Reflection – 2

Array Query problems:

1. **Look-Up table technique:**
   - A key-value pair approach
   - Keeps track of index of minimum value present in the array
   - Application: sum array, max element, min element, array query problem
   - Memory Usage: $O(n^2)$
   - Processing Time: $O(n^2)$
   - Fetch Time: O(1)

2. **Square root decomposition:**
   - It decomposes given array into small blocks
   - processing time for scanning n array is O(n)
   - whereas, processing or searching time for decomposed array is O(Sqrt(n))

3. **Segment Tree:**
   - It is strictly binary tree
   - Follows bottom up binary tree approach for populating the tree
   - Creates query paths that limits the amount of processing required
   - Useful when frequently working with ranges of numerical data
   - Time complexity for tree construction: O(n)
   - Time complexity for no. of comparisons: O(Log(n))