Power Problem

Let $g(a,b) = a^{b} \pmod{10^9 + 7} \\ f(a, b, c, d) = g(a, b)^{c^{d}} \pmod{10^9 + 7} $.

Constraints

$1 \le T \le 5 \times 10^5$

$1 \le a, b, c, d\lt 10^9$

Input Format

The first line contains T, number of test cases.

T lines follow. Each line contains four integers a, b, c, d.

Output Format

For each test case output a single integer $f(a, b, c, d)$.

Sample Input

```
1
2 2 2 2
```

Sample Output

```
256
```

Explanation

$g(2, 2) = 4 \\ f(2,2,2,2) = 4^{2^2} = 256$