BSP-Homework5

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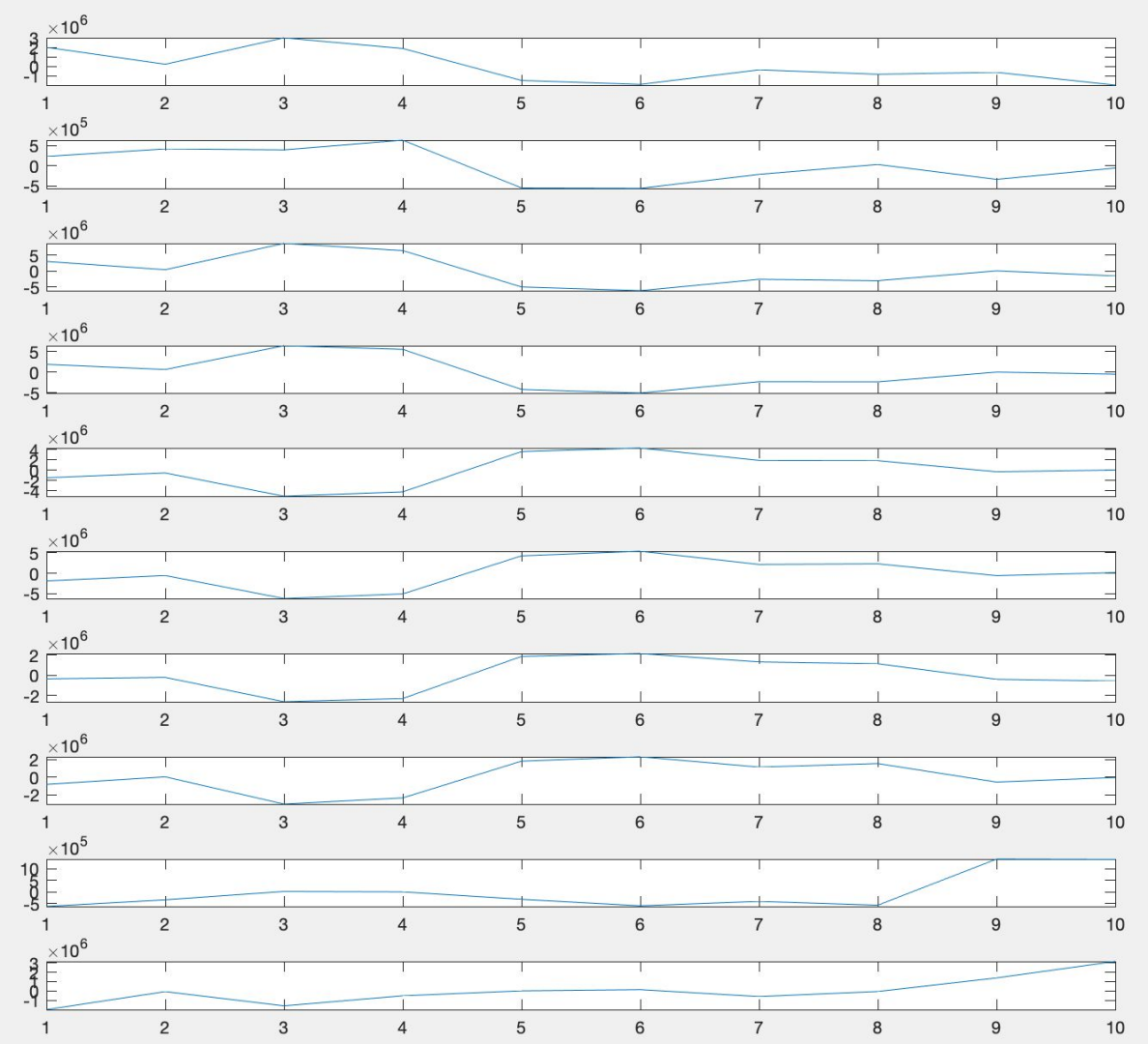
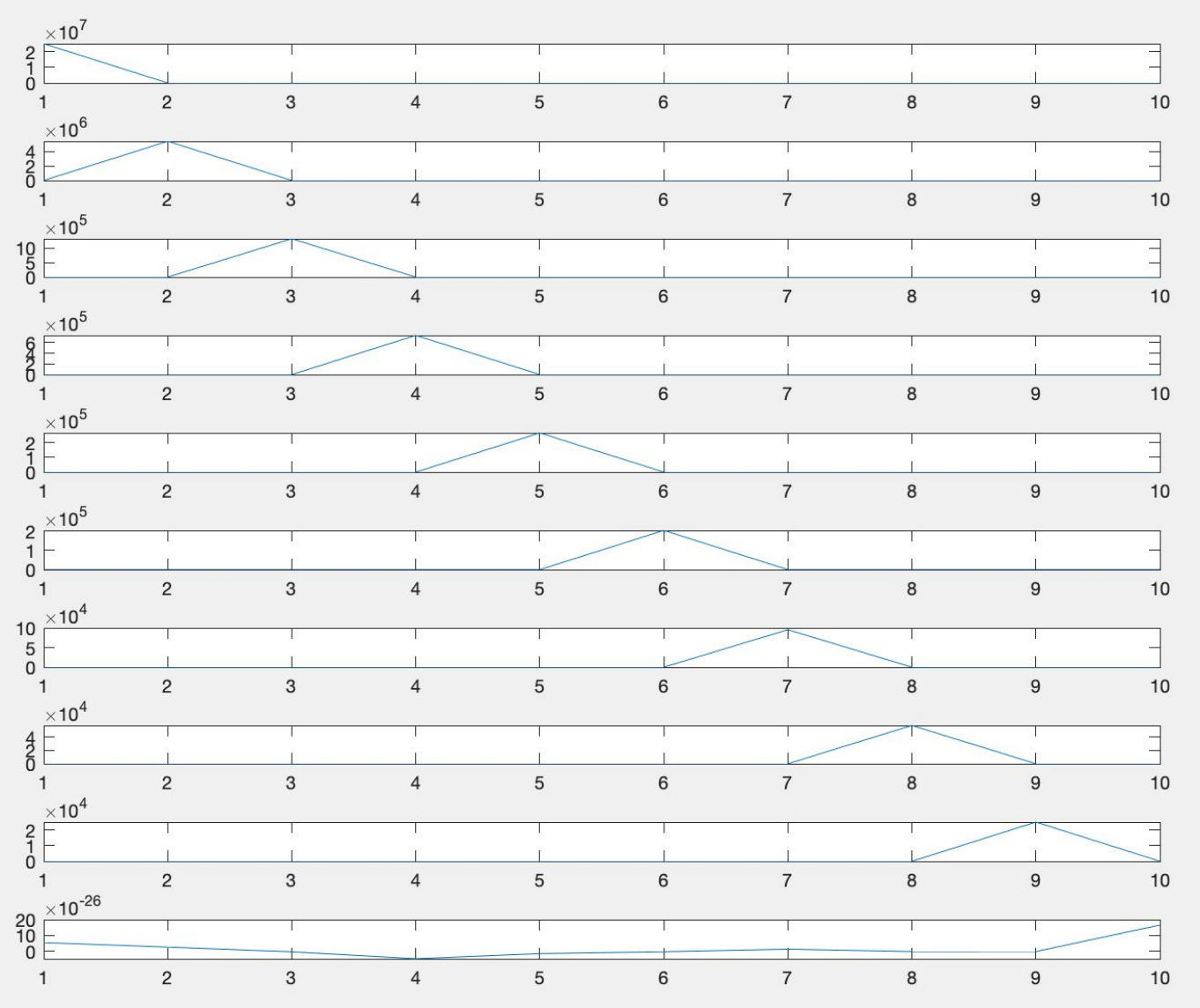
Problem1 - eeg2

