

867. New 21 Game

Difficulty : Medium

<https://leetcode.com/problems/new-21-game>

Alice plays the following game, loosely based on the card game "21".

Alice starts with 0 points and draws numbers while she has less than k points. During each draw, she gains an integer number of points randomly from the range $[1, \text{maxPts}]$, where maxPts is an integer. Each draw is independent and the outcomes have equal probabilities.

Alice stops drawing numbers when she gets k **or more points**.

Return the probability that Alice has n or fewer points.

Answers within 10^{-5} of the actual answer are considered accepted.

Example 1:

Input: $n = 10, k = 1, \text{maxPts} = 10$

Output: 1.00000

Explanation: Alice gets a single card, then stops.

Example 2:

Input: $n = 6, k = 1, \text{maxPts} = 10$

Output: 0.60000

Explanation: Alice gets a single card, then stops.

In 6 out of 10 possibilities, she is at or below 6 points.

Example 3:

Input: $n = 21, k = 17, \text{maxPts} = 10$

Output: 0.73278

Constraints:

- $0 \leq k \leq n \leq 10^4$
- $1 \leq \text{maxPts} \leq 10^4$