27th Jan 2023

First:-

Total Decoding Messages : : Medium

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

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

You are an FBI agent. You have to determine the total number of ways that message can be decoded, as the answer can be large return the answer modulo $10^9 + 7$.

Note: An empty digit sequence is considered to have one decoding. It may be assumed that the input contains valid digits from 0 to 9 and If there are leading 0s, extra trailing 0s and two or more consecutive 0s then it is an invalid string.

Example 1:

```
Input: str = "123"
Output: 3
Explanation: "123" can be decoded as "ABC"(123),
"LC"(12 3) and "AW"(1 23).
```

Example 2:

```
Input: str = "90"
Output: 0
Explanation: "90" cannot be decoded as it's an
invalid string and we cannot decode '0'.
```

Your Task:
You don't need to read or print anything. Your task is to complete the function **CountWays()** which takes the string as str as input parameter and returns the total number of ways the string can be decoded modulo $10^9 + 7$.

Expected Time Complexity: O(n)
Expected Space Complexity: O(n) where n = |str|

Constraints:
1 <= |str| <= 10^4

CODE SECTION:-

```
int CountWays(string s)
{
    // Code here
    if (s[0] == '0')
        return 0;
    int n = s.length();
    int mod = 1e9 + 7;
    vector<int> dp(n + 1, 1);
    for (int i = n - 1; i >= 0; i--)
    {
        int one = 0, two = 0;
        if (s[i] != '0')
        {
            one = dp[i + 1];
            if (i + 1 < s.length())
            {
                int temp = stoi(s.substr(i, 2));
                if (temp <= 26)
                    two = dp[i + 2];
            }
        }
        dp[i] = (one + two * 1LL) % mod;
    }
    return dp[0];
}
```

-: Done for the today :-