- 利用PCA 分析EEG2 10 channel 之 EEG data.
- 分析EEG 各 channel 之 covariance matrix，及 10 個 PC 之 covariance matrix
- 需要多少個 PC 才能包含 85% 的 variance?

EEG 各 channel 之 covariance matrix



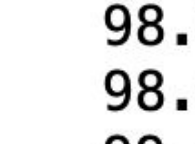
10 個 PC 之 covariance matrix



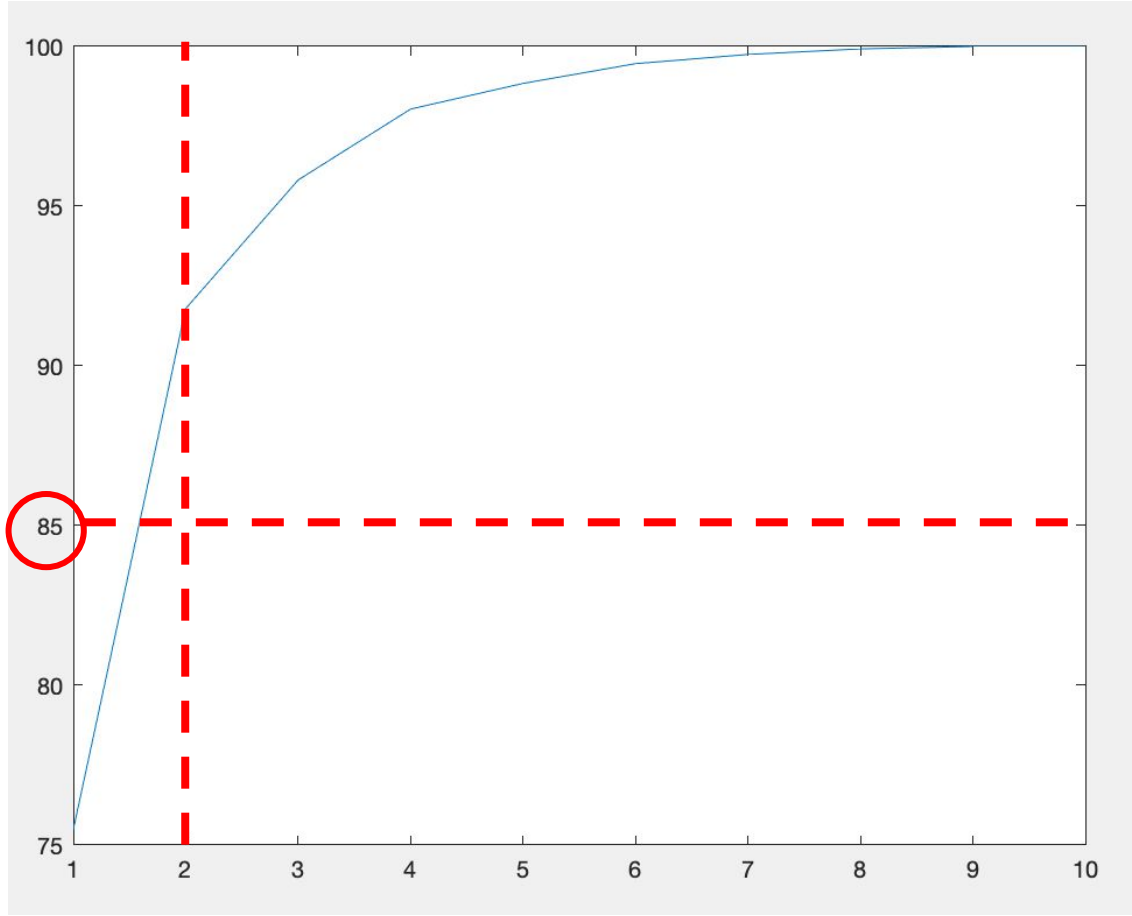
需要多少個 PC 才能包含 85% 的 variance?

