Assignment 10

Sung Soo Hwang

Assignment 10

- Perform image compression using DCT and Quantization for Y channel of Lena image and restore it.
  - Use "CV_BGR2YCrCb" for color conversion.
  - DCT & Quantization are applied on each 8x8 sub block.
  - Display the results for each of the three quantization matrices given.
  - Calculate the PSNR to measure the quality of reconstruction of image compression.
- Display 4 windows
  - The name of window should be
    - "Original Y"
    - "QM1"
    - "QM2"
    - "QM3"

Assignment 10

- Quantization Matrix

```
Mat quantization_mat1 = (Mat_<double>(8, 8) <<
16, 11, 10, 16, 24, 40, 51, 61,
12, 12, 14, 19, 26, 58, 60, 55,
14, 13, 16, 24, 40, 57, 69, 56,
14, 17, 22, 29, 51, 87, 80, 62,
18, 22, 37, 56, 68, 109, 103, 77,
24, 35, 55, 64, 81, 104, 113, 92,
49, 64, 78, 87, 103, 121, 120, 101,
72, 92, 95, 98, 112, 100, 103, 99
);
```

```
Mat quantization_mat2 = (Mat_<double>(8, 8) <<
1, 1, 1, 1, 1, 1, 1, 1,
1, 1, 1, 1, 1, 1, 1, 1,
1, 1, 1, 1, 1, 1, 1, 1,
1, 1, 1, 1, 1, 1, 1, 1,
1, 1, 1, 1, 1, 1, 1, 1,
1, 1, 1, 1, 1, 1, 1, 1,
1, 1, 1, 1, 1, 1, 1, 1,
1, 1, 1, 1, 1, 1, 1, 1
);
```

