Manasa and Pizza

With the college fest approaching soon, Manasa is following a strict dieting regime . Today, she just cannot resist her temptation for having a pizza. An inner conflict ensues, and she decides that she will have a pizza, only if she comes up with a solution to the problem stated below. Help her get the pizza for herself.

Given a list L of N numbers, where
$L = \{ a_1, a_2, a_3, a_4 \ldots . , a_N\}$
Find the value of M that is computed as described below.

$$M = \sum_{\substack{S \\ S \text{ is a sublist of } L}} F\left(\left|\Sigma(S) - \Sigma(\overline{S})\right|\right)$$

$$\begin{aligned} \text{where } F(0) &= 1 \\ F(1) &= 3 \\ F(n) &= 6F(n-1) - F(n-2),\ \forall n \geq 2 \\ \text{and } \Sigma(S) &= \text{sum of all elements in the list } S \end{aligned}$$

Input Format
The first line contains an integer N i.e. size of the list L.
The next line contains N space separated integers, each representing an element of the list L.

Output Format
Print the value of M _modulo $(10^9 + 7)$_.

Constraints
$1 \leq N \leq 5100$
$0 \leq a_i \leq 10^{15}$, where $i \in [1 .. N]$

Sample Input 00

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3
1 2 3
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Sample Output 00

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40392
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Explanation

There are 8 subsets of given set,

1. S = {1,2,3} and L - S ={0} value of F(6) = 19601
2. S = {1,2} and L - S ={3} value of F(0) = 1
3. S = {1,3} and L - S ={2} value of F(2) = 17
4. S = {2,3} and L - S ={1} value of F(4) = 577
5. S = {1} and L - S ={2,3} value of F(4) = 577
6. S = {2} and L - S ={1,3} value of F(2) = 17
7. S = {3} and L - S ={1,2} value of F(0) = 1

8. S = {} and L - S ={1,2,3} value of F(6) = 19601

Adding all these values, we get M = 40392.