

# Data Sutructure Programing HW3

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Introduction:

lang: cpp14

environment: linux or mac

Using `make` to compile the program, the excutable file will be `calculate`.

After excute the program, please input the infix expression string without `=` and space, such as `1+2+3`, `4*5*6`. If input escape key(screen will show `^[]`) and press enter, the program will stop.

Time complexity

Suppose the infix expression string's length is  $N$ .

## Build binary tree

It will screen the infix, and each char will only push and pop from stack, then the stack operation is  $O(1)$ . So, building binary tree time complexity is  $O(N)$

## prefix traversal and postfix traversal and counting

Both traversal the visit each node, so the time complexity is  $O(n)$ . Counting is visit each node and return child node calculate result, so it time compelxity is also  $O(N)$ .