

Assignment 01

Name: 陈怡安

Student ID: 118010030

1. Learn to use VirtualBox

2. Basics operations of vectors and matrix

2.1 Basic vector operations (10 points)

```
*****
```

```
Question1
```

```
*****
```

```
v + w:
```

```
1
```

```
2.5
```

```
4
```

```
7
```

```
v * w:
```

```
0.458333
```

```
v x w:
```

```
0.0833333
```

```
-0.166667
```

```
0.0833333
```

2.2 Basic Matri operations

Question2

m1

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

m2

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

m1 + m2

5 5 5 5
13 13 13 13
21 21 21 21
29 29 29 29

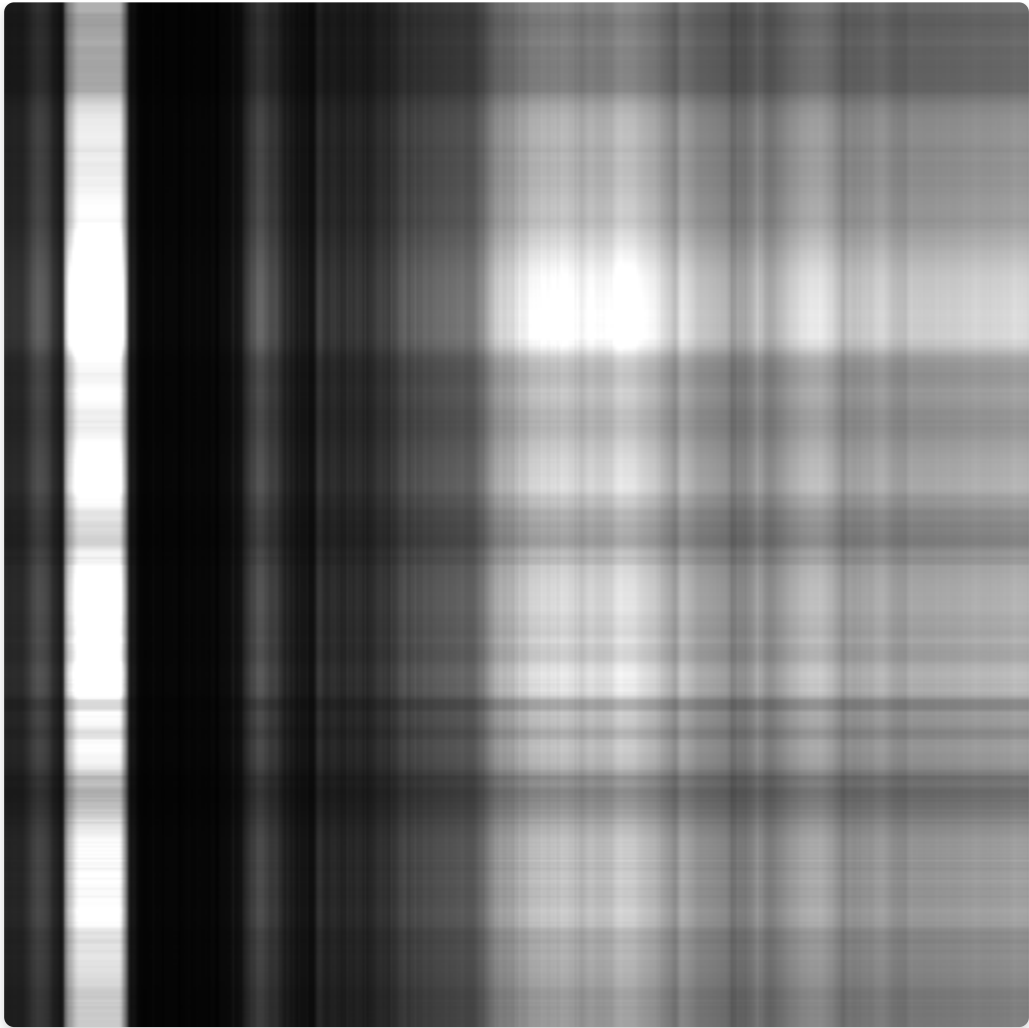
m1 * m2

120 110 100 90
280 254 228 202
440 398 356 314
600 542 484 426

m1 * v

22
52
82
112

2.3 SVD decomposition of "lenna"



First Singular Value Selected



First 10 Singular Values Selected



First 50 Singular Values Selected

- Explanation: The number of singular values we choose while recovering the image represents the extent of information that could be restored. The more singular values selected, the better image will be. In this question, 50 singular values suffice to restore a good quality.

2.4 Basic transformation operations

Question4

Rotated Point1

0.853312

2.96739

2.39905