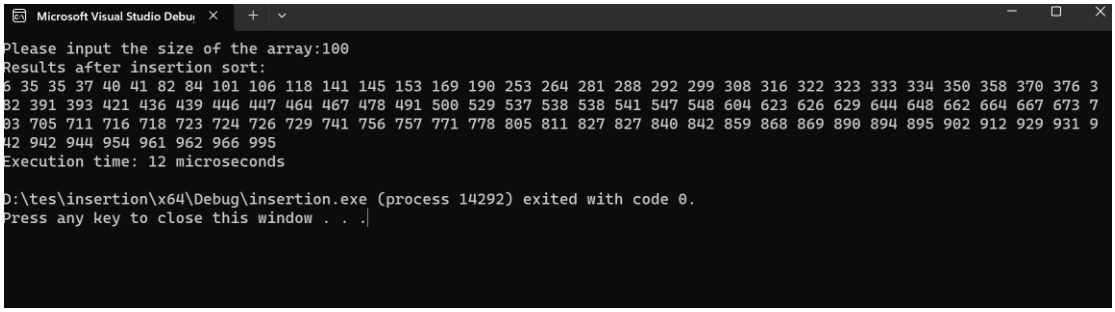
0810546_張理為_HW1

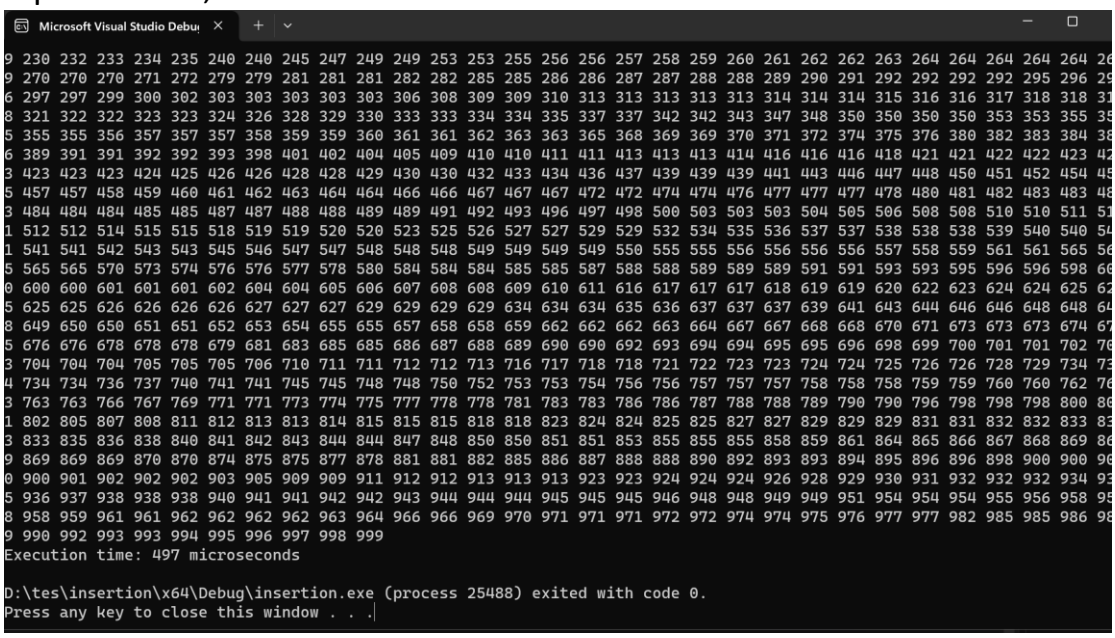
1. Insertion sort

Input size = 100



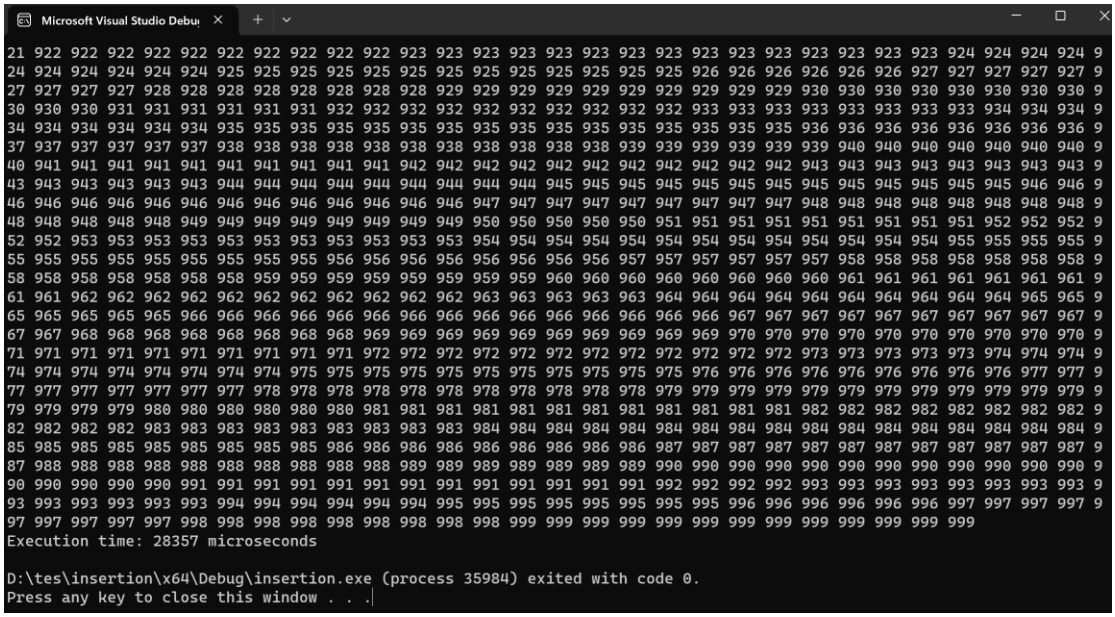
Time duration: 12 microseconds

Input size = 1,000



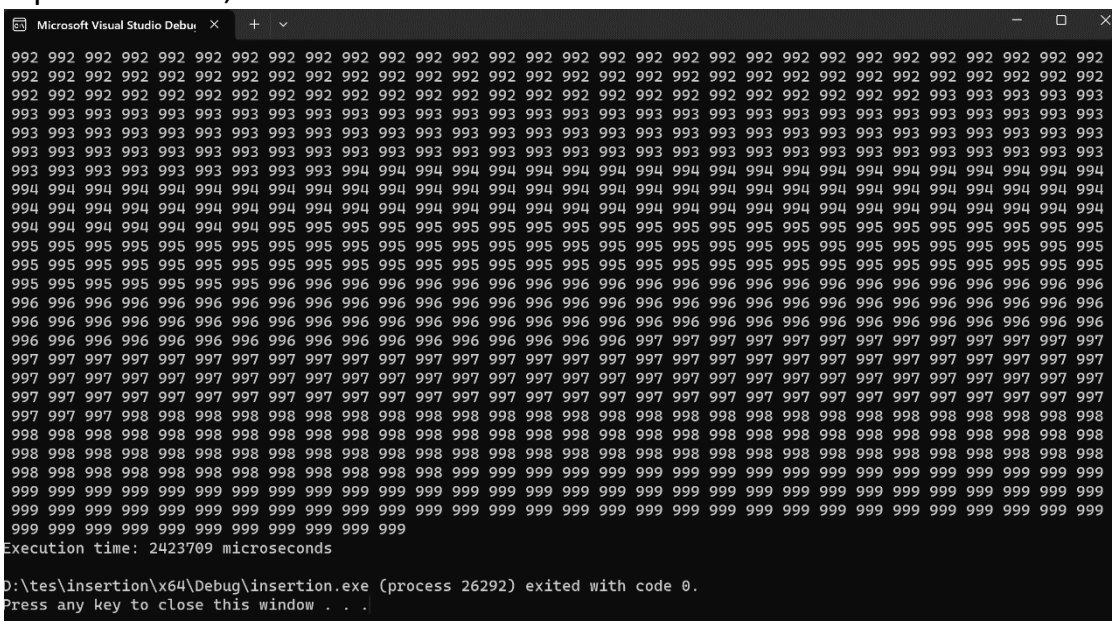
