Program3 output format

step 1

用 cin 方式輸入數值

1. <= 0 跑 part1
2. else : 設定產生多少 random number

```
DS-00 Program3-Demo
10000
```

Output format Cases

1. 當 nums.length 數量 <= 100 ‐ format 1 (part1 屬於 format 1)
2. 當 nums.length 數量 > 100 ‐ format 2

Insertion sort (format 1)

```
Before : 168,179,208,306,93,859,984,55,9,271,33,

Insertion sort:
 1 : 168,179,208,306,93,859,984,55,9,271,33,
 2 : 168,179,208,306,93,859,984,55,9,271,33,
 3 : 168,179,208,306,93,859,984,55,9,271,33,
 4 : 93,168,179,208,306,859,984,55,9,271,33,
 5 : 93,168,179,208,306,859,984,55,9,271,33,
 6 : 93,168,179,208,306,859,984,55,9,271,33,
 7 : 55,93,168,179,208,306,859,984,9,271,33,
 8 : 9,55,93,168,179,208,306,859,984,271,33,
 9 : 9,55,93,168,179,208,271,306,859,984,33,
10 : 9,33,55,93,168,179,208,271,306,859,984,
sorting time : 0.000201 s
```
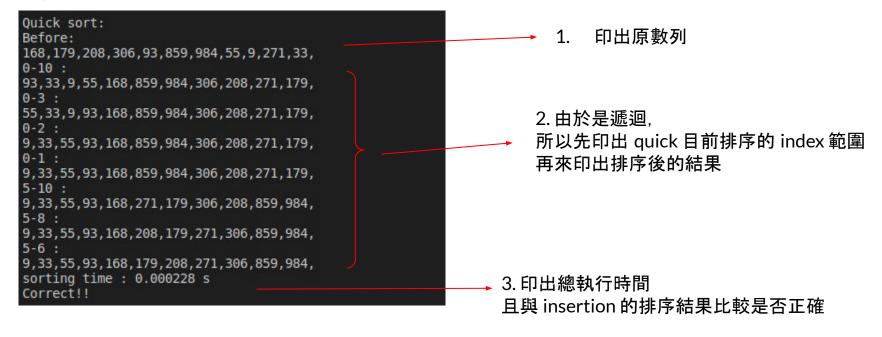
幫同學寫了

quick sort (format 1)

```
Quick sort:
Before:
168,179,208,306,93,859,984,55,9,271,33,
0-10 :
93,33,9,55,168,859,984,306,208,271,179,
0-3 :
55,33,9,93,168,859,984,306,208,271,179,
0-2 :
9,33,55,93,168,859,984,306,208,271,179,
0-1 :
9,33,55,93,168,859,984,306,208,271,179,
5-10 :
9,33,55,93,168,271,179,306,208,859,984,
5-8 :
9,33,55,93,168,208,179,271,306,859,984,
5-6 :
9,33,55,93,168,179,208,271,306,859,984,
sorting time : 0.000228 s
Correct!!
```

1. 印出原數列

2. 由於是遞迴,
所以先印出 quick 目前排序的 index 範圍
再來印出排序後的結果

3. 印出總執行時間
且與 insertion 的排序結果比較是否正確

radix sort (format 1)

根據 radix sort 的介紹，應該很清楚這邊要印什麼，這裡不做詳細描述，請照圖規定產生output
(pass, 容器, resulting chain)

```
Radix sort:
First-pass:
0 |
1 | --> 271
2 |
3 | --> 93 --> 33
4 | --> 984
5 | --> 55
6 | --> 306
7 |
8 | --> 168 --> 208
9 | --> 179 --> 859 --> 9
resulting chain : 271,93,33,984,55,306,168,208,179,859,9,
```

```
Second-pass:
0 | --> 306 --> 208 --> 9
1 |
2 |
3 | --> 33
4 |
5 | --> 55 --> 859
6 | --> 168
7 | --> 271 --> 179
8 | --> 984
9 | --> 93
resulting chain : 306,208,9,33,55,859,168,271,179,984,93,
```

```
Third-pass:
0 | --> 9 --> 33 --> 55 --> 93
1 | --> 168 --> 179
2 | --> 208 --> 271
3 | --> 306
4 |
5 |
6 |
7 |
8 | --> 859
9 | --> 984
resulting chain : 9,33,55,93,168,179,208,271,306,859,984,
```

```
sorting time : 0.000543 s
Correct!!
```

印出總執行時間
且與 insertion 的排序結果比較是否正確

format 2（當排序數量大於 100）

```
DS-OO Program3-Demo
10000
Insertion sort:
sorting time : 0.158101 s


Quick sort:
sorting time : 0.00131 s
Correct!!


Radix sort:
sorting time : 0.00148 s
Correct!!
```

只須印出執行時間與是否正確