

Homework 11

Objective :

Learning how to use *function call* and *array*.

Exercise :

10

Design a program which includes three functions. You can write user input in the *main()* function. However, the part of execution should be put in the function individually. User output is not specified. The function should follow the rule below:

1. *void binomial(int):*

The function have one *int* parameter *n*. You should print **all the binomial coefficient** from $(x + 1)^0$ to $(x + 1)^n$. The output will be show next page.

2. *void median(int*):*

The function have one *int array* parameter *Array*. **The capacity of Array is 11.** You should reorganize the *Array* with **bubble sort**. After sorted, you should print the result *Array*. Then, find out **the median** of *Array* and output it. You should write sorted function yourself. **You can't call build-in *sort()*.**

3. *void magic_square(int):*

The function have one *int* parameter *n*. The *n* is **odd number between 1~15**. You need to output *n*n* magic square. Magic square is a special **two-dimension array**. The summation of each row, column and two diagonals are equal. There are some steps to construct a magic square:

- (1)Put number 1 in the central column of first row.
- (2)Put 2,3,4,..., *n*n* at the top left square diagonally in order.
- (3)If top left move would leave the matrix, it is wrapped around to the last row or first column respectively.
- (4)If you encounter filled square when top left move, move vertically down one square instead and fill in the number.
- (5)Repeat (1)~(4)steps until you fill in all the squares of matrix.

Because each *n*n* matrixs have different solution. **Please use the steps above to construct magic square for consistency.** Because magic square is two-dimension array, it is not easy to pass to function. It is no restriction to define array as global variable.

Example:

The output of each binomial coefficient :

```
0
1
1 1
1 2 1
1 3 3 1
1 4 6 4 1
1 5 10 10 5 1
1 6 15 20 15 6 1

3
1
1 1
1 2 1
1 3 3 1
4
1
1 1
1 2 1
1 3 3 1
1 4 6 4 1

5
1
1 1
1 2 1
1 3 3 1
1 4 6 4 1
1 5 10 10 5 1
1 6 15 20 15 6 1

7
1
1 1
1 2 1
1 3 3 1
1 4 6 4 1
1 5 10 10 5 1
1 6 15 20 15 6 1
1 7 21 35 35 21 7 1
```

The output of magic square:

```
1st order magic square
1

3rd order magic square
6 1 8
7 5 3
2 9 4

5th order magic square
15 8 1 24 17
16 14 7 5 23
22 20 13 6 4
3 21 19 12 10
9 2 25 18 11

7th order magic square
28 19 10 1 48 39 30
29 27 18 9 7 47 38
37 35 26 17 8 6 46
45 36 34 25 16 14 5
4 44 42 33 24 15 13
12 3 43 41 32 23 21
20 11 2 49 40 31 22

9th order magic square
45 34 23 12 1 80 69 58 47
46 44 33 22 11 9 79 68 57
56 54 43 32 21 10 8 78 67
66 55 53 42 31 20 18 7 77
76 65 63 52 41 30 19 17 6
5 75 64 62 51 40 29 27 16
15 4 74 72 61 50 39 28 26
25 14 3 73 71 60 49 38 36
35 24 13 2 81 70 59 48 37
```

Output:

```
Please input number of binomial powers:6
1
1 1
1 2 1
1 3 3 1
1 4 6 4 1
1 5 10 10 5 1
1 6 15 20 15 6 1

Please input 11 numbers:
9 8 7 5 6 2 4 8 6 3 5
2 3 4 5 5 6 6 7 8 8 9
median is :6

Please input the size of magic square:7
28 19 10 1 48 39 30
29 27 18 9 7 47 38
37 35 26 17 8 6 46
45 36 34 25 16 14 5
4 44 42 33 24 15 13
12 3 43 41 32 23 21
20 11 2 49 40 31 22
```

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 **2018.12.13** (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”

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| 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"

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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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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