Two PCs!

```
latent =

   75.4810
   16.3141
    4.0256
    2.2198
    0.8028
    0.6182
    0.2885
    0.1742
    0.0759
    0.0000
```



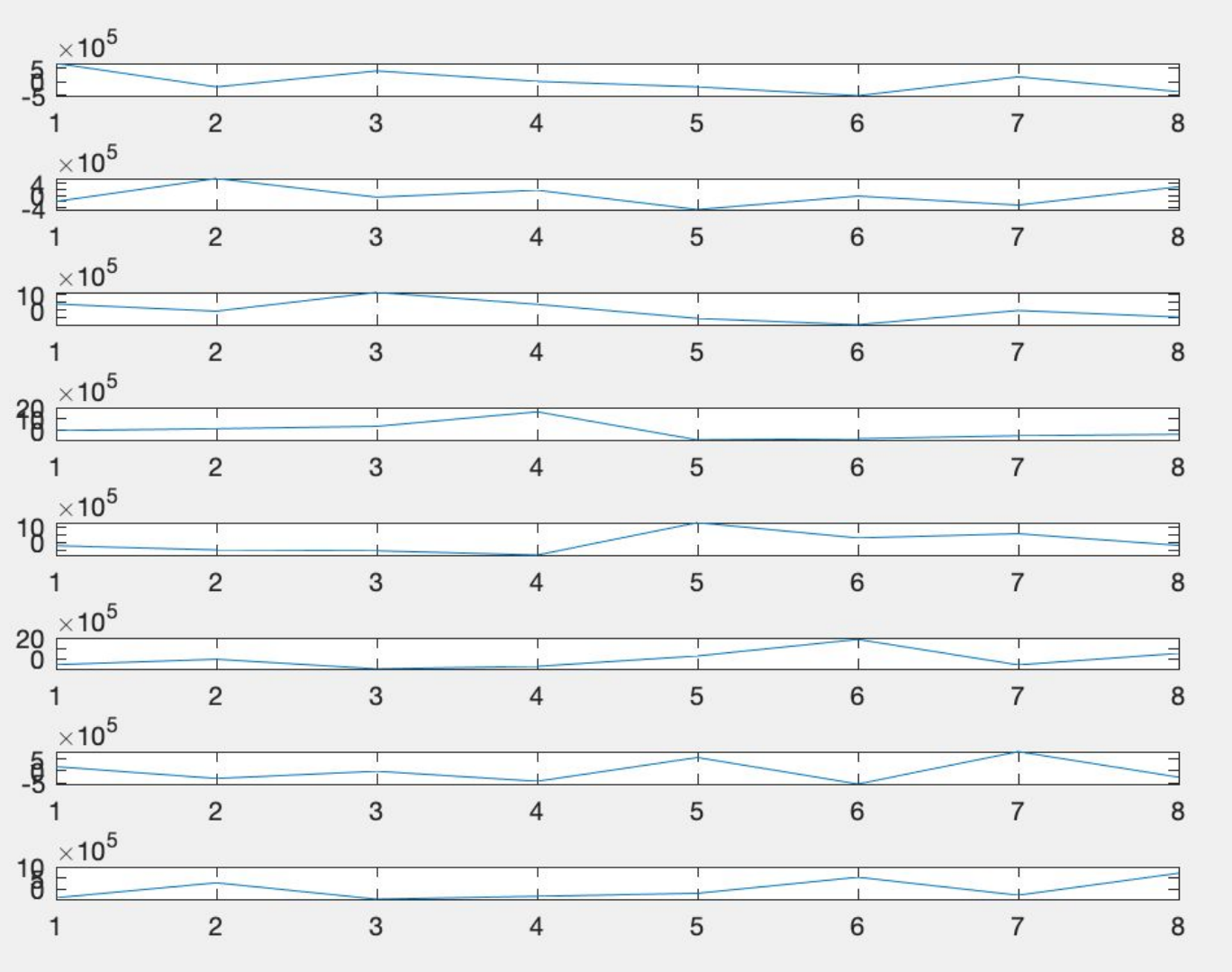
```
latent =

   75.4810
   91.7951
   95.8207
   98.0404
   98.8433
   99.4614
   99.7499
   99.9241
  100.0000
  100.0000
```



