
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 .

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

Author : Salvador Roura

Translator : Salvador Roura

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