Data Structure HW#3

Part I Paper Work

1 (Exercise 2 of Chapter 3.2) Consider the railroad switching network given in Fig. 3.3...

2 (Exercise 6 of Chapter 3.3) A linear list is …

3 (Exercise 1 of Chapter 3.4) Implement *Stack* as a publicly derived class of *Bag* using templates.

4 (Exercise 1(b) of Chapter 3.5) Trace out the action of function Path …

5 (Exercise 1(b)(d)(f) of Chapter 3.6) Write the postfix from of the …

6 (Exercise 3(c) of Chapter 3.6) Write a C++ function to transform an infix expression into its prefix equivalent.

Part II Programming Exercise

請實作一個堆疊結構如下：

```
class NStack
{
    public:
        NStack (int=10);
        ~ NStack();
        void Push(int d);
        int Pop();
        bool IsEmpty();
        void Output (NStack &s);
        //列印參數 s 中所有的元素，列印完後，s 中必須保留原有的元素並依
        //原順序排好
        bool Remove(NStack &s, int num);
        //移除根據給定的一個數字 num，將 NStack 中和 num 相等的數字移除；
        //回傳 true 表示移除成功，回傳 false 表示 num 不存在 stack 中
        //移除過後，其他的元素仍須依原有的順序排好
        void Sort(NStack &s);
        //將 stack s 中的元素由小到大排好序

    private:
        void Resize();    //如 narray 的容量已滿，呼叫 Resize()將陣列變原本的兩倍大小
        int top, size;
        int *narray;
};
```

注意！！本次 NStack 類別的宣告不得擅自修改。Output Remove Sort **此三個函式**

中只能宣告其他 NStack 作為暫存，不得使用陣列。

主程式先輸入資料，之後顯示功能選項，等待使用者輸入功能選項的編號。
範例如下：

Input a positive integer (-1 to end): 5
Input a positive integer (-1 to end): 22
Input a positive integer (-1 to end): 18
Input a positive integer (-1 to end): 18
Input a positive integer (-1 to end): 4
Input a positive integer (-1 to end): 56
Input a positive integer (-1 to end): 10
Input a positive integer (-1 to end): 23
Input a positive integer (-1 to end): 13
Input a positive integer (-1 to end): -1

Option: 1) Output. 2) Remove. 3) Sort. 4) Quit: 1
5 22 18 18 4 56 10 23 13

Option: 1) Output. 2) Remove. 3) Sort. 4) Quit: 2
Number to remove: 24
Not found!

Option: 1) Output. 2) Remove. 3) Sort. 4) Quit: 2
Number to remove: 18

18 is deleted!

5 22 18 4 56 10 23 13

Option: 1) Output. 2) Remove. 3) Sort: 3

4 5 10 13 18 22 23 56

Option: 1) Output. 2) Remove. 3) Sort: 1

4 5 10 13 18 22 23 56

Note 1: You can reuse one-side used papers but must in A4 size. Please hand in your assignments to the TAs (R721, Applied Science &Technology Building) by the deadline.

Note 2: Please compress your code as well as the snapshot your execution results into a zip file and upload it to **iLearning**.