You are given an array with n 64-bit integers: $d[0], d[1], \ldots, d[n-1]$.

BIT(x, i) = (x >> i) & 1. (where $B(x, i)$ is the i^{th} lower bit of x in binary form.)

If we regard every bit as a vertex of a graph G, there exists one undirected edge between vertex i and vertex j if there exists at least one k such that BIT(d[k], i) == 1 && BIT(d[k], j) == 1.

For every subset of the input array, how many connected-components are there in that graph?

The number of connected-components in a graph are the sets of nodes, which are accessible to each other, but not to/from the nodes in any other set.

For example if a graph has six nodes, labelled $\{1, 2, 3, 4, 5, 6\}$. And contains the edges $(1, 2), (2, 4) and (3, 5)$. There are three connected-components: $\{1, 2, 4\}$, $\{3, 5\}$ and $\{6\}$. Because $\{1, 2, 4\}$ can be accessed from each other through one or more edges, $\{3, 5\}$ can access each other and $\{6\}$ is isolated from everone else.

You only need to output the sum of the number of connected-component(S) in every graph.

Input Format

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n
d[0] d[1] ... d[n - 1]
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Constraints

$1 \leq n \leq 20$
$0 \leq d[i] \leq 2^{63} - 1$

Output Format

Print the value of S.