Name        Size              Bytes  Class    Attributes

  d           256x256           65536  uint8
```

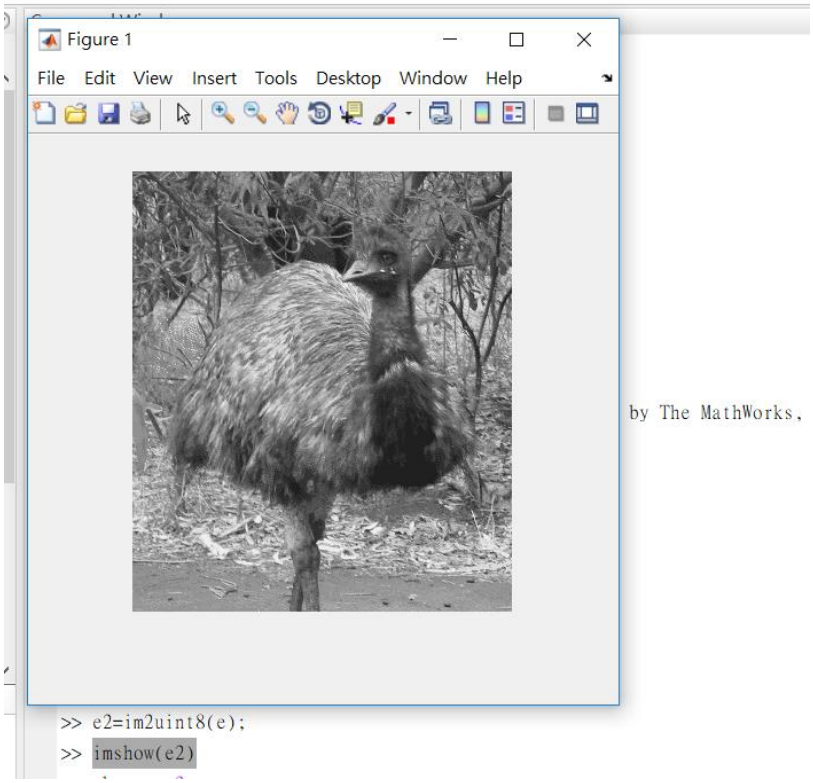
unit8
(實驗)

2.



(實驗)

3.



im2unit8 函數可以將圖片轉換為 unit8 型態的影像。

(a) 影像的外觀、(b)影像矩陣的元素都不會影響。

(實驗)

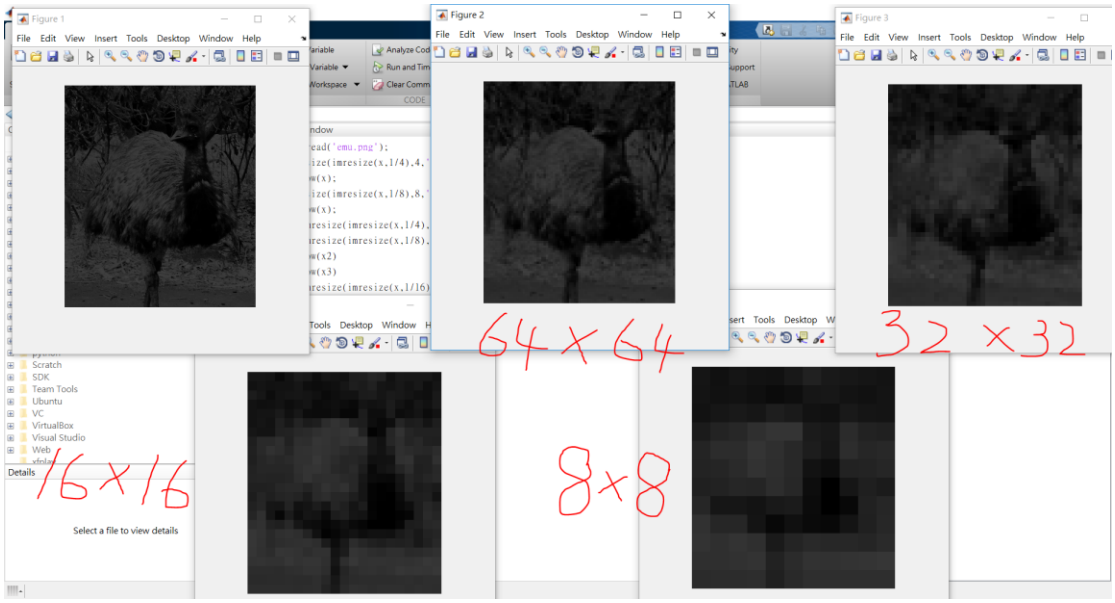
4.

