Homework 4

You are asked to use a **binary search tree** to implement the following operations using C++:

1. It first prompts the user for entering a sequence of data elements of type *int* and constructs a **binary search tree** by inserting these elements one by one. The elements are **ranked** such that v_i represents the *i*th smallest element in the binary search tree at any time.
2. The user can then **insert** or **delete** from the **binary search tree** from a **menu** arbitrarily. If an inserted element already exists in the tree, return "element already existed." If the element to be deleted does not exist in the tree, simply print out "no match."
3. In addition, you have to implement a **function** called ***minelement*** which, given a threshold value ***T***, it returns the element v_i with the **lowest rank** r such that $\sum_{i=1}^{r} v_i \geq T$ at the current time. If such element does not exist in the binary search tree, return "no such element."

Example for ***minelement***: Suppose that at the current time we have six elements in the binary search tree: 12, 34, 43, 50, 66, 68. If you are given a threshold ***T***=91, then your program should return 50 because we have $12+34+43+50 \geq 91$ but $12+34+43 < 91$.

Hint: You might want to include some additional field to each element node in the binary search tree.

Due date: Dec. 11, 2017