Coding Area

N-pod Numbers

Problem Description

Consider the natural numbers 1, 2, 4. Using these numbers alone or in combinations (as sums), one can realize the following natural numbe
1
2
3 = 1 + 2
4
5 = 1 + 4
6 = 2 + 4
7 = 1 + 2 + 4
That's all!
Let us call 1, 2 and 4 as the "**seeds**" and the generated numbers 1 through 7 as the "**plants**".
Let us call a seed-list as an "**N-pod**" if its seeds are **distinct** and it generates plants 1 through N.
We shall confine ourselves to *natural number* (positive integer) seeds.
Hence 7-Pod-1 = {1, 2, 4} generates Plant-set {1, 2, 3, 4, 5, 6, 7}.
Note that seed-list {1, 2, 2, 2}, having the seed "2" repeated 3 times, also generates plants 1 through 7:
1
2
3 = 1 + 2
4 = 2 + 2
5 = 1 + 2 + 2
6 = 2 + 2 + 2
7 = 1 + 2 + 2 + 2
However, since the seed-list has non-distinct seeds, {1, 2, 2, 2} is not a pod.
Consider 7-Pod-2 = {1, 2, 3, 6}. We can check that this pod also generates 1 through 7:
1
2
3
4 = 1 + 3
5 = 2 + 3
6
7 = 1 + 6
Note that the number of seeds in 7-Pod-1 (3) is smaller than that (4) in 7-Pod-2. Let us call the numbers of seeds in a pod as its "**Len**
Hence 7-Pod-1-Length = 3 < 7-Pod-2-Length = 4.
Note also that the sum of the seeds in 7-Pod-1 (1 + 2 + 4 = 7) is smaller than that (1 + 2 + 3 + 6 = 12) of 7-Pod-2.
Let us call the sum of the seeds in a pod as its "**Sigma**". Hence 7-Pod-1-Sigma = 7 < 12 = 7-Pod-2-Sigma.
Consider the following 19-Pods that each have the least lengths and sigmas possible:
19-Pod-1 = {1, 2, 3, 4, 9}
19-Pod-2 = {1, 2, 3, 5, 8}
19-Pod-3 = {1, 2, 3, 6, 7}
19-Pod-4 = {1, 2, 4, 5, 7}
Note that the largest seed ("**max-seed**") in both 19-Pod-3 and 19-Pod-4 is 7, which is smaller than the max-seeds of the first two 19-Pod
Focusing on the 19-Pods that have max-seeds 7. let us calculate the **medians** of the seeds:
Median-19-Pod-3 = Median(1, 2, 3, 6, 7) = 3
Median-19-Pod-4 = Median(1, 2, 4, 5, 7) = 4

When number of seeds in pod is even then median has to be calculated as the average of middle two numbers.
The Median should be considered up-to accuracy of 2 decimal places.

Thus 19-Pod-3 is the *least-Length, least-sigma, least-max-seed* and *least-median* 19-Pod. Let us call such a pod as "**Atomic**".
Thus ***an Atomic N-Pod is a least-Length, least-sigma, least-max-seed and least-median pod that consists of seeds generating all the pla***
Here's the problem: *Accept number N and identify all Atomic N-pods.*

Constraints

1 <= N <= 35

Input Format

First line contains Integer N.

Output

Atomic N-pods separated by OR arranged in ascending order if there are multiple such pods. Within a pod, arrange the seeds in ascending order.

Explanation

Example 1: Input: 7
Output: {1,2,4}
Example 2:
Input: 32
Output: {1,2,3,7,9,10}OR{1,2,4,6,9,10}

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I, **vishal agrawal** confirm that the answer submitted is my own.

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