Time duration: 497 microseconds

Input size: 10,000



Time duration: 28357 microseconds

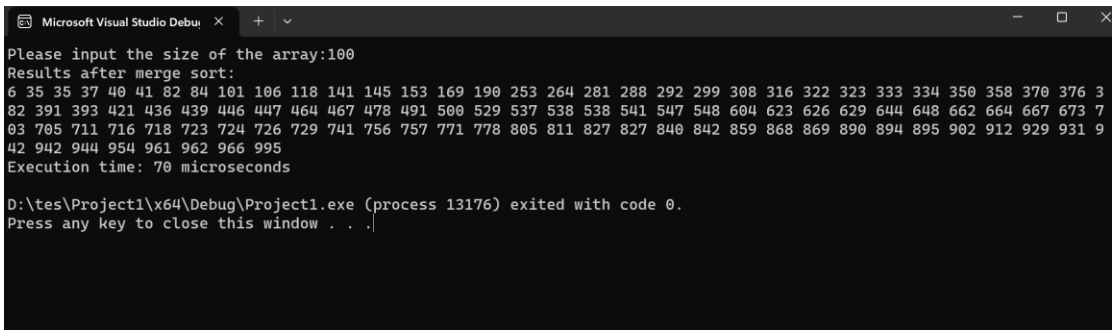
Input size: 100,000



Time duration: 2423709 microseconds

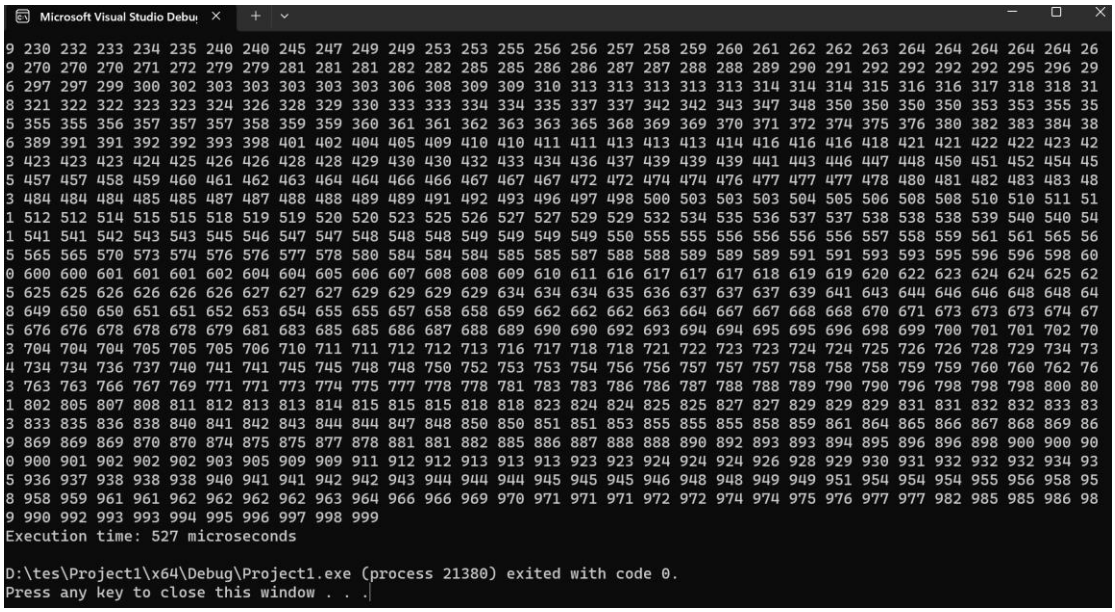
2. Merge sort

Input size = 100



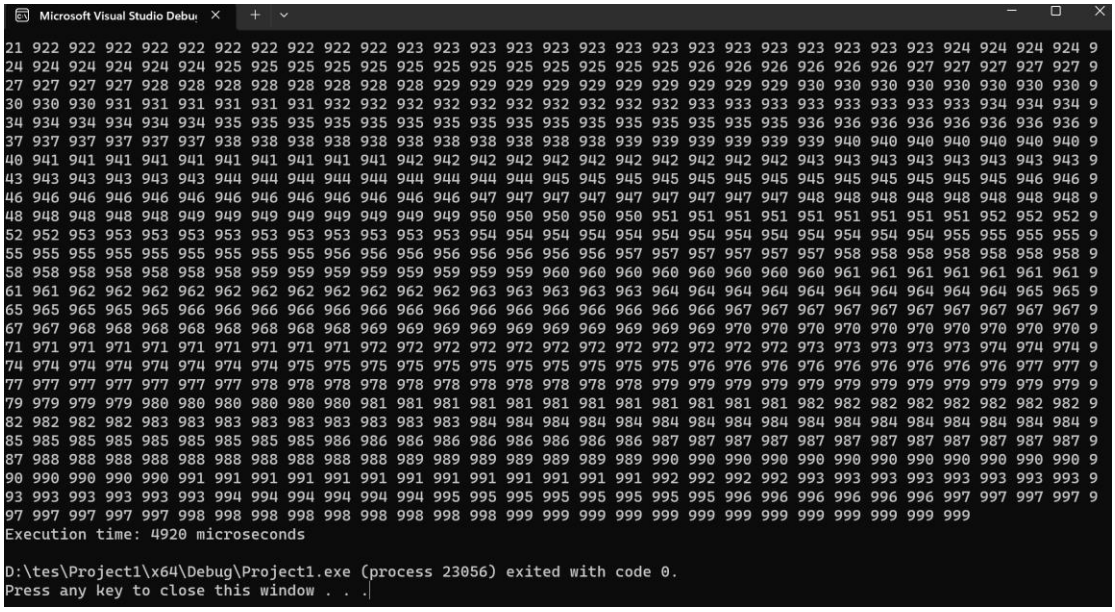
