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Mobile Keypad(DPP31)

Problem

Submissions

Leaderboard

Discussions

Program to count total possible combinations of N-digits numbers in a mobile keypad

1	2 ABC	3 DEF
4 GHI	5 JKL	6 MNO
7 PQRS	8 TUV	9 WXYZ
*	0	#

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Submissions: 1

Max Score: 40

Difficulty: Medium

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For example, for N = 2 the combinations are –

00, 08, 11, 12, 14, 21, 22, 23, 25, 32, 33, 36, 41, 44, 45, 47, . . . 96, 98, 99

Input Format

1. Take number from the user

Constraints

1. $0 \leq \text{num} \leq 1000$

Output Format

1. It should count total possible combinations of N-digits numbers in a mobile keypad

Sample Input 0

2

Sample Output 0



36

Sample Input 1

5

Sample Output 1

2062

Current Buffer (saved locally, editable)  

C++



```
1 ▼#include <iostream>
```

```
2  #include <map>
3  using namespace std;
4
5
6  #define N 8
7  int lookup[10][N];
8
9  int row[] = { 0, -1, 0, 1 };
10 int col[] = { -1, 0, 1, 0 };
11
12 int isValid(int i, int j)
13 {
14     if (i == 3 && (j == 0 || j == 2))
15         return 0;
16
17     return (i >= 0 && i <= 3 && j >= 0 && j <= 2);
18 }
19
20
21 void fillMap(multimap<int, int>& mp)
22 {
23
24     char key[4][3] =
25     {
26         { '1', '2', '3' },
27         { '4', '5', '6' },
28         { '7', '8', '9' },
29         { '*', '0', '#' }
30     };
31
32     for (int i = 0; i < 4; i++)
33     {
34         for (int j = 0; j < 3; j++)
35         {
36             for (int k = 0; k < N; k++)
37             {
```

```
38
39     for (int k = 0; k < 4; k++)
40     {
41         int r = i + row[k];
42         int c = j + col[k];
43
44         if (isValid(i, j) && isValid(r, c))
45             mp.insert(make_pair(key[i][j] - '0', key[r][c] - '0'));
46     }
47 }
48 }
49 }
50
51
52 int getCount(multimap<int, int> keypad, int i, int n)
53 {
54     if (n == 1)
55         return 1;
56
57
58     if (lookup[i][n] == 0)
59     {
60         lookup[i][n] = getCount(keypad, i, n - 1);
61
62
63         for (auto it = keypad.find(i);
64              (it != keypad.end() && it->first == i); it++)
65             lookup[i][n] += getCount(keypad, it->second, n - 1);
66     }
67
68     return lookup[i][n];
69 }
70
71 int main()
72 {
73     int n ;
```

```
74     cin>>n;
75
76
77     multimap<int, int> keypad;
78     fillMap(keypad);
79
80     int count = 0;
81
82     for (int i = 0; i <= 9; i++)
83         count += getCount(keypad, i, n);
84
85     cout <<  count;
86
87     return 0;
88 }
```

Line: 1 Col: 1

 [Upload Code as File](#) ☐ [Test against custom input](#)

[Run Code](#)[Submit Code](#)Testcase 0 Testcase 1 

Congratulations, you passed the sample test case.

Click the **Submit Code** button to run your code against all the test cases.

Input (stdin)

2

Your Output (stdout)

36

Expected Output

36

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