Codeforces Problem 1945H

> **Problem.** Given an array a and an integer x, determine (if one exists) a pair of elements (a_i, a_j) such that $\gcd(a_i, a_j)$ is strictly greater than $x + \bigoplus_{k \neq i,j} a_k$, where $\oplus$ denotes bitwise AND.

Solution. We shall inspect the first obvious solution path, which is determining the maximum value of the gcd over all pairs. More specifically, we wish to know whether there exists an array such that

- For any pair where the gcd is maximized, the bitwise AND of the remaining elements is not lesser and
- For some pair where the gcd is not maximized, the bitwise AND of the remaining elements is lesser .

We conjecture, however, that such an array does not exist.