Programming Assignment #3 – Graffiti on the fence

Due date : 11/18 23:59:59

<Introduction>

Someone has done graffiti on the fence of Market Minguinho. Hmm ... As we look closer, the numbers are increased with spiral-shaped form, not in a line.

The purpose of the third assignment is making a program which print out a graffiti on the fence of Market Minguinho with following sequence:

1) When you run the program, you choose which rules of the numbers the graffiti will be filled with. (1. Natural numbers (1,2,3,4,5,6,...), 2. Fibonacci numbers (1,1,2,3,5,8,...))

2) Next, enter the size of graffiti N. (3≤N≤6)

3) Then, Print out an N x N array for the graffiti (using "printf("%8d")",
e.g. printf("%8d ", snail[i][j]);).

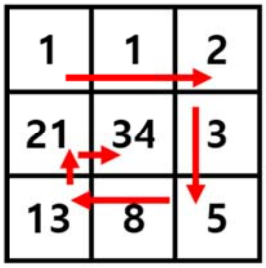
You don't have to consider about incorrect input.

***Challenge (*Not a programming assignment scope*)**

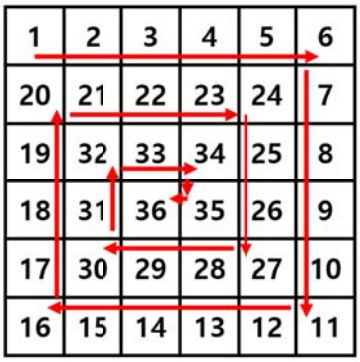
In Fibonacci mode graffiti using '***recursive function***', the larger the value of N (N ≥ 7), the longer the execution time will be (so, the scope of programming assignment is restricted to "3≤N≤6"). At this point, you need to reduce execution time. Make a program whose execution time is **within 30 seconds** when the value of N is 7 or more.
You have to use **"double" type**. You also need to use **"%22.1lf"** instead of "%lf" to maintain space between each number. **22** means to fix the number of spaces in the integer part to align numbers, and **.1** means to display up to 1 decimal point.
If you have done it, notify TAs (*e-mail: yslee.gs@gmail.com*)

<Example & Result>

1) 3 x 3 size Fibonacci graffiti



2) 6 x 6 size natural graffiti



[Case #1 – Choose Natural numbers or Fibonacci numbers]

```
============================================================
Oh, there is a spiral shape graffiti on Market Minguinho's fence!
Hmm.. look at that, it looks like sequence of numbers.
I think it is ...
1. Natural numbers (1, 2, 3, 4, 5, 6, 7 ...)
2. Fibonacci numbers (1, 1, 2, 3, 5, 8 ...)
(Select one)
============================================================
```

[Case #2 – Enter the size of graffiti]

```
============================================================
How big is the graffiti? (Enter the size of array, min: 3 / max: 6)
============================================================
6
```

[Case #3 – Print the graffiti (Natural, 6 x 6)]

```
     1     2     3     4     5     6
    20    21    22    23    24     7
    19    32    33    34    25     8
    18    31    36    35    26     9
    17    30    29    28    27    10
    16    15    14    13    12    11

Process returned 0 (0x0)   execution time : 2.962 s
Press any key to continue.
```

[Case #4 – Print the graffiti (Fibonacci, 6 x 6)]

```
     1     1     2     3     5     8
  6765 10946 17711 28657 46368    13
  4181 2178309 3524578 5702887 75025    21
  2584 1346269 14930352 9227465 121393    34
  1597 832040 514229 317811 196418    55
   987   610   377   233   144    89

Process returned 0 (0x0)   execution time : 3.175 s
Press any key to continue.
```

<Rating>

- Total point is 100 points.
  - ✓ (#rating1) If print out graffiti with natural numbers, you will get **60 points.**
    - ◆ If print out with natural number, not graffiti pattern : just get 20 points
  - ✓ (#rating2) If print out graffiti with Fibonacci numbers, you will get **40 points.**
    - ◆ If print out with Fibonacci number, not graffiti pattern : just get 30 points
  - ➢ Delay penalty: 15 points deducted per day. After 3 days, **you will get 0 point**.
  - ➢ You should submit a source code file on i-campus. The source code should be compiled successfully. Otherwise, **you will get 0 point**.