
Parentheses and brackets

P36384_en

Examen final d'Algorismia, FME (2011-01-12)

Suppose that you have x pairs of parentheses and y pairs of brackets. In how many ways can you correctly put the parentheses and brackets?

For example, there are 15 ways with $x = 2$ and $y = 1$:

```
( ) ( ) [ ]      ( ) [ ( ) ]      ( ( ) [ ] )      ( [ ( ) ] )      [ ( ) ] ( )
( ) ( [ ] )      ( ( ) [ ] )      ( ( [ ] ) )      [ ] ( ) ( )      [ ( ) ( ) ]
( ) [ ] ( )      ( [ ] ) ( )      ( [ ] ( ) )      [ ] ( ( ) )      [ ( ( ) ) ]
```

The number of combinations grows very fast with x and y . Therefore, make the calculations modulo a given natural number m .

Input

Input consists of several cases. Every case has x , y and m . Suppose $0 \leq x \leq 50$, $0 \leq y \leq 50$, and $2 \leq m \leq 10^8$.

Output

For every case, print the number of correct ways to place x pairs of parentheses and y pairs of brackets, modulo m .

Hint

Consider the position of the counterpart of the first symbol.

Sample input

```
2 1 1000000
1 2 1000000
1 2 4
0 0 1000000
1 0 1000000
2 0 1000000
3 0 1000000
6 6 100000000
6 6 1000
50 50 100000000
```

Sample output

```
15
15
3
1
1
2
5
92203088
88
24825920
```

Problem information

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