Time duration: 70 microseconds

Input size = 1,000



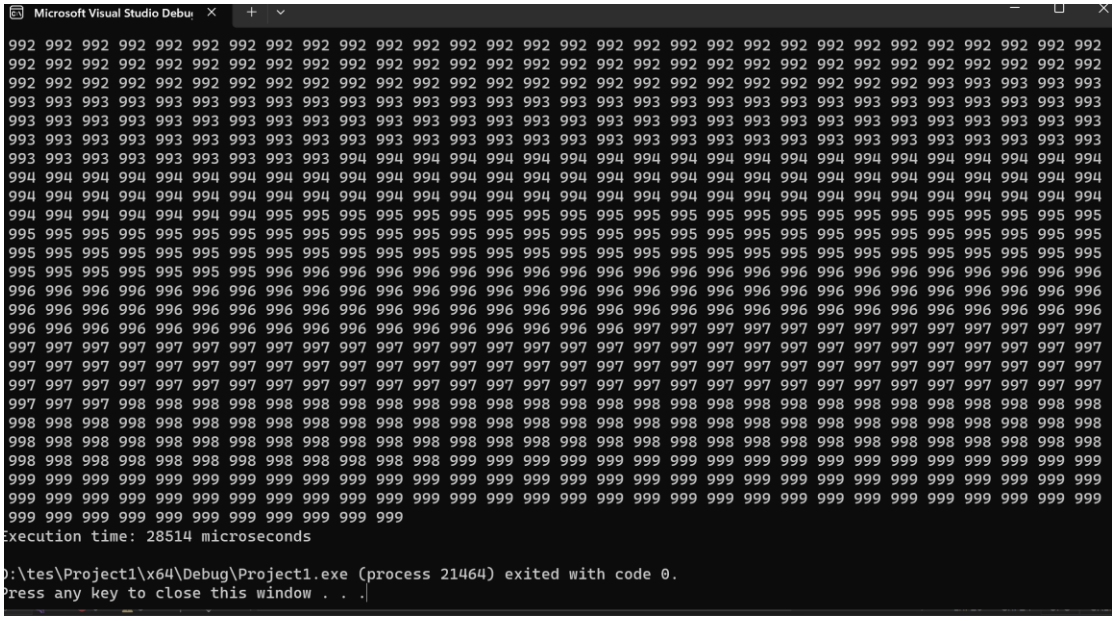
Time duration: 527 microseconds

Input size = 10,000



Time duration: 4920 microseconds

Input size = 100,000



Time duration: 28514 microseconds

