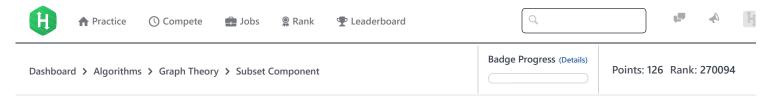
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Subset Component ■



Problem Submissions Leaderboard Discussions Editorial €

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

Constraints

$$1 <= n <= 20$$

 $0 <= d[i] <= 2^{64} - 1$

Output Format

Print the value of S.

Sample Input

3 2 5 9

Sample Output

504

{}

Explanation

There are 8 subset of $\{2, 5, 9\}$.

=> We don't have any number in this subset => no edge in the graph => Every node is a component by itself => Number of connected-components = 64.

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{2}

=> The Binary Representation of 2 is **00000010**. There is a bit at only one position. => So there is no edge in the graph, every node is a connected-component by itself => Number of connected-components = 64.

{5}

=> The Binary Representation of 5 is 00000101. There is a bit at the 0^{th} and 2^{nd} position. => So there is an edge: (0, 2) in the graph => There is one component with a pair of nodes (0,2) in the graph. Apart from that, all remaining 62 vertices are independent components of one node each (1,3,4,5,6...63) => Number of connected-components = 63.

{9}

=> The Binary Representation of 9 is **00001001**. => There is a 1-bit at the 0th and 3rd position in this binary representation. => edge: (0, 3) in the graph => Number of components = 63

 $\{2, 5\}$

- => This will contain the edge (0, 2) in the graph which will form one component
- => Other nodes are all independent components
- => Number of connected-component = 63

{2, 9}

- => This has edge (0,3) in the graph
- => Similar to examples above, this has 63 connected components

{5, 9}

- => This has edges (0, 2) and (0, 3) in the graph
- => Similar to examples above, this has 62 connected components

{2, 5, 9}

- => This has edges(0, 2) (0, 3) in the graph. All three vertices (0,2,3) make one component => Other 61 vertices are all independent components
- => Number of connected-components = 62

S = 64 + 64 + 63 + 63 + 63 + 63 + 62 + 62 = 504

f in
Submissions:1389
Max Score:50
Difficulty: Hard
Rate This Challenge:
☆☆☆☆☆

```
Current Buffer (saved locally, editable) & 40
                                                                                             Java 7
 1 ▼ import java.io.*;
 2 import java.util.*;
    import java.text.*;
 4
    import java.math.*;
 5
    import java.util.regex.*;
 6
 7 ▼ public class Solution {
 8
 9 ▼
         public static void main(String[] args) {
10 ▼
             /* Enter your code here. Read input from STDIN. Print output to STDOUT. Your class should be named Solution. */
11
         }
12
    |}
                                                                                                                       Line: 1 Col: 1
                       Test against custom input
                                                                                                          Run Code
                                                                                                                       Submit Code
1 Upload Code as File
```

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