Build Roads

Input file:	standard input
Output file:	standard output
Time limit:	2 seconds
Memory limit:	256 megabytes

In the cat country, there are n cities. The cat country king wants to build $n - 1$ roads to connect all the cities. The i-th city has a construction company with an experience value of a_i. To build a road between the i-th city and the j-th city, the two cities' construction companies need to cooperate with each other. However, in the process of building a road, the two construction companies may have conflicts due to poor communication, and it will result in a waste of building materials. Formally, building a road between the i-th city and the j-th city will waste $\gcd(a_i, a_j)$ building materials.

Can you help the cat country king choose to build $n - 1$ roads that connect all the cities and minimize the waste of building materials?

To decrease the input size, the king of the cat country gives you a random integer generator and 3 parameters $L, R, seed$. The following C language code shows how to generate n integers $a_1, a_2, \ldots, a_n$, and $a[i]$ stores the experience value of the construction company of the i-th city. You can use the code directly in your submissions.

```c
#include <stdio.h>

int n, L, R, a[200001];
unsigned long long seed;

unsigned long long xorshift64() {
  unsigned long long x = seed;
  x ^= x << 13;
  x ^= x >> 7;
  x ^= x << 17;
  return seed = x;
}

int gen() {
  return xorshift64() % (R - L + 1) + L;
}

int main() {
  scanf("%d%d%d%llu", &n, &L, &R, &seed);
  for (int i = 1; i <= n; i++) {
    a[i] = gen();
  }
  // ...
}
```

Input

The only line contains four integers $n, L, R, seed$ ($2 \leq n \leq 2 \times 10^5, 1 \leq L \leq R \leq 2 \times 10^5, 1 \leq seed \leq 10^{18}$).

Output

Print one integer – the minimum waste of connecting all the cities.

Example

standard input	standard output
5 1 200000 123	4