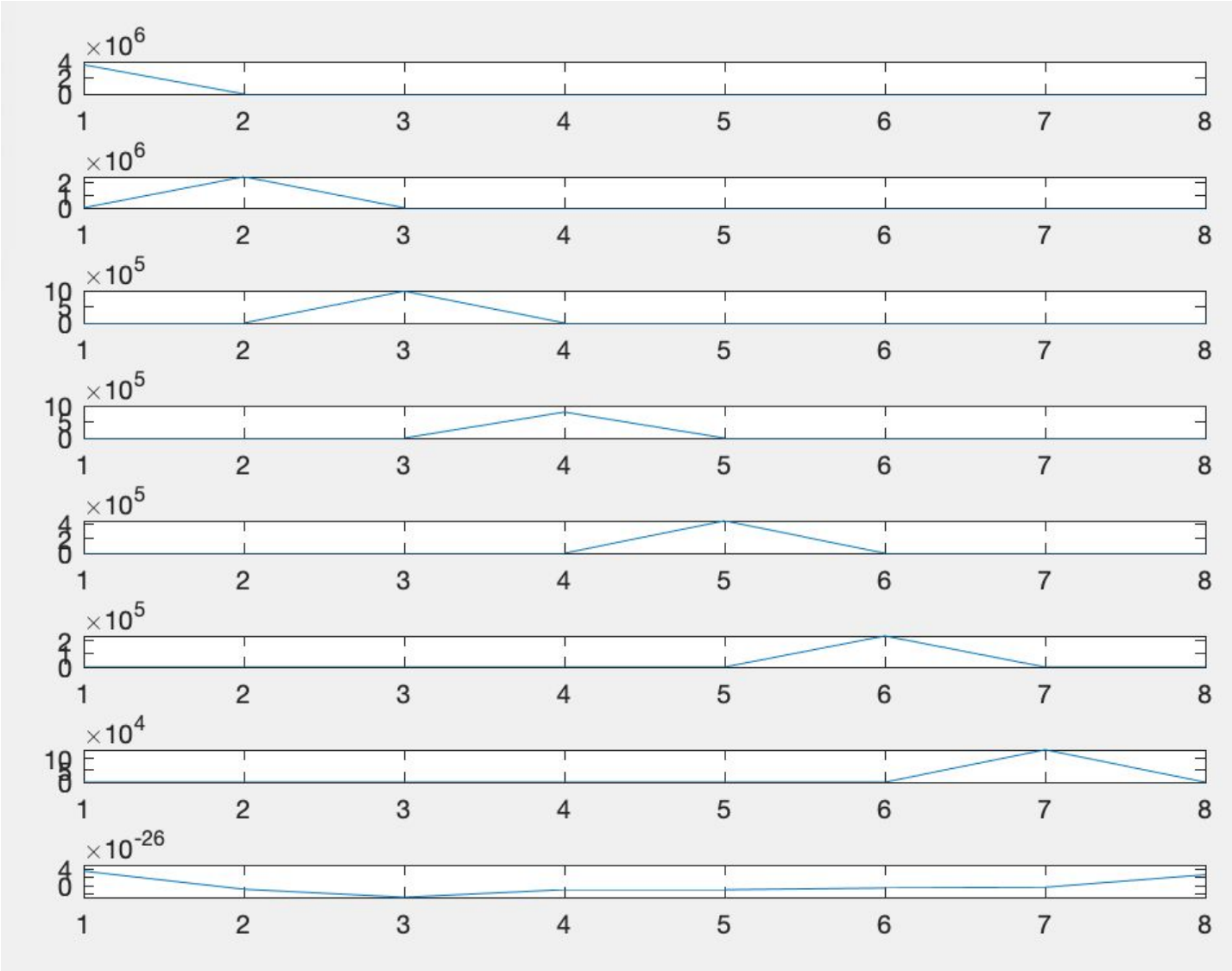
Problem2 - eeg1

- 利用PCA 分析EEG1 10 channel 之 EEG data.
- 分析EEG 各 channel 之 covariance matrix，及 10 個 PC 之 covariance matrix
- 需要多少個 PC 才能包含 85% 的 variance?

