C++ Programming

STL Homework 2

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Teaching, Training and Coaching since more than a decade!

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Homework 7: Score of Parentheses

Given a balanced parentheses string `S`, compute the score of the string based on the following rule:

- `()` has score 1
- `AB` has score `A + B`, where A and B are balanced parentheses strings.
- `(A)` has score `2 * A`, where A is a balanced parentheses string.

- Use stack
- Inputs
  - () ⇒ 1
  - (()) ⇒ 2
  - ()() ⇒ 2
  - (()()) ⇒ 4
  - ((()())) ⇒ 6
  - ()((())()) ⇒ 7

Homework 8: Asteroid Collision

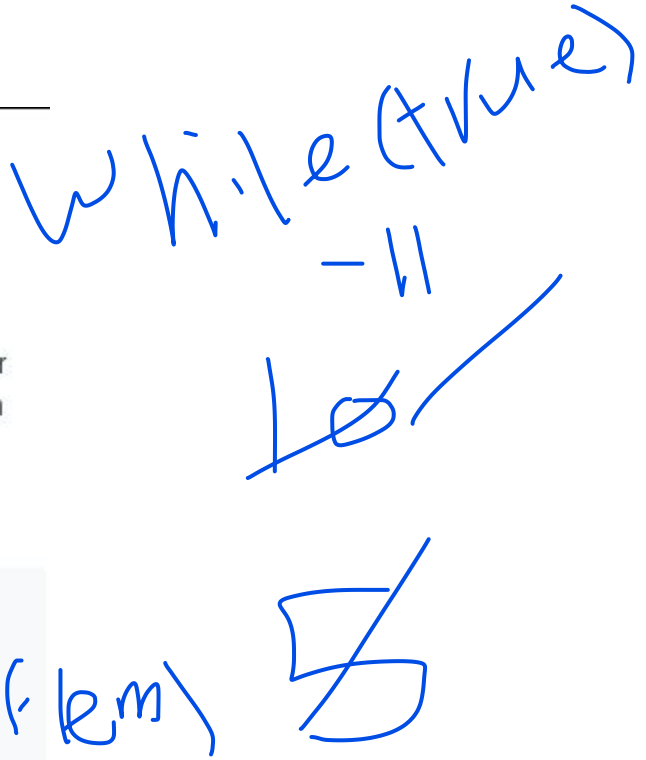
We are given an array `asteroids` of integers representing asteroids in a row.

For each asteroid, the absolute value represents its size, and the sign represents its direction (positive meaning right, negative meaning left). Each asteroid moves at the same speed.

Find out the state of the asteroids after all collisions. If two asteroids meet, the smaller one will explode. If both are the same size, both will explode. Two asteroids moving in the same direction will never meet.

Example 1:

```
Input:
asteroids = [5, 10, -5]
Output: [5, 10]
Explanation:
The 10 and -5 collide resulting in 10.  The 5 and 10 never
collide.
```



Homework 8: Asteroid Collision

Example 2:

```
Input:
asteroids = [8, -8]
Output: []
Explanation:
The 8 and -8 collide exploding each other.
```

Example 3:

```
Input:
asteroids = [10, 2, -5]
Output: [10]
Explanation:
The 2 and -5 collide resulting in -5.  The 10 and -5 collide
resulting in 10.
```

Example 4:

```
Input:
asteroids = [-2, -1, 1, 2]
Output: [-2, -1, 1, 2]
Explanation:
The -2 and -1 are moving left, while the 1 and 2 are moving right.
Asteroids moving the same direction never meet, so no asteroids
will meet each other.
```

Homework 9: Next Greater Element

- Given an array, for every number, find the first number after it of a higher value
- E.g. 10, 5, 7, 15, 11 ⇒ 15 7 15 -1 -1
  - First number greater than 10 ⇒ 15
  - First number greater than 5 ⇒ 7
  - First number greater than 7 ⇒ 15
  - First number greater than 15 and 11 ⇒ None, so use -1
- Input:
  - 8 73 74 75 71 69 72 76 73 ⇒ 74 75 76 72 72 76 -1 -1
- We can easily solve that with 2 nested loops
- We can solve it with 1 loop using stack. Find it

"Acquire knowledge and impart it to the people."

"Seek knowledge from the Cradle to the Grave."