Polynomial f(x) to Polynomial h(x)

Given polynomial of degree d, $f(x) = c_0 + c_1x + c_2x^2 + c_3x^3 + ... + c_dx^d$

For each polynomial f(x) there exists polynomial g(x) such that:

- $f(x) = g(x) - g(x - 1)$ for each integer x
- $g(0) = 0$

Your task is to calculate polynomial $h(x) = g(x) / x$.

(Note : degree of polynomial h(x) = degree of polynomial f(x))

Input

The first line of input contain an integer T, T is number of test cases ($0 < T \leq 10^4$)

Each test case consist of 2 lines:

- First line of the test case contain an integer d, d is degree of polynomial f(x) ($0 \leq d \leq 18$)
- Next line contains d+1 integers $c_0, c_1 ... c_d$, separated by space, represent the coefficient of polynomial f(x) ($-2^{31} < c_0, c_1 ... c_d < 2^{31}$ and $c_d \neq 0$)

Output

For each test case, output the coefficient of polynomial h(x) separated by space. Each coefficient of polynomial h(x) is guaranteed to be an integer.

Example

Input:

```
5
0
13
1
-1 2
1
0 2
2
2 -5 9
3
23 9 21 104
```

Output:

```
13
0 1
1 1
1 2 3
31 41 59 26
```

Explanation

First Test Case

- $f(x) = 13$
- $g(x)$ that satisfy: $g(x) - g(x - 1) = f(x) = 13$ and $g(0) = 0$ is: $g(x) = 13x$
- $h(x) = g(x)/x$ so $h(x) = 13$
- output : 13

Second Test Case

- $f(x) = -1 + 2x$
- $g(x)$ that satisfy: $g(x) - g(x - 1) = f(x) = -1 + 2x$ and $g(0) = 0$ is: $g(x) = x^2$
- $h(x) = g(x) / x$ so $h(x) = x = 0 + 1x$
- output : 0 1

Third Test Case

- $f(x) = 0 + 2x$
- $g(x)$ that satisfy: $g(x) - g(x - 1) = f(x) = 2x$ and $g(0) = 0$ is: $g(x) = x + x^2$
- $h(x) = g(x) / x$ so $h(x) = 1 + 1x$
- output : 1 1

See also: Another problem added by Tjandra Satria Gunawan