Zigzag Conversion

6. Zigzag Conversion

Solved

Medium Topics Companies

The string "PAYPALISHIRING" is written in a zigzag pattern on a given number of rows like this: (you may want to display this pattern in a fixed font for better legibility)

```
P   A   H   N
A P L S I I G
Y   I   R
```

And then read line by line: "PAHNAPLSIIGYIR"

Write the code that will take a string and make this conversion given a number of rows:

```
string convert(string s, int numRows);
```

Example 1:

```
Input: s = "PAYPALISHIRING", numRows = 3
Output: "PAHNAPLSIIGYIR"
```

Example 2:

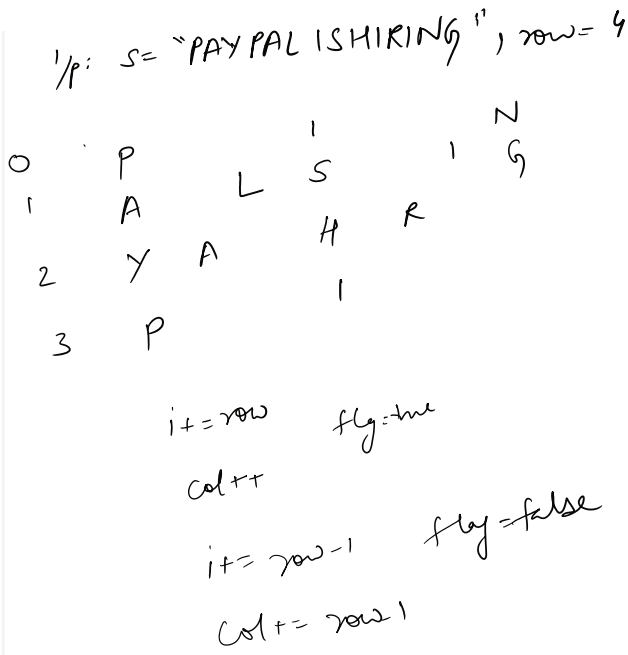
```
Input: s = "PAYPALISHIRING", numRows = 4
Output: "PINALSIGYAHRPI"
Explanation:
P     I    N
A   L S  I G
Y A   H R
P     I
```

Example 3:

```
Input: s = "A", numRows = 1
Output: "A"
```

Constraints:

- 1 <= s.length <= 1000
- s consists of English letters (lower-case and upper-case), ',' and '.'.
- 1 <= numRows <= 1000




```
class Solution {
public:
    string convert(string s, int numRows) {
        if(numRows==1)return s;
        int len=s.size();
        int i=0, col=0;
        bool f=false;
        while(i<len){
            if(!f){
                int x=len-i;
                i+=min(x, numRows);
                col++;
                f=1;
            }
            else{
                int x=len-i;
                i+=min(x, numRows-2);
                col+=min(x, numRows-2);
                f=0;
            }
        }
        vector<vector<char>> a(numRows, vector<char>(col, '0'));
        f=0;
        int x=0, y=0;
        for(int i=0;i<s.size();i++){
            if(!f){
                if(x==numRows-1){
                    a[x][y]=s[i];
                    x--;
                    y++;
                    f=1;
                }
                else{
                    a[x][y]=s[i];
                    x++;
                }
            }
            else{
                if(x==0){
                    a[x][y]=s[i];
                    x++;
                    f=0;
                }
                else{
                    a[x][y]=s[i];
                    x--;
                    y++;
                }
            }
        }
        string ans="";
        for(int i=0;i<numRows;i++){
            for(int j=0;j<col;j++){
                if(a[i][j]!='0')ans+=a[i][j];
            }
        }
        return ans;
    }
};
```

C++ Auto

```
class Solution {
public:
    string convert(string s, int numRows) {
        if(numRows == 1 || numRows >= s.size())return s;
        vector<string> rows(numRows);
        int currRow=0;
        bool goingDown = false;
        for(char c: s){
            rows[currRow] += c;
            if( currRow == 0 || currRow == numRows-1) goingDown = !goingDown;
            currRow += goingDown ? 1:-1;
        }
        string result;
        for( string row : rows) result += row;
        return result;
    }
};
```

T.C. O(length of string)

S.C. O(length of string)