

1. DP. let  $g[i][j]$  denote the maximum floor we can detect using  $i$  moves and  $j$  eggs.

$$\begin{cases} g[i][j] = g[i-1][j-1] + g[i-1][j] + 1 & (i, j > 1) \\ g[1][j] = 1 \end{cases}$$

$O(\sqrt{n})$ .

国家集训队2004论文集：朱晨光《优化,再优化! ——从《鹰蛋》一题浅析对动态规划算法的优化》

<https://wenku.baidu.com/view/286731b765ce05087632131b.html>

2. use generating functions to optimize the calculation for  $g$ .  $g[i][j] = \sum_{k=0}^j \binom{j}{k} - 1$ .

this algorithm is actually for a more general problem: 1893: Ural 鹰蛋

see <https://blog.csdn.net/limboman/article/details/53366049>

Approximate an upper bound for  $j$  and then binary search for  $j$ .  $O(\log n + j \log j) \leq O(\log n \log \log n)$  since we can wlog assume  $j \leq O(\log n)$ .

<https://leetcode.cn/problems/egg-drop-with-2-eggs-and-n-floors/solutions/2948790/ologn-jie-jue-ren-yi-ji-dan-ge-shu-de-wen-yjlq/>

## References