# Comprehensive Experiment 2 :

# Tree Comprehensive Experiment

## One. Experimental purpose

1、Do linear list operations by using basic operations of tree or binary tree.

2、Handle file operations.

3、Deep the understanding of tree and binary tree, gradually develop the programming ability to solve practical problems.

## Two. Experimental environment

Computers equipped with Visual C6.0/CFree.

The experiment lasted for 4 hours.

## Three. Experiment content

（Choose one of the following two:）

1. The directory structure of the specified directory file system is given, you should write into the file dir\_structure.txt by the indentation method, and calculate the storage area of the directory.。（The indentation method is shown in P93）
2. design a "automatic calculator" as follows：

（1）The expression that needs to be calculated is stored in the text file in the TXT text；

（2）Each line in the text is an expression；

（3）Expressions include operands, operators such as addition, subtraction, multiplication and division, and parentheses；

For example： （34-72.3）\*54.7-82.4

（4）"Automatic calculator" calculates each expression in the text file according to the input file name, and writes every expression of the result to the original file name in the \_out.txt, you should use the method of covering and when saving the records. The format of each row is：

expression = result。

For example：the original file is: A1.txt

The file for output is： A1\_out.txt

The format of the text in A1\_out.txt is：

（34-72.3）\*54.7-82.4 = -2177.41

For all the calculated results, you'd keep 4 digits after the decimal point if it is decimal.

（5）Generate a statistical document after the calculation, its content is：

Execution time：xxxx-xx-xx hh:mm:ss

The total number of expressions is：XXX

The number of correct expressions is：XXX

The number of error expressions is：XXX

Naming rules for filenames：original file name :\_log.txt，Write files with append write method。

For example：A1.txt corresponding to the statistical file：A1\_log.txt

**Special remind**：★The calculation process requires transform the infix expression to the postfix expression and then transform the postfix expression to expression tree. Finally get the result by calculating the expressions.

(If you are getting into trouble in calculating decimal, you can only consider integer calculation.)

## Four. Requirement

1、Submit experimental reports and reports in groups (no more than 3 persons in each group).

2、Submit the source code individually for submission. The file name is named as:

Long student ID\_Name\_CE1.doc OR Long student ID\_Name\_CE1.pdf

The report template is shown as follows:

**树综合 Experiment Report**

Class:计科201Student ID 1:20401010113Name 1:郭旭 Experiment Date:12/7

Student ID 2:2040101011Name 2：黄柏宁

Student ID 3:2040101011Name 3：俞幸宏

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(see the instruction manual for the above three parts)

**Four. Important data structures**

二叉树，链表，结构体

**Five. Realization idea analysis**

需要用二叉树来存储数据，用括号方式将其读入，再写函数将数据进行处理读入读出，完成对二叉树的运算。其中文件输入输出用文件流来实现

**Six. Program debugging problem analysis**

内存开辟和释放存在很多容易漏掉的小细节，导致有时会错，

**Seven. Experimental summary**

此实验需要熟练掌握二叉树，结构题，指针，树的遍历，计算深度，计算二叉树节点和文件流的操作

**Eight. Crew Division**

|  |  |  |
| --- | --- | --- |
| **Group division** | | |
| **Member name** | **Work done** | **Completion situation** |
| **郭旭** | **编写函数** | **完成** |
| **黄柏宁** | **编写主函数，结构体** | **完成** |
| **俞幸宏** | **整体修改，查bug，写实验报告** | **完成** |