Homework 10

Objective :

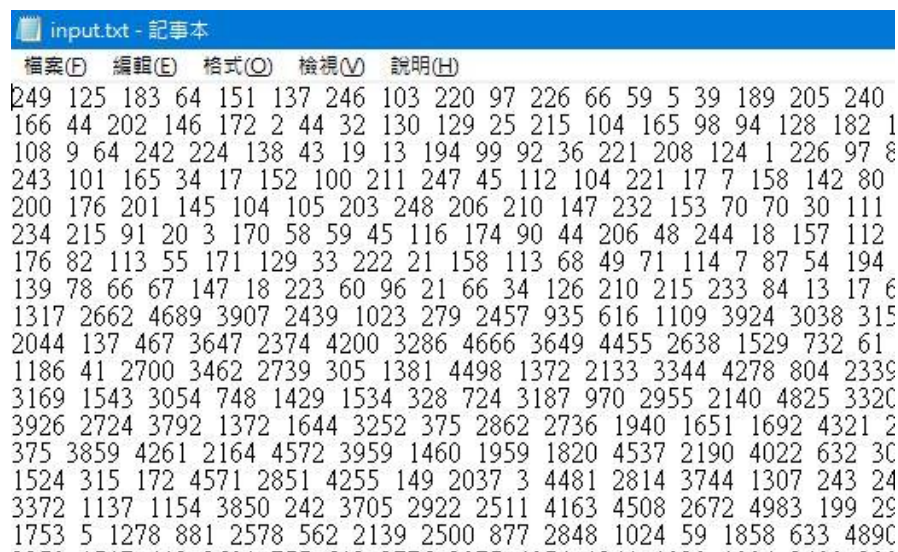Learning how to use *file I/O, call by address* and *array*.

Exercise :

10

Design a program which includes three functions. This homework has a txt file *input.txt*. There are three sequences of integers in txt file. The numbers of integer are 500, 1000 and 2000 each sequence. You need to get the integer from *input.txt* and use three kinds of sort to arrange the numbers from small to large. Each kind of sort should include two statistics: swap times and time consuming. After sorted, you should output the result to another txt file named with its sorted name every sort. And output the statistics to the terminal. The function is shown below:

1. *int bubble_sort(int*,int,int*)*: input an integer *array*, *size* and *num* for compare times used call by address. Implement the bubble sort. Return swap times.

2. *int selection_sort(int*,int,int*)*: input an integer *array*, *size* and *num* for compare times used call by address. Implement the selection sort.

3. *int insertion_sort(int*,int,int*)*: input an integer *array*, *size* and *num* for compare times used call by address. Implement the insertion sort.

After runnung your program, there should be three new txt files named with the name of sort and the statistics show in the terminal. The output format should be the same as the exampel picture.

Note: swap times means if the number is changed to another position. You need to count not only the target number but all the number changed position.

input.txt(part of txt file)*:*

(name of sort).txt(part of txt file):

bubble.txt
insertion.txt
selection.txt

bubble.txt - 記事本

檔案(F)　編輯(E)　格式(O)　檢視(V)　說明(H)

```
Bubble sort result:
1   1   1   2   2   2   3   3   3   4   5   6   6   6   6   7   7   7   7   7   8   8   9   10  11  12  12  13  13  14
21  21  21  21  23  24  24  24  25  25  25  26  27  28  29  30  30  32  32  32  33  33  33
43  43  43  44  44  44  44  44  45  45  45  45  46  46  46  47  47  48  48  48  48  49  49
56  56  57  57  58  58  59  59  59  59  60  61  62  62  62  63  64  64  64  65  65  66  66
70  71  71  72  73  74  74  75  75  76  77  78  78  78  80  81  82  83  83  83  83  84  84
90  91  92  92  93  93  94  94  94  95  95  96  97  97  97  98  98  99  99  99  100 100
105 106 106 106 107 107 107 108 108 108 108 109 109 110 110 110 110
115 116 116 116 117 117 117 117 118 118 120 120 120 121 121 121 122
125 125 126 126 126 126 127 127 128 128 129 129 129 129 130 130 131
142 142 143 144 144 144 145 145 146 147 147 148 149 149 149 149 149
153 153 154 155 156 157 157 157 157 157 158 158 158 158 159 160 161
166 166 166 168 170 171 172 172 172 173 174 175 175 175 176 176 177
```

insertion.txt - 記事本

檔案(F)　編輯(E)　格式(O)　檢視(V)　說明(H)

```
Insertion sort result:
1   1   1   2   2   2   2   3   3   3   4   5   6   6   6   6   7   7   7   7   7   8   8   9   10  11  12  12
21  21  21  21  23  24  24  24  25  25  25  26  27  28  29  30  30  32  32  32
43  43  43  44  44  44  44  44  45  45  45  45  46  46  46  47  47  48  48  48
56  56  57  57  58  58  59  59  59  59  60  61  62  62  62  63  64  64  64  65
```

selection.txt - 記事本

檔案(F)　編輯(E)　格式(O)　檢視(V)　說明(H)

```
Selection sort result:
1   1   1   2   2   2   2   3   3   3   4   5   6   6   6   6   7   7   7   7   7   8   8   9   10  11  12
21  21  21  21  23  24  24  24  25  25  25  26  27  28  29  30  30  32  32
43  43  43  44  44  44  44  44  45  45  45  45  46  46  46  47  47  48  48
```

The difference between files is the first line. You need to output the name of sort.

Output:

Sequence 1	bubble	selection	insertion
swap times	63256	499	63755
compare times	124750	124750	63256
Sequence 2	bubble	selection	insertion
swap times	245117	999	246116
compare times	499500	499500	245117
Sequence 3	bubble	selection	insertion
swap times	1001060	1999	1003059
compare times	1999000	1999000	1001060

Rule and Format：

Comment in your program will get addition point in consider.

Please hand in .c file and name your .c file with your student number.

Compress all the .c file and name with your student number.

Upload the compressed file finally.

Example:

If your student number is B073040055, the file name will be B073040055.c.

Compressed file is B073040055.rar/.zip.

Deadline is **2018.12.06** (Thur.) before class.

No input/output will get 0 point.

Please upload homework to Cyber University:

1. Go to NSYSU Cyber University http://cu.nsysu.edu.tw/

2. Sign in and select C program design(I)

3. Click "Assessment Center"

4. Click "Do assignment"

5. Click "Start"

6. Click "選擇檔案" -> upload file .cpp -> submit