

```

1 //
2 // Find the number of integers between 1 and K (inclusive)
3 // satisfying the following condition, modulo  $10^9 + 7$ :
4 // - The sum of the digits in base ten is a multiple of D.
5 //
6 // Time Complexity:  $O(ND)$ 
7 //
8
9 #include <bits/stdc++.h>
10 #define ll long long
11
12 using namespace std;
13
14 const int MOD = 1e9 + 7;
15 inline void uadd(int& a, int b) {
16     a += b;
17     if (a ≥ MOD) a -= MOD;
18 }
19
20 int main() {
21     string s; cin >> s;
22     int v; cin >> v;
23     int n = s.size();
24
25     if (n == 1) {
26         int ans = 0;
27         for (int i = 1; i ≤ (s[0] - '0'); i++) {
28             if (i % v == 0) ans++;
29         }
30         cout << ans << endl;
31         return 0;
32     }
33
34     vector<int> pref(n);
35     pref[0] = (s[0] - '0') % v;
36     for (int i = 1; i < n; i++) {
37         pref[i] = (pref[i-1] + s[i] - '0') % v;
38     }
39
40     // backwards dynamic programming
41     vector<vector<int>> bw(n, vector<int>(v, 0));
42     int ans = 0;
43
44     // Base case
45     for (int d = 0; d < 10; d++) {
46         bw[n-1][d*v] += 1;
47         if (d ≤ s[n-1] - '0' && n-2 ≥ 0 && (pref[n-2] + d) % v == 0) ans++;
48     }
49
50     for (int i = n - 2; i ≥ 0; i--) {
51         for (int d = 0; d ≤ (i == 0 ? s[0] - '0' - 1 : 9); d++) {
52             for (int j = 0; j < v; j++) {
53                 uadd(bw[i][(j+d)%v], bw[i+1][j]);
54             }
55         }
56
57         if (i-1 ≥ 0) {
58             for (int d = 0; d < s[i] - '0'; d++) {
59                 uadd(ans, bw[i+1][(v - ((pref[i-1] + d + 100 * v) % v)) % v]);
60             }
61         }
62     }
63
64     cout << ((ll)ans + bw[0][0] - 1 + MOD) % MOD << endl;
65     return 0;
66 }

```