Homework 002

THINK BIG

DEADLINE: 4/4 WED. 23:59

The big number

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- A Big Number in computer science means a big number which could not been stored inside ONE fundamental type (int, float, char…)
- For example, the maximum integer in the C++ is long long int, the legal range of this number is

$$-2^{64-1} \sim 2^{64-1} -1$$

The big number

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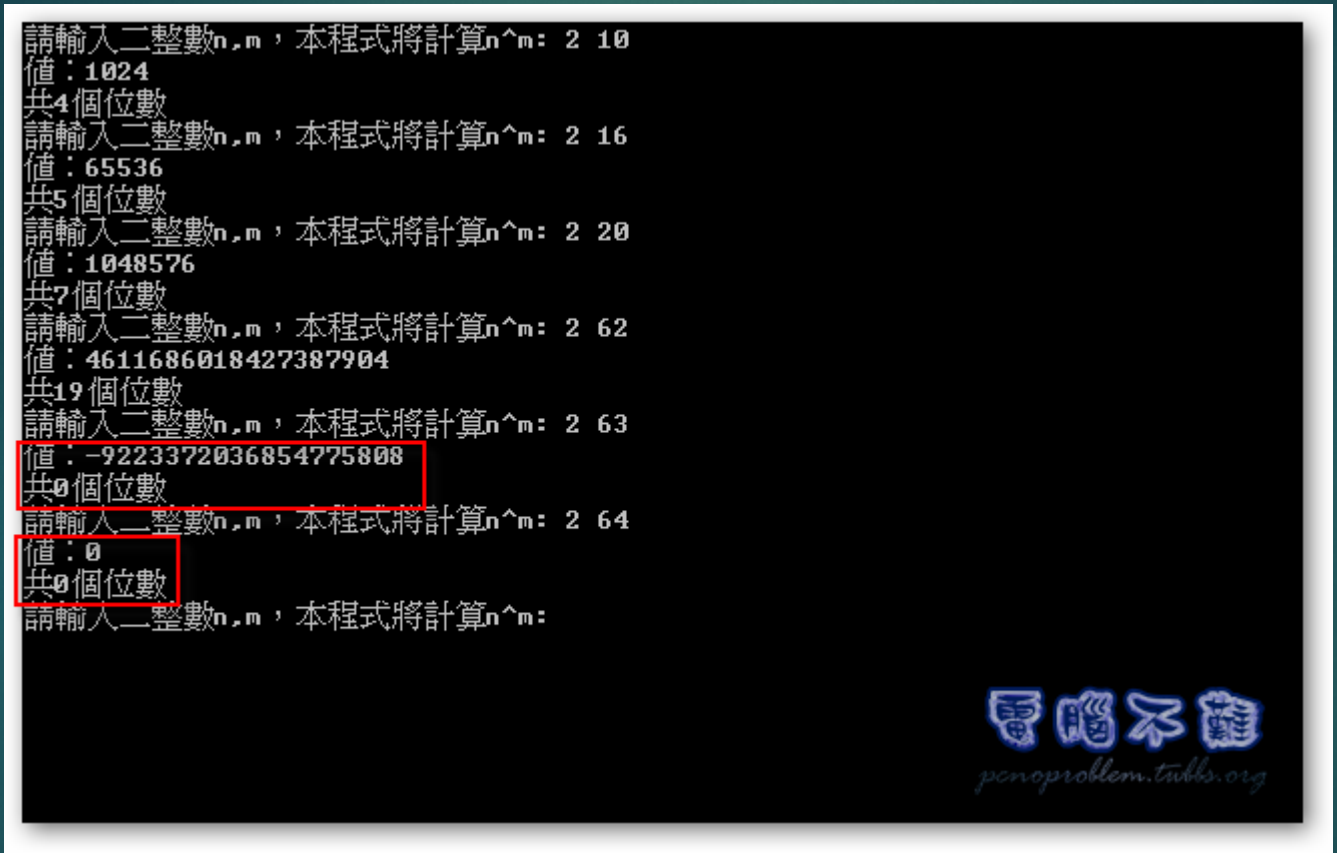

- Please refer this link for more detail and good example.
  - http://it-easy.tw/c-super-large-power/

Basic idea of class BigNUM

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- Use an array of integer to implement a big number. Each integer store parts of this big number.

- 435230457893405238475034857O =

4 352 304 578 934 052 384 750 348 570

- Then, implement your OWN + - * / to achieve specific goal
  - ***Beware negative result!

Requirements

- Implement your own data structure with dynamic array.
  - Construct a array of integer
    - Int * arr = new int[size];
  - Destruct a array.
    - delete[] arr;
  - All constructed elements should be reclaim (release) properly in the Destructor

Requirements

- Required Constructor
  - 1. default constructor (default number is zero)
  - 2. construct a number with n^m (2 integer inputs)
    - BigNUM(int n, int m); (the input number may < 0)
  - 3. (BONUS) construct a number with random number
    - BigNUM(int digit); //digit means number of digit should be generated in this constructor
  - 4. (BONUS) construct a number with user input
    - (These bonus may require an additional document to illustration, in PDF format)

Requirements

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- Implement + - *
  - add(const BigNUM &right), minus(…), multiply(…)
  - The mechanism of these operation are similar to hw1
    - N1.add(n2) means n1 = n1+n2

A List of all requirements

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- Design your own class to store and operator big numbers
  - Each array element should store a least 3 digits (and less than 9 digits)
- Implements
  - your own data structure with dynamic array.
  - 2 Proper constructors & 1 destructor
  - add(…), minus(…), multiply(…)
  - print() function to output your big number

Notes/Reference

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- 106hw2_bignum.pptx
  - This slides
- 106hw2_main.cpp
  - Driver program
- Please refer this link for more detail and good example.
  - http://it-easy.tw/c-super-large-power/
- https://defuse.ca/big-number-calculator.htm
  - A online calculator of big number

Submit your homework

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- Please design your own class **BigNUM** to fulfill all challenge in the driver program (106hw2_main.cpp).
- Make sure the code could be compile with TA's driver program.
  - If we can't compile your code, you get **0** point too.
  - Please **NOT** include the driver program into your own codes. If yes, you get **0** point, too.

Submit your homework

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- Please use s1234567_BigNUM.h and s1234567_ BigNUM.cpp as your file names.
  - Replace s1234567 by your own student ID.
  - And upload **ONLY** these 2 codes.
    - Please ZIP them with your student ID, s1234567_hw2.zip
    - If you try to upload another files (for example *.sln or others), you get **0** point.
  - If you complete additional bonus function please kindly upload a document(in PDF) to illustrate them.
  - Submit your homework before 4/4 Wed. 23:59