Operating System

Question 1

Write a console program in C language that takes an equation in the form of A + B = C from the standard input. A, B and C are either a number having at most `10` digits or a combination of number and a single number sign (`#`). The number sign is a placeholder for any number with any number of digits. If there exists a sequence of numbers which substitute the `#`, and the equation is valid then the program should write the full equation on the standard output. Otherwise, the program should print `-1` on the standard output. Look at the examples for more information.

|  |  |
| --- | --- |
| **Input** | **Output** |
| 10# + 50 = 10052 | 10002 + 50 = 10052 |
| #2 + 3 = 26 | -1 |
| 12 + 13 = # | 12 + 13 = 25 |
| 50 + 1#2 = 10052 | 50 + 10002 = 10052 |

*Examples*

Question 2

Implement a binary tree in C language. For simplicity's sake, consider adding unique positive values to the tree. Your data structure should contain the following methods:

* add\_node
* remove\_node
* search
  + if a value exists in tree return 1 otherwise, 0.

typedef struct < your struct ...> btree\_t;  
  
/\* Add value to the tree  
 \* return 1 if successful otherwise 0.  
\* \*/  
int btree\_add\_node (btree\_t \*t, int value);  
  
/\* Remove a value from the tree  
 \* return 1 if successful otherwise 0.  
\* \*/  
int btree\_remove\_node (btree\_t \*t, int value);  
  
/\* Look up a value in the tree  
 \* return 1 if found otherwise 0.  
\* \*/  
int btree\_search (btree\_t \*t, int value);