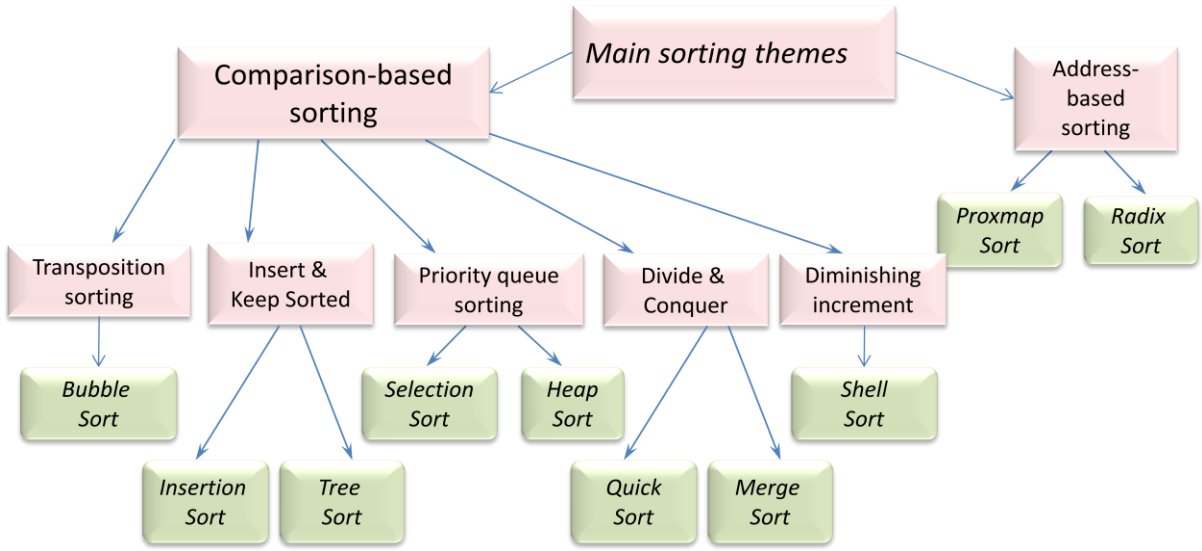
DEFINITION

- Let A be a list of elements A_1, A_2, …, A_n in memory
- Sorting A refers to the operation of rearranging the contents of A so that they are in increasing in order (numerically or lexicographically) so that

  $A_1 \leq A_2 \leq A_3 \leq \ldots \leq A_n$
- Since A has n elements, there are n! ways that the contents can appear in A
- These ways correspond to the n! permutations of 1, 2, …, n
- Accordingly, each sorting algorithm must take care of these n! possibilities

SORTING METHODS



SORTING APPLICATIONS

- Sort a list of names
- Organize an MP3 library
- Display Google PageRank results
- Find the median
- Find the closest pair
- Binary search in a database
- Find duplicates in a mailing list
- Data compression
- Computer graphics
- Supply chain management
- Book recommendations on Amazon
- Load balancing on a parallel computer