

Problem 837: New 21 Game

Problem Information

Difficulty: Medium

Acceptance Rate: 52.01%

Paid Only: No

Tags: Math, Dynamic Programming, Sliding Window, Probability and Statistics

Problem Description

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 <= k <= n <= 104` *`1 <= maxPts <= 104`**

Code Snippets

C++:

```
class Solution {  
public:  
    double new21Game(int n, int k, int maxPts) {  
  
    }  
};
```

Java:

```
class Solution {  
    public double new21Game(int n, int k, int maxPts) {  
  
    }  
}
```

Python3:

```
class Solution:  
    def new21Game(self, n: int, k: int, maxPts: int) -> float:
```