# Problem B. Hack It!

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|---|---|
| Input file: | *standard input* |
| Output file: | *standard output* |
| Time limit: | 1 second |
| Memory limit: | 64 mebibytes |

Let $f(s)$ be a hash function of string $s$. If $s = s_0 s_1 \dots s_{n-1}$, $f(s) = (\sum_{i=0}^{n-1} w(s_i) base^i) \mod r$.

Teacher Mai wants to find two different regular bracket sequences $a$, $b$ with the same length $l \le 10^4$ and the same hash value ($f(a) = f(b)$), where $w(\text{“(”}) = p$, and $w(\text{“)”}) = q$.

Let us define a regular brackets sequence in the following way: Empty sequence is a regular sequence. If $S$ is a regular sequence, then $(S)$ is regular sequence. If $A$ and $B$ are regular sequences, then $AB$ is a regular sequence.

## Input

First line of the input contains integer $T$ ($1 \le T \le 100$) — number of test cases.

There are multiple test cases. All the test cases are generated randomly. For each test case, there is one line contains four numbers $p$, $q$, $r$, $base$ ($1 \le p, q, r, base \le 10^{18}$).

## Output

For each test case, print two different regular bracket sequences $a$, $b$ with the same length, does not exceeding $10^4$ and the same hash value $f(a) = f(b)$.

## Examples

| standard input | standard output |
|---|---|
| 1<br>4 7 37 10 | ((()))<br>()()() |