

Sort a stack

Approach :

For sorting the stack recursively we recursively try to pop all the elements from the stack until only 1 element is left as 1 element is already sorted. A recursive insert function is designed which inserts the top element if it is greater than stack.top() else it will pop the elements from the stack and insert the element at the correct position.

Code :

```
#include <bits/stdc++.h>
void insert(stack<int> &stack,int tp)
{
    if(stack.empty()||tp>=stack.top())
    {
        stack.push(tp);
        return;
    }
    int elem=stack.top();
    stack.pop();
    insert(stack,tp);
    stack.push(elem);
}
void sorthehelp(stack<int> &stack)
{
    if (stack.size() == 1)
    {
        return;
    }
    int tp = stack.top();
    stack.pop();
    sorthehelp(stack);
    insert(stack, tp);
}
void sortStack(stack<int> &stack)
{
    // Write your code here
    sorthehelp(stack);
}
```

- Time Complexity : $O(N^2)$
- Space Complexity : $O(N)$