

1. Let  $f[y]$  denote the gcd of all numbers being a multiple of  $y$ . When we insert a new number  $x$ , update all  $f[y]$  where  $y$  is a factor of  $x$ .  $O(n \cdot \sigma(U) \cdot \log U) = n \cdot 2^{O(\frac{\log U}{\log \log U})}$ .
2. We can get gcd  $x$  iff the gcd of all  $a[i]$ 's being a multiple of  $x$  equals to  $x$ .  $O(\sum_{i=1}^U \frac{U}{i}) = O(U \log U)$ .

## References