EEG 各 channel 之 covariance matrix



10 個 PC 之 covariance matrix

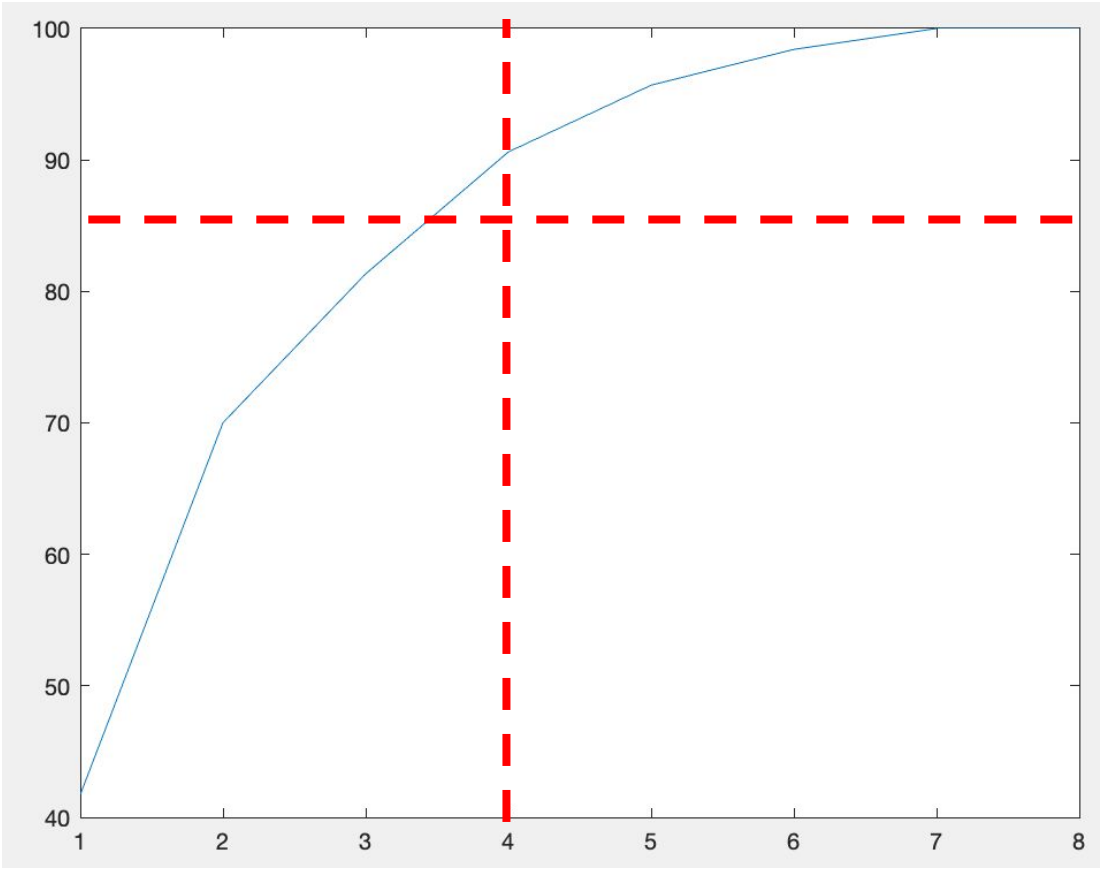


需要多少個 PC 才能包含 85% 的 variance?

