

# Homework 13

## Objective :

Learning how to use *array, header and file IO*.

## Exercise :

### 13

Binary search is a kind of searching ways. If you want to find something in an array, you can just full search. But it is time-consuming. The consuming of time will reduce if use the Binary search. However, Binary search works only when you give a sorted-array. The conception is the target will compare with the middle element of array, from small to big for example, if the target is smaller, reduce the array size to left side of the middle element, and vice versa. Therefore, every time you compare, the data will reduce to half. This homework you need to write a Binary search. The input of array will use a file. The format of file is two rows: first row has one number for array size. Second row is the number set with space between each number. After sorted, user will keep input target until input EOF, the program stop. This homework has two function below:

1. *void mysort(int\* array, int size)*: this function needs two parameters: the array should be sorted, the array size, and this function has no return value. The function need to sort the input array. You can use any sorting way to get the goal. But you can't use build-in sort().

2. *int myBinarySearch(int\* array, int target, int head, int tail)*: this function needs four parameters: the array for searching, the target to find in array, the head of the array, the tail of the array, and this function has to return an integer. The function need to use Binary search to find target in array. You can use loop or recursive to find target. If find, return the index in the array. Otherwise return -1.

This homework need to use the header you made, therefore you should hand in three files:

1. *main.c/.cpp*: you should include your header. In this file, there is no other definition except main function. You can't define global variables and functions.

2. *(student id).h*: include what build-in header you need and define the two functions mentioned above.

3. *(student id).c/.cpp*: you should include your header. In this file, describe how the two functions work.

Note: make sure there are three required files.

Note: You can change the parameters of the function. However, make sure your format in three files is the same.

input.txt

```
input.txt - 記事本
檔案(F) 編輯(E) 格式(O) 檢視(V) 說明(H)
3250
1353 3584 7964 5079 9463 2129 11264 5300 12660 5577 1175 3049 3893 8654 11739 732 5123 9797 12967 8752
4798 5371 5111 2746 11331 12096 5355 3024 4251 10233 11846 3538 6630 11237 727 5686 2008 9403 3173 3407
9555 11754 944 4293 4173 11320 3518 12771 9348 12751 2251 1293 663 1933 6485 3080 7974 6499 567 1350 3757
12112 2859 8562 7301 12815 9422 4386 7755 9846 2014 2163 8373 2152 6839 5712 2418 2918 8799 10110 6250
3713 463 3498 7422 2683 1139 2812 4241 9119 9164 1936 1919 5478 6652 11386 3396 5020 6896 6058 5649 9818
3669 7512 5170 3029 1892 866 10996 302 5512 1620 3405 6612 2243 103 524 10935 2475 8397 7651 11286 354
812 4225 219 9055 5009 10573 6773 3351 759 7176 1743 56 424 6467 3015 255 8026 9817 5858 6624 3430 12086
2054 7886 6253 8264 1992 164 1852 10188 6774 467 5187 4012 12056 10101 2688 2952 6675 1105 9488 4907 9877
10832 2425 2175 1032 7664 4105 5107 9105 12766 459 1492 6936 2505 1964 482 10061 4309 4681 6997 12113
8182 676 1159 3771 12093 6 3043 9308 7599 4582 4719 6077 4852 9531 5670 4679 3278 8887 10169 5395 1379
11420 2751 7299 2868 11196 5563 9648 1823 6643 3149 12974 8066 2767 2091 2749 6073 6036 5360 2474 3161
1785 5502 7029 12014 5783 721 4772 3074 1331 12084 2143 3103 2977 11152 5165 4327 3011 201 856 50 12595
644 11549 2808 5358 1078 3207 4047 11105 6503 9187 5471 8784 759 9254 11948 9012 8095 806 8916 10037 4475
12599 5618 2657 6446 11776 1122 2884 6639 9389 2910 7576 5178 5710 216 6750 4634 11959 7832 334 7302 2377
4561 10604 9234 2105 5255 5308 11648 2567 1788 3014 1046 4378 10804 11941 3777 1819 5612 8461 2194 1247
1450 4723 12608 9312 5913 9658 887 2654 6908 5635 5519 4258 8582 3444 11520 532 1039 1548 6236 8214 6794
10374 2813 2928 3044 7868 2754 11197 2511 1494 2964 1334 9832 4660 9485 5893 5717 896 3203 6237 12795
```

First row is array size. Second is the number set.