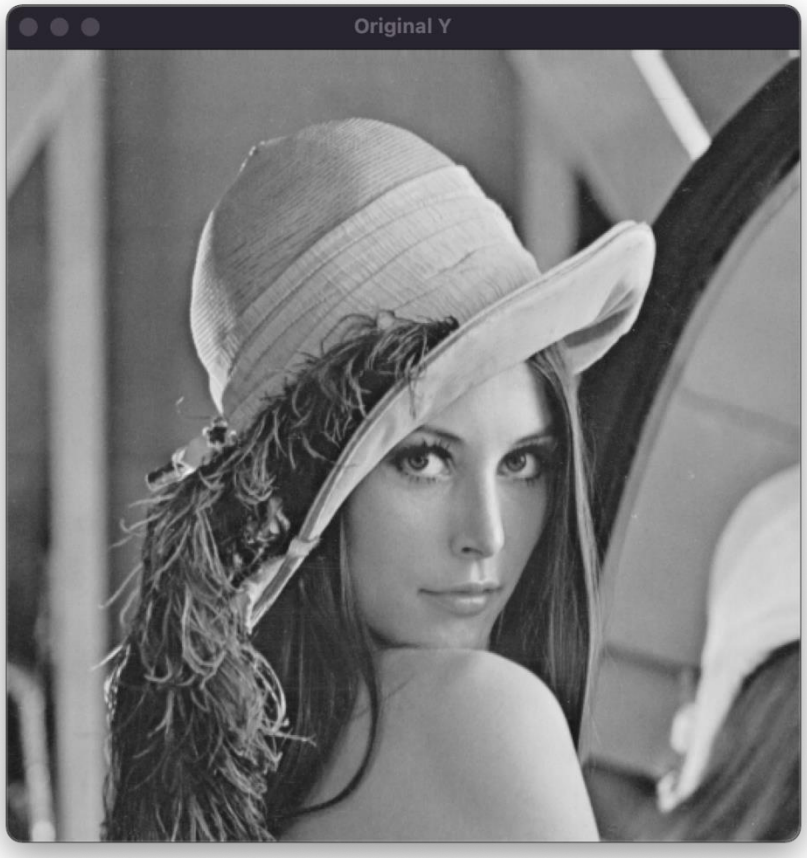
Assignment 10

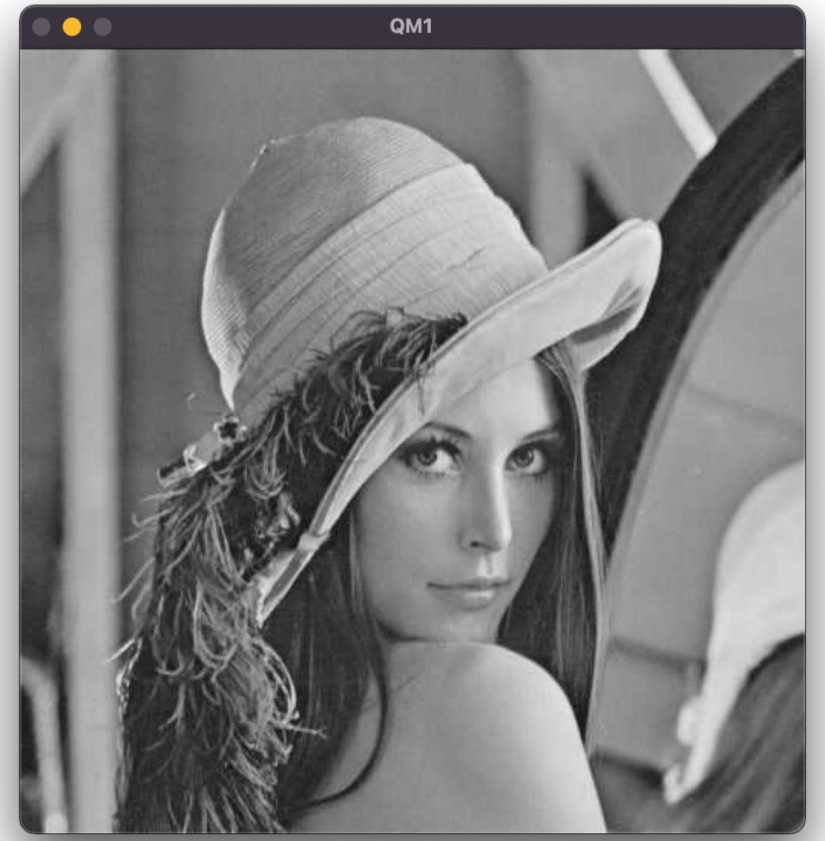
- Quantization Matrix

```
Mat quantization_mat3 = (Mat_<double>(8, 8) <<
100, 100, 100, 100, 100, 100, 100, 100,
100, 100, 100, 100, 100, 100, 100, 100,
100, 100, 100, 100, 100, 100, 100, 100,
100, 100, 100, 100, 100, 100, 100, 100,
100, 100, 100, 100, 100, 100, 100, 100,
100, 100, 100, 100, 100, 100, 100, 100,
100, 100, 100, 100, 100, 100, 100, 100,
100, 100, 100, 100, 100, 100, 100, 100
);
```

