Data Structures

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Arrays

- Consist of *elements*
- Homogenous data type
- Accessed by *index*
  - Zero-based indexing
- [ ]

Aggregates

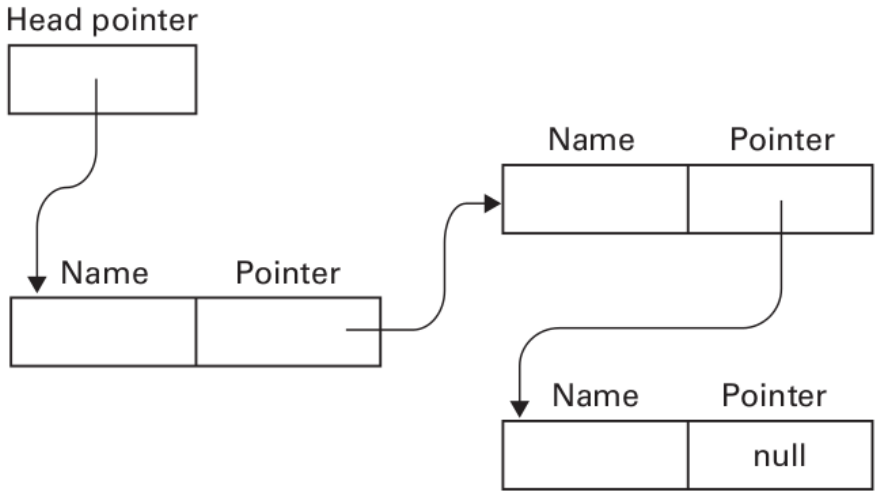
- Consist of *fields*
- Heterogeneous data types
- Accessed by *field name*
- .

Static vs. Dynamic

- Arrays are *static*
  - Size not easily changed
- Advantage: Easy (fast) to look stuff up
- Disadvantage: Hard (slow) to add past end

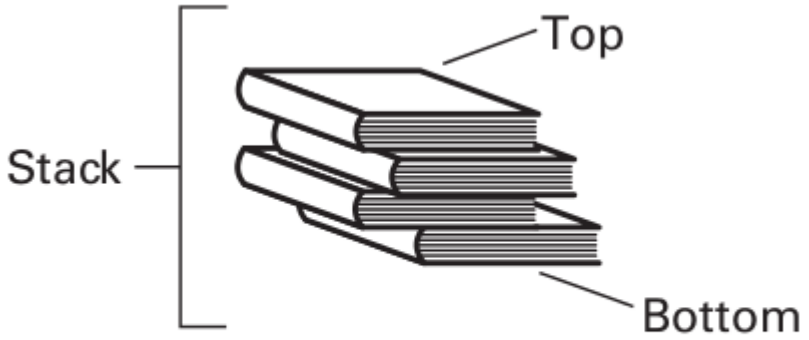
Linked Lists

- Head, Tail
- *Dynamically* allocated (as program runs)
- Time and Space tradeoffs vs. Arrays



Stacks

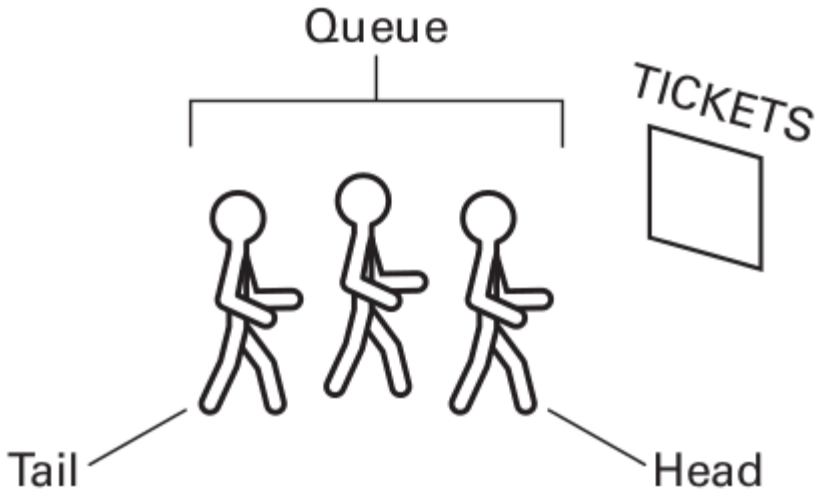
- Last-In, First-Out (*LIFO*)
- Operations:
  - push()
  - pop()
  - top()



