Reflection:2

Array Query Problem

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1. Look-Up table:

- It is a 'Key-Value' pair approach, keeping track of minimum value present
  it the array.
- It has processing time of O (n^2) and fetch time of O (1).
- Application: Lookup table is used to save data in the format of key-value and hence makes the system faster.

2. Square root decomposition method:

- Here the array is decomposed into smaller blocks.
- O(n) is the time complexity of the array whereas O ($\sqrt{n}$) is the time complexity of the decomposed array.
- Applications: Square root Decomposition method is useful to perform some common operations like finding sum of the elements of the sub-array, finding the minimal/maximal element etc in O ($\sqrt{n}$) operations, which is much faster than O(n) of brute force methods.

3. Segment Tree:

- It is a strictly binary tree, following a bottom up approach in the tree construction.
- Time complexity for tree construction is O(n) and time complexity for the number of
- comparisons are O(Log(n)).
- Application: Segment Trees can be used to solve Range Min/Max & Sum Queries and Range Update Queries in O (log n) time.