

D. Nephren Runs a Cinema

time limit per test: 2.5 seconds

memory limit per test: 256 megabytes

input: standard input

output: standard output

Lakhesh loves to make movies, so Nephren helps her run a cinema. We may call it No. 68 Cinema.

However, one day, the No. 68 Cinema runs out of changes (they don't have 50-*yuan* notes currently), but Nephren still wants to start their business. (Assume that *yuan* is a kind of currency in Regulu Ere.)

There are three types of customers: some of them bring exactly a 50-*yuan* note; some of them bring a 100-*yuan* note and Nephren needs to give a 50-*yuan* note back to him/her; some of them bring VIP cards so that they don't need to pay for the ticket.

Now n customers are waiting outside in queue. Nephren wants to know how many possible queues are there that they are able to run smoothly (i.e. every customer can receive his/her change), and that the number of 50-*yuan* notes they have after selling tickets to all these customers is between l and r , inclusive. Two queues are considered different if there exists a customer whose type is different in two queues. As the number can be large, please output the answer modulo p .

Input

One line containing four integers n ($1 \leq n \leq 10^5$), p ($1 \leq p \leq 2 \cdot 10^9$), l and r ($0 \leq l \leq r \leq n$).

Output

One line indicating the answer modulo p .

Examples

input
4 97 2 3
output
13

input
4 100 0 4
output
35

Note

We use A, B and C to indicate customers with 50-*yuan* notes, customers with 100-*yuan* notes and customers with VIP cards respectively.

For the first sample, the different possible queues that there are 2 50-*yuan* notes left are AAAB, AABA, ABAA, AACC, ACAC, ACCA, CAAC, CACA and CCAA, and the different possible queues that there are 3 50-*yuan* notes left are AAAC, AACA, ACAA and CAAA. So there are 13 different queues satisfying the first sample. Similarly, there are 35 different queues satisfying the second sample.