Assignment 10

- Results

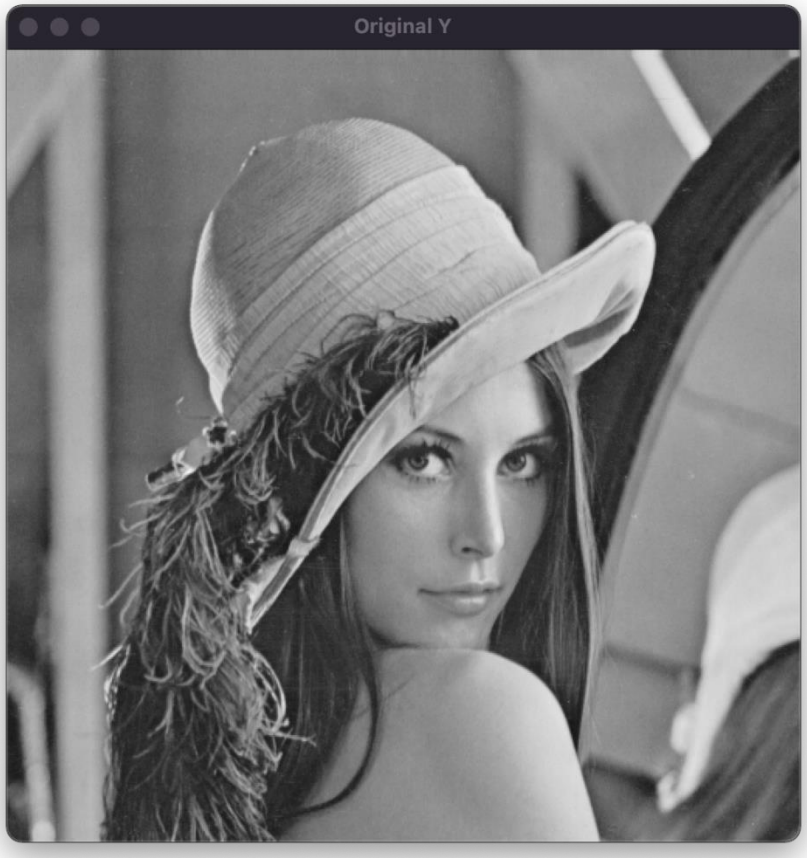


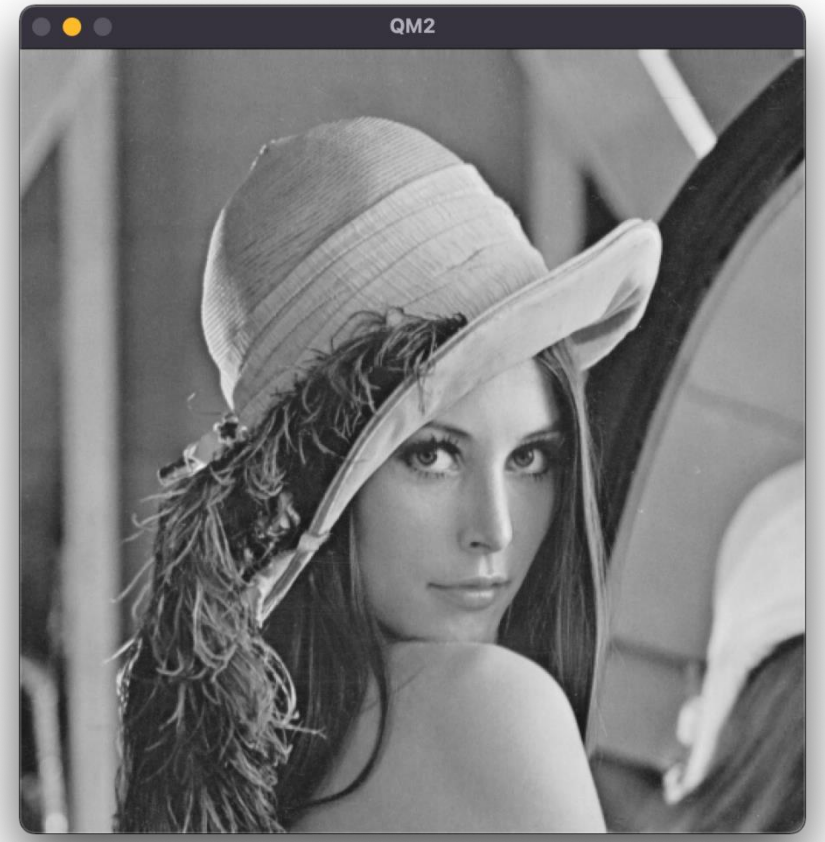



```
QM1: psnr = 35.808827
```

Assignment 10

- Results

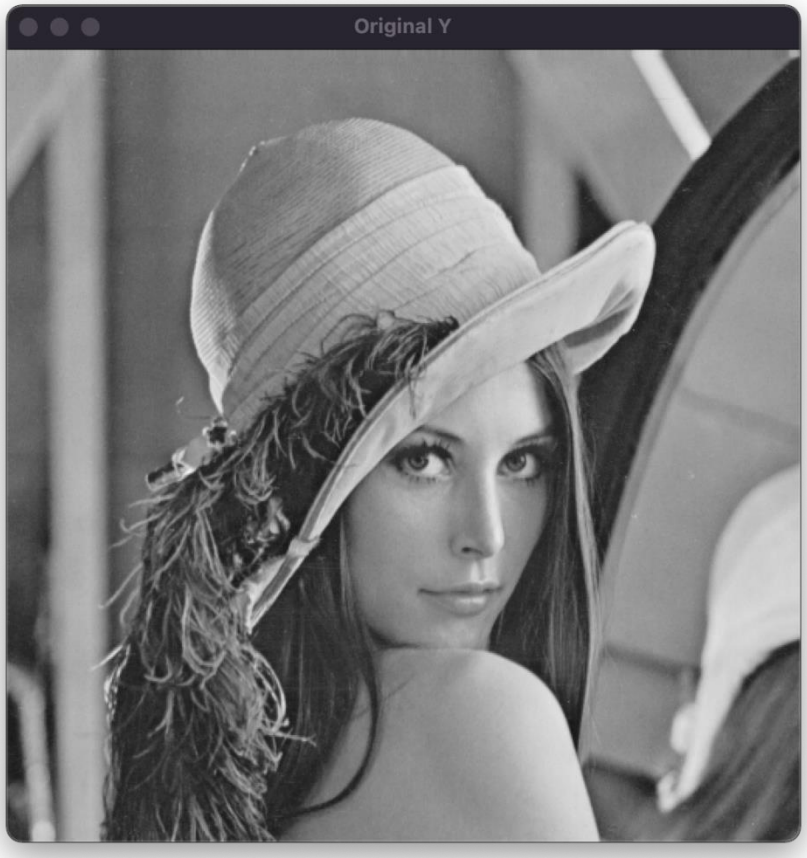


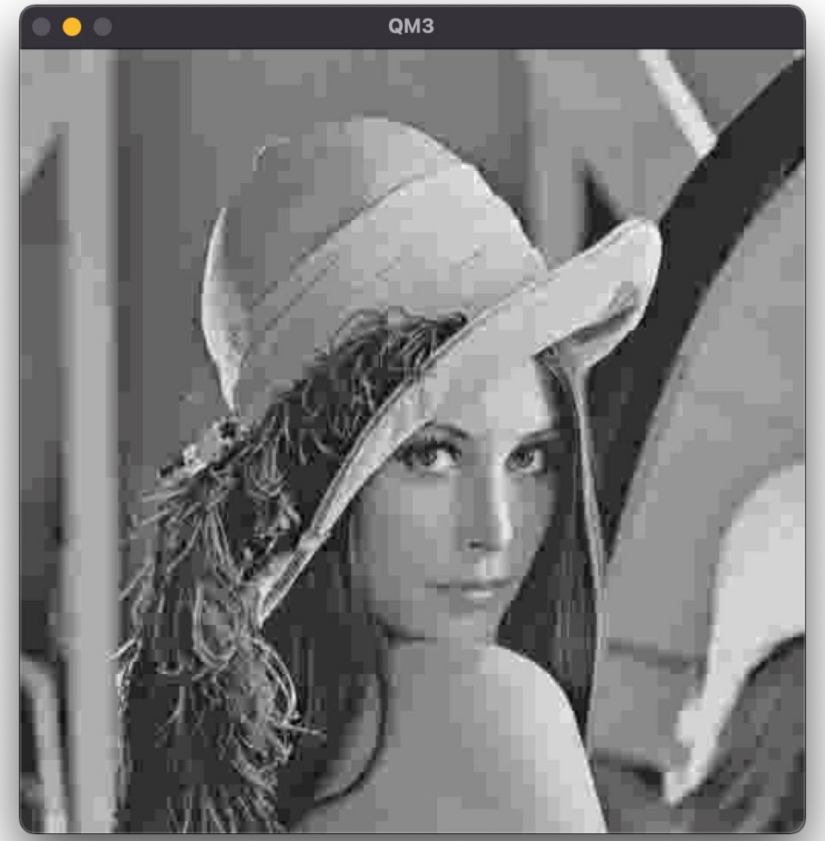



```
QM2: psnr = 58.934029
```

Assignment 10

- Results






```
QM3: psnr = 28.999112
```

Exercise 12

Sung Soo Hwang

Exercise 12

- Estimate the result of DCT on those 4 images
  - Assume that DCT is applied on each 8X8 sub block
  - Assume the resolution of each image is 72X72