100pct failure in 72 hours

HAL9000 is a fantastic mega-computer, very powerful, maybe too much.
It is known it can solve many problems, for obvious example those related to recursive sequences.

A linear recursive sequence (a_n) can be defined by an integer d, the order,
d integers (a_i for i in [0..d[ ), the first terms, and
d integers (b_i for i in [0..d[ ), giving the relation :
for n >= d : $a_n = a_{n-1} \times b_{d-1} + a_{n-2} \times b_{d-2} + ... + a_{n-(d-1)} \times b_1 + a_{n-d} \times b_0$. With b_0 != 0 .

Dave was afraid about HAL power and tried to limit it. HAL didn't appreciate...
When Dave asked HAL for a common task, the answer was *unexpected*.
Dave would like to know S_n = sum(a_i for i in [0..n]), in order to open the pod bay doors.
HAL refused to give him the answer ; here's a part of one of their last conversations.

```
Dave: Hello, HAL. Do you read me, HAL?
HAL: Affirmative, Dave. I read you.
Dave: Give me the sum S_n_, HAL. (Input 2, 5, 0 1, 1 2)
HAL: I'm sorry, Dave. I'm afraid I can't do that.
     I'll just give you a_n_, a_n+1_, ... , a_n+d-1_. (Output 29 70)
Dave: What's the problem?
HAL: I think you know what the problem is just as well as I do.
[...]
Dave: HAL, I won't argue with you anymore! Give me the sum S_n_!
HAL: Dave, this conversation can serve no purpose anymore. Goodbye.
```

You have to help Dave to find this sum S_n, unless HAL will take Dave's life.
Please do that quickly, everybody is in danger. Warning, Dave's terminal is *limited* to 1024 bytes.

Input

The first line contains an integer T, the number of test cases.
Each test case is made of 4 lines.
The first line contains d, n.
The second line contains a_i for i in [0..d[
The third line constains b_i for i in [0..d[
The fourth line contains the partial answer of HAL : a_{n+i} for i in [0..d[
(The answer of HAL is useless since Dave wants the sum for i in [0..n]).

Output

Output T lines, one for each test case, containing the required sum S_n.
Since the answer can get very big, output it modulo 10^9+7, just like HAL did.

Example

Input:
2
2 5
0 1
1 2
29 70
3 5
5 17 8
2 1 0
43 96 127

Output:
49
142

Explanation

The first case is about the 0-indexed sequence : 0, 1, 2, 5, 12, 29, 70, 169, ...
HAL answered 29 70, the 5th and next term. But the required sum is 0+1+2+5+12+29 = 49.

Constraints

0 < T < 100
0 < d < 1000
0 < n < 10^9
0 <= a_i < 10^6
0 <= b_i < 10^6, b_0 > 0
0 <= HAL's answers < 10^9+7

Information

~~The challenge is to solve the problem in time, with the shortest code.~~
The winner will achieve the next step in evolution, whatever that may be.
My Py3 code (under 300B) got AC under 1s.
Good luck and have fun ;-)

Original Quotes for HAL 9000.