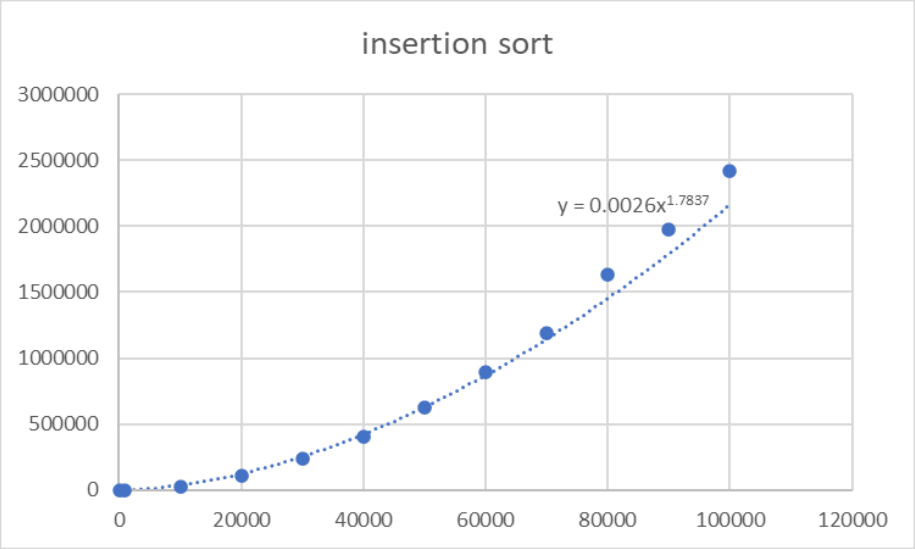
3. 複雜度分析

Insertion sort:

除了原本的數據外，我也測試了 20000~90000 的數據，並將數據輸入

excel 作圖並使用趨勢線預估函數，得到以下結果:

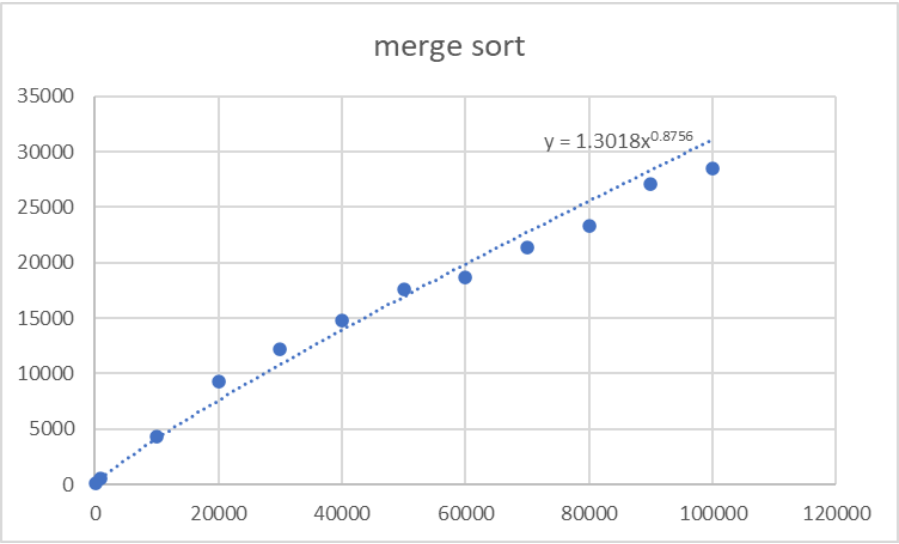
100	12
1000	497
10000	28357
100000	2423709
20000	108927
30000	241473
40000	402552
50000	624675
60000	889998
70000	1189331
80000	1634006
90000	1977509



從趨勢線的函數可以分析 insertion sort 確實屬於 O(n^2)的層級

Merge sort:

100	70
1000	527
10000	4290
100000	28514
20000	9243
30000	12151
40000	14746
50000	17621
60000	18652
70000	21416
80000	23281
90000	27064



步驟相同，從趨勢線的函數可以分析 insertion sort 確實屬於

O(nlogn)的層級，因為 n<nlogn。