640. Solve the Equation

Description HintsSubmissionsDiscussSolution

DiscussPick One

Solve a given equation and return the value of `x` in the form of string "x=#value". The equation contains only '+', '-' operation, the variable `x` and its coefficient.

If there is no solution for the equation, return "No solution".

If there are infinite solutions for the equation, return "Infinite solutions".

If there is exactly one solution for the equation, we ensure that the value of `x` is an integer.

Example 1:

```
Input: "x+5-3+x=6+x-2"
Output: "x=2"
```

Example 2:

```
Input: "x=x"
Output: "Infinite solutions"
```

Example 3:

```
Input: "2x=x"
Output: "x=0"
```

Example 4:

```
Input: "2x+3x-6x=x+2"
Output: "x=-1"
```

Example 5:

```
Input: "x=x+2"
Output: "No solution"
```

```
class Solution {
public:
    string solveEquation(string equation) {
        int n = equation.size(), sign = 1, coeff = 0, tot = 0, i = 0;
        for (int j = 0; j < n; j++) {
            if (equation[j] == '+' || equation[j] == '-') {
                if (j > i) tot += sign*stoi(equation.substr(i, j-i));
                i = j;
            }
            // corner case: x, -x, +x
            else if (equation[j] == 'x') {
                if ((i == j) || equation[j-1] == '+')
                    coeff += sign;
                else if (equation[j-1] == '-')
                    coeff -= sign;
                else
                    coeff += sign*stoi(equation.substr(i, j-i));
                i = j+1;
            }
           // flip sign
            else if (equation[j] == '=') {
                if (j > i) tot += sign*stoi(equation.substr(i, j-i));
                sign = -1;
                i = j+1;
            }
        }
        // there may be a number in the end
        if (i < n) tot += sign*stoi(equation.substr(i));
        if (coeff == 0 && tot == 0) return "Infinite solutions";
        if (coeff == 0 && tot) return "No solution";
        int ans = -tot/coeff;
        return "x="+to_string(ans);
    }
};
```