1003.Find the Number of Paths

Input file:	standard input
Output file:	standard output
Time limit:	8 seconds
Memory limit:	512 megabytes

Huah has $n+k$ cities numbered $1, 2, ..., n+k$, the city $i (1 \le i < n+k)$ to the city $i+1$ has $n+k-i$ distinct one-way roads.

For each $x = 1, 2, ..., n-1$,the city $i (x < i \le n+k)$ to the city $i-x$ has a_x distinct one-way roads.

For $m = k+1, k+2, ..., k+n$,find the number of paths from city $k+1$ to city m that pass through exactly k number of roads.

Two paths are distinct when and only if the sequence of edges they pass through is distinct and the answer is modulo 998244353.

Input

First line has one integer $T (1 \le T \le 14)$, indicating there are T test cases. In each case:

First line input two integers $n, k (2 \le n \le 2 \times 10^5, 1 \le k \le 2 \times 10^5)$.

Second line $n-1$ integers $a_1, a_2, ..., a_{n-1} (0 \le a_i \le 998244352)$.

There is a blank line between case $i (1 \le i < T)$ and case $i+1$.

Input guarantee $\sum (n+k) \le 1006769$.

Output

In each case, output a row of n integers with the i-th integer being the answer when $m = k+i$.

Example

standard input	standard output
4 3 2 1 2 3 1 1 2 5 10 2 3 3 3 3 3 166374059 748683265	5 0 2 0 2 0 114307026 825469567 425461680 73846080 5140800 5 2 0