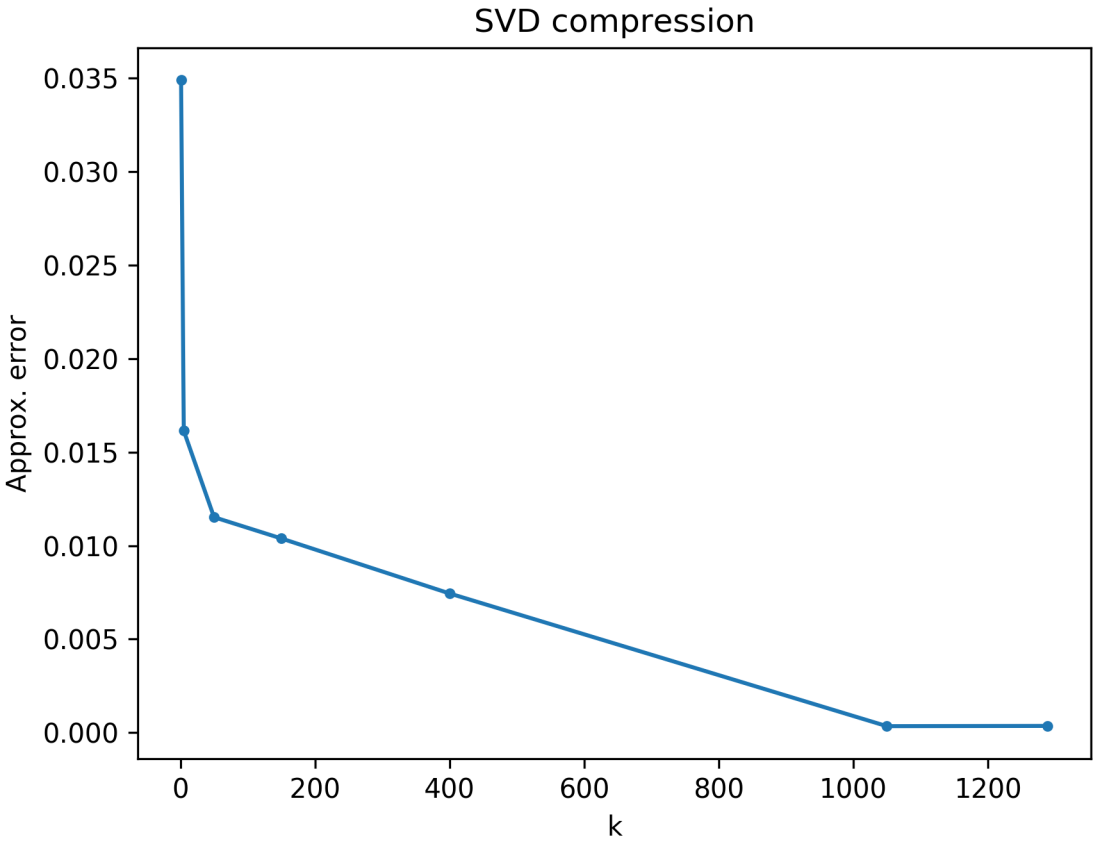
B06901090 電機二 沈哲瑋 LA hw6

1. A plot includes curve describing the relation of k and approximation error




2.Analyze the rank of R channel of the provided image and explain how you analyze.