```
>> c=imread('cameraman.png');
>> c2=im2uint8(c);
>> imshow(w2)
Undefined function or variable 'w2'.

>> imshow(c2)
>> figure2,imshow(c);
Undefined function or variable 'figure2'.

>> figure(2),imshow(c);
>> whos c c2
  Name        Size              Bytes  Class    Attributes

  c         256x256             65536  uint8
  c2        256x256             65536  uint8
```

不會發生什麼事。

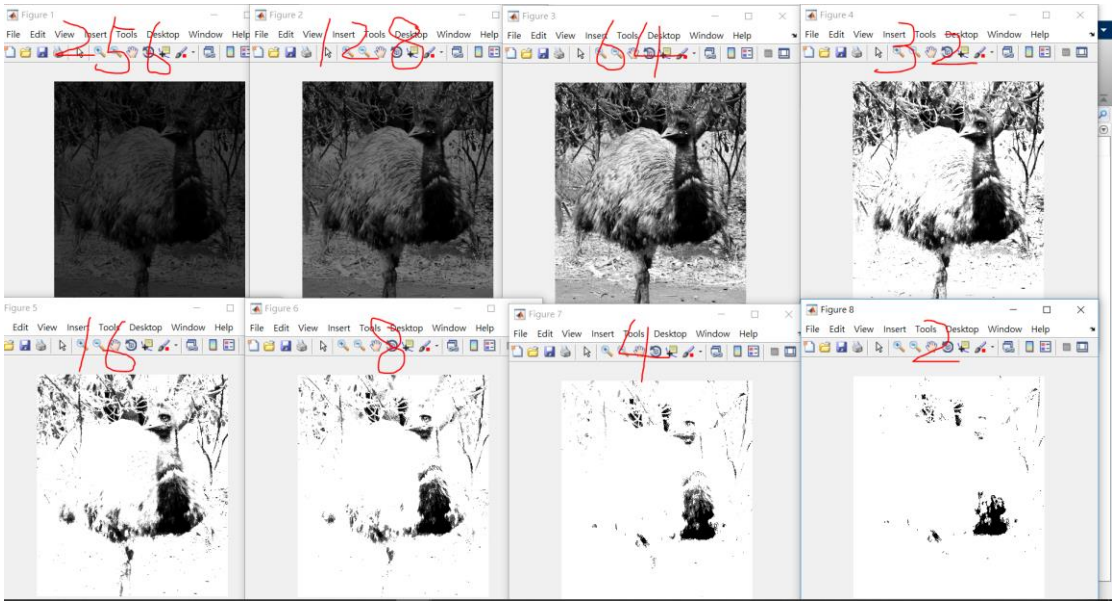
(實驗)

5.



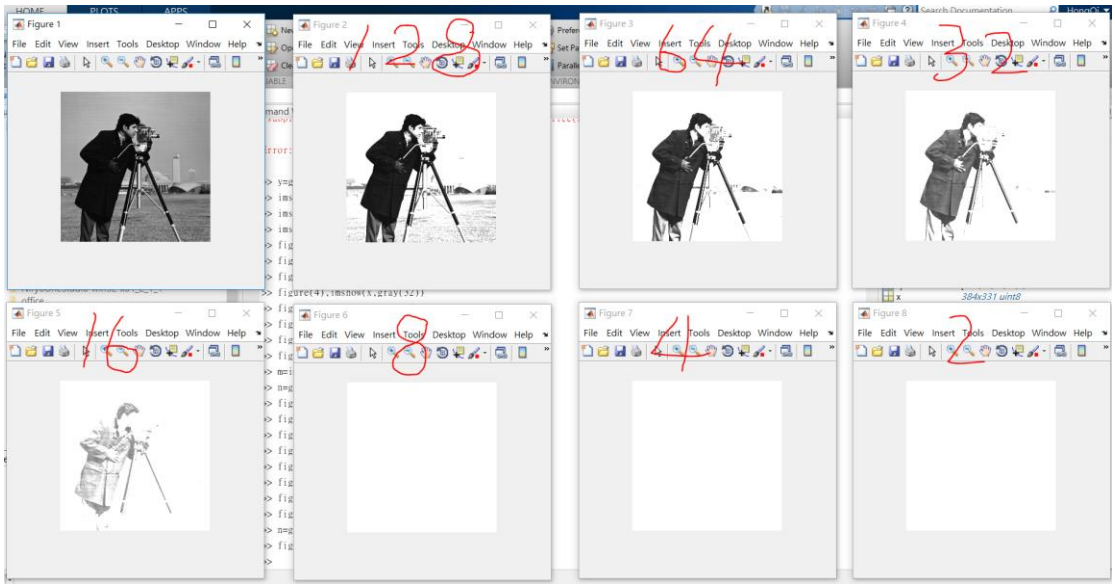
在有效解析度 8*8 時，圖片已無法辨識。
(討論)

6.



