

Missing Numbers Topics | Algorithms Question

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Caching

Caching or Indexing is a technique used to store counts of values which lie in a small range.

Example:

You are given a million numbers in a range, say $\in [1, 1000]$; now, if ordering is not important, a good way to store these value is to create an array of size 1000 and simply update counts of each index.

This has many benefits in simple array-based problems and string problems.

A more advanced topic is hashing, where large values of x can be hashed into small index values with a collision probability which, if below a certain value, can be used in practice.

Usage:

Such mapping of elements from larger domain to comparatively smaller domain is useful when we need to compare elements only with $>$ or $<$ symbol. For example Coordinate Compression is useful in case of Longest Increasing Subsequence Problem and some other problems if

$$A_i \leq 10^9 \text{ and } N \leq 10^5.$$