1, 5, 50, 150, 400, 1050, 1065。

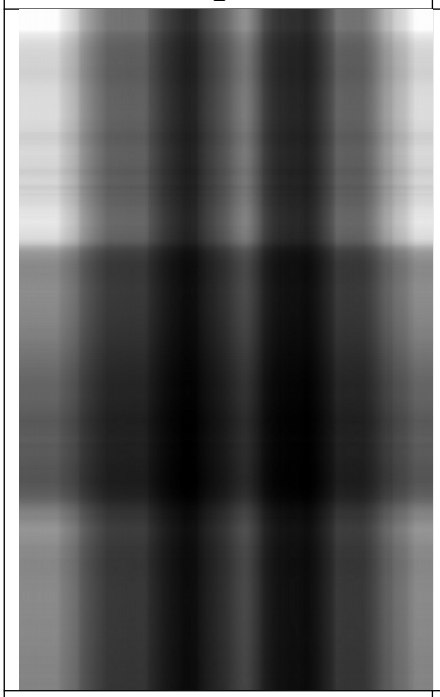
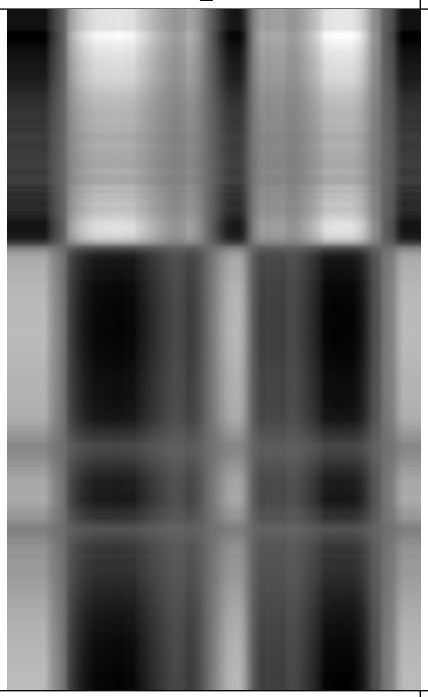
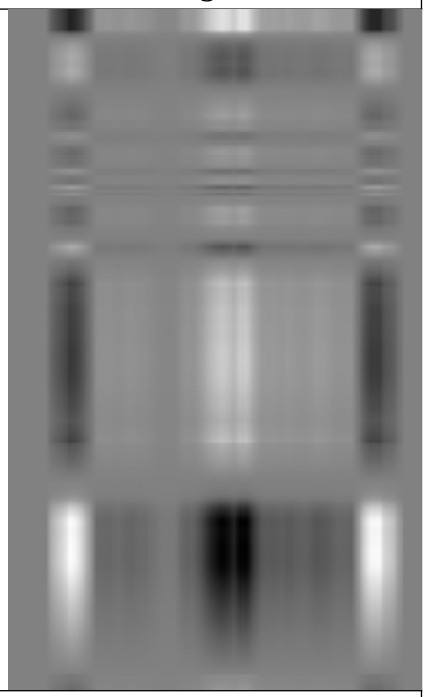
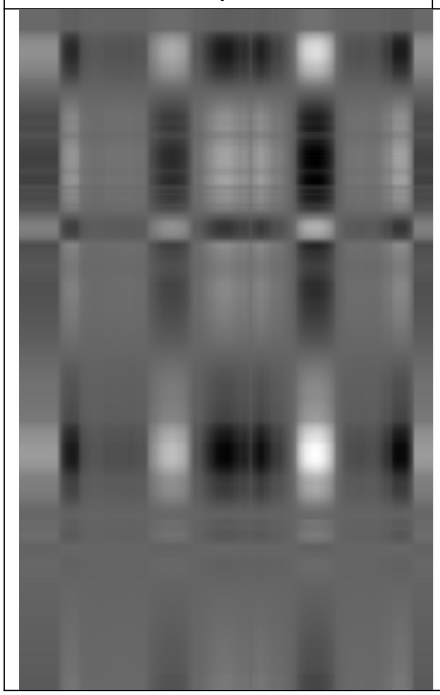
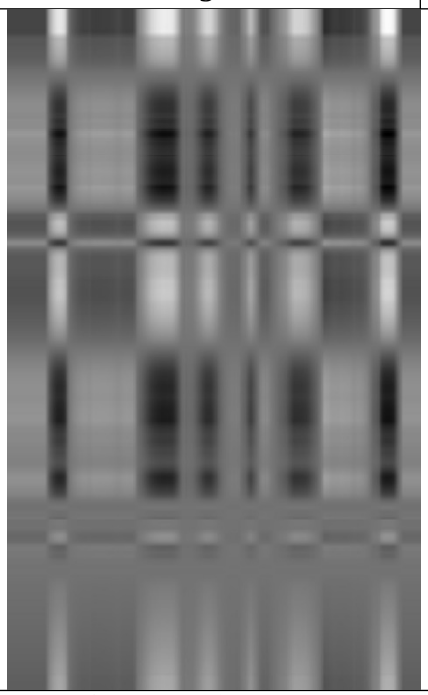
```
Perform SVD for k=1 ...
rank = 1
Perform SVD for k=5 ...
rank = 5
Perform SVD for k=50 ...
rank = 50
Perform SVD for k=150 ...
rank = 150
Perform SVD for k=400 ...
rank = 400
Perform SVD for k=1050 ...
rank = 1050
Perform SVD for k=1289 ...
rank = 1065
```

取 rank 的方法就是直接用 numpy.linalg 的 matrix_rank：

```
if ch == 1:
    print('\nrank =', np.linalg.matrix_rank(imArr_compressed[:, :, 1]))
```

而值得注意的是當 k=1289 時，rank 並非 1289，而是 1065，這是因爲原本 svd 裡 sigma 那項就含有 0，因此 rank 才會比 k 值小。

3.Plots in page 6 but on G channel($A_{i,G}$ , $\forall 1 \leq i \leq 5$)

| 1 | 2 | 3 |
|---|---|---|
|  |  |  |
| 4 | 5 | 1+2+3+4+5 |
|  |  |  |

註：是灰階而不是綠色是因爲我把他降一個維度，這部份的 code 寫在 py 檔的__main__ (但註解掉了，避免執行上會發生奇怪的錯誤）。