Four PCs!

```
latent =

   41.7225
   28.2906
   11.3257
    9.2754
    5.0749
    2.7192
    1.5919
    0.0000
```

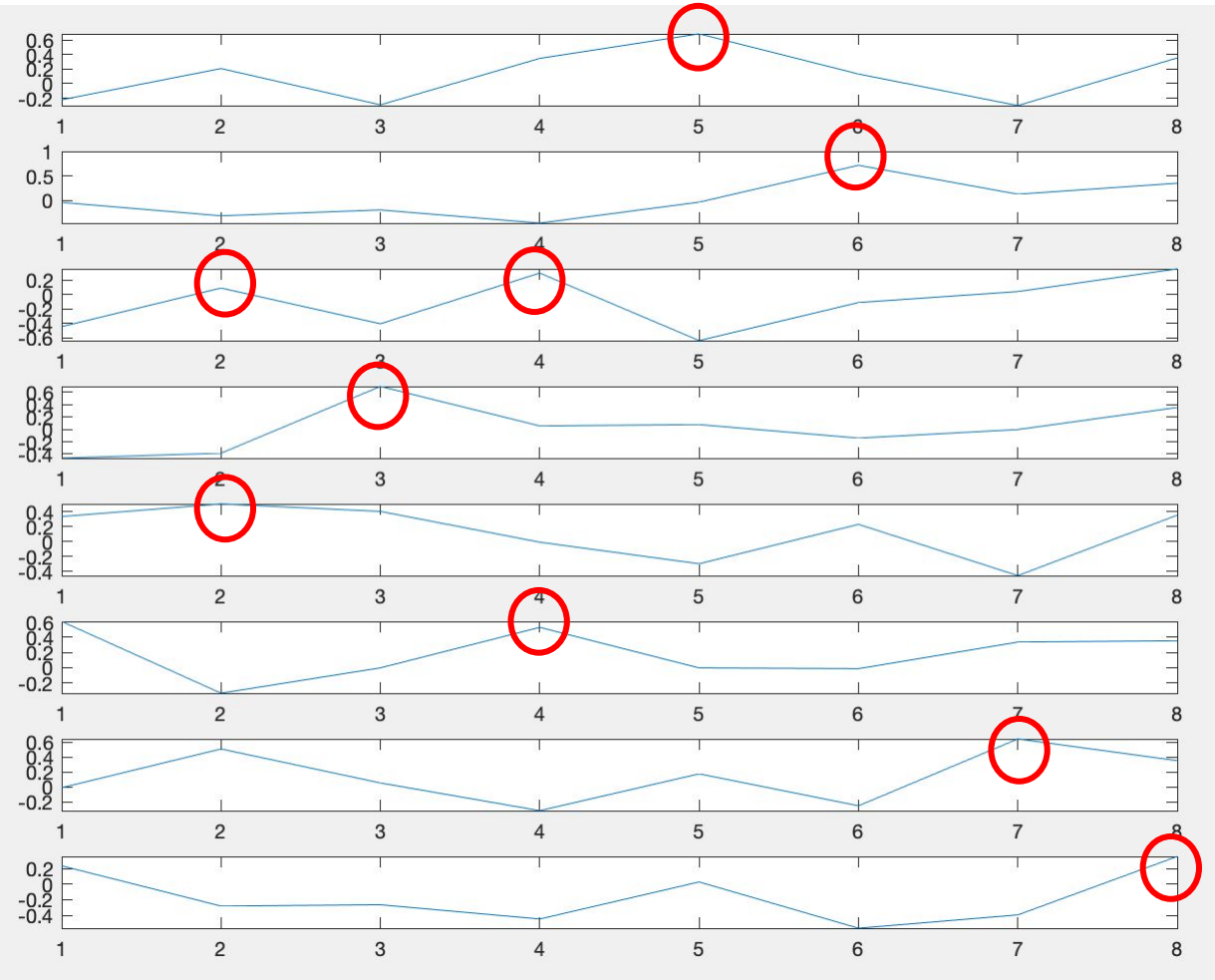
```
latent =

   41.7225
   70.0130
   81.3387
   90.6141
   95.6889
   98.4081
  100.0000
  100.0000
```



