**What is Backtracking?**

Backtracking is a method of exhaustive search using divide and conquers.

* Sometimes the best algorithm for a problem is to try all possibilities.
* This is always slow, but there are standard tools that can be used to help.
* Tools: algorithms for generating basic objects, such as binary strings [2n possibilities for n-bit string], permutations [n!], combinations [n!/r!(n-r)!], general strings [k – ary strings of length n has kn possibilities], etc…
* Backtracking speeds the exhaustive search by pruning.

**Example Algorithms of Backtracking**

* Binary Strings: generating all binary strings
* Generating k-ary Strings
* The Knapsack Problem
* Generalized Strings
* Hamiltonian Cycles
* Graph Coloring Problems