

Data Structures and Algorithms

Project Evaluation Sheet

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Algorithm/Data Structure	Used?	How and Where?	Space Efficiency	Time Efficiency
Structures	Yes	Multiple structs are defined for incidents, resources, shelters, community members, etc. Depends on the size and number of instances	$O(n)$	-
List	Yes	Used in binary search tree	-	-
Stack	Yes	Used in the stack struct for keeping track of recent choices in the menu.	$O(n)$	$O(n)$
Queue	Yes	Used in the queue struct for BFS traversal of the connectivity graph.	$O(n)$	$O(n)$
Binary Tree	Yes	Used in the BST struct for resource storage.	$O(n)$	$O(n)$
Binary Search Tree	Yes	Used for resource storage in rBST .	$O(n)$	Insertion- Worst- $O(n^2)$ Average- $O(n \log n)$ Search- Worst- $O(n)$ Average- $O(\log n)$
AVL Tree	No	-	-	-
2-3 Tree	No	-	-	-
Red-Black Tree	No	-	-	-
Trie	No	-	-	-
Heap	Yes	Used in the heapSort function for sorting shelters.	$O(n)$	$O(n \log n)$
Lookup Table	No	-	-	-
Sparse Table	No	-	-	-
Fenwick Tree	No	-	-	-
Segment Tree	No	-	-	-
Skip List	No	-	-	-
Union-Find	No	-	-	-
Hashing	Yes	Used for efficient incident lookup in the hash struct.	$O(n)$	Worst- $O(n)$ Average- $O(1)$
DFS	No	-	-	-
BFS	Yes	Used for connectivity checking in the bfs	$O(n)$	$O(n + m)$

		function.		
Bubble Sort	No	-	-	-
Selection Sort	No	-	-	-
Insertion Sort	No	-	-	-
Quick Sort	Yes	Used in the <code>quicksort</code> function for sorting incidents based on their location.	$O(n)$	Worst- $O(n^2)$ Average- $O(n \log n)$
Merge Sort	Yes	Used in the <code>mergeSort</code> function for sorting resources urgency.	$O(n)$	$O(n \log n)$
Brute Force String Search	No	-	-	-
Rabin Karp	Yes	Used in the <code>search1</code> function for shelter search.	$O(n)$	Average- $O(n+m)$ Worst- $O(n * m)$
Boyer-Moore	No	-	-	-
Knuth-Morris-Pratt	Yes	Used for searching resources.	$O(m+n)$	$O(m*n)$
Heap Sort	Yes	Used for sorting shelters based on the safety score in the <code>heapSort</code> function.	$O(n)$	$O(n \log n)$
Kruskal	No	-	-	-
Prim	No	-	-	-
Dijkstra	No	-	-	-
Floyd	No	-	-	-
Warshall	No	-	-	-
Bellman-Ford	No	-	-	-
Any Other	No	-	-	-