Day 4: Geometric Distribution II

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Points: 15/20

10 Days of Statistics

Problem Submissions Leaderboard Editorial

Objective

In this challenge, we go further with geometric distributions. We recommend reviewing the Geometric Distribution tutorial before attempting this challenge.

Task

The probability that a machine produces a defective product is $\frac{1}{3}$. What is the probability that the 1^{st} defect is found *during the first* 5 *inspections*?

Input Format

The first line contains the respective space-separated numerator and denominator for the probability of a defect, and the second line contains the inspection we want the probability of the first defect being discovered by:

```
1 3
5
```

If you do not wish to read this information from stdin, you can hard-code it into your program.

Output Format

Print a single line denoting the answer, rounded to a scale of 3 decimal places (i.e., 1.234 format).

Python 3

```
# Enter your code here. Read input from STDIN. Print output to STDOUT

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p1, p2 = [int(i) for i in input().split()]
n = int(input())
p = p1/p2
q = 1-p

# Calculate Geometric Distribution
print (round(sum([(q**(n-x))*p for x in range(1, 6)]),3))
```