# Problem J. Just Convolution

| | |
|---|---|
| Input file: | *standard input* |
| Output file: | *standard output* |
| Time limit: | 1 second |
| Memory limit: | 512 mebibytes |

Do you remember the problem "Just Composite" in NTU Final 2014? Here is another one of "Just" series. Of course, This one is easier. I would even give you a correct (but too slow) implementation in C++.

```
struct Con {
    int x;
    Con(int _x) : x(_x) {}
};
Con operator *(Con a, Con b) { return a.x + b.x; }
void operator +=(Con &a, Con b) { if (b.x > a.x) a.x = b.x; }

void convolution(int n, Con *a, Con *b, Con *c) {
    for (int i = 0; i < n; i++) c[i] = 0;
    for (int i = 0; i < n; i++)
        for (int j = 0; j < n; j++)
            c[(i + j) % n] += a[i] * b[j];
}
```

## Input

The first line contains an integer $n$. The second line contains $n$ integers $a_0, a_1, \ldots, a_{n-1}$. The third line contains $n$ integers $b_0, b_1, \ldots, b_{n-1}$.

- $1 \le n \le 2 \times 10^5$
- $0 \le a_i, b_i < n$
- $a$ is a permutation of $0, 1, \ldots, n-1$
- $b$ is a permutation of $0, 1, \ldots, n-1$
- The permutations $a$ and $b$ are generated randomly to make our life much more easier.

## Output

Please output the value of $c_0, c_1, \ldots, c_{n-1}$ in one line.

## Examples

| standard input |
|---|
| 5<br>3 4 2 0 1<br>2 3 0 4 1 |
| **standard output** |
| 6 6 7 7 8 |

| standard input |
|---|
| 10<br>9 2 0 1 6 3 4 5 8 7<br>3 8 0 9 7 1 4 2 6 5 |
| **standard output** |
| 15 17 16 18 16 14 14 15 15 16 |