```
>> y=grayslice(x,4);
>> imshow(x,gray(4))
>> imshow(x,gray(8))
>> imshow(x,gray(256))
>> figure(1),imshow(x,gray(256))
>> figure(2),imshow(x,gray(128))
>> figure(3),imshow(x,gray(64))
>> figure(4),imshow(x,gray(32))
>> figure(5),imshow(x,gray(16))
>> figure(6),imshow(x,gray(8))
>> figure(7),imshow(x,gray(4))
>> figure(8),imshow(x,gray(2))
```

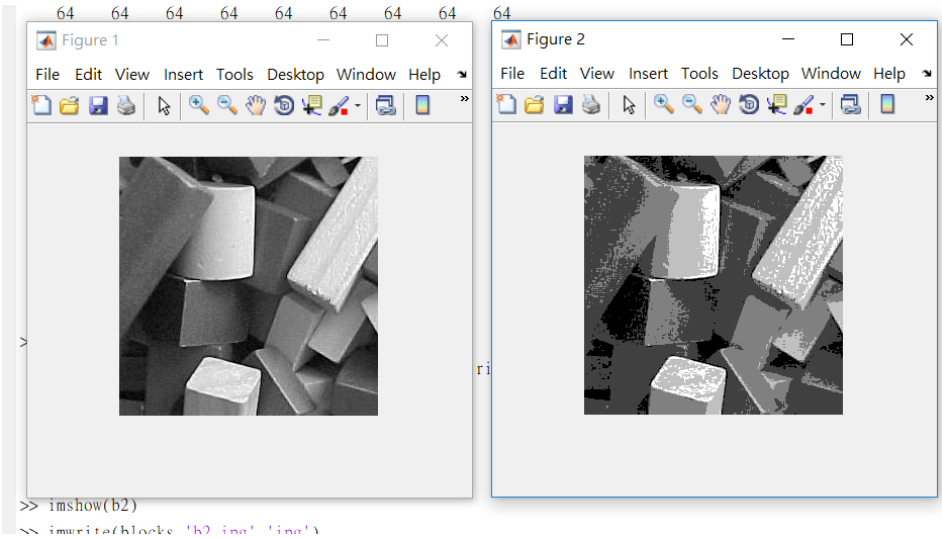
emu.png 這張影像在量化為 8 灰階之後嚴重劣化，並不可辨識。
(討論)



cameraman.png 這張影像在量化為 16 灰階之後嚴重劣化，8 灰階不可辨識。
(討論)

CH4

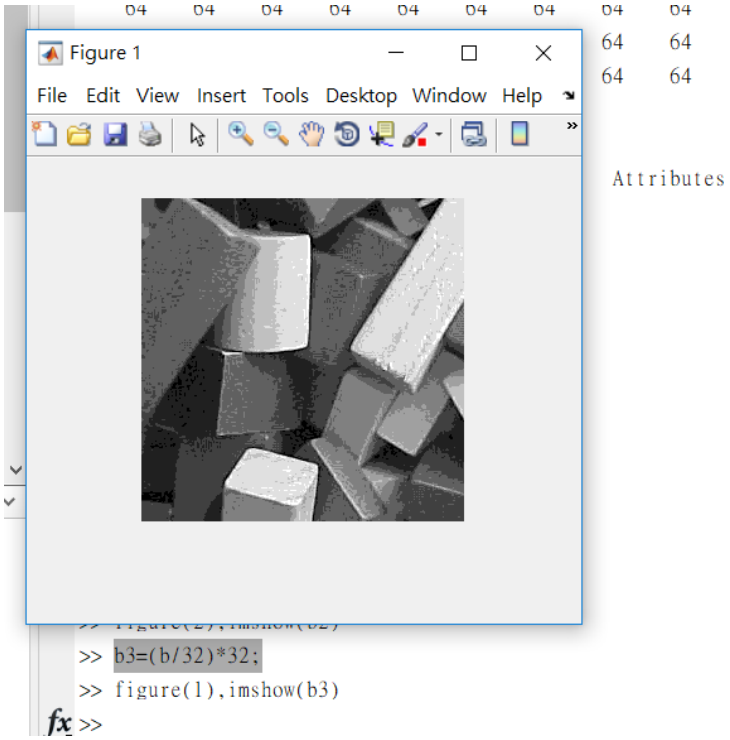
2.