Problem 3

- 觀察eigenvector 係數與channel 間的關係

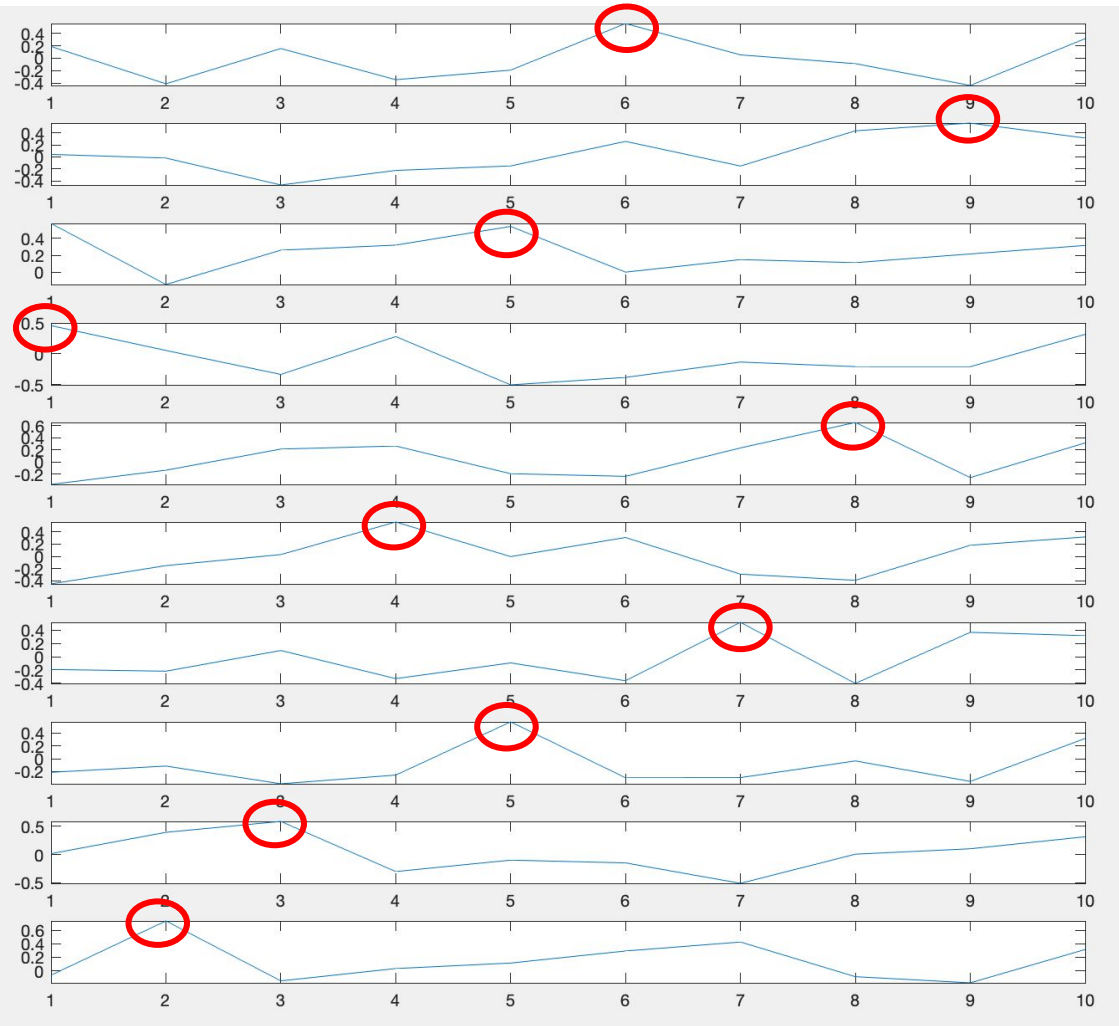
eeg1



1 eeg1-c3.dat
eeg1-c4.dat
eeg1-f3.dat
eeg1-f4.dat
eeg1-o1.dat
eeg1-o2.dat
eeg1-p3.dat
8 eeg1-p4.dat

数値偏低

eeg2



1 eeg2-c3.dat
eeg2-c4.dat
eeg2-f3.dat
eeg2-f4.dat
eeg2-o1.dat
eeg2-o2.dat
eeg2-p3.dat
eeg2-p4.dat
eeg2-t3.dat
10 eeg2-t4.dat