

HCF or GCD of an Array

Given an array of numbers, find HCF of the array elements.

Examples:

Input : arr[] = {1, 2, 3}

Output : 1

Input : arr[] = {2, 4, 6, 8}

Output : 2

Explanation:

The HCF of three or more numbers equals the product of the prime factors common to all the numbers, but it can also be calculated by repeatedly taking the HCF of pairs of numbers.

$$\begin{aligned} \text{hcf}(a, b, c) &= \text{hcf}(a, \text{hcf}(b, c)) \\ &= \text{hcf}(\text{hcf}(a, b), c) \\ &= \text{hcf}(\text{hcf}(a, c), b) \end{aligned}$$

For an array of elements, we do the following. We will also check for the result if the result at any step becomes 1 we will just return the 1 as $\text{hcf}(1, x) = 1$.