原本影像為 256 灰階，經公式運算過後，量化為 4 灰階。

(實驗)

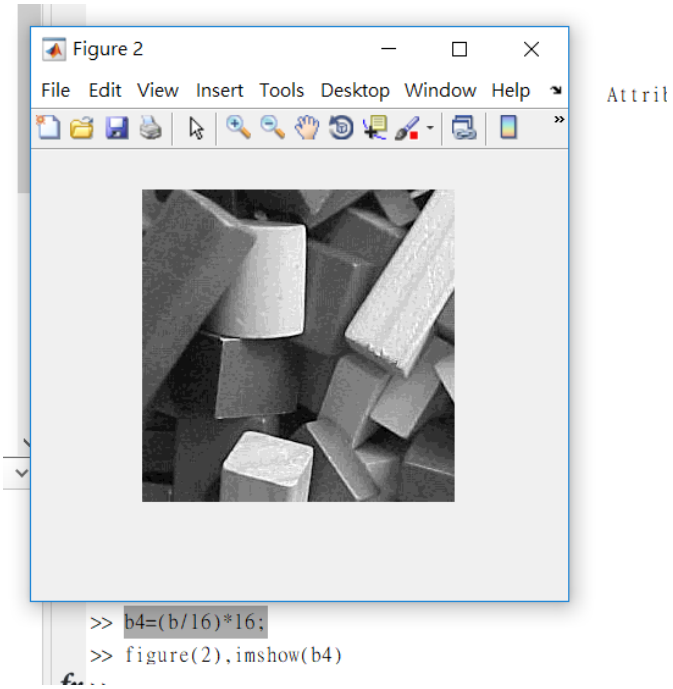
3.



b3=(b/32)*32

量化為 8 灰階。

(實驗)



B4=(b/32)*32

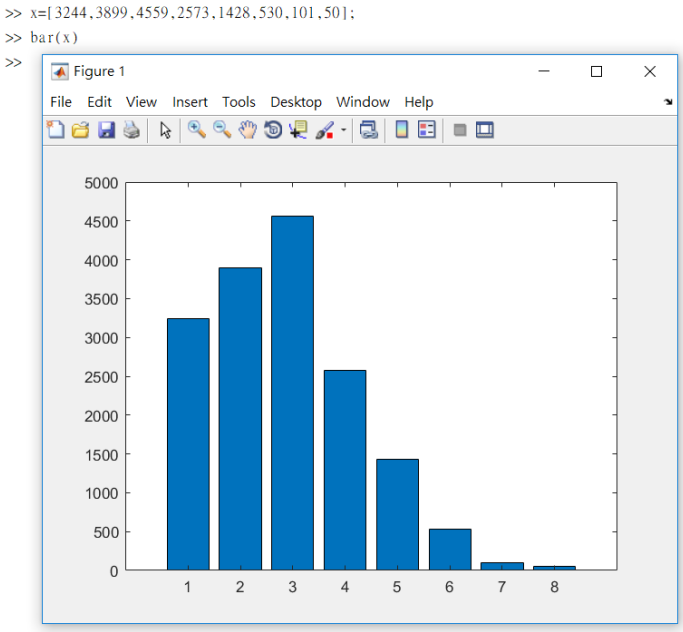
量化為 16 灰階。

(實驗)

5.