(student id).h:

```
main.cpp myheader.cpp myheader.h
1  #include<stdio.h>
2  #include<stdlib.h>
3
4  void mysort(int* array, int size);
5  int myBinarySearch(int* array, int target, int head, int tail);
```

Include other headers you need and define function name.

(student id).c/.cpp:

```
main.cpp [*] myheader.cpp myheader.h
1  #include"myheader.h"
2
3  void mysort(int* array, int size){
4  |    ...
5  | }
6
7  int myBinarySearch(int* array, int target, int head, int tail){
8  |    ...
9  | }
```

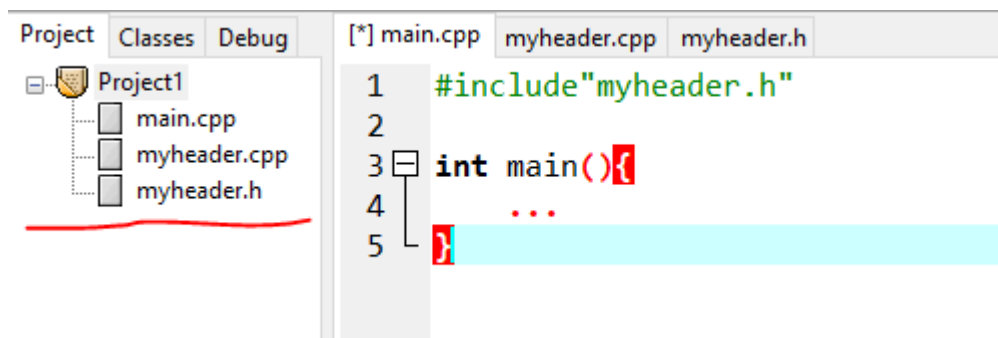
describe how the two functions work.

main.c/.cpp:

```
[*] main.cpp myheader.cpp myheader.h
1  #include"myheader.h"
2
3  int main(){
4  |    ...
5  | }
```

Can only include your header and describe main function.

File location:



Need to be in the same project.

Output:

The screenshot shows a command prompt window with the title 'C:\Users\IPL\Desktop\C\_HW13\Project1.exe'. The output of the program is as follows:

```
Sorted finish.
Please input your target:50
target found at index 11.
Please input your target:2000
target not found.
Please input your target:2133
target not found.
Please input your target:2807
target found at index 869.
Please input your target:5079
target found at index 1550.
Please input your target:5080
target not found.
Please input your target:^Z

-----
Process exited after 46.88 seconds with return value 0
請按任意鍵繼續 . . .
```

## 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 **2018.12.27** (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”

M063040037 您好！您正在[教室環境]中  
 【請遵守智慧財產權觀念，不得非法影印，教師所提供之教材供學生本人自修學習使用，不得散播及做為商業用途】

課程學習互動區 作業評量區 課程資訊區 個人區 校園廣場

| 作業/報告 | 測驗/考試 | 問卷/投票

作業 / 報告

作業型態	比重	名稱	時間	繳交狀態	開始	開放觀摩	教師試做
個人	100%	Homework01	從 即日起 到 2017-10-12 12:00		進行作業	不公布	教師試做

## 5. Click "Start"

M063040037 您好！您正在[教室環境]中  
 【請遵守智慧財產權觀念，不得非法影印，教師所提供之教材供學生本人自修學習使用，不得散播及做為商業用途】

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準備進行作業

您好，請詳細閱讀以下作答注意事項後開始作答。若不馬上作答，可按「下次再來」離開。

作業名稱：	Homework01
總分	0分
比重	100%
總題數	0題
作答起訖日期與時間	從 即日起 到 2017-10-12 12:00
是否可重繳	可重繳
開放觀摩	不公布
作答說明/師長叮嚀	C程式設計(一)作業繳交 請繳交.cpp檔。 .cpp檔的檔名一律統一，以學號為檔名。 Ex:B063040001.cpp

開始作答 下次再來

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

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 【請遵守智慧財產權觀念，不得非法影印，教師所提供之教材供學生本人自修學習使用，不得散播及做為商業用途】

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1061\_C程式設計(一) | 作業/報告 | 測驗/考試 | 問卷/投票

作業 / 報告

作業名稱：Homework01

作業內容

附檔繳交區 選擇檔案 B063040001.cpp 放棄此檔 每個檔案限1500M，總合不得超過1500M

更多檔案 確定繳交 不作答離開