Assignment 1

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1. When a = 10, b = 5, c = 1, the output is 5.

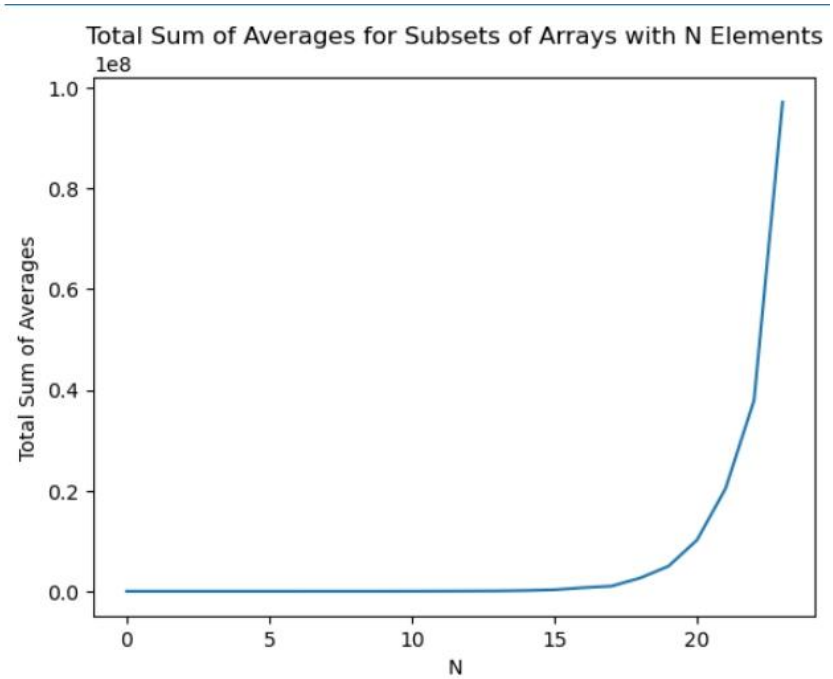
2. No need to report, but there is a example:
When list=[8, 3, 7, 11, 16], continuous ceiling function values is [23, 7, 21, 35, 49].

3. 3.1: I can calculate the total number of methods that the sum of any number of dice can give a given number.

Example: When dice=10, face =6, the number of ways to get sum <=9 with 10 dice is: 0; the number of ways to get sum 20 with 10 dice is 85228.

3.2: x=35 yields the maximum of ways: 4395456.

4. As N increases, the total sum of averages for all subsets of the array also rises, with an accelerating trend in this increase.
Because my laptop has limited computing power, I calculated N in the range (1, 25) and plotted it. As shown in the following gragh:



5. The average of the total number of paths from 1,000 runs is very different for each run, which I guess is probably because 1000 runs is too few. Therefore, I increased the number of runs to 10,000 times, but the output value still fluctuated, about 0.3 ± 0.2; When I increased the number of runs to 100,000, the output stabilized at about0.35 ± 0.02. So it follows that when there are enough runs, we can approximate the mean of total number of paths.