原始灰階像數目：

0	1	2	3	4	5	6	7
3244	3899	4559	2573	1428	530	101	50



原直方圖。

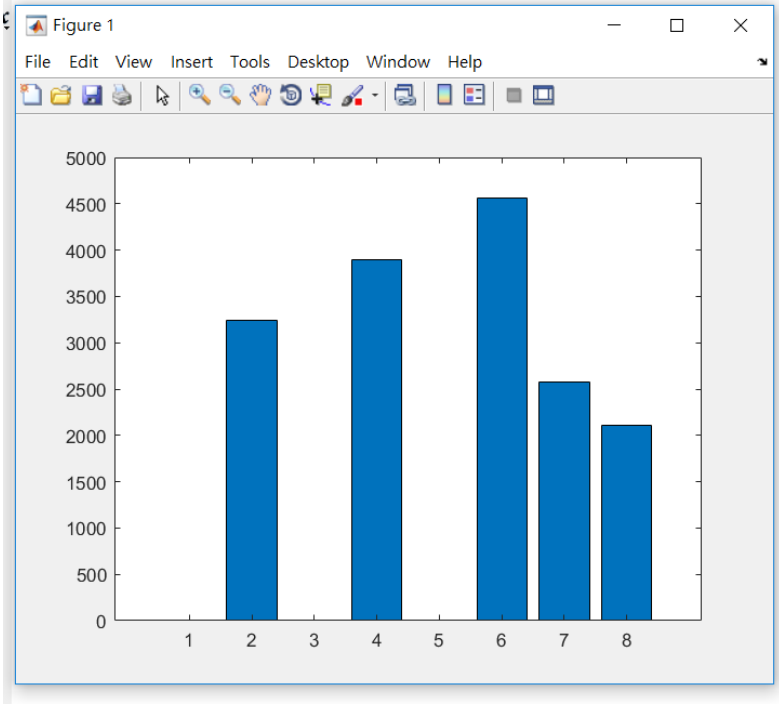
接著轉換出最終灰階值：

原始灰階 i	0	1	2	3	4	5	6	7
最終灰階 j	1	3	5	6	7	7	7	7

等化後的灰階值像素目：

0	1	2	3	4	5	6	7
0	3244	0	3899	0	4559	2573	2109

```
>> x2=[0,3244,0,3899,0,4559,2573,2109];
>> bar(x2);
```



等化後直方圖。

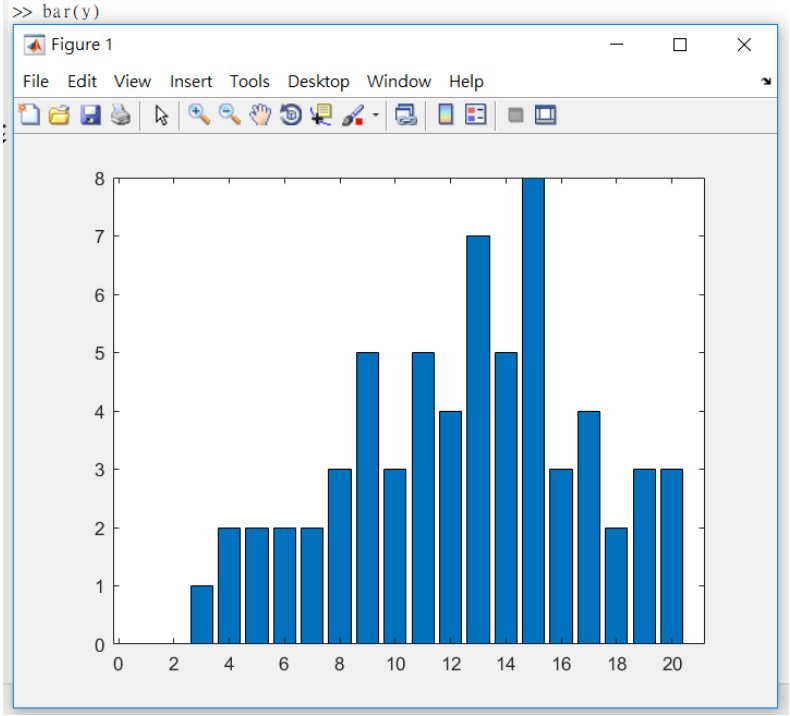
(討論)

7.