- Real examples: Pez dispensers, dining hall dish/glass stacks

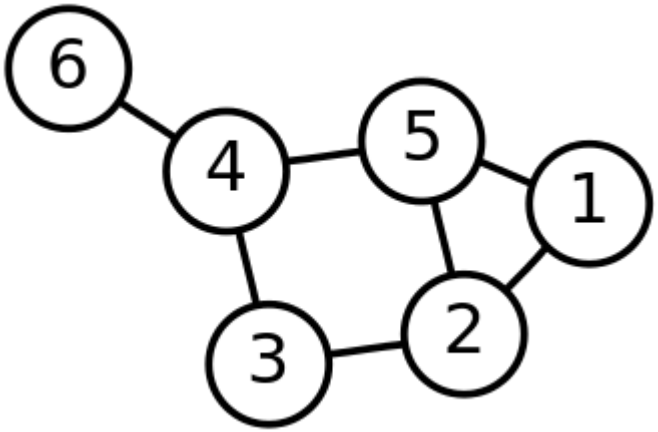
Queues

- First-In, First-Out (*FIFO*)
- Operations:
  - enqueue()
  - dequeue()
- Real examples:
  - Grocery store lines
  - Operating System queues



Other Linked Structures

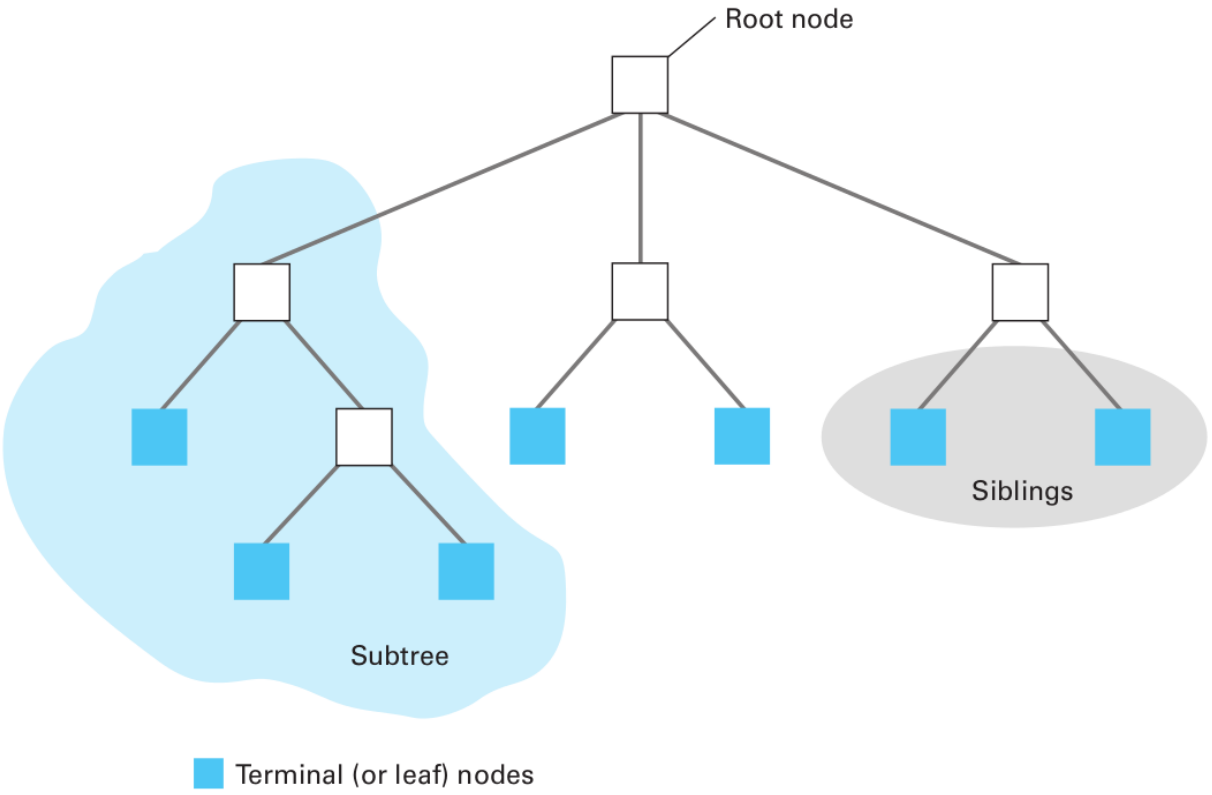
- Graphs (Networks)
  - Nodes (Vertices)
  - Edges (Arcs)



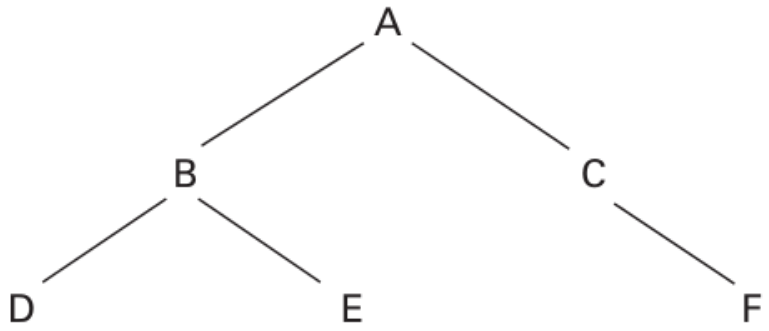
* - Wikipedia 6n-graf.svg

Other Linked Structures

- Trees
  - Root
  - Child
  - Leaf
  - Sibling



Conceptual tree



Actual storage organization