

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

```
1 class Solution {
2 public:
3     int numDecodings(string s) {
4         vector<int> res(s.size()+1,0);
5         res[0] = 0;
6         res[1] = (s[0]!='0') ? 0 : 1;
7         for (int i = 1; !s.empty() && i<=s.size()-1; ++i){
8             // detect if can move from 1 steps away
9             if (s[i]!='0')
10                res[i+1] += res[i];
11            // detect if can move from 2 steps away
12            if (s[i-1]=='1' || (s[i-1]=='2' && s[i]<='6'))
13                res[i+1] = (i>1) ? res[i+1]+res[i-1] : res[i+1]+1;
14
15            if (res[i+1]==0)
16                break;
17        }
18        return res[s.size()];
19    }
20 };
```