原始灰階像數目：

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
0	0	1	2	2	2	2	3	5	3	5	4	7	5	8	3	4	2	3	3

```
>> y=[0,0,1,2,2,2,2,3,5,3,5,4,7,5,8,3,4,2,3,3];
>> bar(y)
```



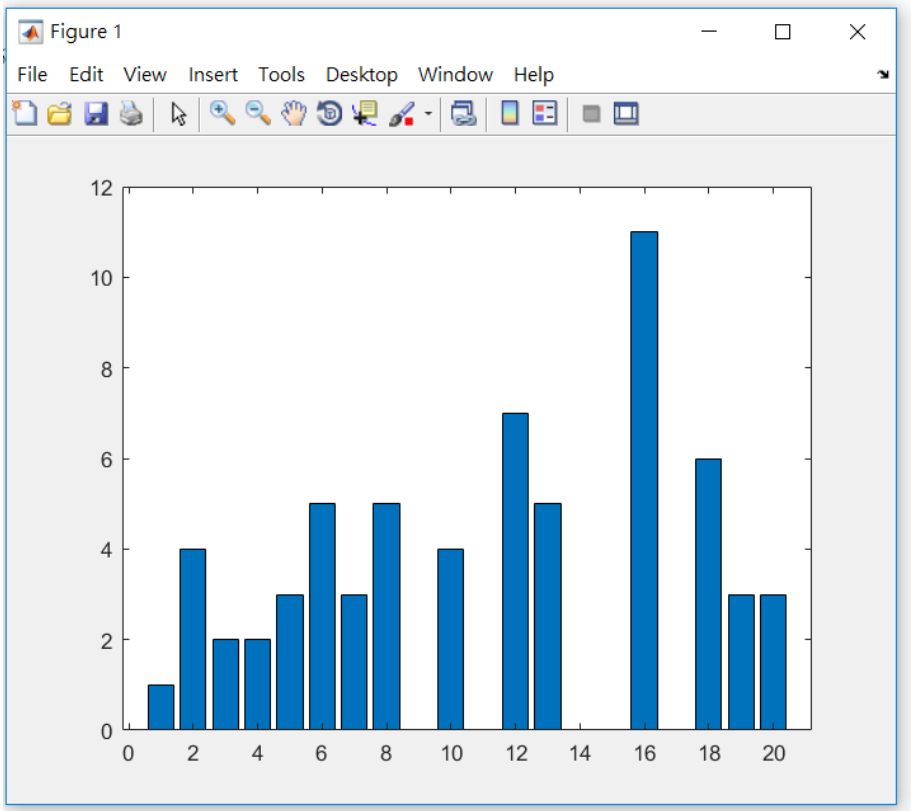
原直方圖。

接著轉換出最終灰階值：

原始灰階 i	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
最終灰階 j	0	0	0	1	1	2	3	4	5	6	7	9	11	12	15	15	17	17	18	19

等化後的灰階值像素目：

