

Problem K. Knapsack Problem

Input file: **standard input**
Output file: **standard output**
Time limit: 2 seconds
Memory limit: 1024 megabytes

You are given $2^k - 1$ numbers $c_1, c_2, \dots, c_{2^k-1}$ and k numbers $a_0, a_1, \dots, a_{k-1}$.

You want to find nonnegative integers $x_1, x_2, \dots, x_{2^k-1}$ such that for all j ($0 \leq j < k$)

$$\sum_{i=1}^{2^k-1} (\lfloor i/2^j \rfloor \bmod 2) x_i = a_j$$

holds and $\sum_{i=1}^{2^k-1} x_i c_i$ is maximized.

Input

In the first line, T ($1 \leq T \leq 100$) — the number of test cases.

For each test case:

- In the first line, k ($2 \leq k \leq 4$).
- In the second line, $c_1, c_2, \dots, c_{2^k-1}$ ($0 \leq c_i \leq 10^8$).
- In the third line, $a_0, \dots, a_{k-1}$ ($1 \leq a_i \leq 10^9$).

Output

For each test case, one integer — the answer.

Example

standard input	standard output
3	18
2	1949753378
1 2 4	7832404777567179
4 5	
3	
3226252 19270256 2430652 1187613 \	
12496062 10286165 17494834	
24 85 34	
4	
901133 6693218 13245489 14740234 \	
16186210 11382783 19277321 3855635 \	
16523184 10168517 16195031 971041 \	
10303441 8395899 11618555	
(There won't be extra line breakers \	
in the actual test cases.)	
529321239 218214127 92942310 207467810	