Project Euler #93: Arithmetic expressions

This problem is a programming version of Problem 93 from projecteuler.net

By using each of the digits from the set, ${1, 2, 3, 4}$, exactly once, and making use of the four arithmetic operations $(+, −, *, /)$ and brackets/parentheses, it is possible to form different positive integer targets.

For example,

$8 = (4 \times (1 + 3)) / 2$
$14 = 4 \times (3 + 1 / 2)$
$19 = 4 \times (2 + 3) − 1$
$36 = 3 \times 4 \times (2 + 1)$

Note that concatenations of the digits, like $12 + 34$, are not allowed.

Using the set, ${1, 2, 3, 4}$, it is possible to obtain thirty-one different target numbers of which 36 is the maximum, and each of the numbers 1 to 28 can be obtained before encountering the first non-expressible number.

Given a set of m distinct digits, S, find the largest possible integer n such that each integer from 1 to n is expressible using elements of S and following the above rules. If 1 is also not expressible, output 0 instead.

Constraints
$1\le m \le 5$

Input Format

The first line contains m.
The second line contains m space separated integers, the elements of S.

Output Format

Output a single integer, the answer to the problem.

Sample Input

```
4
1 2 3 4
```

Sample Output

```
28
```

Explanation

Explained in the statement.