

Quiz Section for Program Design (II)

Exercise #4

Let's write a program that can evaluate polynomial values and practice how to use `struct`. First, the user needs to provide the numbers of the polynomial term with the coefficient and exponent of each term. The program will show the polynomial for the user. For example, the polynomial with two terms $3x^2 + 2x^1 =$ will be displayed as $3x^2 + 2x^1 =$ by the program. **Moreover, please use the `struct` to store each polynomial term. If you don't do so, you will get no points for this exercise.**

After creating a polynomial equation, the user will then input values for the unknown number x , and the program needs to show the calculation result for each x . The program will firstly show the message "How many times to calculate:" to ask users to specify the number of how many times the user can input the unknown number. Then, the program will display "The unknown number x is:" to ask the user to input the integer value for the unknown number x . For example, the program allows users to input the unknown number two times in the example inputs below. However, for unwary users, we need to prevent them from inputting 0 for the number of the polynomial term, calculating times, and the unknown number x . Therefore, the warning message "The number must be greater than zero!" will be displayed if the user input zero for the unknown number x . Then the program will show the "The unknown number x is:" to ask the user to input the value again (see the second input example).

The table below shows the example input and output. The underscored number is the input from users. **Notice: The data type for the calculation result of the polynomial is long integer.**

Input	Output
Enter the number of terms: <u>2</u> Enter each term with cof and exp: <u>3</u> <u>2</u> <u>2</u> <u>1</u> How many times to calculate: <u>2</u> The unknown number x is: <u>1</u> The unknown number x is: <u>2</u>	$3x^2 + 2x^1 =$ 5 16
Enter the number of terms: <u>2</u> Enter each term with cof and exp: <u>3</u> <u>2</u> <u>2</u> <u>1</u> How many times to calculate: <u>2</u> The unknown number x is: <u>0</u> The unknown number x is: <u>1</u> The unknown number x is: <u>2</u>	$3x^2 + 2x^1 =$ The number must be greater than zero! 5 16
Enter the number of terms: <u>0</u> Enter the number of terms: <u>1</u> Enter each term with cof and exp: <u>1</u> <u>1</u> How many times to calculate: <u>2</u> The unknown number x is: <u>1</u> The unknown number x is: <u>2</u>	The number must be greater than zero! $1x^1 =$ 1 2