Lebanese University
Faculty of Sciences
- Section I -

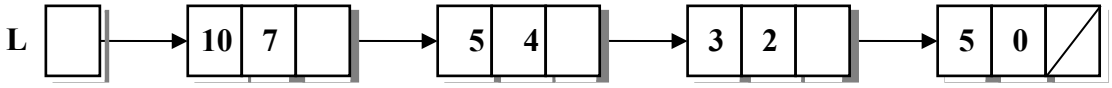
Session2- 2007/2008
Duration : 2 hours
Closed book examination

INFO 206
IMPERATIVE PROGRAMMING II

Exercise 1

We use linked lists to represent polynomial equations. Each node in the list corresponds to a term, with its coefficient and its exponent. For example, in the figure below, we represent the linked list corresponding to the polynomial equation:

$$10x^7 + 5x^4 + 3x^2 + 5$$



We define the data type:

```
typedef struct term {
      int coef ;
      int exp;
      term * p;
} term;
```

⟹ While resolving each question you can use the previous ones even if not resolved yet.

1.1 Write a function that takes as a parameter, a polynomial and adds to it a term. The coefficient and the exponent of the term to be added will be passed as parameters also. It is assumed that the exponent of the term to be added is greater than the degree of the polynomial.

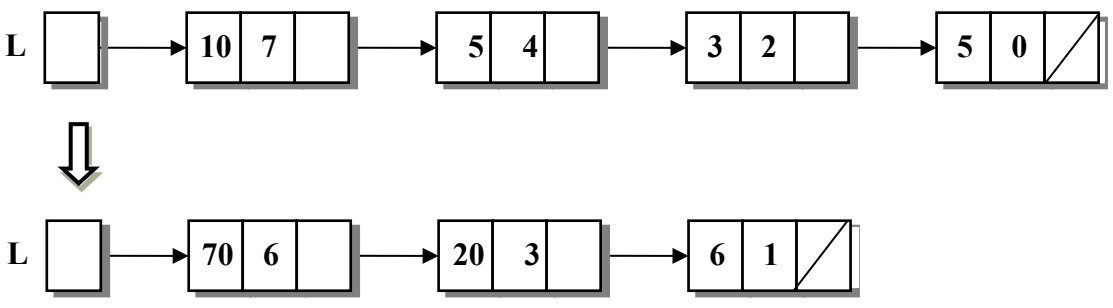
1.2 Using the function in 1.1 write a function that reads a polynomial from the keyboard.

1.3 Write a function that diplays a polynomial.

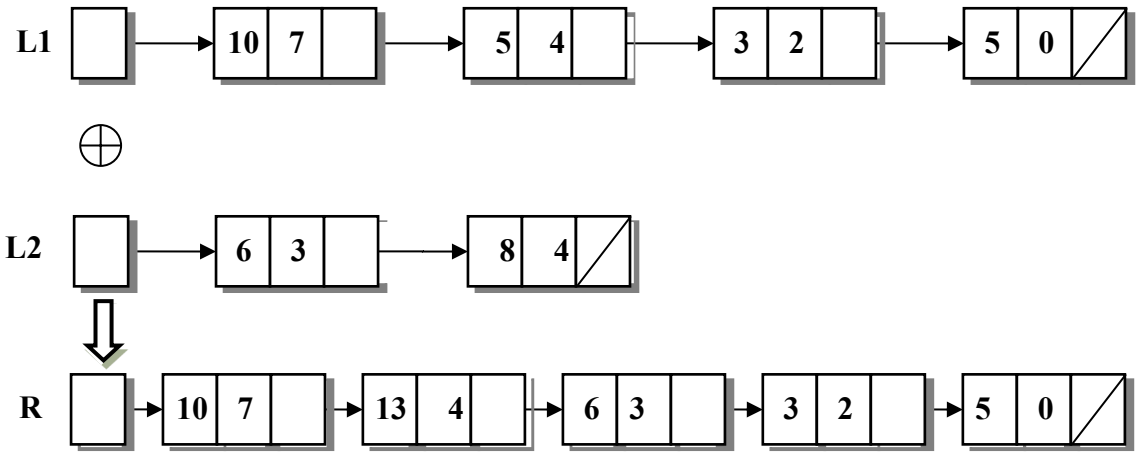
1.4 Write a function that destructs a polynomial.

1.5 Write a function that copies a polynomial. (Pay attention to allocate a new memory for each data copied.)

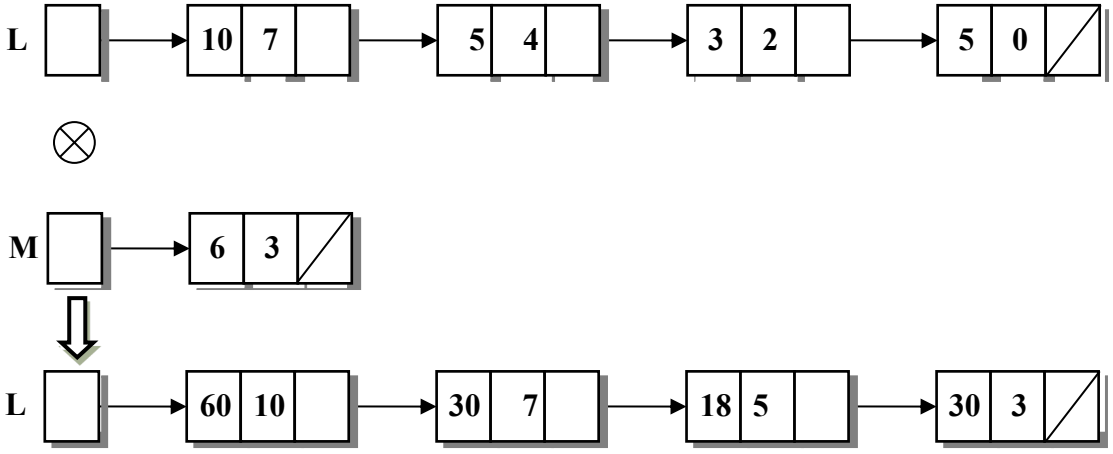
1.6 Write a function that derives a polynomial. (The polynomial will be replaced by its derivation).



1.7 Write a function that adds two polynomials and returns the result.



1.8 Write a function that multiplies a polynomial and a term. The polynomial will be replaced by the result.



1.9 Write a function that saves a polynomial in a file (text or binary). The name of the file is given as a parameter.

1.10 Write a function that opens two files (of the same type as in 1.9), reads each content in a polynomial, adds the two polynomials by invoking a call to the function in 1.7, and saves the result in a third file using the function in 1.9. This function takes three parameters; the names of the two files to be read, and the name of the resulting file.

GOOD LUCK