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1	4	2	2	3	5	3	5	0	4	0	7	5	0	0	11	0	6	3	3

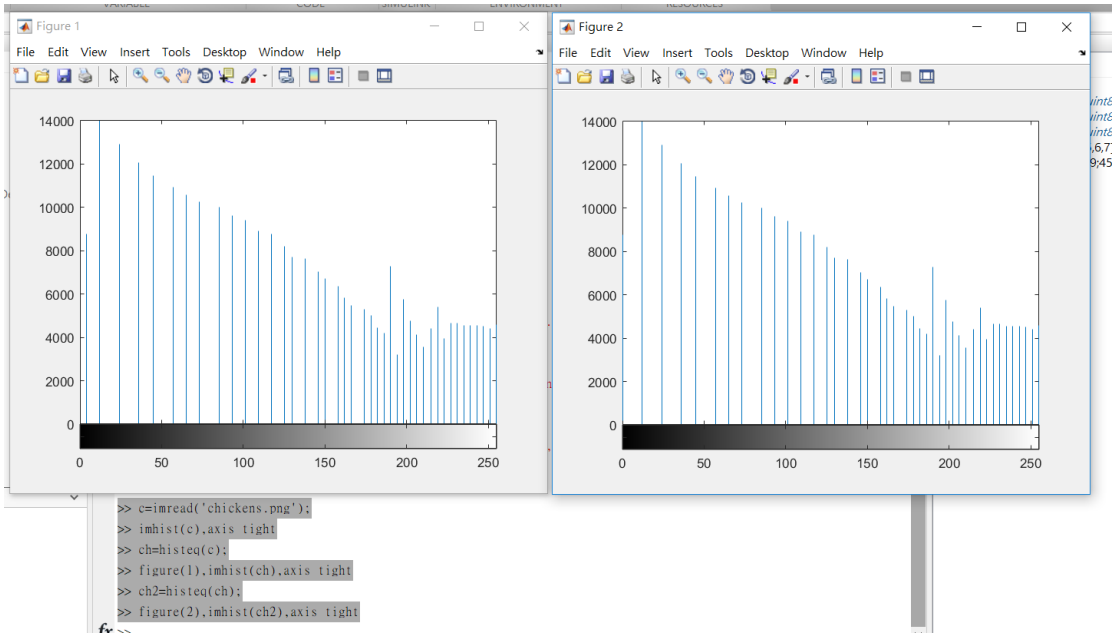


等化後直方圖。

11	3	2	12	15	15	17	15
9	7	5	2	5	9	15	15
6	5	1	1	4	11	18	19
7	4	1	0	7	11	12	17
17	6	12	12	17	19	19	17
11	7	15	15	18	18	17	15
9	5	7	11	15	12	15	15
5	3	1	4	6	9	11	11

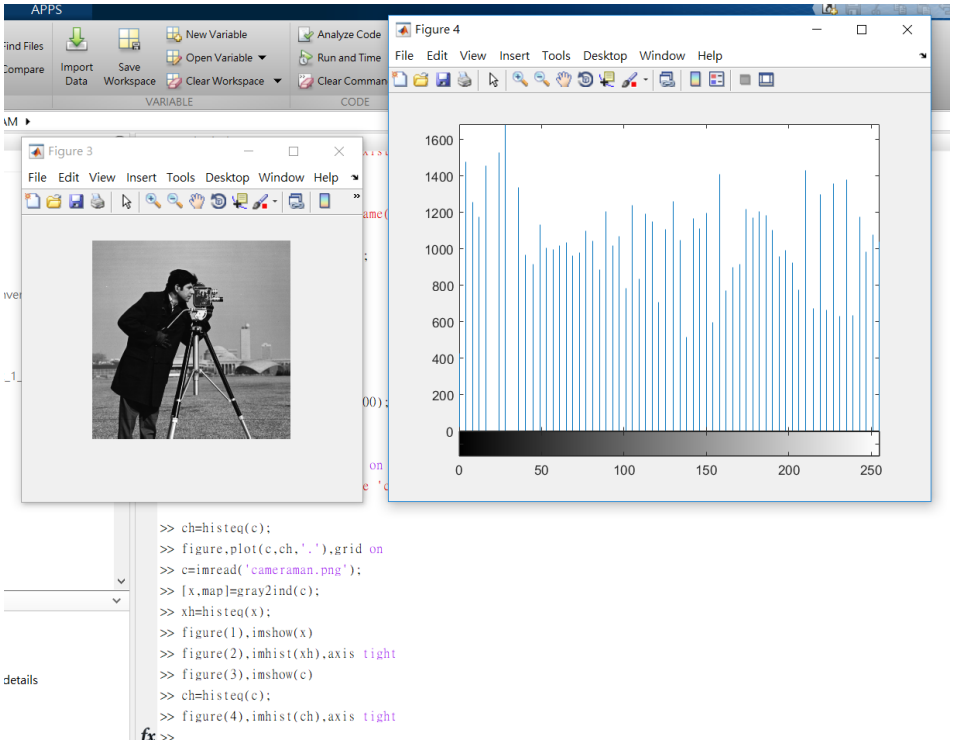
(討論)

8.

