

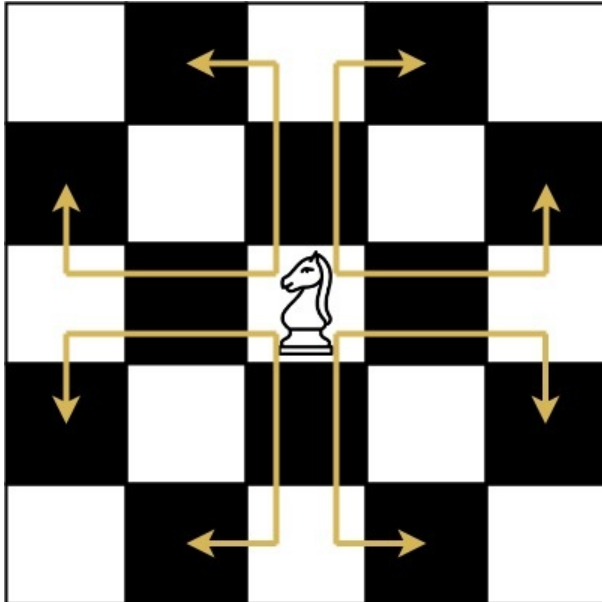
972. Knight Dialer

Difficulty : Medium

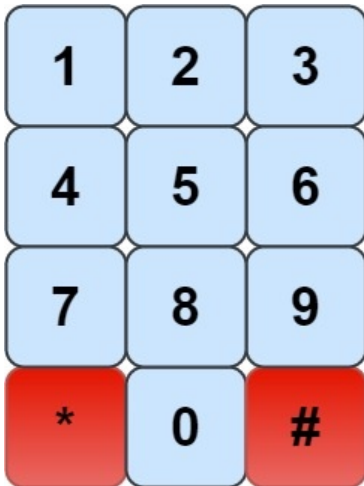
<https://leetcode.com/problems/knight-dialer>

The chess knight has a **unique movement**, it may move two squares vertically and one square horizontally, or two squares horizontally and one square vertically (with both forming the shape of an **L**). The possible movements of chess knight are shown in this diagram:

A chess knight can move as indicated in the chess diagram below:



We have a chess knight and a phone pad as shown below, the knight **can only stand on a numeric cell** (i.e. blue cell).



Given an integer n , return how many distinct phone numbers of length n we can dial.

You are allowed to place the knight **on any numeric cell** initially and then you should perform $n - 1$ jumps to dial a number of length n . All jumps should be **valid** knight jumps.

As the answer may be very large, **return the answer modulo** $10^9 + 7$.

Example 1:

Input: $n = 1$

Output: 10

Explanation: We need to dial a number of length 1, so placing the knight over any numeric cell of the 10 cells is sufficient.

Example 2:

Input: $n = 2$

Output: 20

Explanation: All the valid number we can dial are [04, 06, 16, 18, 27, 29, 34, 38, 40, 43, 49, 60, 61, 67, 72, 76, 81, 83, 92, 94]

Example 3:

Input: n = 3131

Output: 136006598

Explanation: Please take care of the mod.

Constraints:

- $1 \leq n \leq 5000$