List of data structures

This is a list of data structures. For a wider list of terms, see list of terms relating to algorithms and data structures. For a comparison of running time of subset of this list see comparison of data structures.

1 Data types

1.1 Primitive types

- Boolean, true or false
- Character
- Floating-point, single-precision real number values
- Double, a wider floating-point size
- Integer, integral or fixed-precision values
- String, a sequence of characters
- Reference (also called a pointer or handle), a small value referring to another object's address in memory, possibly a much larger one.
- Enumerated type, a small set of uniquely-named values

1.2 Composite types or Non-primitive type

- Array
- Record (also called tuple or struct)
- Union
- Tagged union (also called variant, variant record, discriminated union, or disjoint union)

1.3 Abstract data types

- Container
- List
- Associative array
- Multimap
- Set
- Bag
- Multiset
- Stack
- Queue
- Double-ended queue
- Priority queue
- Tree
- Graph

Some properties of abstract data types:

2 Linear data structures

A data structure is said to be linear if its elements form a sequence.

2.1 Arrays

- Array
- Bit array
- Bit field
- Bitboard
- Bitmap
- Circular buffer
- Control table
- Image
- Dope vector
- Dynamic array
- Gap buffer
- Hashed array tree
- Heightmap
- Lookup table
- Matrix
- Parallel array
- Sorted array

- Sparse array
- Sparse matrix
- Iliffe vector
- Variable-length array

2.2 Lists

- Doubly linked list
- Array list
- Linked list
- Self-organizing list
- Skip list
- Unrolled linked list
- VList
- Conc-Tree list
- Xor linked list
- Zipper
- Doubly connected edge list
- Difference list
- Free list

3 Trees

Main article: Tree (data structure)

3.1 Binary trees

- AA tree
- AVL tree
- Binary search tree
- Binary tree
- Cartesian tree
- Left-child right-sibling binary tree
- Order statistic tree
- Pagoda
- Randomized binary search tree
- Red–black tree
- Rope
- Scapegoat tree
- Self-balancing binary search tree
- Splay tree
- T-tree
- Tango tree
- Threaded binary tree
- Top tree
- Treap
- WAVL tree
- Weight-balanced tree

3.2 B-trees

- B-tree
- B+ tree
- B*-tree
- B sharp tree
- Dancing tree
- 2-3 tree
- 2-3-4 tree
- Queap
- Fusion tree
- Bx-tree
- AList

3.3 Heaps

- Heap
- Binary heap
- Weak heap
- Binomial heap
- Fibonacci heap
    - AF-heap
- Leonardo Heap
- 2-3 heap
- Soft heap
- Pairing heap
- Leftist heap

- Treap
- Beap
- Skew heap
- Ternary heap
- D-ary heap
- Brodal queue

3.4 Trees

In these data structures each tree node compares a bit slice of key values.

- Trie
- Radix tree
- Suffix tree
- Suffix array
- Compressed suffix array
- FM-index
- Generalised suffix tree
- B-trie
- Judy array
- X-fast trie
- Y-fast trie
- Merkle Tree
- Ctrie

3.5 Multiway trees

- Ternary tree
- K-ary tree
- And–or tree
- (a,b)-tree
- Link/cut tree
- SPQR-tree
- Spaghetti stack
- Disjoint-set data structure
- Fusion tree
- Enfilade
- Exponential tree
- Fenwick tree
- Van Emde Boas tree
- Rose tree

3.6 Space-partitioning trees

These are data structures used for space partitioning or binary space partitioning.

- Segment tree
- Interval tree
- Range tree
- Bin
- K-d tree
- Implicit k-d tree
- Min/max k-d tree
- Relaxed k-d tree
- Adaptive k-d tree
- Quadtree
- Octree
- Linear octree
- Z-order
- UB-tree
- R-tree
- R+ tree
- R* tree
- Hilbert R-tree
- X-tree
- Metric tree
- Cover tree
- M-tree
- VP-tree
- BK-tree
- Bounding interval hierarchy
- Bounding volume hierarchy
- BSP tree
- Rapidly exploring random tree

3.7 Application-specific trees

- Abstract syntax tree
- Parse tree
- Decision tree
- Alternating decision tree
- Minimax tree
- Expectiminimax tree
- Finger tree
- Expression tree
- Log-structured merge-tree
- Lexicographic Search Tree

4 Hashes

- Bloom filter
- Count-Min sketch
- Distributed hash table
- Double Hashing
- Dynamic perfect hash table
- Hash array mapped trie
- Hash list
- Hash table
- Hash tree
- Hash trie
- Koorde
- Prefix hash tree
- Rolling hash
- MinHash
- Quotient filter
- Ctrie

5 Graphs

- Graph
- Adjacency list
- Adjacency matrix
- Graph-structured stack
- Scene graph
- Binary decision diagram
- Zero-suppressed decision diagram
- And-inverter graph
- Directed graph
- Directed acyclic graph
- Propositional directed acyclic graph
- Multigraph
- Hypergraph

6 Other

- Lightmap
- Winged edge
- Doubly connected edge list
- Quad-edge
- Routing table
- Symbol table

7 External links

- Tommy Benchmarks Comparison of several data structures.

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8.1 Text

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