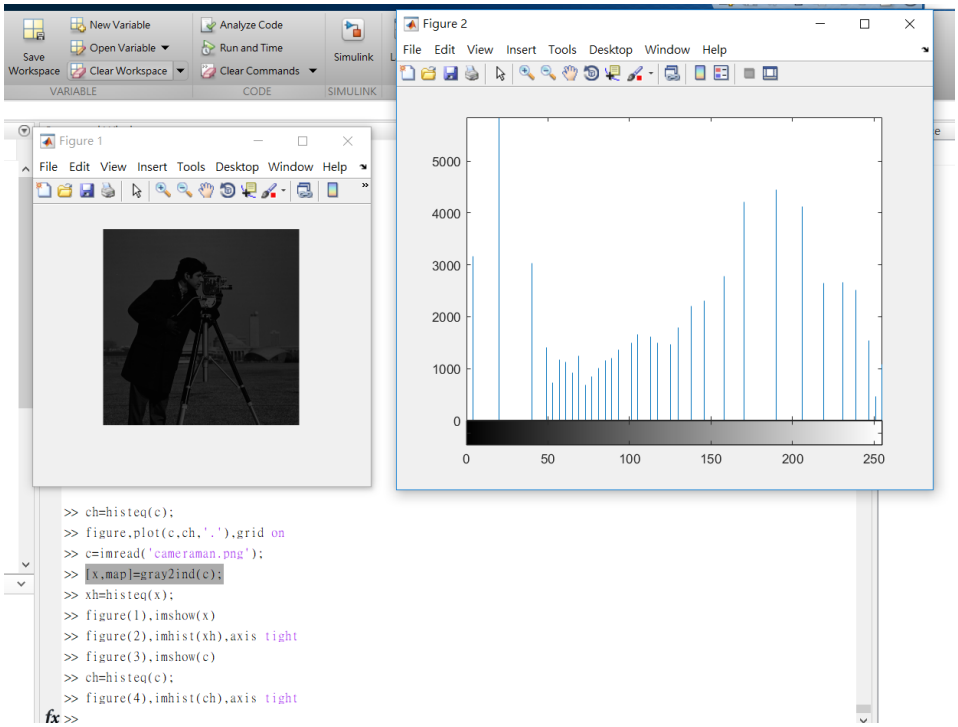


直方圖等化運算為等冪，執行兩次直方圖等化結果與執行一次相同。(實驗)

10.



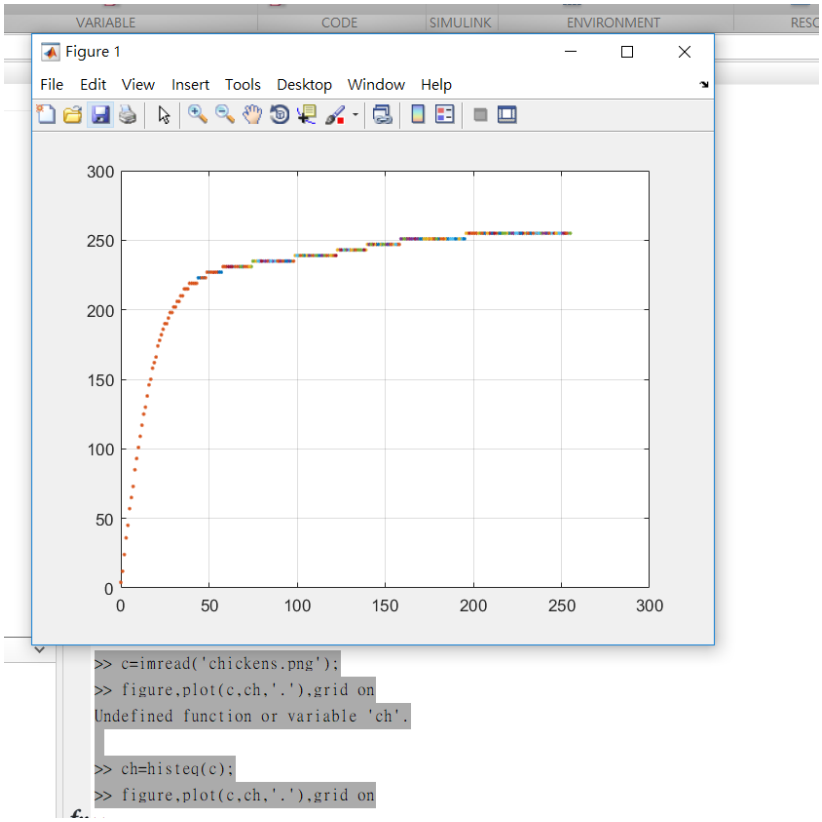
原圖



經處理後暗色影像，直方圖等化。

(實驗)

11.



執行 plot 函數便可觀察到 imadjust 擴展函數。

(實驗)