Data Structure Homework B : Linked Lists

- Objective
  - implement the polynomial addition with linked lists.
  - implement the polynomial multiplication with linked lists.
- Description
  - Your program should read the input file and correctly add and multiply numbers for the polynomial addition and multiplication functions.
  - The following functions are needed in the program:
    - insertIn()– read the input file and insert into the list by this function
    - printList() –print all the values in the list
    - polynomialAddition() – implement the addition and return the result list
    - polynomialMultiplication() - implement the multiplication and return the result list
  - Other functions you could use:
    - invertList() –you may need to invert the list to descending order
  - A list structure example:

    typedef struct polynomialList *listPointer;
    typedef struct polynomialList{
        float coef; //係數
        unsigned int exp; //次數
        listPointer next;
    };
  - Input :

    Two input files are listed as follows.
    (for example, look at the right textbox):
    - A.txt to store the polynomial A.
    - B.txt to store the polynomial B.

    Both files will be given to you

    A: $3.5x^5 + 2x^3 + 9x^2 + 25$
    係數次方
    ---
    25 0
    9 2
    2 3
    3.5 5
  - Output :

    The following polynomial should print in descending order.
    - A polynomial
    - B polynomial
    - C polynomial as the result of A+B
    - D polynomial as the result of (A+B)*B
- Grade policies
  - 10% - Source code can be compiled without any error

- 15% - read file, insertIn(), printList()
- 25% - polynomialAddition()
- 30% - polynomialMultiplication()
- 20% - readme file, code style, and comments in source code

- Turn in
  - System
    - Turn in files to the workstation : csie0.cs.ccu.edu.tw
    - Command: turnin ds.hwB [files…]
    - This source code will be compiled and tested on the workstation
  - Source code
    - Source code with appropriate comments
  - Report
    - A document named “readme.txt” or “readme.doc” or “readme.pdf”. you should describe the details of your project in your readme file
- Output example

  A: $3.5x^5 + 2x^3 + 9x^2 + 25$

  B: $7x^4 – 2x^3 + 5x^2 – 4x + 7$

  C: $3.5x^5 + 7x^4 + 14x^2 - 4x + 32$

  D: $24.5x^9 + 42x^8 + 3.5x^7 + 119x^6 – 59.5x^5 + 351x^4 – 140x^3 + 274x^2 - 156x + 224$

```
A:3.5x^5 2.0x^3 9.0x^2 25.0x^0
B:7.0x^4 -2.0x^3 5.0x^2 -4.0x^1 7.0x^0
C:3.5x^5 7.0x^4 14.0x^2 -4.0x^1 32.0x^0
D:24.5x^9 42.0x^8 3.5x^7 119.0x^6 -59.5x^5 351.0x^4 -140.0x^3 274.0x^2 -156.0x^1
 224.0x^0
Press any key to continue
```