091. Decode Ways

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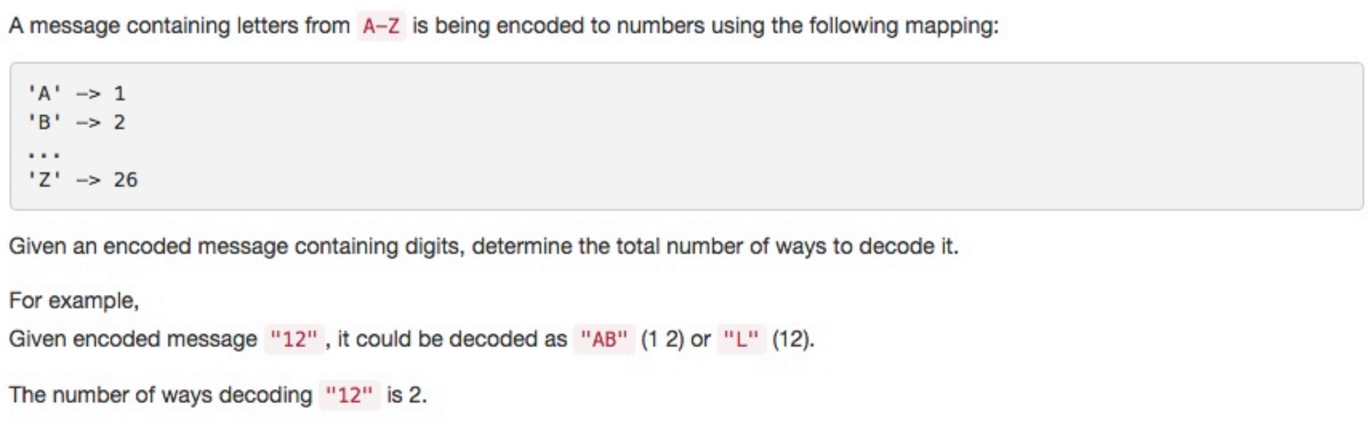
- **Dynamic Programming** + String

Description



A message containing letters from `A-Z` is being encoded to numbers using the following mapping:

```
'A' -> 1
'B' -> 2
...
'Z' -> 26
```

Given an encoded message containing digits, determine the total number of ways to decode it.

For example,
Given encoded message `"12"`, it could be decoded as `"AB"` (1 2) or `"L"` (12).

The number of ways decoding `"12"` is 2.

1. Thought line

(1) corner cases at res[0], res[1], res[2];

- res[0] is always 0;
- res[1] is 0 or 1;
- res[2] is 0, 1, or 2;

2. Dynamic Programming + String

```cpp
class Solution {
public:
    int numDecodings(string s) {
        vector<int> res(s.size()+1,0);
        res[0] = 0;
        res[1] = (s[0]=='0') ? 0 : 1;
        for (int i = 1; !s.empty()&&i<=s.size()-1; ++i){
            // detect if can move from 1 steps away
            if (s[i]!='0')
                res[i+1] += res[i];
            // detect if can move from 2 steps away
            if (s[i-1]=='1' || (s[i-1]=='2' && s[i]<='6'))
                res[i+1] = (i>1) ? res[i+1]+res[i-1] : res[i+1]+1;

            if (res[i+1]==0)
                break;
        }
        return res[s.size()];
    }
};
```