Problem A. Three Dimensions

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	256 megabytes

Let's define a strange "distance" between two lattice points $a = (x_a, y_a, z_a)$ and $b = (x_b, y_b, z_b)$ in three-dimensional space:

$$d(a,b) = \max\{|x_a - x_b|, |y_a - y_b|, |z_a - z_b|\} \oplus x_a \oplus y_a \oplus z_a \oplus x_b \oplus y_b \oplus z_b,$$

where $\max\{S\}$, $|x|$ and $\oplus$ correspond to the maximum value in S, the absolute value of x and the bitwise exclusive-or operator respectively.

Given six non-negative integers mx_a, my_a, mz_a, mx_b, my_b, mz_b, please calculate the sum of $d(a, b)$ for all lattice points a and b meeting the conditions that $x_a \in [0, mx_a]$, $y_a \in [0, my_a]$, $z_a \in [0, mz_a]$ and $x_b \in [0, mx_b]$, $y_b \in [0, my_b]$, $z_b \in [0, mz_b]$. Since the sum may be very large, please output it modulo 2^{30}.

Note that x_a, y_a, z_a, x_b, y_b, z_b should all be integers.

Input

The input only contains six non-negative integers mx_a, my_a, mz_a, mx_b, my_b, mz_b, each of which is not larger than 10^9.

Output

Output an integer denoting the sum modulo 2^{30}.

Example

standard input	standard output
3 2 1 2 1 3	778